

# University of Kentucky Department of Entomology Academic Year 2021-2022 Periodic Program Review

Department of Entomology  
Periodic Program Review 2016-2022

Submitted by Dr. S.R. Palli, Chair, Department of Entomology

Self-Study Report Committee

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Submitted to Dr. Nancy Cox, Dean College of Agriculture, Food and Environment and Entomology  
Department Program Review Committee

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## **I. Overview**

The University of Kentucky Department of Entomology is comprised of ~125 individuals (Figure 1, Table 1); it is one of the oldest continuously operating intact departments of entomology in the nation and among the most productive. Four faculty members have served as President of the Entomological Society of America (ESA), the world's largest and most significant organization of entomologists, six have been elected as prestigious ESA Fellows, and one current faculty member is an elected member of the American Association for Advancement of Science. The department has been designated as a Top 10 Entomology Program by the *Chronicle of Higher Education* Faculty Scholar Activity Index. This outstanding level of recognition arises from a rich legacy of vibrant and progressive scholarship, an innovative and caring educational approach, and forward-thinking extension and outreach programming coupled with strong and steady leadership.

For over 130 years, members of the Department of Entomology have been committed to providing dynamic, high-quality programs. We are continually looking for new and exciting opportunities and adapting our current programs to enhance our ability and capacity to meet society's changing needs. We strive to develop long-term solutions to entomologically related issues while providing answers that address immediate short-term problems through creative synergies between fundamental and applied entomological research. We actively integrate research and extension efforts to address emerging issues, enhancing our effectiveness and visibility rapidly. We integrate graduate education with our research and extension activities, further strengthening our outcomes. Examples of our response effectiveness include developing solutions associated with the recent world-wide outbreak of bed bugs, the emergence of ticks and tick-borne illnesses, pressing needs associated with pollinator decline and invasive species mitigation, and alleviating insect-related effects of stresses associated with our changing climate. Each area demonstrates rapid responses to critical needs on a local, national, and global scale.

# Department of Entomology

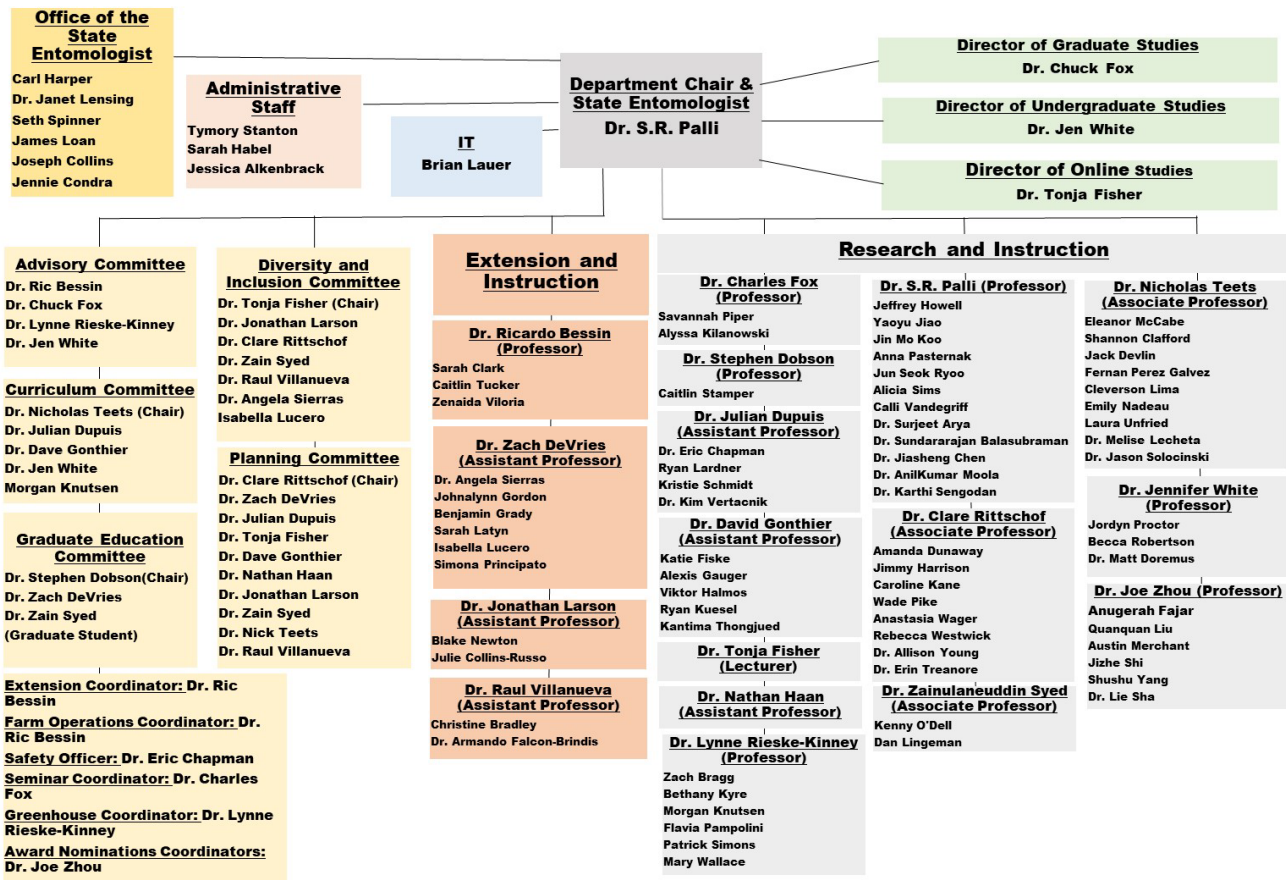


Figure 1. Organizational chart of the University of Kentucky Department of Entomology, July 2022.

Table 1. Current positions and average salary by position in the Department of Entomology, July 2022.

Job Title	No. Positions	Average Salary
Administrative Support Staff	4	\$49,479
Faculty	16	\$105,524
Graduate Research Assistant	35	\$25,000
Laboratory Technician	11	\$36,427
Post-Doctoral Scholar	11	\$47,476
Program Coordinator I	1	\$56,848
Research Analyst	4	\$42,408
Scientist II	1	\$64,708
State Entomologist Office	4	\$59,972
Student/Non-work Study	21	\$5,500
Temporary Professional Non-Admin	3	\$6,000
Temporary Technical/Paraprofessional	17	\$30,000
Total	126	

We excel in graduate training and education, research, teaching, and extension. Department of Entomology faculty actively engage in several undergraduate degree and certification programs, both within the College and in other colleges within the University. We offer an individualized program in Entomology within the BS program in agriculture. Our faculty support the College and the University by teaching undergraduate courses that are required for several majors within the College of Agriculture, Food and Environment (CAFE) (e.g., Forestry, Horticulture, and Plant and Soil Sciences) and Arts and Sciences (Biology). For over 21 years, the Department has taught Insect Biology (ENT 110) every semester, which fulfills a natural sciences requirement in the current UK Core - General Education Requirements at the University of Kentucky. Bees and People (ENT 209) and Plagues, Pests, and Pestilence (ENT 220) also fulfill UK Core education requirements (Natural Sciences and Global Dynamics cores, respectively). Thus, even without a formal undergraduate entomology degree program, departmental faculty make substantial contributions to undergraduate teaching.

Department of Entomology faculty are dedicated and take pride in their department and in their responsibilities; ties to the department are strong. Faculty composition is dynamic yet stable, with new hires replacing retirees who have departed after ~35-40 years of service. Currently, the department has five faculty at the Assistant Professor level and one faculty Lecturer, with another additional hire joining within the next 12 months. There are three faculty at the Associate Professor level and seven at the Professor level. Several of our nine emeritus faculty remain actively involved in the department's mission. Support for new faculty hires is strong, with competitive startup packages provided in support of their research programs. In addition to laboratory space, new faculty members receive substantial funding for equipment and supplies, funding for a graduate Research Assistant for four to five years, and funding for a laboratory/ field technician for five years. Field-oriented researchers are allotted monies to purchase a vehicle for field research, a storage/mobile lab unit on the research farm, and help secure land for field research.

The Department of Entomology maintains internal Rules of Procedure, which were revised, approved by the faculty and administration, and implemented in April 2016.

See:

<https://www.uky.edu/universitysenate/sites/www.uky.edu.universitysenate/files/Rules/PriorYears/CAFE%20ENT%20RoP%20approved%20by%20provost%2004%2028%202016.pdf>

In addition, the department adheres to the Rules of Procedure as amended by the College of Agriculture, Food and Environment on May 09, 2019, and approved by faculty vote on Aug 16, 2019. See: [http://administration.ca.uky.edu/files/2019\\_cafe\\_rop\\_08-21-19.pdf](http://administration.ca.uky.edu/files/2019_cafe_rop_08-21-19.pdf)

## **A. Mission and values for the Department of Entomology and alignment with College and University**

The mission of the Department of Entomology is to safeguard and enhance the quality of human and animal life and to protect our environment through an improved understanding of insects and related arthropods. We conduct fundamental and applied research on arthropods; deliver information through education, extension, and outreach activities; educate and train graduate and undergraduate students and post-doctoral scholars; develop and provide resources to professionals involved in managing arthropod populations that affect plant, animal and human health; implement integrative and effective systems for pest/vector management and environmental protection, and enhance science education and public knowledge of and appreciation of human-arthropod interactions. We continually strive for programmatic improvements and student success. Our core values include the personal and professional development of our faculty and staff; promoting diversity, inclusion, and equity among our students, faculty, and staff; and being a collaborative part of the University of Kentucky (UK) and of the College of Agriculture, Food and Environment (CAFE).

**Alignment with Goals and Values of UK.** The Department of Entomology supports the mission and goals outlined in the [University of Kentucky Strategic Plan](#) and embraces the core values of the University. Specifically, the Department supports the following Strategic Objectives in the updated 2021 Strategic Plan:

- Putting Students First. Student success is our collective objective. We strive to offer an integrated education process where the student and their academic journey are the centerpieces, surrounded by services and professional development opportunities in a culture of supportive faculty, staff, and fellow students. We are dedicated to facilitating student success. The Department exemplifies this goal by elevating student opportunities for professional development at every opportunity (travel awards, publication scholarships, seminars, etc.).
- Taking Care of our People. We undertake scholarship, creative endeavors, research, and outreach across the full range of disciplines and structure our graduate programs to transform our students into accomplished scholars and professionals, to focus on addressing the most important challenges of the Commonwealth, our nation, and the world to assure the well-being of our people. We are dedicated to innovation as a means of equity for all.
- Inspiring Ingenuity. In our educational and research mission, we use convergent approaches that deliberate on problem formulation, use a systems-level perspective, and employ flexible but persistent problem-solving skills that become the framework to inspire ingenuity in our students, faculty, and staff. We are dedicated to problem solving. Research and mentoring efforts in the



department are cross-disciplinary and highly collaborative, generating diverse and nimble problem-solving capacity.

- Trust, Transparency and Accountability. We have a heightened responsibility to ensure trust as a core value of our community, and to increase accountability and transparency. We are dedicated to instilling a sense of trust and we use regular faculty and staff meetings to ensure transparent communication.
- Many People, One Community. We are committed to enhancing the diversity and inclusivity of our University community through recruitment, promotion, and retention of an increasingly diverse population of faculty, administrators, staff, and students and by implementing initiatives that provide rich diversity-related experiences for all to help ensure their success in an interconnected world. We are dedicated to modeling unity.

**Alignment with Goals and Values of CAFE.** The Department of Entomology supports the mission and goals outlined in the [College of Agriculture, Food and Environment Strategic Plan](#) and embraces the core values of the University. Specifically, the Department of Entomology supports the following Strategic Objectives in the 2015-2020 Strategic Plan:

- Prepare highly motivated and culturally adaptive graduates who are competitive in a global economy and support societal values.
- Build and nurture relationships with the people of the Commonwealth and across the world.
- Recruit, develop, and retain exceptional faculty and staff who are leaders in expanding knowledge to improve the quality of life and sustainability of the human and physical environment.
- Show CAFE commitment to diversity and inclusion to attract and retain students, staff and faculty and provide a culturally aware environment for successful engagement in a global society.
- Produce innovative solutions through multidisciplinary collaborations
- Build state-of-the-art facilities equipped with cutting-edge technology.

## **B. Recommendations and changes from the most recent periodic review**

The Department of Entomology underwent a periodic review in 2016-2017.

In the 2017 Self-Study document, the Department outlined four specific areas for improvement. These areas reflect the results of a 2015 UK Human Resources survey and include:

- Improve laboratory and office space
- Move Entomology Faculty out of the Animal Pathology (Dimmock) Building.
- Renovate laboratory space in Ag. Science North.
- Move molecular biology research to the Plant Science Building.

Space quantity and quality continue to be challenging. While Animal Pathology remains a resource for certain components of several programs, no research programs are entirely housed there, an improvement from the last review. Additionally, we have undertaken extensive renovations in Ag. Science North, and as of June 2022, there have been 12 laboratories and 45 offices renovated. Entomology has a strong research presence in the Plant Science Building, but as additional faculty embrace molecular tools in their research programs, it becomes an unrealistic goal to fully consolidate.

In addition to holding a regularly scheduled faculty retreat (which is now done annually), the following

recommendations were made by the External Review Committee in Feb 2017 and agreed upon by the Chair and CAFE Dean in April 2017.

1. The future focus of the department and new faculty hires. Develop a transition strategy to manage retirement of key extension personnel to ensure program continuity for stakeholders and county agents. Consider transfer of some federally mandated programs to the college.

ACTIONS:

- a. In Faculty meetings and at Faculty retreats, a significant amount of time is spent articulating the vision and guiding development of the Department of Entomology's long-range strategic plan. Faculty meetings are held monthly during the academic year, and the Faculty retreat has become an annual event.
  - b. In 2018, a departmental planning committee consisting of all junior faculty (Assistant and Associate Professors) was formed. This committee formulated four new faculty positions that were designed to replace several retirees. The committee's method was to identify the key conceptual areas of expertise and teaching abilities of departing members. They then identified cutting-edge methods, tools, approaches, and areas of emphasis in the field of entomology that intersect with these areas and abilities. Merging these pieces, the committee then crafted position descriptions that targeted well-trained scientists whose modern and exciting research programs simultaneously balance the intellectual losses associated with retirements. These positions were presented to the faculty for feedback, and two hires so far have been made.
  - c. Administration of the federally mandated Pesticide Applicator Training program has been reorganized and handled by Dr. Bessin.
2. Review the suitability, relevance, and availability of all departmental course offerings. Develop a plan to enhance undergraduate enrollment and course offerings.

ACTION:

The Curriculum Committee critically evaluates graduate and undergraduate course offerings at least annually. Since the last review, we have created numerous additional courses, including an online version of ENT 110, Insect Biology; ENT 209, Bees and People; ENT 220, Plague, Pests, and Pestilence: History and Global Perspective; ENT 509, Brains and Buds: Neuroscience of Pollination; ENT 695, Agroecology; and importantly, ENT 770, Practicum in Entomology Teaching. Additionally, we have or are in the process of removing obsolete courses from the books that haven't been offered due to a lack of interest, relevance, or an instructor.

3. Create meaningful graduate Research Assistants' opportunities for teaching experiences and access to travel funds. Critically evaluate Research Assistant stipends.

ACTIONS:

- a. Faculty approved creation of an *ENT 770 Topical Seminar: Practicum in Teaching* to provide opportunities and academic credit for teaching experiences for graduate students. Since its initial offering in 2018, 21 graduate students have taken advantage of teaching opportunities both within

and outside of ENT courses. Students and instructors work with the DGS to ensure these opportunities are meaningful and contain elements beyond simple grading assistance.

- b. There are 2 paid Teaching Assistantships (one each for ENT 110 and ENT 209) and one paid grader for ENT 110.
- c. Graduate students are provided up to \$400 travel support for one conference presentation per year if nominated by their faculty advisor.
- d. Graduate Research Assistant stipends have increased incrementally. In 2018 RA stipends were \$18,000 annually, in addition to health insurance and tuition. In Fall 2022 RA stipends are \$25,000 (an annual increase averaging \$1750), again with health insurance and tuition covered. These are competitive with our benchmark institutions, which range from \$19-\$32K.

- 4. Consolidate the department into a single location.

**ACTION:**

Without additional infrastructure, this remains an elusive goal.

- 5. Identify mechanisms to increase collaborative research within the department and across colleges.

**ACTION:**

There are numerous federal grant programs that encourage collaborations within the department and across departments and colleges; we have 107 federal grants that include collaborators outside our department. These collaborations stem from common research interests but also service teaching and undergraduate mentoring efforts that build broader communities beyond the department. Faculty have also applied for several university-level funding mechanisms designed to enhance intercollege collaboration. These include the Ignite program, programs offered by the Office of the Vice President for Research, the Commonwealth Undergraduate Research Experience fellowship to fund undergraduate summer research, and the Research Priority Area Program. Faculty are encouraged to explore collaborative opportunities through mechanisms such as NSF Center for arthropod management technologies, CAMTech.

- 6. Develop opportunities for staff professional development, career enhancement, and social event planning.

**ACTION:**

Professional development is 5% of staff effort. Department staff members are encouraged as part of their benefits package to take advantage of 1) UK's Staff Professional Development Fund, which provides a match for funds related to staff travel and training, 2) the opportunity to enroll in one UK course per semester, and 3) MyUK learning platform for unlimited web-based training. Additionally, a Departmental Social Committee actively seeks opportunities to increase social interactions and group activities; this has been particularly challenging the past two years due to covid constraints.

7. Support in-state travel by extension faculty.

**ACTION:**

After multiple discussions with Associate Deans of Extension, this suggestion has not been implemented due to lack of funding.

### **C. Self-Study process**

February 2022 Department of Entomology Chair Dr. Reddy Palli appointed a faculty Departmental Review Committee consisting of Drs. Lynne Rieske-Kinney, Clare Rittschof, Ric Bessin, Zach DeVries, and Ken Haynes. Chuck Fox joined the committee with the retirement of Ken Haynes July 01.

March 9, 2022. Committee met and Dr. Palli provided guidelines and a timeline for the completion of this Self-Study document.

May – July 2022. Committee developed Self-Study document.

July 2022. Department Chair and Review Committee solicited faculty input.

August 2022. Departmental retreat for faculty, staff, and student input.

October 2022. Finalized by Department and forwarded.

## **II. DEGREE AND CERTIFICATE PROGRAMS**

The Department of Entomology offers graduate programs leading to the Doctor of Philosophy and the Master of Science thesis (Plan A) or non-thesis (Plan B) degrees. The non-thesis Plan B MS can be completed in person or online, which began in August 2019 and graduated the first two students in December 2021. 57% of the current graduate students are Ph.D. students, 28% are MS Plan A students, and 15% are MS Plan B students.

1. Doctor of Philosophy. Requires original research for the preparation of a dissertation and 36 credit hours of coursework. Of our current graduate students, 57% are enrolled in the Ph.D. program. Of those, 65% are female and 31% are international. We confer an average of 3.6 Ph.D. degrees per year (Figure II.1) (50 Ph.Ds over a 14-year period).
2. MS Plan A. Requires research for the production of a thesis and 30 credit hours of coursework. Of the current graduate students, 28% are MS Plan A students. Of those, 50% are female and 14% are international. We confer an average of 3.1 MS Plan A degrees per year (44 over a 14-year period).
3. MS Plan B. Requires completion of a practicum and 36 credit hours of coursework. MS Plan B (Non-Thesis) students comprise 15% of our graduate students. Of those, 75% are female and none are international. The MS Plan B option is continually evolving as the department adapts it to accommodate an online format that caters to working professionals.
4. Undergraduate Entomology Option in Agriculture Individualized Curriculum Major (AICU-ENT). In addition, the Department of Entomology offers a major in Entomology as an individualized program for students pursuing a Bachelor of Science degree in Agriculture, and an undergraduate minor in Entomology. Faculty meetings are intermittently dedicated to discussing undergraduate teaching and scheduling to assure that all courses required for an undergraduate degree are offered during a scheduled four-year plan. See <https://entomology.ca.uky.edu/academics/undergraduate>.

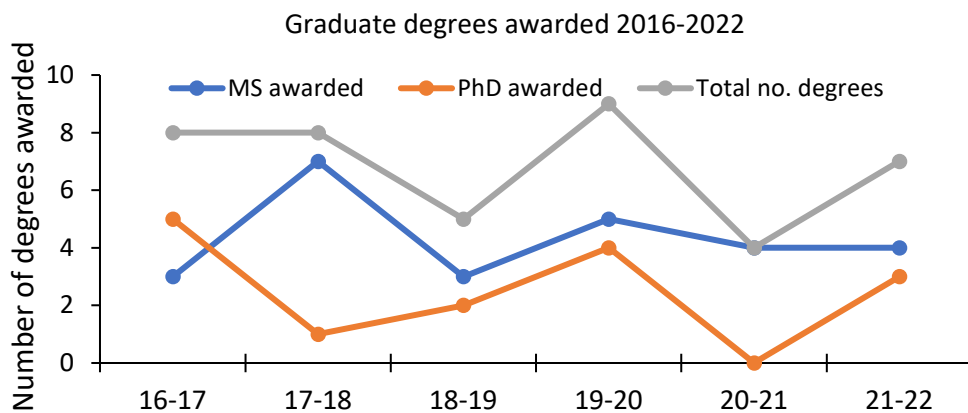


Figure 2. Graduate degrees conferred from the University of Kentucky Department of Entomology since our last departmental review (2016-2017 through August 2022).

Table 2. Number of students enrolled in each degree program, 2013-2022

Academic year	AICU-ENT	MS-A	MS-B	Ph.D.	Postdoctoral Fellows/Scholars
2016-2017	2	16	1	15	14
2017-2018	4	10	0	17	10
2018-2019	7	8	3	17	13
2019-2020	5	11	6	23	13
2020-2021	8	8	7	24	13
Spring 2022	7	11	6	26	8
Fall 2022	2*	12	9	25	13

\*Fall 2022 AICU-ENT data incomplete

The [Graduate Student Handbook](#) (revised August 2021) is updated as needed and provides explicit descriptions and guidelines. Graduate students consult with their Advisor, Advisory Committee, and the Director of Graduate Studies to develop an individualized program that fits their interests and builds their credentials. Students may pursue research in various areas, including applied entomology, behavior, biochemistry, neurobiology, ecology, genetics, plant resistance, insect biology, medical and veterinary entomology, molecular biology, physiology, systematics, and taxonomy. Additionally, department faculty provide considerable academic input into UK Core instruction and to majors outside of Entomology (e.g., Agricultural and Medical Biotechnology, Biology, Forestry and Natural Resources, Public Health, Natural Resources and Environmental Science and General Education). While these inputs are not part of our own degree programs, they are major contributions to the missions of the Department, College, and University. See table 12 for credit hours of instruction provided by Entomology faculty among departments and colleges at UK.

As a discipline, entomology is rapidly evolving; to maintain relevance, the Department of Entomology has a nimble curriculum with flexibility in the core curricula. Course work associated research opportunities are broadly available in the core areas of (i) insect molecular biology, physiology, and

genetics, (ii) insect behavior, ecology, evolution, and systematics, and (iii) pest management and applied ecology.

## **A. Admission Requirements**

Admission to all three graduate programs in Entomology requires an overall undergraduate grade point average of 3.0 and an overall graduate grade point average of 3.25. Since 2019 we have not required GRE scores. Those whose native language is not English must have a Test of English as a Foreign Language (TOEFL) with a minimum score of 79 on the TOEFL-IBT or a minimum score of 6.5 on the International English Language Testing System (IELTS). Meeting the minimum requirements does not guarantee admission. In fact, letters of recommendation and personal statement influence the holistic decision to admit or reject. A major professor must also indicate an interest to guide MS Plan A and Ph.D. students. The minimal GPA requirements for admission may be waived by the Graduate School in exceptional cases if sufficient additional evidence is presented regarding the ability of the student to do graduate work.

Admission does not automatically guarantee financial assistance, but 100% of Ph.D. and MS Plan A graduate student enrolled in our program during the past six years received either a research assistantship or an internally or externally funded graduate fellowship. Online Plan B students are financially responsible for tuition at the online tuition rate, and with rare exceptions, are not supported by the Department.

## **B. Degree Requirements**

During their first year of graduate studies, Ph.D. and MS Plan A students prepare a formal written research proposal encompassing a thorough literature review, a clear statement of research objectives, and materials and methods of the project. An oral research proposal seminar is presented to the department upon completion of the written research proposal (Ph.D. and MS Plan A). An oral exit seminar, usually presented during the last semester of the student's tenure, is required for all graduate students (Ph.D., MS Plan A, MS Plan B). MS Plan B students are required to provide a detailed outline of their practicum to their Advisory Committee. The practicum must be 3 – 6 credit hours and may consist of library research, laboratory/field research, special problems, internships, etc., as agreed upon by the student, advisor and mentor and approved by the Advisory Committee.

All graduate students must satisfy the following core course requirements.

- A.** An undergraduate course in general entomology or ENT 300.
- B.** STA 570 Basic Statistical Analysis or equivalent level course approved by the Advisory Committee
- C.** ENT 770 Entomological Seminar. Each MS student must take two semesters of ENT 770 (or approved equivalent seminars) and Ph.D. students must take four semesters of approved seminars.
- D.** Each Ph.D. and MS Plan A student must take a minimum of one course from two of the following core areas. MS Plan B students must take at least one course from all three core areas.

**Core Area 1.** Insect Molecular Biology, Physiology and Genetics

**Core Area 2.** Insect Behavior, Ecology, Evolution and Systematics

**Core Area 3.** Pest Management and Applied Ecology

An equivalent graduate-level course from another institution is acceptable upon approval of the Advisory Committee.

Detailed information on the graduate program in Entomology can be found at:

<http://www.research.uky.edu/gsbulletin/bullinfo.shtml>. A complete list of Entomology courses is here: <http://entomology.ca.uky.edu/academics/courses>. Course syllabi are compiled in Appendix II.1.

Ph.D. students take 36 credit hours of coursework, but the DGS can petition for a waiver of 18 credit hours for a student who has completed an MS degree.

MS Plan A students take 30 credit hours of coursework, including 6 hours of ENT 768 (Residence Credit For Master's Degree). The DGS recommends that ENT 768 be taken over two concurrent semesters at the beginning of studies. These credits should be taken in addition to a full-time load of courses.

MS Plan B students take 36 credit hours of coursework, including at least 3 hours of ENT 780 (Special Problems in Entomology). ENT 780 is the mechanism for giving credit for practicum studies.

### C. Student and employer demand

One metric that reflects the quality of our graduate programs is the placement of our graduates in positions consistent with their education. Entomology Ph.D. programs (The Classification of Instructional Programs (CIP) code 26.0702) are expected to lead to jobs that include: College Professor / Instructor, Wildlife Biologist, Biologist, Laboratory Manager, Natural Science Research Manager, Biological Technician, and Researcher / Research Associate (Burning Glass Institute). These job titles are largely consistent with our Ph.D.-graduate placement (see the section on Evaluating Post-Graduate Success). Graduates from Entomology MS Plan A programs (CIP code 26.0702) nationwide have jobs titles including Laboratory Manager, Biologist, Wildlife Biologist, Researcher, Research Associate, Biological Technician, and Natural Science Research Manager (According to Burning Glass Institute). These job titles are largely consistent with placements of our MS students (again, see Evaluating Post-Graduate Success). MS Plan B graduates typically are employed prior to and during their degree program. However, obtaining an MS degree provides an additional credential that facilitates professional advancement.

### D. Composition of student enrollment and recent graduates

The current composition of our graduate student population (Spring 2022) is 60% female (33) and 40% male (22); 78% (43) are US citizens; 6.9% of these self-identify as Hispanic or Latina, and 0% Black or African American.

#### 2020-2021 Enrollment (majors)

	Total	Female	Male	URM	1st Gen
Master's	15	11	4	3	1
Doctoral	24	15	9	3	0
Total	39	26	13	6	1



Degrees were awarded in 2016-2022 to 25 females (59.5%) and 34 US citizens (81%). One degree was awarded to a Hispanic US citizen.

**2020-2021 Degrees Awarded**

	Total	Female	Male	URM	1st Gen
Master's	4	2	2	1	0
Doctoral	0	0	0	0	0
<b>Total</b>	<b>4</b>	<b>2</b>	<b>2</b>	<b>1</b>	<b>0</b>

Additional enrollment and degrees awarded data are found in Appendix III.1

**E. Curriculum development**

The Entomology Curriculum is a product of faculty effort. With assistance from a Curriculum Committee and a Graduate Program Committee, the Director of Graduate Studies and the Director of Undergraduate Studies identify needed changes in the curriculum, which is then taken to the faculty at large.

Curriculum Committee

The Curriculum Committee provides recommendations on teaching objectives, curriculum planning, course content, and scheduling. The Curriculum Committee meets at least once each academic year to review proposals and syllabi for new courses, periodically evaluate course offerings, and may suggest additions, deletions, revisions, or renumber of courses. The Department Chair appoints the Curriculum Committee Chair, who has the rank of Full or Associate Professor; this appointment is re-evaluated bi-annually. The committee consists of two additional faculty members and one graduate student. Committee appointments are for two-year terms, except for the student member who serves for one academic year.

Graduate Program Committee

The Graduate Program Committee gives general guidance to the graduate program, coordinates graduate course needs with the Curriculum Committee, establishes and reports on graduate program Student Learning Objectives, and coordinates the evaluation of graduate student performance for graduate program assessments. The Graduate Program Committee also reviews and makes recommendations to the Department Chair regarding applications for admission for students that do not meet the departmental requirements for admission. The Department Chair appoints the Graduate Program Committee Chair, who has the rank of Full or Associate Professor; this appointment is re-evaluated annually. The committee consists of two additional faculty members and one graduate student. Committee appointments are for two-year terms, except for the student member who serves for one academic year.

### Director of Graduate Studies

The DGS is a faculty member in the Entomology Department appointed by the Graduate School Dean. The DGS administers the rules of the Graduate School as they pertain to the graduate program and serves as a liaison between the Graduate Dean and the faculty and students of the program. Students consult with the DGS over concerns about course requirements and degree progress.

### Director of Undergraduate Studies

The DUS is a Department of Entomology faculty member that is appointed by the Associate Dean of Instruction. The DUS administers the rules of the college and university as they pertain to the department's undergraduate program and serves as a liaison between the Associate Dean of Instruction and the faculty and students of the program. The DUS issues relevant deadline reminders to undergraduate students. Students meet regularly with the DUS for academic advising about course requirements and degree progress.

### Director of Online Program

The DOP is a Department of Entomology faculty member that is appointed by the Associate Dean of Instruction. The DOP helps with the recruitment of students and serves as a liaison between the Associate Dean of Instruction and the faculty and students of the program. The DOP also advises students and helps them find a mentor.

Our graduate curriculum is divided into three broad areas of emphasis, and graduate students in Entomology pursue coursework for Ph.D. or MS degrees in one of these areas, all of which provide preparation for competitive positions in academics, extension, government agencies, or industry:

- Insect Molecular Biology, Physiology and Genetics
- Insect Behavior, Ecology, and Evolution Insect Pest
- Management and Applied Ecology

The Department of Entomology reflects the integrated complexity of the field of entomology, and faculty members are often engaged in research and teaching that transcend these core areas. Department of Entomology faculty include Ricardo T. Bessin, Zachary DeVries, Stephen L. Dobson, Luke Dodd (adjunct, Eastern Kentucky University), Julian R. Dupuis, Tonja Fisher, Charles W. Fox, David Gonthier, Nathan Haan, Jonathan Larson, Subba Reddy Palli, Daniel A. Potter, Lynne K. Rieske-Kinney, Clare Rittschof, Brian Stevenson (adjunct, UK Microbiology), Zainulabeuddin Syed, Nicholas Teets, Raul Villanueva, Jennifer A. White, and Steve Yanoviak (adjunct, University of Louisville), and Xuguo Zhou. Additionally, Beryl Jones will be joining the department in July 2023.

**Core Area 1.** Insect Molecular Biology, Physiology and Genetics. Programs in this area train students to use insects as model systems to understand the general principles of molecular biology, physiology, and genetics. Areas of strength include:

- Insect neurobiology
- Genetic engineering of microbes
- Insect immunity
- Insect/bacterial symbioses
- Physiological basis of chemical communication
- Stress physiology
- Biochemistry of insect-plant interactions
- Mendelian and quantitative genetics

- Genomics/transcriptomics/proteomics
- Development/reproduction/diapause

**Core Area 2.** Insect Behavior, Ecology, Evolution, and Systematics. Students trained in this area use insects to understand general principles of biology. Areas of strength include:

- Chemical and acoustic communication
- Community ecology
- Evolutionary and behavioral genetics
- Mating behavior
- Predator/prey interactions
- Insect/plant interactions
- Systematics

**Core Area 3.** Pest Management and Applied Ecology. Students trained in this area are prepared for careers in agricultural, urban, horticultural, or forest pest management. Areas of strength include:

- Integrated pest management
- Host (plant or animal)/insect interactions
- Biological control
- Host resistance
- Extension and technology transfer
- Urban entomology
- Forest entomology
- Conserving biodiversity

## F. Doctor of Philosophy Graduate Program

Of our current graduate students, 57% are enrolled in the Ph.D. program. Of those, 65% are female and 31% are international. We confer an average of 3.6 Ph.D. degrees per year (50 Ph.D.s over a 14-year period).

Ph.D. students must complete 36 credit hours (two years) of residency before their qualifying exam. Those that have a MS degree from UK or another University before enrolling in our Ph.D. program can request that their MS degree count for up to 18 credit hours of residency, allowing them to finish their pre-qualifying residency requirements in two consecutive semesters. Residency requirements may be completed in three years of full-time graduate work or the equivalent in combined full-time and part-time study (see the [Graduate School Bulletin](#) for specific residence requirements). In all cases, an equivalent graduate-level course from another institution is acceptable upon approval of the student's Advisory Committee. This approval will not decrease the minimum number of credits required for residency or full-time status but will permit the student to take other courses.

For Ph.D. students, additional course requirements (beyond the core requirements) are agreed upon by the student and the Advisory Committee. The student is expected to have a general knowledge of entomology as well as the broad areas of general biology and statistics (particularly statistical or bioinformatic approaches appropriate to the student's research). The Advisory Committee has the responsibility of verifying that the student has general knowledge in entomological areas, and in those areas identified as areas of particular expertise. This evaluation can be achieved in Advisory Committee meetings with the student, the written qualifying examination, and/or the oral qualifying examination. The Ph.D. degree is conferred upon a candidate who after completing at least three years of graduate work devoted to study of a special field of knowledge, passes a comprehensive examination on his/her dissertation subject, presents a satisfactory dissertation, and shows evidence of scholarly attainment.

Some specific requirements for a Ph.D. through the Department of Entomology are:

1. ENT 767. Each student must register for 2 credits of ENT 767 each Fall and Spring semester after passing the Qualifying Examination. If all course work has been completed prior to the semester of the Qualifying Examination, the student may also register for 2 credits of ENT 767 during the semester that he/she takes the Qualifying Examination. Registration for 2 credits of ENT 767 (once a student is eligible to register in this course) constitutes full-time enrollment status. Please refer to the [Graduate School Bulletin](#) for details on post-qualifying residency.
2. Annual Progress Report. All graduate students will meet at least once per year with their advisor to discuss the student's progress. The advisor completes the Annual Review of Progress of Graduate Students in Entomology form and discusses the content with students. The completed and signed form is submitted to the DGS before July 01 annually.
3. Qualifying Examination. The qualifying examination must be both written and oral and is normally taken after the student's fourth semester of full-time graduate work or the equivalent. Students are tested on their knowledge of general biology, general entomology, and statistics, and in-depth knowledge in the particular areas of expertise identified at the student's first Advisory Committee meeting.
  - a. Written Examination. A written examination that precedes the oral examination (typically by two weeks) is required by the Graduate School. The form of the written qualifying examination is agreed upon by the student and the Advisory Committee. Two common formats for the written exam include (i) written questions submitted by each member of the advisory committee to the Major Professor; administered and monitored by the Major Professor over the course of five days, or (ii) a grant proposal or a review article; the requirements for the format of the grant proposal/review article are set by the Advisory Committee.
  - b. The Oral Examination. The oral examination is scheduled through the Graduate School, with the approval of the DGS (<http://gradschool.uky.edu/studentforms>).

The request to schedule the exam must be submitted to the Graduate School at least two weeks prior to the date of the exam. However, students are advised to schedule their exam with their Advisory Committee at least three months prior to the exam date to avoid scheduling difficulties. If the examination is failed, a student may repeat his/her qualifying examination only with the permission of their Advisory Committee, the DGS and the Graduate Dean, and only after a minimum of four months has passed. A student has only two chances to pass a qualifying examination.

4. Dissertation. Each student must generate a dissertation resulting from original research that conforms to instructions from the Graduate School. <http://gradschool.uky.edu/thesis-dissertation-preparation>
5. Presenting the Dissertation and Final Examination. Procedures for presenting the dissertation to the Advisory Committee and the Graduate School are:
  - a. Notification of the Intent to Schedule a Final Examination (Notif). AT LEAST EIGHT WEEKS prior to the final examination, the student will submit a Notif form to the Graduate School. The Major Professor must verify with the DGS that the dissertation is sufficiently prepared to merit this action and the DGS must approve the Notif.
  - b. Outside Examiner. The Graduate Dean will appoint an Outside Examiner as a core member of the Advisory Committee. See below regarding copy for Outside Examiner.

- c. Dissertation distribution. The Ph.D. candidate will distribute a complete copy of the dissertation to members of the Advisory Committee at least two weeks prior to the Final Examination.
- d. Final Examination. The Final Examination is primarily a defense of the dissertation, including knowledge of the literature, methods, results, statistics, and conclusions. Additional broad, conceptual, or philosophical questions arising from the discussion of the dissertation research and the student's future are also appropriate. Exceptions to this would be further examination of any deficiencies identified during the qualifying examination that may be re-examined here. The Final Examination is conducted by the Advisory Committee plus an Outside Examiner appointed by the Graduate School. The examination is a public event. Any member of the University may attend.
- e. Dissertation submission. The final copy of the dissertation is prepared to incorporate appropriate input from the Advisory Committee after the Final Examination is passed. Completed dissertations must be submitted to the Graduate School within 60 days of the Final Exam. A degree is not conferred until the Graduate School has received the final dissertation.

### Ph.D. Student Success Measures and Outcomes

In 2019-20 the Department of Entomology developed nine Program Student Learning Outcomes (PSLOs) for all successful Ph.D. students (Table 3).

Table 3. Program Student Learning Outcomes (PSLOs) for the Ph.D. program.

Learning Outcome	Description
1) Biology	Student understands and can explain core principles of biology.
2) Entomology	Student can summarize and explain diverse subjects in entomology.
3) Quantitative	Student can explain and apply appropriate quantitative methods for the discipline and provide justification for their approach.
4) Scientific Method	Student demonstrates an understanding of scientific methods, designs informative experiments, and applies these to their own studies.
5) Literature	Student can summarize published research in their area of expertise.
6) Ethics	Student understands and can summarize ethical issues and responsibilities associated with research and publication.
7) Areas of Expertise	Student explains principles, processes, and patterns in student's area of expertise (organismal biology, pest management or molecular biology).
8) Oral Communication	Student demonstrates effective presentation of science to audience (proposals, debates, seminars, lay presentations, submitted presentations, discussions, oral examinations, invited talks), including present theory, principles, research findings and implications.
9) Written Communication	Student creates original written scientific works (proposals, thesis, dissertation, assignments, scientific papers, lay articles).

Eleven assessment measures were developed to evaluate those PSLOs, and whenever possible standardized evaluation metrics are used to assess Ph.D. student performance. These include:

- [Graduate student achievement assessment form](#);
- [Written Proposal Assessment](#);
- [Seminar Evaluation \(Proposal and Exit\)](#);
- [Annual Progress Report](#)

### Delivery of Instruction

Graduate classes in the Department of Entomology usually involve small classroom and laboratory instruction (generally <20 students), blending lectures with considerable discussion and interpersonal interactions. Seminar classes tend to be smaller (~8-12 students). The arrival of Covid-19 necessitated a pivot to online delivery; this has provided a successful alternative, particularly with the rise of our online Plan B MS program, but trends indicate a return to traditional instructional delivery.

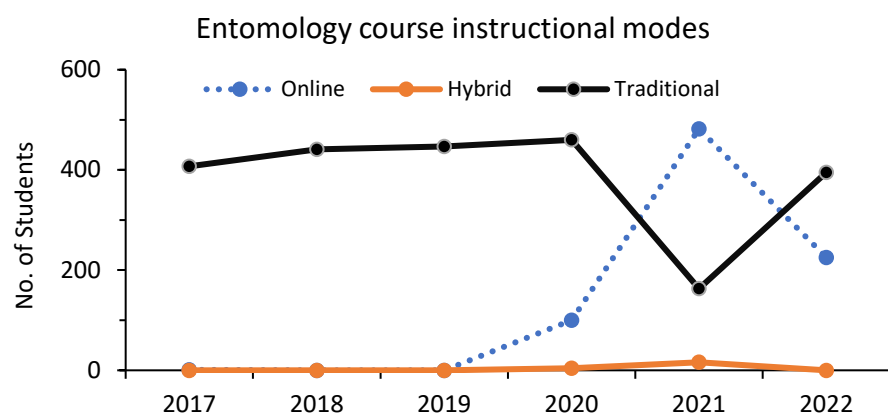


Figure 3. UK Department of Entomology instructional modes for graduate courses, 2017 to present

### Summary of Learning Outcomes

The assessment results for July 1, 2020 – June 30, 2022 (Table 4) indicate performance is at or above the benchmark for all 9 Program Student Learning Outcomes (PSLOs) assessed for Ph.D. students. Additionally, all 11 assessment measures were fully met during this period.

Table 4. Assessment measures used to evaluate Ph.D. Program Student Learning Outcomes (PSLOs) for the UK Department of Entomology over a 2-year period (July 01, 2020 – June 30, 2022)

Assessment Measure #	Students Assessed	Sampling Strategy	Scoring Process	Summary of Results
(1) Research conduct	6	All incoming Ph.D. students must complete training	All students were included	All incoming students completed training

(2) Written proposal	11	All Ph.D. students complete by end of Year 2	Evaluated by major professor and advisory committee according to established metrics	Written proposal evaluated as 'good' or better by advisory committee
(3) Proposal seminar	11	All Ph.D. students complete by end of Year 2	Evaluated by randomly chosen subset of departmental faculty according to established metrics	All students receive assessment of 'fair' or better using standardized evaluation matrix
(4) Annual progress report	27	All Ph.D. students annually	Assessment by Ph.D. advisor according to established metrics	All students receive positive annual assessment of progress in course work, research, and accomplishments
(5) Individual development plan	7	All incoming students	All students are included	100% completion by incoming students
(6) Written qualifying exam	9	All Ph.D. students who have made appropriate progress in coursework take written qualifying exam	Evaluation by major professor and advisory committee according to established metrics	All students receive positive assessment of written qualifying exam; 9 students completed their exam during evaluation period with an overall score of 3.6 of 4
(7) Oral qualifying exam	9	Ph.D. students who have completed coursework and written qualifying exam then sit for the oral qualifying exam	Evaluation by major professor and advisory committee	All students receive positive assessment of oral qualifying exam
(8) Oral presentations in coursework		All pre-qualifying exam students complete oral presentation in coursework	Assessment by faculty instructors	Satisfactory completion of oral assignments in courses
(9) Written assignments in coursework		All pre-qualifying exam students complete written assignments in coursework	Assessment by faculty instructors	Satisfactory completion of written assignments in courses
(10) Exit seminar	3	After completion of coursework, qualifying exam, and majority of research, student presents exit seminar	Evaluated by randomly chosen subset of departmental faculty	All students assessed using standardized evaluation matrix; 3 Ph.D. students gave an exit seminar during this period, with a score of 4.23 out of 5



(11) Dissertation defense, final examination	3	Final step in completion of degree requirements	Evaluation by major professor and advisory committee (evaluation metrics Table 3)	All students receive positive assessment of Ph.D. defense; 3 Ph.D. students sat for their defense during the evaluation period with score of 3.4 out of 4
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In addition to the PSLOs and assessment measures outlined, the department encourages (but does not require) Ph.D. students to:

- present oral or poster presentations of their findings at scientific, extension, or professional trade meetings. Presentations at appropriate meetings are assessed by colleagues, and students that choose to compete in graduate student competitions are evaluated by professionals using criteria established by the award-granting entity. During the 2-year period of July 01, 2020 – June 30, 2022, there were 77 presentations.
- submit their research findings for publication in scientific, extension, or trade journals. Research findings submitted for publication are evaluated and reviewed by professional colleagues. During the period of July 01, 2020 – June 30, 2022, there were 57 publications, 44% of which had the student serving as the first author. These 57 publications appeared in 41 different scientific journals and had an average impact factor of 3.76.
- compete for graduate student awards appropriate for their discipline. Nominees for awards are evaluated by professional colleagues using criteria established by the award-granting entity. During the July 01, 2020 – June 30, 2022 period, there were 61 awards among the Ph.D. students in the Department.
- participate in outreach/extension activities to disseminate findings to non-scientific stakeholders. There were 80 outreach/extension activities among the 27 Ph.D. students during the 2-year review; an outstanding number given the constraints associated with covid 19.

The department continues to emphasize and encourage these aspects of professional development for our Ph.D. students.

### **Data Analysis**

The Director of Graduate Studies (DGS), Department Chair, and faculty members of the departmental Curriculum Committee are involved in the analysis of the data. Based on our learning outcomes assessment, our graduate curriculum can be modified to address any learning outcomes that need improvement. At the annual Department of Entomology retreat, faculty are asked to critically evaluate our PSLOs and identify areas for potential improvement. If areas for improvement are identified, we meet in near-monthly faculty meetings and use that time to address concerns.

## Teaching Effectiveness

Teaching effectiveness in graduate courses is assessed using online Teacher-Course Evaluation (TCE) forms. Faculty in the Department of Entomology routinely meet or exceed averages in the College and across the University (Table 5 and Appendix II.2).

Table 5. Summary of Department of Entomology instructional performance, measured on a 5-point scale through online TCE, Fall 2017 - Spring 2022

		N	% response	Course mean	Instructor mean
2017	Fall	119	71.7	4.54	4.38
2018	Spring	94	81	4.31	4.41
2018	Fall	85	74	4.69	4.81
2019	Spring	106	74.4	4.68	4.76
2019	Fall	117	62.9	4.58	4.65
2020	Spring	521	72.8	4.56	4.60
2020	Fall	121	66.6	4.19	4.43
2021	Spring	129	74.3	4.51	4.73
2021	Fall	123	74.4	4.58	4.64
2022	Spring	1011	70.2	4.48	4.61
		2426	72.23	4.51	4.602

Opportunities to enhance teaching effectiveness are available through workshops and consultations with members of UK's [Center for Enhancement of Learning and Teaching](#) (CELT).

## Plans for Evaluating Students' Post-Graduate Success

The department tracks program graduates to determine their post-graduate success. Placement of graduate students is used as one of the indicators of post-graduate success. All (100%) students that graduated from our program during the past six years are employed in positions appropriate for their education (see Table 6).

Table 6. Professional placement of Ph.D. graduates from the Department of Entomology, 2015 – current

Date PhD Degree completed	Current position
<b>3/25/2016</b>	Research Associate, UK Horticulture
<b>4/19/2016</b>	Postdoctoral Research Associate, University of Southern California
<b>10/31/2016</b>	Assistant Professor, North Carolina State University
<b>11/16/2016</b>	Plunkett's Pest Control Company
<b>11/18/2016</b>	Research Entomologist, USDA
<b>4/7/2017</b>	Senior Scientist, Lepidext

4/12/2017	Extension Assistant Professor, University of Illinois
5/2/2018	Assistant Professor, Morehead State University
6/6/2018	Assistant Professor, Chonbuk National University
7/26/2018	Research Scientist, University of Florida
4/15/2020	Davey Tree Expert Company
4/22/2020	Postdoctoral Fellow, Van Andel Research Institute
4/29/2020	Postdoctoral Scholar, UC Berkeley
5/5/2020	Postdoctoral Fellow, University of Alaska, Fairbanks
11/22/2021	Postdoctoral Scholar, Texas A&M
7/1/2022	Postdoctoral Scholar, UK
7/15/2022	USDA Postdoc
7/15/2022	Assistant Professor, King Faisal University Saudi Arabia
11/10/22	Research Scientist, Renaissance BioScience
12/01/22	Forest Entomologist, US Forest Service Forest Health

### Student Teaching and/or Research Assistantships

Based on suggestions from our last departmental review, in 2018 faculty created and implemented *ENT 770 Topical Seminar: Practicum in Teaching* as a mechanism to provide opportunities and academic credit for teaching experiences for graduate students. Twenty-one students have taken advantage of these opportunities both within and outside of ENT courses. Students and instructors work with the DGS to ensure these opportunities are meaningful and contain elements beyond simple grading assistance. In addition, each semester, one or two paid Teaching Assistants are hired to support high enrolment courses. Teaching Assistantships are distributed from the Graduate School and a limited number are provided to each college. Tuition is covered and the department pays the student salary and benefits.

### G. Master of Science Plan A (Thesis) Program

Of the current graduate students, 28% are MS Plan A students. Of those, 50% are female and 14% are international. We confer an average of 3.1 MS Plan A degrees per year (44 over a 14-year period).

MS Plan A students must complete 30 credit hours of graduate course work with a GPA of 3.0 or higher. 16 hours in regular courses (excluding ENT 768, ENT 780, ENT 790). One-half of required coursework hours must be in the major area of study (12 hours, because ENT 768 is excluded from total requirements for this calculation), and one-half of required coursework hours must be at the 600 level or above (12 hours, because ENT 768 is excluded from total requirements for this calculation). Once coursework is

completed, MS Plan A students should enroll in ENT 768 (3 credit hours) in two semesters (total of 6 credit hours). These credit hours may be added on top of a regular 9 credit hour semester.

Some specific requirements for a MS Plan A through the Department of Entomology are:

1. Annual Progress Report. All MS Plan A students will meet at least once per year with their advisor for a discussion of the student’s progress. The advisor will complete the Annual Review of Progress of Graduate Students in Entomology form and discuss content with student. The completed and signed form is submitted to the DGS before July 01 annually.
2. Thesis. Each student must generate a thesis resulting from their research that conforms to instructions from the Graduate School. <http://gradschool.uky.edu/thesis-dissertation-preparation>
3. Presenting the Thesis and Final Examination. Procedures for presenting the Thesis to the Advisory Committee and the Graduate School are:
  - a. Notification of the Intent to Schedule a Final Examination (Notif). At least 8 weeks prior to the final examination, the student will submit a Notif form to the Graduate School. The Major Professor must verify with the DGS that the dissertation is sufficiently prepared to merit this action and the DGS must approve the Notif.
  - b. Thesis distribution. The MS Plan A student will distribute a complete copy of the Thesis to members of the Advisory Committee at least two weeks prior to the Final Examination.
  - c. Final Examination. Oral defense of the written MS Thesis.
  - d. Thesis submission. The final copy of the Thesis is prepared incorporating appropriate input from the Advisory Committee after the Final Examination is passed. Completed theses must be submitted to the Graduate School within 60 days of the Final Exam. A degree is not conferred until the Graduate School has received the final Thesis.

### MS Plan A Student Success Measures and Outcomes

In 2019-20 the Department of Entomology developed eight Program Student Learning Outcomes (PSLOs) for all successful MS Plan A students (Table 7).

Table 7. Program Student Learning Outcomes (PSLOs) for the MS Plan A (Thesis) program

Learning Outcome	Description
1) Biology	Student understands and can explain core principles of biology.
2) Entomology	Student can summarize and explain diverse subjects in entomology.
3) Quantitative	Student can explain and apply appropriate quantitative methods for the discipline and provide justification for their approach.
4) Scientific Method	Student demonstrates an understanding of scientific methods, designs informative experiments, and applies these to their own studies.
5) Literature	Student can summarize published research in their area of expertise.
6) Ethics	Student understands and can summarize ethical issues and responsibilities associated with research and publication.

- 7) Oral Communication Student demonstrates effective presentation of science to audience (proposals, debates, seminars, lay presentations, submitted presentations, discussions, oral examinations, invited talks), including present theory, principles, research findings and implications.
- 8) Written Communication Student creates original written scientific works (proposals, thesis, dissertation, assignments, scientific papers, lay articles).

Nine assessment measures were developed to evaluate those PSLOs, and whenever possible standardized evaluation metrics are used to assess MS Plan A student performance, as with students in the Ph.D. program.

### Summary of Learning Outcomes

The assessment results for July 1, 2020 – June 30, 2022 (Table 8) indicate performance is at or above the benchmark for all 8 PSLOs assessed for MS Plan A students. Additionally, all 9 assessment measures were fully met during this period.

Table 8. Assessment measures used to evaluate MS Plan A (Thesis) Program Student Learning Outcomes (PSLOs) for the UK Department of Entomology over a 2-year period (July 01, 2020 – June 30, 2022)

Assessment Measure #	Students Assessed	Sampling Strategy	Scoring Process	Summary of Results
(1) Research conduct	8	All incoming MS students must complete training	All students were included	All incoming students completed training
(2) Written proposal	9	All MS students complete by end of Year 1	Evaluated by major professor and advisory committee according to established metrics	Written proposal evaluated as 'good' or better by advisory committee
(3) Proposal seminar	9	All MS students complete by end of Year 1	Evaluated by randomly chosen departmental faculty according to established metrics	All students receive assessment of 'fair' or better using standardized evaluation matrix
(4) Annual progress report	9	All MS students annually	Assessment by MS advisor according to established metrics	All students receive positive annual assessment of progress in course work, research, and accomplishments
(5) Individual development plan	8	All incoming students	All students are included	100% completion by incoming students
(6) Oral presentations in coursework		All students complete oral presentation in coursework	Assessment by faculty instructors	Satisfactory completion of oral assignments in courses
(7) Written assignments in coursework		All students complete written assignments in coursework	Assessment by faculty instructors	Satisfactory completion of written assignments in courses

(8) Exit seminar	4	After completion of coursework and majority of research, student presents exit seminar	Evaluated by randomly chosen subset of departmental faculty	All students assessed using standardized evaluation matrix; 4 MS students gave an exit seminar during this period
(9) Thesis defense	6	Final step in completion of degree requirements	Evaluation by major professor and advisory committee (evaluation metrics Table 7)	All students receive positive assessment of MS defense; 6 MS students sat for their defense during the evaluation period with score of 3.1 out of 4

In addition to the assessment measures outlined, the department encourages (but does not require) MS Plan A students to:

- present oral or poster presentations of their findings at scientific, extension, or professional trade meetings. Presentations at appropriate meetings are assessed by colleagues, and students that choose to compete in graduate student competitions are evaluated by professionals using criteria established by the award-granting entity. There were 6 MS Plan A student presentations during July 1, 2020 – June 30, 2022.
- submit their research findings for publication in scientific, extension, or trade journals. Research findings submitted for publication are evaluated and reviewed by professional colleagues. However, because of the short duration of a MS program, these publications usually appear after the student has graduated. Between July 01, 2020 – June 30, 2022, there were 6 publications generated by MS Plan A students, four of which were listed as the first author.
- compete for graduate student awards appropriate for their discipline. Nominees for awards are evaluated by professional colleagues using criteria established by the award-granting entity. Department of Entomology MS Plan A graduate students received 9 awards between July 01, 2020 – June 30, 2022.

The department will continue to encourage these aspects of professional development for MS Plan A students.

The Department of Entomology regularly critiques the PSLOs to identify areas for improvement, and addresses those on an as-needed basis.

### Data Analysis

Like the Ph.D. data analysis, the DGS, Chair, and Curriculum Committee analyze the learning outcomes assessments to address any shortcomings. If areas for improvement are identified these are addressed in faculty meetings.

## Teaching Effectiveness

Teaching effectiveness in graduate courses is assessed using online TCE forms (Table 5) and the department as a whole scores favorably (Appendix II.2).

## Plans for Evaluating Students' Post-Graduate Success

Post-graduate success is tracked for MS Plan A graduates (Table 9).

Table 9. Professional placement of MS Plan A graduates from the Department of Entomology, 2015 – current

Date Degree completed	Current position
2/16/2016	Fermentation Process Support Engineer, AbbVie
4/18/2016	Post-doctoral Fellow, Arnold School of Public Health
6/24/2016	Extension Agent, NY State
11/21/2016	Laboratory Manager, University of Florida
4/18/2017	Technical Services Manager, Industrial Fumigant Company
4/26/2017	Private arborist
7/17/2017	Pursuing Ph.D. at UK
7/20/2017	Pursuing Ph.D. at LSU
11/17/2017	Pursuing Ph.D. at Purdue
4/3/2018	Tree Health Specialist, Davey Tree Experts
7/1/2018	Kentucky State Virology Lab, Microbiology branch manager
8/1/2018	JR Specialist, University of California Riverside
11/26/2019	Michigan State University?
4/14/2020	Entomologist and Land Steward, Pennypack Ecological Trust
11/25/2019	Florida State Parks Service
7/23/2020	Pursuing Ph.D. at Tohoku University
10/14/2020	Medical Entomologist, Brownsville, TX District Office
10/28/2020	Research Analyst, UK
11/4/2020	Horticulture Extension Agent, North Carolina State University
5/8/2020	Agricultural Assistant, Clemson University
7/26/2021	Forest Health Specialist, Tennessee Division of Forestry
4/20/2022	Pursuing Ph.D. at Auburn



## **Student Teaching and/or Research Assistantships**

MS - A students are eligible to enroll in *ENT 770 Topical Seminar: Practicum in Teaching* as a mechanism to provide opportunities and academic credit for teaching experiences for graduate students.

### **H. MS Plan B (Non-Thesis)**

MS Plan B (Non-Thesis) students comprise 15% of our graduate students. Of those, 75% are female and none are international. The MS Plan B option is continually evolving as the department adapts it to an online format, which caters to working professionals. All our MS Plan B students are professionally employed.

MS Plan B students must complete 36 credit hours of graduate course work with a GPA of 3.0 or higher. 24 credit hours in regular courses (excluding ENT 780, ENT 790). 18 credit hours must be in ENT. 18 credit hours must be at 600 or 700 level. The practicum must be a minimum of 3 credit hours (of ENT 780 and 790) and a maximum of 6 credit hours.

Some specific requirements for an MS Plan B through the Department of Entomology are:

1. Annual Progress Report. Like our other graduate programs, all MS Plan B students should meet at least once per year with their advisor for a discussion of the student's progress. The advisor will complete the Annual Review of Progress of Graduate Students in Entomology form and discuss content with student. The completed and signed form is submitted to the DGS before July 01 annually.
2. Practicum. Each MS Plan B student must generate a report resulting from their Practicum in a format that conforms to that mutually agreed upon by the Advisor, Mentor, and student.
3. Presenting the Practicum and Final Examination. Procedures for presenting the Practicum to the Advisory Committee and the Graduate School are:
  - a. Notification of the Intent to Schedule a Final Examination (Notif). AT LEAST EIGHT WEEKS prior to the final examination, the student will submit a Notif form to the Graduate School. The Major Professor must verify with the DGS that the Practicum is sufficiently prepared to merit this action and the DGS must approve the Notif.
  - b. Practicum distribution. The MS Plan A student will distribute a complete copy of the Practicum to members of the Advisory Committee AT LEAST TWO WEEKS prior to the Final Examination.
  - c. Final Examination. Oral defense of the written MS Practicum.
  - d. Practicum submission. The final copy of the practicum is prepared incorporating appropriate input from the Advisory Committee after the Final Examination is passed.

### **MS Plan B Student Success Measures and Outcomes**

The eight Program Student Learning Outcomes (PSLOs) (Table 7) developed for MS Plan A students also pertain to MS Plan B students. Similarly, the nine Assessment Measures also pertain (Table 8), except that the Plan B Practicum replaces the requirements associated with the Plan A Thesis (Assessment Measures 3 and 9).

## Summary of Learning Outcomes

The assessment results (Table 10) for MS Plan B students for the period July 1, 2020 – June 30, 2022 indicate performance is at or above the benchmark for all 8 PSLOs assessed, and all 9 assessment measures were fully met during this period.

Table 10. Assessment measures used to evaluate MS Plan B (Non-Thesis) Program Student Learning Outcomes (PSLOs) for the UK Department of Entomology over a 2-year period (July 01, 2020 – June 30, 2022)

Assessment Measure #	Students Assessed	Sampling Strategy	Scoring Process	Summary of Results
(1) Research conduct	2	All incoming MS students must complete training	All students were included	All incoming students completed training
(2) Written proposal	1	All MS students complete by end of Year 1	Evaluated by major professor and advisory committee according to established metrics	Written proposal evaluated as 'good' or better by advisory committee
(3) Practicum presentation	1	If Advisory Committee requests, Plan B student must complete by end of Year 1	Evaluated by MS Advisor and Advisory Committee	All students receive assessment of 'fair' or better using standardized evaluation matrix
(4) Annual progress report	6	All MS students annually	Assessment by MS advisor according to established metrics	All students receive positive annual assessment of progress in course work, research, and accomplishments
(5) Individual development plan	2	All incoming students	All students are included	100% completion by incoming students
(6) Oral presentations in coursework		All students complete oral presentation in coursework	Assessment by faculty instructors	Satisfactory completion of oral assignments in courses
(7) Written assignments in coursework		All students complete written assignments in coursework	Assessment by faculty instructors	Satisfactory completion of written assignments in courses
(8) Exit seminar	2	After completion of coursework and majority of research, student presents exit seminar	Evaluated by randomly chosen subset of departmental faculty	All students assessed using standardized evaluation matrix; 2 MS Plan B students gave an exit seminar during this period
(9) Practicum defense	2	Final step in completion of degree requirements	Evaluation by major professor and advisory committee	All students receive positive assessment of MS defense; 2 MS Plan B students sat for their defense with score of 3.3 out of 4

## Data Analysis

The Plan B Non-Thesis option is growing and evolving as the department adapts it to an online format to meet the needs of working professionals. Assessment results are reviewed and discussed in depth at the annual Department of Entomology Faculty Retreat. Templates and workflows are identified and formalized; areas of strength are noted. The DGS, Graduate Program Committee, and Curriculum Committee critically evaluate the content and identify areas for updates and potential improvements. Follow up on any action items that occur at subsequent faculty meetings/retreats.

## Plans for Evaluating Students' Post-Graduate Success

MS Plan B students are typically employed prior to and during their degree program. However, obtaining a MS degree provides an additional credential that facilitates professional advancement. Post-graduate MS Plan B student success is tracked (Table 11).

Table 11. Professional positions of MS Plan B graduates from the Department of Entomology, 2018 – current

Date Degree completed	Current position
4/18/2018	County Extension Agent, Horticulture, Mercer Co.
7/1/2019	Senior Laboratory Technician, UK
10/19/2021	Science Teacher, Fayette Co. Schools
11/15/2021	Private tutor

## Student Teaching and/or Research Assistantships

MS - B students are working professionals who complete program requirements remotely. Student funding is not provided through the Entomology Department or UK; TAs and RAs are not applicable.

### I. Undergraduate Specialization in Entomology

In the Agriculture Individualized Program Specializing in Entomology (AICU-ENT), undergraduate students learn about insects from the molecular to the ecosystem level with a customized curriculum based on specific interests and career goals. In course work students study numerous aspects of entomology and examine insects' effects on humans, crops and food and fiber. In addition to University requirements, course requirements for the individualized program include ENT 300 General Entomology (3 cr), ENT 395 Independent work (1-3 cr), ENT 564 Insect Taxonomy (4 cr), and 14 cr of ENT electives. The number of students enrolled in AICU-ENT since our last review (2017 – current) is 16. Additionally, we've had 36 students enrolled in Entomology as a minor, and 7 students enrolled in a Pest Management minor, for which the Department provides key courses. We also teach key courses in other majors (Table 12).

Table 12. Sum of attempted credit hours delivered by Entomology faculty organized by college and by major of student (note this includes all undergraduate and graduate credit hours)

	2017	2018	2019	2020	2021	2022	Total
College of Agriculture, Food & Environment	1087	1057	1298	1907	2342	2285	9976
Agricultural Biotechnology	147	171	279	422	568	440	2027
Agriculture General				63	75	108	246
Entomology	888	859	923	1353	1663	1662	7348
Forestry & Natural Resources	52	27	57	69	36	69	310
Plant & Soil Sciences				39		3	42
Sustainable Agriculture						3	3
College of Arts and Sciences	45	107	94	48	72	50	416
Biology	45	107	94	48	72	50	416
College of Public Health			18		3	12	33
Public Health			18		3	12	33
Lewis Honors College					27		27
Grand Total	1132	1182	1392	1982	2417	2347	10452

The majority of AICU-ENT majors are interested in graduate degrees; of the 13 graduates since 2017 most have either completed or are currently enrolled in graduate programs (Table 13).

Faculty intermittently discuss the idea of re-establishing the Entomology major, which was eliminated by the College of Agriculture in the 1990s due to low enrollment. However, our curriculum is geared toward graduate education and without additional Entomology majors to drive course development we may be unable to make enrollment quotas. The recent effort by Entomology faculty to develop 200 level courses (ENT 209, Bees and People (3 cr) and ENT 220, Plague, Pests and Pestilence: History and Global Perspective (3 cr)) may pique the interests of more undergraduates and change the dynamics to the point where an undergraduate major is worth revisiting. After extensive discussion at the August 2022 retreat the faculty agree that focused marketing of the AICU-ENT option could prove fruitful. At this time maintaining and promoting the AICU-ENT program, rather than creating an Entomology major, is in the best interests of the Department.

Table 13. Student enrollment in the undergraduate Agriculture Individualized Program Specializing in Entomology, 2017 - current

Major(s)	Year Graduated	Post-graduate
AICU-ENT	2017	MS degree in Entomology, UK
AICU	2019	Pest Control Technician
AICU-ENT	2019	Ph.D. student in Entomology, Cornell
AICU-ENT	2020	Graduate school Alabama, HS teacher Aberdeen HS
AICU-ENT	2020	MS student in Entomology, UK
AICU-ENT	2021	MS degree in Entomology, UK; Ph.D. student Auburn

AICU-ENT	2021	Research technologist, Pennsylvania State University
AICU-ENT	2021	Ph.D. student in Entomology, KSU
AICU	2022	MS student in Entomology, Georgia
AICU-ENT, Sust. Ag	2022	MS student in Entomology, UK
AICU-ENT, Ag. Biotech	2022	Research technician, food safety, private industry
AICU-ENT	2022	Instructional Assistant, JCPS; planning grad school 2023
AICU-ENT	In progress	
AICU-ENT	In progress	

## J. Post-doctoral training

Entomology faculty train post-doctoral scholars supported by grant funding. Table 14 shows post-doctoral scholars that completed training during the review period.

Table 14. Post-doctoral scholars trained during the review period and their current position

Year Training Completed	Current position
2016	Assistant Professor, Clayton State University
2016	Assistant Professor, Penn State University
2016	Assistant Professor, Louisiana State University
2016	Associate Professor, South China Agricultural University
2016	Associate Professor, Institute of Plant Protection, Chinese Academy of Agricultural Sciences
2017	Assistant Professor, Central University of Rajasthan
2017	Research Scientist, Indian Council of Agriculture Research
2017	Entomologist, Pest Surveillance at European Food Safety Authority (EFSA)
2018	Captain, US Army
2018	Postdoctoral Researcher, University of Connecticut
2018	Research Associate, Indiana University
2018	Head, Forest Molecular Biology Lab, Czech University of Life Sciences Prague
2018	Assistant Professor, Kongunadu Arts and Science College, Bharathiar University

2018	Senior Scientist, Head of Discovery Biology - Plant Health R&D, GreenLight Biosciences
2018	Associate Professor, Shengyang Agricultural University
2019	Lecturer, University of Bedfordshire, Watford, England
2020	Assistant Professor at Southwestern Oklahoma State University
2020	Agricultural Science Fellow at USDA Office of the Chief Scientist
2020	Research Scientist, USDA-ARS, Knippling-Bushland U.S. Livestock Insect Research Laboratory
2021	Assistant Professor, University of Tampa
2021	Associate Professor, Sun-Yat-Sun University
2021	Group leader, BioMed X GmbH
2021	Postdoctoral scholar, USDA
2022	Science Lab Evaluator for the genomics unit at the Canadian National Centre for Foreign Animal Diseases
2022	Research Scientist, Greenlight Technologies
2022	Research Scientist, RNAissance Ag LLC
2022	Associate Professor, Agriculture and Forestry University
2022	Postdoctoral Scholar at Czech University of Life Sciences Prague
2022	Scientist for the Food and Drug Administration, Environmental Protection Branch
2022	Product Development Specialist, Central Life Sciences
2022	R&D scientist, Nattaro Labs, Sweden
2022	Postdoctoral scholar, Swedish University of Agricultural Sciences, Sweden

### III. FACULTY AND STAFF

#### A. Composition of faculty and staff

The Department of Entomology is currently comprised of 17 full-time faculty (Table 15). Of these, 13 (77%) are in the Regular Title Series, with their primary distribution of effort (DOE) emphasizing research. Three faculty (17%) are in the Extension Title Series, with their effort emphasizing extension and applied

research, and one (6%) is a lecturer. Seven faculty members (41%) are at the rank of Full Professor; three (18%) are Associate Professors, and five (29%) are at the rank of Assistant Professor.

Table 15. Department of Entomology faculty, including Title Series, Rank, and Distribution of Effort (DOE Instruction (I); Research (R); Service (S); Administration (A)).

Faculty name	Title Series	Rank	DOE (I:R:S:A)*
Bessin, Ric	Extension	Full Professor	4:5:91:0
DeVries, Zachary	Regular	Assistant Professor	4:76:20:0
Dobson, Stephen	Regular	Full Professor	9:86:5:0
Dupuis, Julian	Regular	Assistant Professor	28:63:9:0
Fisher, Tonja	Lecturer	Lecturer	85:0:5:10
Fox, Charles	Regular	Full Professor	28:47:5:20
Gonthier, David	Regular	Assistant Professor	43:52:5:0
Haan, Nathan	Regular	Assistant Professor	25:70:5:0
Larson, Jonathan	Extension	Assistant Professor	16:8:76:0
Palli, Subba Reddy	Regular	Full Professor	6:64:5:25
Rieske-Kinney, Lynne	Regular	Full Professor	14:81:5:0
Rittschof, Clare	Regular	Associate Professor	29:66:5:0
Syed, Zainulabeuddin (Zain)	Regular	Associate Professor	25:70:5:0
Teets, Nicholas	Regular	Associate Professor	26:69:5:0
Villanueva, Raul	Extension	Assistant Professor	0:30:70:0
White, Jennifer	Regular	Full Professor	40:45:5:10
Zhou, Xuguo (Joe)	Regular	Full Professor	37:54:9:0

\* as of August 01, 2022

Faculty composition and demographics have changed substantially since our most recent (2017) review. While the total number of faculty has remained constant, the proportion of senior faculty has decreased, and the number of junior faculty has increased (Figure 4). Six research faculty have retired (Table 16), including Brown, Haynes, Obrycki, Potter D, Sharkey, and Webb, and two extension faculty (Potter M, Townsend).

Table 16. Retirees from the Department of Entomology since 2016.

Retiree	Title Series	Retirement date	Areas of Expertise
Brown, Grayson	Regular	Jul 01, 2017	Public health
Haynes, Ken	Regular	Jun 30, 2022	Chemical ecology; behavior
Obrycki, John	Regular	Oct 31, 2020	Biological control
Potter, Dan	Regular	Sep 02, 2022	Horticultural entomology; pollinator conservation
Potter, Mike	Extension	Sep 25, 2020	Urban; structural
Sharkey, Mike	Regular	Sep 30, 2017	Taxonomy; systematics
Townsend, Lee	Extension	Feb 01, 2019	Animal/veterinary/livestock; household; horticultural
Webb, Bruce	Regular	Oct 01, 2020	Molecular biology; virology



The department responded quickly and effectively to fill gaps in expertise and teaching effort resulting from these retirements by hiring Drs. DeVries, Dupuis, Fisher, Gonthier, Haan, and Syed. Additionally, Dr. Beryl Jones will join the Department in July 2023. Our department historically has exceptional strengths in organismal biology and since our last review, we have made a particular effort to expand our expertise to landscape and population levels (hiring Gonthier, Dupuis, and Haan).

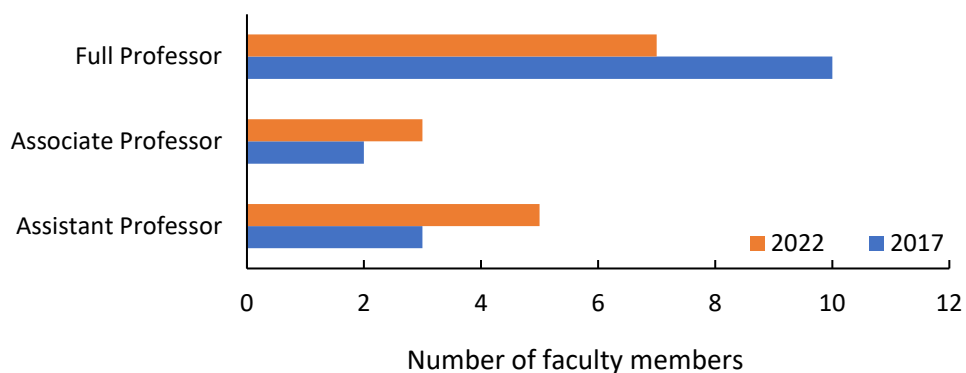


Figure 4. Department of Entomology faculty ranks in 2017 (■) compared to 2022 (■), showing replacement of retirees and reflecting the vitality of the Department.

The number of female faculty members has nearly tripled since 2017, as has faculty diversity (different races and ethnic origin) within the Department (Figures 5 and 6). See Appendix III.1 for details regarding faculty composition over time.

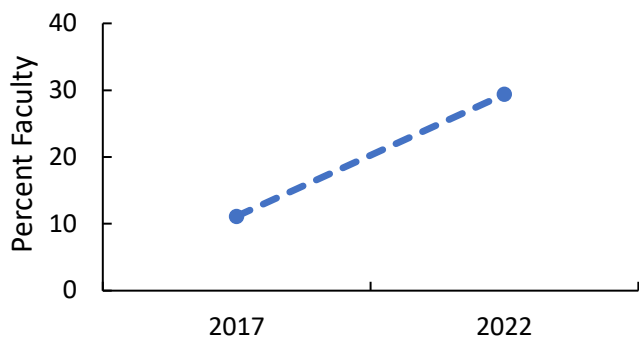


Figure 5. Increase in female faculty (%) since our last review (includes new faculty hire Jones, arriving July 2023).

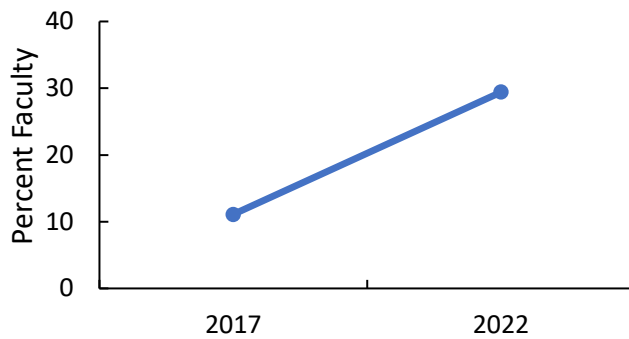


Figure 6. Faculty diversity (%) has increased significantly since our 2017 review.

The Department of Entomology has 27 professional and support staff that are essential to our ability to deliver on the three missions of CAFE (Research, Instruction, Extension) (Table 16). Three of these are office staff that are vital for faculty, staff, and student support. There is one Research Scientist II and five Research Analysts. There are 11 research/laboratory technicians; these technicians support our research mission within individual faculty research programs, and one supports the extension faculty team. One staff position specializes in 4H and youth education and assists with insect identification/ diagnosis. One staff member (0.5 FTE) is a Computer Support Specialist II.

The University of Kentucky Department of Entomology is unique in that it also supports the State Entomologist's Office, which conducts regulatory functions performed by members of the state government in most states (Table 17). This office (see Section V) consists of a Senior Nursery Inspector and two Nursery Inspectors. Additionally, it houses the State Survey Coordinator and the Pest Survey Coordinator, as well as support staff.

Table 17. Department of Entomology staff, including classification and title.

Classification	Title	Staff name
Administrative	Business Officer	Tymory Stanton
	Administrative Support Associate I	Jessica Alkenbrack
	Human Resources Coordinator	Sarah Habel
Professional	Research Scientist II	Angela Sierras
	Research Analyst	Scott Bessin
		Eric Chapman
		Armando Falcon-Brindis
		Laura Rosenwald
		Zenaida Viloría
	Senior Laboratory Technician	Sarah Clark
		Katie Fiske
		Jimmy Harrison
		Jeff Howell
		Ellie McCabe
		Kenny O'Dell
		Joseph Palmer
		Savannah Piper
		Caitlin Stamper
Shushu Yang		
Laboratory Technician	Christine Bradley	
4H/ Youth Extension Specialist	Blake Newton	
Computer Support Specialist II	Brian Lauer	
Office of State Entomologist	Senior Nursery Inspector	Joe Collins
	Senior Nursery Inspector	Carl Harper
	Nursery Inspector	Jenny Condra
	State Survey Coordinator/ Instructor	Janet Lensing
	Laboratory Technician	JD Loan
	Laboratory Technician	Seth Spinner

## B. Deployment and workload of faculty and staff

Department of Entomology faculty and staff continue to be productive (Appendix III.1 for Entomology annual departmental reports, 2017-2021) and compare favorably within the College (Appendix III.2 for composite College of Agriculture, Food & Environment FY21 report).

Entomology faculty FTE by mission area (research, teaching, service, administration) and year are shown in Table 18.

Table 18. Faculty FTE by mission area and by year.

Full Time Faculty FTEs					
Mission area	FY17	FY18	FY19	FY20	FY21
Research	10.43	8.36	9.11	9.94	3.95
Extension/Service	3.66	3.81	3.48	4.55	9.61
Instruction	2.3	2.51	2.14	3.77	3.89
Administration	N/A	0.6	0.65	0.75	0.55

The majority (53%) of current faculty effort (Figure 7) is dedicated to Research. Effort toward Service/extension and Instruction is split evenly at 22%, and the remaining 3% of faculty effort is for Administrative tasks.

Faculty and staff deployment and workload, as reflected by attempted credit hours, are found in Tables 19 and 20.

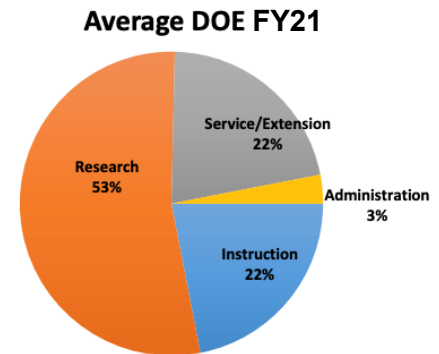


Figure 7. FY 21 faculty effort by mission area.

Table 19. Attempted credit hours by title series, 2017 - current

Sum of Attempted Credit Hours by title series							
	2017	2018	2019	2020	2021	2022	Total
-	2	2	12	2	119		137
Adjunct	363	372	330	357	279	213	1914
Extension	107	123	12	12	25	18	297
Lecturer				190	541	449	1180
Part-Time			118	21	27		166
Post-Retirement		64	60	44	84	303	555
Regular	660	621	860	1358	1459	1245	6203
Grand Total	1132	1182	1392	1982	2417	2347	10452

Table 20. Attempted credit hours by rank, 2017 - current

Sum of Attempted Credit Hours by rank							
	2017	2018	2019	2020	2021	2022	Total
-	2	2	12	2	119		137
Assistant Professor	25	71	142	623	904	528	2293
Associate Professor	167	78	191	68	81	238	823
Instructor	363	372	448	378	306	213	2080
Lecturer				190	541	449	1180
Professor	575	659	599	723	583	800	3939
Grand Total	1132	1182	1392	1982	2417	2347	10452

### C. Faculty and staff success measures and outcomes

#### Faculty success

Faculty in the UK Department of Entomology are widely recognized for their scholarly contributions and service to the scientific community, as well as to stakeholders, end-users, and the general public. Faculty are regularly invited to present at local, national, and international conferences, host symposia, author publications, serve on editorial boards, serve on panels to evaluate competitive federal grants, and collaborate on regional, national, and international projects. Historically faculty research efforts were somewhat discreetly divided into core research areas that parallel the emphasis of our course curriculum (see II. Degrees and Certifications). However, more recently, the Department more closely reflects the integrated complexity of the field of entomology, and faculty members are often engaged in research, teaching, and extension that transcend these core areas and blur the distinction between title series' appointments.

Faculty in both the Research and Extension Title Series routinely advise and mentor graduate students and serve on advisory committees. From 2017 through 2022 the number of refereed journal publications produced by the Department averaged 53.3 per year (42 to 67). This is an output of 3.1 scientific publications per faculty member per year, exclusive of book chapters and other types of publications. Research conducted by faculty has been featured in high-impact scientific journals such as Nature Biotechnology, Nature Communications, and PNAS, as well as numerous, applied and professional publications.

Entomology faculty have mentored 18 Ph.D., 21 MS Plan A, and 4 MS Plan B students through to degree completion since our last review (2016 – present). All graduate students who completed their degrees during this time have the opportunity to co-author peer-reviewed publications, often as the first author. Additionally, several undergraduate students have co-authored publications in that timeframe.

Professional development opportunities and service to the profession by faculty extend beyond research and extension. One important mechanism for faculty professional development within academia is

sabbatical leave. Since the last self-study report in 2017, two faculty members have participated in the sabbatical leave program (Stephen Dobson, Lynne Rieske-Kinney).

Participation in professional societies such as the Entomological Society of America, the Chemical Ecology, Behavior, the Ecological Society of America, and the International Union of Forest Research Organization are important for faculty development. As engaged members of these professional entities, Entomology faculty make important contributions to leadership and service roles within these organizations at the regional, national, and international levels. Several of our research faculty also serve on the editorial boards of national and international journals. These endeavors increase the visibility and standing of the Department on a national and international scale, and also serve to improve the faculty experience. In turn, these activities help faculty enrich educational experiences for students. Faculty and staff have received numerous honors and awards from various organizations and entities for teaching, research, and extension, recognizing outstanding achievements or contributions in their fields, since the last review (Appendix III.3 and 4). Faculty also provide important leadership contributions within CAFE and UK through avenues such as the CAFE Faculty Council and the UK Faculty Senate.

#### Faculty evaluations

Faculty are evaluated according to the appropriate University regulations, as well as the Statements of Evidence documents of the College and the Department. Untenured faculty are evaluated annually, and additionally undergo a thorough two- and four-year review to assure adequate progress toward tenure. Tenured faculty are evaluated every two years. The evaluation process involves submission of a curriculum vitae (CV) generated from Digital Measures (now Faculty Success™) and accompanied by narratives addressing each component of the DOE. Teaching portfolios are included when applicable. The Department of Entomology Faculty Advisory Committee, consisting of four full professors elected by their colleagues, advise the Chair on ratings and generate comments, and the Chair submits the evaluations and appropriate comments to CAFE administration. The final evaluation is conducted by the Dean and Associate Deans, who meet with the Chair and finalize the evaluations. An appeals process is available if necessary.

For faculty promotion and tenure (P&T), the candidate submits a CV, narratives for each DOE component, and examples of scholarly output. The Chair solicits letters from outside experts, some of which are identified by the candidate and some of which are identified by the Chair. External letters are added to the dossier before its evaluation by tenured faculty within the Department, who also generate letters. The completed dossier is then evaluated at the College level by the CAFE P&T Committee and the Dean, then by the University P&T Area Committee, and ultimately by the University Provost. Since our last review in 2017, three out of three faculty have been promoted successfully from the Assistant to the Associate level, and two out of two have been promoted successfully from Associate to Full Professor.

#### Staff evaluations

Staff members are first given the opportunity to self-evaluate before evaluation by their supervisors. Each major job responsibility (MJR) is evaluated, and a summary score is determined based on the score and percentage effort for each MJR. The supervisor drafts the evaluation and conducts an

individual meeting with the staff member to discuss progress and identify any deficiencies. The process is completed with the signatures of the supervisor and the supervisee.

### Work-life balance

Entomology faculty and staff participated in two work-life balance surveys conducted by UK during the review period. In general, members of the department expressed positive opinions about their work, department operations and leadership. The survey results in 13/14 categories in the recent survey are above College and UK averages. Faculty and staff had a positive opinion about work schedule flexibility, decisions made by leadership and treatment of employees with respect. Physical working conditions continue to be the number one problem faced by the members of the department.

## **IV. RESEARCH**

### **A. Areas of Research Emphasis**

The Department of Entomology has 17 full-time faculty leading innovative research, Instruction and extension programs in diverse areas. Thirteen faculty (77%) lead programs emphasizing research, three (17%) are involved in extension and applied research programs, and one (6%) focuses solely on instruction. Faculty are engaged in a wide range of impactful, well-funded, highly collaborative projects that often transcend traditional boundaries of entomological research (See Appendix IV.1 for Faculty CVs). Although our graduate curriculum consists of coursework in three core areas, departmental research efforts reflect the integrated complexity of the field of entomology, and faculty members are often engaged in research and teaching that transcend those core areas. Faculty, staff and students are actively pursuing extramural and intramural funding in support of research, extension, and instruction (Appendix IV.2). Entomology Faculty, staff and students were awarded 22 million dollars in extramural funding during the review period (Appendix IV.3).

Department of Entomology faculty include Ricardo T. Bessin, Zachary DeVries, Stephen L. Dobson, Luke Dodd (adjunct, Eastern Kentucky University), Julian R. Dupuis, Tonja Fisher, Charles W. Fox, David Gonthier, Nathan Haan, Jonathan Larson, Subba Reddy Palli, Lynne K. Rieske-Kinney, Clare Rittschof, Brian Stevenson, Zainulabeuddin Syed, Nicholas Teets, Raul Villanueva, Jennifer A. White, and Steve Yanoviak (adjunct, University of Louisville), and Xuguo Zhou. Additionally, Beryl Jones will be joining the department in July 2023. The following descriptions of research emphasis are provided by the faculty.

#### **Ric Bessin, Extension Professor, DOE 4:5:91 (Instruction: Research: Service)**

My recent research includes evaluation and implementation of alternative treatments for control of evaluation of alternative and organic controls for cucumber beetle, bacterial wilt, squash bug, and yellow vine decline control in cucumbers and squash, and manipulation of wild pollinators in cucurbit

production systems. I have evaluated insecticide seed treatments and soil applied insecticides for corn against secondary soil insect pests. I have recently been involved with IR-04 to find new insecticide chemistry for management of wireworms attacking sweet potatoes. Current studies underway include alternative management strategies for brown marmorated stink bug control in vegetable systems and effects of its invasion on native stink bugs, monitoring the spread of spotted wing drosophila in Kentucky, and management of sugarcane aphid on sweet sorghum. I have been investigating RNAi for control of a cabbage pest and am studying alternative controls for harlequin bug on broccoli.

**Zach DeVries, Assistant Professor, DOE 4:76:20 (Instruction: Research: Service)**

My research program focuses on the biology, behavior, and management of indoor/structural pests. Specifically, the mission of his program is to understand how indoor pests function and behave, why they have evolved to possess these traits and behaviors, and how their various and often unique physiologies and behaviors can be exploited for improved integrated pest management (IPM) practices. Furthermore, he seeks to understand the epidemiological and mechanistic relationships between indoor pests and their excretions, the health risks they pose, and mitigation strategies to minimize exposure and adverse health effects. Ultimately, he strives to provide scientifically backed evidence to support the most effective, affordable, and sustainable pest management solutions, facilitating proper pest control for everyone.

**Stephen Dobson, Professor, DOE 9:86:5 (Instruction: Research: Service)**

The invasive mosquito *Aedes albopictus* (the Asian tiger mosquito) is a significant biting pest and competent vector in a large portion of the United States, including Kentucky. A component of my current research is dedicated to understanding how *Ae. albopictus* behaves in a non-endemic habitat. Research has centered on a series of Mark-Release-Recapture (MRR) experiments in which both traditional and novel insect marking technologies are applied to mark non-biting male mosquitoes, which are released into the environment and then recaptured at various time periods thereafter. Results obtained from this research have helped to estimate dispersal, longevity, and relative population sizes in the field, which enhances the understanding and the ability to control this pest species. The interaction between mosquitoes and their *Wolbachia* infections, which are obligate, intracellular bacteria that can affect insect reproduction, are also being studied. In addition to characterizing the general impacts on mosquito fitness, we have developed strains and strategies for manipulating medically important mosquito populations. Additional efforts focus on collaborating with public health agencies in Kentucky to monitor tick distribution and make the data available to state stakeholders.

**Julian Dupuis, Assistant Professor, DOE 28:63:9 (Instruction: Research: Service)**

Research in my group focuses on many facets of insect systematics and evolution, which in the big picture aims to understand the dynamics and mechanisms by which biodiversity arises. Despite this broad context, many of our research questions operate on more microevolutionary scales, assessing species identification and delimitation in adaptive radiations, difficult species complexes, and hybrid interactions. To do so, we use tools from integrative taxonomy, genomics (particularly phylogenomics and population genomics), and bioinformatics. Taxonomically, we focus on lepidopteran and dipteran systems, but have research projects on varied insect groups. We also have projects exploring how DNA-

based techniques can be used to study biodiversity, apart from the realm of systematics and taxonomy, including diet analysis and DNA metabarcoding.

**Tonja Fisher, Lecturer, DOE 85:0:5:10 (Instruction: Research: Service: Administration)**

**Charles Fox, Professor, DOE 28:47:5:20 (Instruction: Research: Service: Administration)**

My lab group works on the evolution of insect life histories and behavior and the scientific peer review process. The primary focus of the research continues to be at the interface of ecology, evolutionary biology, behavior, and genetics of insects. Our major projects focus on: Metapopulation ecology, adaptation to new environments, the ecology and genetics of inbreeding depression, larval competition within seeds, and the evolution of reproductive behavior. All of this work uses seed beetles as a model system.

**David Gonthier, Associate Professor, DOE 43:52:5 (Instruction: Research: Service)**

My lab studies the ecology of agriculture and sustainable food systems. We seek to evaluate the viability of agricultural management systems to curtail environmental problems, promote sustainable pest control and biodiversity conservation while maintaining productivity and profitability. We use ecological and evolutionary theory to better identify and design agroecological practices that promote improved farm multi-functionality. Finally, we describe the intersection between ecology and socio-economic forces that form incentives and barriers to the adoption of sustainable practices through collaboration in interdisciplinary teams.

**Nathan Haan, Assistant Professor, DOE 25:70:5 (Instruction: Research: Service) Arrived Sep 01, 2022**

My lab group will research the ecology, management, and conservation of insects. Our main area of focus will be on practices that have the potential to enhance biodiversity while leveraging biodiversity-based services to agriculture, particularly pest suppression. Our research will help inform both targeted arthropod conservation efforts and agricultural pest management challenges. Projects range in ecological scope from individual species to whole communities and landscapes.

**Jonathan Larson, Assistant Professor, DOE 16:8:76 (Instruction: Research: Service)**

My research focuses on improving integrated pest management tactics for professionals that work in tree and ornamental plant protection, nurseries, turfgrass management, and invasive species control. I want to provide applied and useful tools that growers and managers can easily integrate into their work. I also study the effectiveness of modern Extension methods such as videos, podcasts, and infographics, so we can improve transmission of entomological information.

**Reddy Palli, Professor, DOE 6:64:5:25 (Instruction: Research: Service: Administration)**

Synthetic chemicals continue to be one of the major weapons used to manage insect pests. However, due to growing concerns on the effect of these chemicals on the ecosystem, and human and animal health, there is a continuous demand for discovery and development of alternate methods of pest



management. Insect physiology, biochemistry, molecular biology, and toxicology program employs multiple epigenetics, functional genomics, genome editing and single-cell sequencing approaches to study insect biology using major pests (the fall army worm and the Colorado potato beetle), disease vector (the yellow fever mosquito) and model insect (the red flour beetle). The major focus of my program includes (1) Identification of epigenetic regulators, hormone receptors, transcription factors involved in the regulation of growth, development, molting, metamorphosis, and reproduction, (2) mechanisms of RNA interference (RNAi) to understand its differential efficacy among insects, (3) molecular basis of insecticide resistance and (4) application of RNAi technology to control pests such as Colorado potato beetle and Japanese beetle. The information from these studies is being utilized to develop pest and vector management methods through RNA interference and other biotechnology approaches.

**Lynne Rieske-Kinney, Professor, DOE 14:81:5 (Instruction: Research: Service)**

My lab broadly addresses issues associated with forest health, investigating invasion dynamics and trophic interactions of forest pests, and with an emphasis on investigating innovative mitigation strategies. We are focusing efforts on developing RNAi technology as a pest management strategy. Initial work with the highly invasive emerald ash borer (EAB) led to licensing for patent protection through the US Patent Office in 2022; field trials are pending. In addition to proof of concept with EAB and bark and ambrosia beetles, we are demonstrating specificity of the RNAi pathway in selected systems through bioassays and *in silico* analyses; thus far we have discovered no nontarget effects. In addition, we are evaluating dsRNA delivery approaches. Spatial distribution and retention of dsRNAs through *in planta* delivery demonstrates the feasibility of dsRNA applications for season-long, single tree protection for both deciduous and coniferous trees. With an eye toward semi-sustainable, forest-wide protection, we are also investigating the feasibility of disrupting aggregation behaviors rather than causing direct mortality, and the feasibility of delivering dsRNAs to target sites by exploiting microbial symbionts for delivery.

**Clare Rittschof, Associate Professor, DOE 29:66:5 (Instruction: Research: Service)**

Insects, like all other animals, show tremendous sensitivity to their environment. Behaviors are not only highly responsive to environmental inputs, but they are also often an organism's first line of defense against changes to the environment that may compromise survival and health. Our lab applies approaches from neuroscience, genomics and landscape and behavioral ecology to investigate how environmental inputs shape social behaviors and colony health in the honey bee (*Apis mellifera*). We explore why certain social and environmental experiences give rise to lifelong impacts on behavior, while others are easily reversed. Because life with conspecifics increases individual disease risk, we investigate the links between social behavior and health. Specifically, we investigate why certain socially sensitive behaviors, like defensive aggression, are predictive of positive health outcomes. Our research touches questions fundamental to basic sciences like animal behavior as well as questions with applied relevance to bee and pollinator health.

**Zain Syed, Associate Professor, DOE 25:70:5 (Instruction: Research: Service)**

Like all living organisms, insects detect and respond to chemicals in their environment. Their remarkable success is largely due to their ability to adapt to new environments and utilize new food resources. To accomplish this, they display an amazing diversity in sensory structure and function. Among these, olfaction is pronounced. In some cases half of their brain is dedicated to smell. A male moth can track a 'calling' female from miles. Females, when ready to mate, emit tiny amounts of chemicals that are detected by elaborate and exquisite olfactory organs, i.e. antenna, in male moths. Just fifty years ago, the chemical identity of these signaling molecules was determined and the term 'pheromone' was coined. Subsequent neuroethological observations were groundbreaking: a single molecule of this newly discovered pheromone chemical in silk moth, bombykol, was sufficient to elicit an action potential and only a handful of bombykol molecules could induce a complete stereotypic female-search behavior in males. Now we are at the forefront of combining these two fascinating worlds of signals and receptors. On the one hand we use various analytical and behavior/ neurophysiology-guided methods to isolate and identify chemicals (*ligands*) that are detected by insects (*receptors*), and on the other hand we combine molecular, cellular, genetic and organismal studies to understand and exploit the sense of smell in insects towards their management.

**Nick Teets, Associate Professor, DOE 26:69:5 (Instruction: Research: Service)**

Research in my lab focuses on how insects cope with variable environments, and how environmental variation influences modern pest control strategies. Our work includes fundamental research on the physiological and genetic mechanisms of thermal stress tolerance, including 1) the genetic architecture and molecular mechanisms of thermal tolerance plasticity, 2) mechanisms of extreme adaptation in Antarctic insects, and 3) thermal tolerance and overwintering biology of economically important pest insects. In addition, we conduct applied research on 1) how environmental conditions and genetic makeup influence susceptibility to biotechnology-based pest control (i.e., genetic sterilization and RNA interference), and 2) improving methods of insect cryopreservation. Our group uses an integrative approach and incorporates molecular, cellular, organismal, and population level approaches, and we have particular strengths in insect overwintering biology. Together, our research can inform our understanding of insect responses to climate change, and it contributes to risk assessment and optimization of genetically based control strategies.

**Raul Villanueva, Assistant Professor, DOE 0:30:70 (Instruction: Research: Service)**

I conduct field applied entomological studies for field crops (wheat, soybeans and corn), and for industrial hemp. My research program incorporates mentoring of undergraduate and graduate students to conduct research on issues relevant to arthropods affecting crops of Kentucky farmers. Topics currently evaluated in my program are: (1) Management of aphids in small grains, insecticide applications and insecticide seed treatments, and barley yellow dwarf virus (BYDV) infections (funded by Siemer Mills Co.) (2) Management of stink bugs on soybean in Kentucky (3) Mollusk management, and the trophic relationships with ground carabid beetles. (4) Evaluating the management of the soybean stem borer, and use of sunflowers as trap crop in Kentucky (5) Control of mites and lepidopteran pests in hemp and the identification of pests in field and indoor systems. (6) Partners with colleagues serving

other subjects: (a) Ambrosia beetles: phenology and management and (b) Detection of codling moth infestation in apples using non-destructive technologies

**Jen White, Professor, DOE 40:45:5:10 (Instruction: Research: Service: Administration)**

The focus of my laboratory is investigating the ecological, evolutionary, and behavioral effects of bacterial endosymbionts in arthropods. We are particularly interested in exploring the consequences of endosymbiont infection within the context of introduced species and biological control. Maternally inherited bacterial endosymbionts are common among arthropods and can have major effects on their host's biology, including manipulation of host reproduction, influencing dispersal, affecting host plant choice, changing host temperature tolerances, altering fecundity, and providing defense against parasitoids, fungi, and viruses. These effects, in turn, can affect the ecological interactions between infected hosts and other members of the community. Currently, lab research is centered on spiders, particularly a tiny sheetweb spider, *Mermessus fradeorum*. This spider can be simultaneously infected by up to five separate strains of inherited bacterial symbiont that manipulate the spider's reproduction in various ways. Our focus is understanding the collaborative versus competitive ways these symbionts interact in their shared host, and how these interactions affect symbiont spread in the host spider population.

**Joe Zhou, Professor, DOE 37:54:9 (Instruction: Research: Service)**

My research focuses on the adaptive innovations in insects, which enable them to be the most successful group of animals on this planet. This fundamental interest has led me to pursue various research areas at five different institutions. Multi-disciplinary experiences in toxicology, physiology, biochemistry, ethology, molecular biology, and genomics have provided me with unique perspective and inspired me to understand how insects have coped with various biotic and abiotic challenges during the course of evolution. Building on an integrative genomics platform, my research and teaching program at the University of Kentucky is a marriage between basic and applied research. Overall, my goal is to integrate molecular and "omics" toolsets with various branches and sub-disciplines within biology to address some outstanding questions with practical implications. Currently, my research foci are 1) behavioral- and socio- genomics in eusocial termites, 2) risk assessment of transgenic RNAi crops, and 3) insect-plant-pathogen multi-trophic interactions.

**Adjunct Faculty**

**Luke Dodd, Eastern Kentucky University.**

Broadly, I am interested in management and conservation of natural resources. I focus on understanding the impacts of land management on bats and other small mammals and their insect prey. Given the global ubiquity and ecological significance of insects, as well as the primary role that predators such as bats play in depredating insects, these trophic linkages are important and in need of increased depth and breadth of study. My students pursue a wide variety of field and lab-based projects.

**Brian Stevenson, UK Microbiology, Immunology and Molecular Genetics.**

Lyme disease, caused by the spirochetal bacterium *Borrelia burgdorferi*, is spread by the bites of *Ixodes* tick species. It is the most common arthropod-borne disease of humans in the United States and many other temperate regions of the world. *B. burgdorferi* has evolved mechanisms by which it can infect both mammalian and arthropod hosts and be efficiently transmitted between these two very different types of animals. To do so, *B. burgdorferi* senses its environment and responds accordingly by producing proteins appropriate for each step in the infectious cycle. Our research primarily focuses on understanding the mechanisms by which *B. burgdorferi* and other pathogenic bacteria sense their environments and respond by regulating gene expression, and the functions of bacterial surface proteins during infection processes.

**Steve Yanoviak, University of Louisville.**

Research in my lab is a blend of behavioral, evolutionary, and community ecology. We conduct field-based observational and experimental investigations addressing three general questions: 1) How do species interactions and anthropogenic disturbance shape local biodiversity? 2) What selection pressures shape the behavior and morphology of arboreal organisms? and 3) How do ecological patterns in the forest canopy relate to those in the understory? Most of our current work is in the neotropics and focuses on arthropods, especially ants.

**B. Research Productivity**

**Publications-**

The Department’s 17 faculty members have produced 320 scientific publications since our last review (2016 - 2021) (Appendix IV.4). The mean Scopus CiteScore value was 6.7, with some publications appearing in extremely high-profile journals such as Science (CiteScore 49.5), Nature Biotechnology (37.4), Annual Review of Entomology (20.2), Nature Communications (18.1), and PNAS (17.1). Publication productivity is increasing, and the significance of those publications, as reflected by CiteScores, remains strong (Table 20). Further, the productivity per faculty member shows a strong upward trend (Figure 8).

Table 20. Number of publications and average CiteScores, 2016-2020.

Year	Publications	Average CiteScore
2016	46	6.71
2017	51	5.84
2018	48	6.71
2019	42	6.36
2020	66	7.66
2021	67	n/a

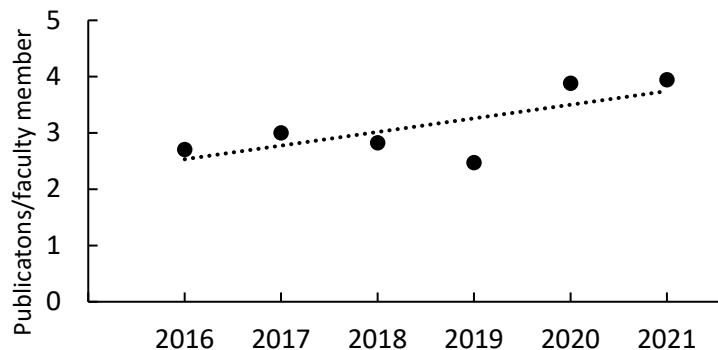


Figure 8. Number of publications per faculty member, 2016-2021.

Graduate Research Assistants play an essential role in our publication success. During the period under review, faculty report a total of 132 papers with at least one student author, which averages 7.76 student papers for each faculty member during this period. Faculty report an average of 70 unique graduate student authors, which averages to over four different graduate student coauthors during this six-year period. But publication success is not limited to our graduate students; the faculty averaged 1.12 undergraduate coauthors during this time period.

**Funding-**

Our faculty have a strong record of success in securing competitive grant funding to support research and extension activities, including federal awards (Figure 9). Total direct grants for FY21 amounted to \$5,244,459. Of these, 64% were federal competitive grants. In addition, our faculty had over \$1.1M of collaborative grants with faculty with the primary PI in another department. Thirteen of our 17 faculty members and two of our staff have federal grants. Eleven of our Research faculty and three of our Extension faculty have federal competitive grant awards; 107 of these grants include collaborators outside of our department. Several of these are multi-disciplinary and multi-institutional. Additionally, faculty are successful in obtaining funding from state and local government agencies, industry, commodity groups, and conservation groups.

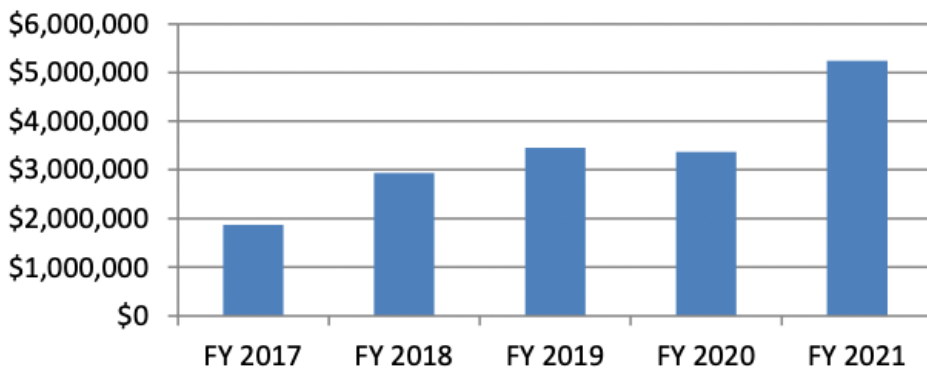


Figure 9. Five-year trend in direct awards to Department of Entomology.

## V. SERVICE, EXTENSION, AND OUTREACH

### A. Public service

Extension is a vital part of the Department and has been an area of strength since our inception. People from around the world seek out advice from experts at the University of Kentucky on insects that affect food and fiber crops, livestock, people, and homes. Our extension efforts utilize both classical and cutting-edge techniques to ensure that stakeholders both within and outside of Kentucky are well prepared to manage arthropod pests. Our extension efforts are well integrated with applied research, ensuring a seamless transfer of knowledge from various research programs to stakeholders. Extension faculty regularly seek and are awarded extramural funding for both applied research and extension efforts. Additionally, these faculty regularly train undergraduate and graduate students, and postdoctoral researchers, exposing these trainees to extension.

The Department of Entomology has three faculty with primary effort in extension, and two faculty with at least 10% effort in extension. Additionally, we have one 1 Extension Specialist. These personnel are located in Lexington, KY, with the exception of one faculty member housed at the UK CAFE Research and Education Center (REC) in Princeton, KY serving the Western part of the state. Because of the tornado that destroyed the UK REC in December 2021, that faculty member and associated staff are currently working remotely. These individuals report to the Department of Entomology on the Lexington campus.

#### Extension Personnel and Responsibilities

- Dr. Ric Bessin (91% extension). Integrated Pest Management (IPM) program coordinator, Pesticide Safety Education Program (PSEP) coordinator, minor use pesticide clearance program state liaison (IR-4), Fruit, vegetables, forages, tobacco, livestock, and sustainable Agriculture.
- Dr. Zachary DeVries (20% extension). Indoor and structural Pest management, professional pest management (certification and licensing), homeowner pest management.
- Dr. Jonathan Larson (76% extension). Pests of turfgrasses, ornamental plants, trees, nursery crops, greenhouses, and households; social media information distribution.
- Dr. Raul Villanueva (70% extension, UK REC Princeton). Pest Management Centers (PMC), Corn, Small Grains, Soybeans, Grain Sorghum, Stored Grain, Hemp.
- \*Dr. Lee Townsend (Retired in 2018; previously 80% extension). Livestock Insects, Turf and Ornamentals, Invasive Species, Forages, Tobacco, and Biocontrol of Weeds.
- \*Dr. Mike Potter (retired in 2020; previously 100% extension). Structural Pest Control, Homeowner Pest Control and Medical Entomology.

\*These faculty retired prior to 2022, but they contributed to the activities reported in this review.

- Blake Newton, MS (100% extension). 4-H/Youth Extension and Pesticide Safety Education.

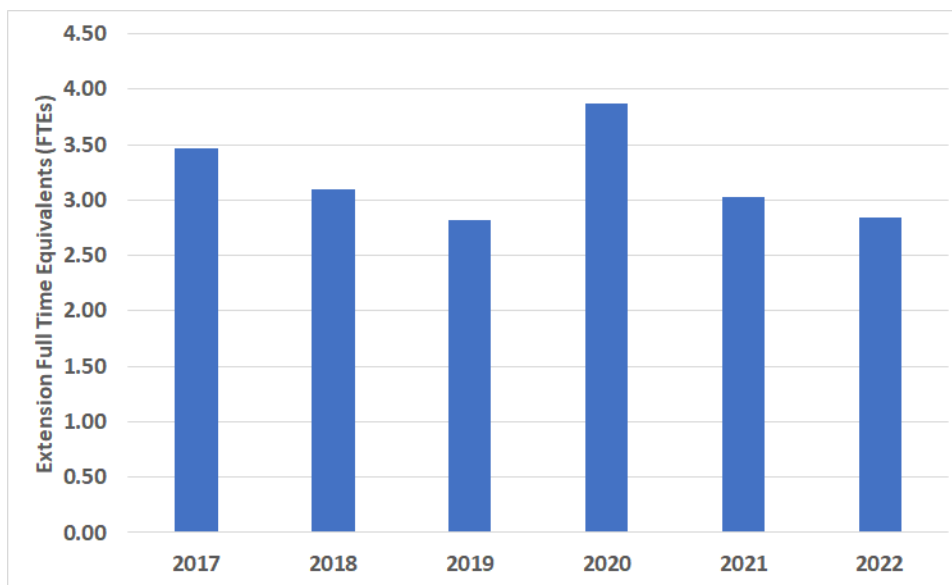


Figure 11. Total extension faculty FTEs have dropped during this period with the exception of 2020 when Drs. Potter and DeVries worked concurrently.

## MAJOR EXTENSION EFFORTS

### A. Insects, People, and Homes

Homeowners and Pests (DeVries and Larson): Insects have the potential to impact every Kentucky resident and thus have a high impact. As such, many of our efforts are directed towards informing residents of the biology and management of pests commonly encountered in and around their homes in Kentucky. More specifically, we look to educate residents on what insects they are dealing with, how they got to where they are, and what needs to be done to solve the problem (if necessary). Considerable effort is put into information distribution using traditional fact sheets and newer technologies such as social media and podcasts. These resources are also used extensively by extension agents throughout the state, ensuring a sustainable route of information distribution that makes use of local personnel in Kentucky counties.

University of Kentucky Pest Control Short Course (DeVries and Potter): Currently in its 50<sup>th</sup> year, the University of Kentucky Pest Control Short Course is one of the largest state-run pest control training programs in the county. This three-day program incorporates >15 talks across multiple sessions with world-renowned speakers from around the country presenting (e.g., Dr. Bobby Corrigan, Dr. Rick Cooper, Dr. Jerome Goddard). Attendance usually exceeds 450 people, with attendees coming from Kentucky and surrounding states. This meeting is vital to professional pest management and the state of Kentucky to ensure pest control operators maintain their licensee and certification by receiving continuing education units (CEUs) and ensuring safe and effective pest control practices will continue in Kentucky and surrounding states.

During the review period, average attendance was 466/year, resulting in >6,900 CEUs in structural pest management per year. In addition, this conference has generated >\$200,000 in funding for the

Department of Entomology since 2016, funds which are used for urban entomology research and student training/scholarships.

*Turf and Ornamental IPM (Larson)*: The Kentucky green industry employs over 15,000 Kentuckians and is worth over \$2 billion to our economy. We provide continuing education to managers through Pesticide Safety Education Programs (PSEP) to ensure they are up-to-date and licensed. Professionals can also turn to our 400-series of ENTfacts for information on pest management and/or subscribe to Kentucky Pest News for timely updates on pest issues. Applied research, such as the Kentucky Pest Alert System and WeevilTrak, are building tailored recommendations for managers to better know when to scout for key pests and how to take action with environmentally and economically sustainable methods once a pest has been found.

*Homeowner Ornamental Plant Protection (Larson)*: Kentucky Cooperative Extension agents report that 74% of their time is spent consulting with homeowners and that most of their questions focus on ornamental landscape plants. We provide Extension material through our ENTfacts that can be printed out and highlighted to teach homeowners about steps they can take to manage pests on these plants, with six new publications and over 50% updated since 2016. Two identification websites were also produced to help with pest ID. We have also provided multiple Zoom trainings on ornamental plant protection, including a collaboration between entomology and plant pathology called “The Guide to Common Diseases and Insects of Ornamental Plants,” which introduced the most common pests and pathogens before focusing on specific and common ornamental plants and their problems. Between 13 and 45 agents participated in each session. A survey at the conclusion of the series found that between 60 and 80 percent of agent respondents indicated a moderate or extreme increase in knowledge after each session. Ninety percent of agents found the webinar series valuable.

*Delusional Parasitosis (Larson and DeVries)*: Unfortunately, there are instances where extension professionals and entomologists are confronted with clients who believe they are infested with insects or mites, despite no supporting evidence. Our extension personnel regularly interact with these clients and work to help them find solutions and get the help they need to move forward. To prepare students and extension personnel, a topical seminar (Ent 770) was offered on this topic in 2021 and will be offered again based on course feedback (Course Quality = 4.8/5).

## **B. Training and Certification**

*Pest Applicator Professional Certification (DeVries and Bessin)*: Working with the Kentucky Department of Agriculture (KDA), UK Extension personnel are responsible for developing and curating many of the state licensing exams to ensure all exams are up to date and sufficiently challenging, thus ensuring those who pass the exams are properly qualified to use and apply pesticides safely. The structural pest management exam (Category 7A) has been administered to >300 people since 2016.

UK Extension personnel, operating under a memorandum of agreement with the Kentucky Department of Agriculture (KDA), coordinate the certification and training of private pesticide applicators that apply restricted use pesticides to their own property of property they rent for the purpose of producing and selling agricultural commodities. All certification, record keeping, and reporting for the private applicator program is done through UK. There are currently 10,924 certified private applicators (8/17/22) who must



be trained/retrained and certified every three years. While training is conducted by County Agriculture and Natural Resources agents, the department extension personnel provide the training resources, supplies, and guidance for the agents. With Covid-19 constraints, the Department worked with KDA to set up a temporary online training and certification program to continue to certify private applicators through Lexington until extension offices could be reopened in mid-2021.

Meeting the New EPA Training and Certification Standards (Bessin and Devries): In 2017, the EPA mandated new standards for training and certification plans for private and commercial applicators in each state. The KDA was required to revise and replace the plan they had used since 1978. The KDA consulted with entomology specialists while submitting new pesticide regulatory statutes and regulations as a result of the new EPA Certification and Training rule. Training materials and certification procedures have been modified to meet these new standards which will take effect in 2023.

Commercial Pesticide Applicator Continuing Education (Bessin): Extension personnel provide continuing education for various commercial pesticide applicator categories and facilitate approval of other meetings for CEU credit. Commercial applicators must have 12 hours of continuing education credit every three years to avoid retesting and added fees. The KDA consulted with our Department while revising pesticide regulation statutes and regulations as a result of the new EPA Certification and Training rule.

Non-Certified Applicators Program (Bessin): With the new 2017 EPA Certification and Training Rule for pesticide applicators, the KDA adopted a new category of applicator not previously recognized in Kentucky, the *Non-Certified Applicators Applying Pesticides under the Supervision of a Certified Applicator*. This category applies only to applicators applying agricultural pesticides analogous to the Private Applicator Category. As non-English readers cannot be certified as Private Applicators, this will enable them to apply general use pesticides. Training materials have been developed to meet this need.

### **C. Information Distribution, Community Engagement, and Timely Responses**

News/Podcast/Social Media Efforts (Larson): Our department is expanding its use of online Extension tools such as social media, podcasts, infographics, and videos. Our Extension Facebook page, [Kentucky Bugs](#) was founded in 2014. The page has grown from 1,944 followers in 2019 to 3,039 in 2022.

Another relatively new Extension method is [Arthro-Pod](#), an entomology themed podcast which has about 1,100 subscribers and over 62,000 “listens” since 2019. These audio programs feature discussions on innovative research being done across the country, engaging entomology topics, or pest management discussion.

We also have an active [TikTok channel, Kentucky Bugs](#), which is one of the first (if not *the* first) dedicated entomology Extension channels on that platform. Since its inception in 2021, over 90 videos have been produced and the channel has nearly 2,000 followers.

In addition to these self-published materials, our Extension team is active nationally as media contacts for traditional media outlets such as newspapers, local news programming, and magazines. These media

contacts have featured novel research being done at UK but also may feature our faculty as experts on trending entomology topics.

- [How to get rid of fruit flies — and stop them before they appear - The Washington Post](#)
- [University of Kentucky Research: Human Skin Lipids Repel Bed Bugs - PCT - Pest Control Technology](#)
- [Some ticks can cause a red meat allergy. What to know about tick-borne diseases, removal](#)
- [Invasion of the Hammerhead Flatworms! Is This Toxic Species Putting Your Home and Garden at Risk?](#)

4-H/Youth Education Programs (Larson and Newton): Current 4-H and Youth Extension programs include:

- [4-H Stream Team](#): County 4-H clubs work with Kentucky Division of Water to gather data on local watersheds, including macroinvertebrate populations. This project is still in the pilot stage, but so far over 25 4-H agents, staff, and volunteers have participated in Stream Team leader training. The project includes a leader's guide and curriculum that is aligned with Next Generation Science Standards (NGSS).
- [4-H Bee Ambassador Program](#): This certification program recognizes counties that offer educational resources related to beekeeping, pollinators, and pollinator habitats. Counties earn points annually for establishing and maintaining pollinator gardens, keeping demonstration honeybee hives, providing programming related to pollinators, and more. A program manual provides seasonal, NGSS-aligned activities. 18 counties have become certified since 2018.
- [CAFE Insectarium](#): In 2021, S-202 AgN was modified into a USDA inspected insect-rearing facility and reimagined as the UK CAFE Insectarium. This facility allows us to maintain a diverse array of live arthropods for educational efforts. Currently, the Insectarium is home to 19 species, including 9 breeding colonies. These arthropods are often used by members of the department, extension agents, and other educators to offer entomology programming. These arthropod specimens have been seen by over 1000 Kentuckians so far in 2022. Pending approval from UK Environmental Health and Safety, we plan to open the Insectarium for future guided tours.

Citizen science and invasive species (Larson, Bessin, Villanueva): In a collaboration between Extension and the Office of the State Entomologist, 'Kentucky Keepers' is a citizen science program aimed at monitoring invasive species in Kentucky. Extension faculty recruited Extension agents across the state to help coordinate and recruit volunteers in their counties from 4-H clubs, Master Gardeners, and Master Naturalists. A curriculum on two invasive organisms, the spongy moth and spotted lanternfly, was produced for adults and youth and sessions were delivered through Zoom. The Office of the State Entomologist designed an app program that volunteers can use to report sightings of the tree of heaven, spotted lanternfly, and spongy moth. They also provided pheromone traps that were given to volunteers for use in monitoring for the spongy moth. These traps are a part of the National Slow the Spread program for this pest. In total, 27 agents agreed to be local coordinators and 30 counties are being monitored. Nearly 300 pheromone traps have been deployed by volunteers. This has added valuable new data to the Slow the Spread monitoring project by adding 7 counties that were not previously being monitored. Four of these, Whitley, Knox, Laurel, and Harlan, are near the current border for spongy moth distribution and need to be included to protect Kentucky forests. Currently, the value of this project is about \$8,000 in effort for the Office of the State Entomologist as they normally have hired external contractors to perform this work.

*Insect identification (Bessin, Larson, Newton, DeVries, Villanueva)*: Approximately 1000 insect and mite identifications are made annually by Extension personnel. While many of these have been traditional physical samples submitted through extension offices, the majority now are received electronically through email and text messaging. Besides pest identification, situation specific recommendations are provided at no cost. We strive to send a reply within one day of receipt of the sample.

#### **D. Agricultural Commodities**

*Integrated Pest Management (Bessin)*: Extension personnel coordinate the extension IPM program within the college including grant preparation and submission, management, and reporting. Over this review period, the IPM program in the college is composed of 5 to 6 somewhat autonomous working groups operating in the areas of agronomic crops and specialty crops. As part of this program, a pest trapping network in Princeton (W. KY) and Lexington (C. KY) is maintained throughout the growing season and supplied alerts for two fall armyworm outbreaks during this period. These timely alerts, such as the fall armyworm outbreak of 2021, are transmitted to agents and stakeholders through newsletters and a listserv.

*Pest Management Recommendations (Bessin, Villanueva)*: Pest management recommendations including insecticides/miticides are provided to stakeholders on our departmental website for cattle, field crops, and forages and updated annually. Pest management recommendations for fruit and vegetable crops are updated every other year, printed, and distributed to county extension offices. Extension specialists work with colleagues in other states to produce a biannual fruit pest management guide used in 13 Midwestern states and an annual guide for vegetable crop producers in 13 southeastern states.

*Expanding Pesticide Availability (Bessin)*: Extension personnel canvass the state for minor use pesticide needs for specialty crops and conduct research studies in support of minor use pesticide registrations through the IR-4 Project. These needs are carried to the southern region director and supported at the national food use workshop. The outbreak of sugarcane aphid on sweet sorghum resulted in an insecticide being granted a section 18 registration for 5 years until IR-4 was able to get that insecticide approved by the EPA and labeled for sweet sorghum. Five other states modified the Kentucky section 18 request for their states. With the deregulation of hemp, 4 biopesticides received 24(c), State Local Needs, registration to support this growing industry. After the recent discovery of numerous imported fire ant mounds in south central Kentucky in 2022, two 24(c) registrations were obtained for use of insecticide baits in pastures and rangelands.

*Grain Production (Bessin and Villanueva)*: This program provides education, research-based information, and technical assistance to approximately 5 million acres of grains planted annually in Kentucky. The program helps corn, soybean, and wheat farmers to make decisions on the use of pesticides to manage and reduce pest impacts on grain production issues. Also, the program has a significant impact on consultants, and Agriculture and Natural Resource County Extension Agents. This program emphasizes environmental stewardship while implementing sustainable and judicious pest management efforts. The program also provides information on the Corn and Soybean newsletter and the Small Grains newsletter.

Hemp IPM Production (Villanueva): Kentucky is one of the leading states in hemp production. As part of the University of Kentucky’s Hemp Working group the hemp IPM program provides information on the main arthropod pests occurring in hemp. The program also conducts novel tests on efficacies of organic and conventional products to control mites and insects affecting hemp. This information has relevance for local and out of the state hemp producers as information on this crop is scarce.

Livestock and Forages (Bessin and Larson): Kentucky is a major forage producing state to meet the needs of its livestock industry. Our Extension professionals provide pest management leadership to steward this industry. In 2020, following up on reports of poor control of alfalfa weevil in alfalfa, bioassays conducted by extension personnel provided evidence of high levels of pyrethroid resistance by alfalfa weevil. In 2021, an impending outbreak of fall armyworm was detected through our pheromone trapping network and county agents and producers alerted through our newsletter and listservs. With the recent discovery of Asian longhorned tick and the protozoan that causes bovine anemia, extension programming is being developed to address this issue.

Specialty Crops (Bessin, Larson, Villanueva): Applied research, demonstration plots, and extension meeting are used to advance IPM for specialty crops in Kentucky. As the number of small producers selling retail through farmers markets and moderate sized producers selling wholesale through produce auctions have expanded during the past decade, an emphasis is placed on developing tools that are size appropriate for scale of production.

**E. Extension Contacts**

Extension entomology specialists deliver programming in a variety of methods including direct contacts with target audiences through field days and field walks, workshops, conferences, site visits, and interactive on-line webinars. Specials also provide programming indirectly through television and radio programs, web resources, and social media.

**Extension Contact Hours**

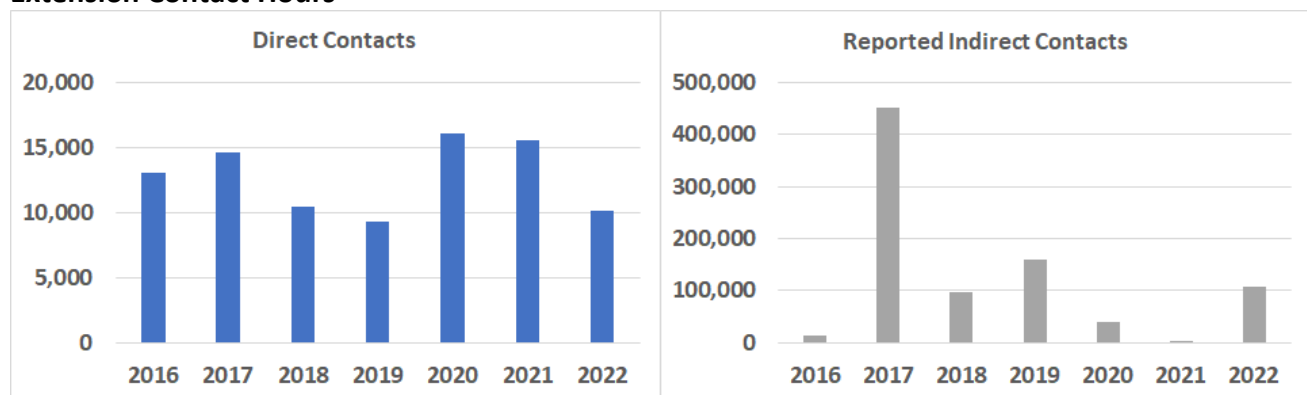


Figure 12. Direct (l.) and indirect (r.) contacts were variable during the period of review, but direct contacts increased with the change in delivery methods during Covid-19.

## F. Extension Materials and Resources

Entomology Fact Sheets (ENTFacts): UK Extension professionals produce and curate fact sheets (Table 21) that are used by homeowners, extension agents, and professionals in Kentucky and globally. ENTFacts provide vital information about the biology and control of various arthropod pests relevant to Kentucky residents. These factsheets receive thousands of pageviews monthly; in June 2022, our ten most-visited factsheets (which are also the ten most-visited pages on the entire UK Entomology website) received over 104,000 views. Furthermore, during the calendar year 2022, our factsheets occupied at least 3 of the top ten most-visited sites for the entire CAFE website domain (ca.uky.edu). A complete list of factsheets is here: <https://entomology.ca.uky.edu/entfacts>

Table 21. Summary of ENTFact activities involves active work on >50% of the 277 published factsheets.

Category	No. of fact sheets	No. published since 2016	No. updated since 2016	% published or updated since 2016
Field Crops	61	6	20	43
Fruit	31	0	31	100
Vegetables	31	1	24	80
Landscape	65	6	32	58
Livestock	18	1	0	6
Home and Health Pests	57	5	23	49
Miscellaneous	14	1	5	42
TOTAL	277	20	135	56

## G. Departmental Web Resources

Kentucky Critter Files: The [Kentucky Critter Files](#) is an online guide to insects and their relatives that are commonly encountered by 4-Hers, K-12 students, and other Kentuckians. It is organized taxonomically and currently covers over 50 groups at the order or family level. It receives about 25,000 views annually. We are currently working with CAFE web services staff to migrate the Critter Files to the Drupal platform, which will allow us to build interactive functionality to the site, such as customized searches.

Kentucky Pest News: Articles contained in the Kentucky Pest News (KPN) e-newsletter are submitted by UK CAFE Entomology, Plant Pathology, and Weed Science Cooperative Extension Specialists. Topics cover a variety of timely pests including insects, diseases, and weeds of concern. Members of the Department of Entomology regularly contribute articles to KPN to inform Kentucky Extension Agents and residents about important insect/arthropod problems.

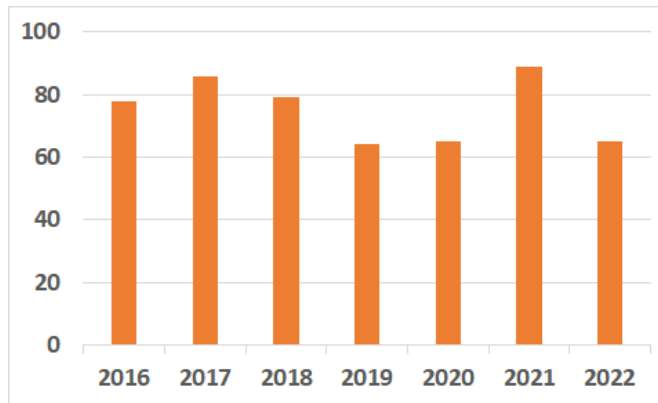


Figure 13. Kentucky Pest News newsletter articles submitted by Entomology Extension faculty.

## H. Extension Funding

Extension specialists do not receive funding from the department/college for travel or extension programming and rely on state and federal competitive grants, commodity group support, and industry grants to conduct applied research that aid in programmatic development.

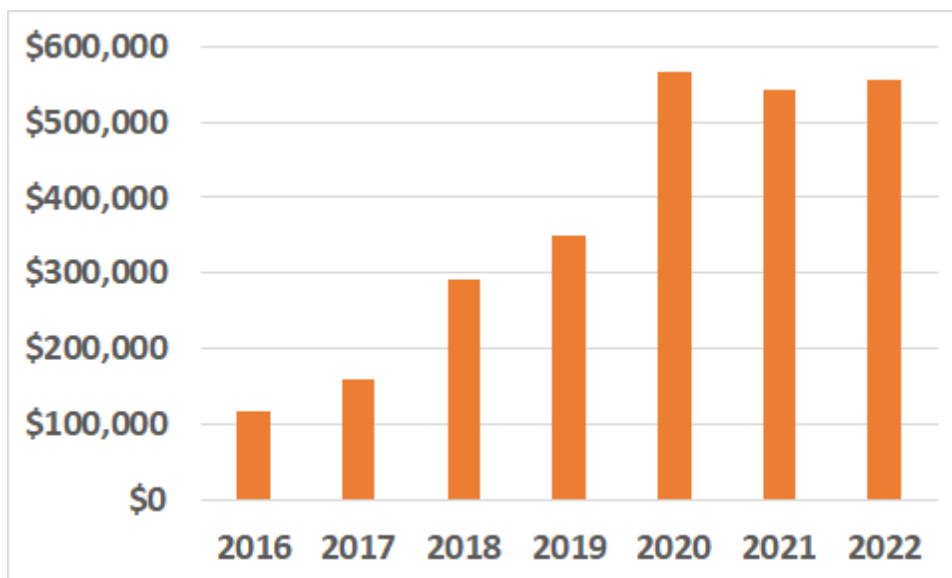


Figure 14. Entomology Extension funding increased dramatically with the addition of new faculty.

## I. Extension Awards

- Townsend: 2018 Outstanding Extension Specialist, KY Assoc. County Ag. Agents.
- Bessin: 2019 Outstanding Extension Specialist, KY Assoc. County Ag. Agents.

## NON-EXTENSION EFFORTS

### A. Office of the State Entomologist

The vast majority of State Plant Regulatory Officials in the US are associated with state governmental Departments of Agriculture. However, Kentucky statutes state that the Chair of the Department of Entomology of the Agricultural Experiment Station at the University of Kentucky shall be the State Entomologist and in turn is deemed the State Plant Regulatory Official.

The Office of the State Entomologist is responsible for licensing businesses and individuals that buy, sell, ship, or distribute nursery stock for commercial or monetary gain in Kentucky. This includes, but is not limited to, nurseries, garden centers and landscapers. We conduct annual inspections of nurseries and assist nursery owner/managers with their pest problems. Nine hundred twenty-four nursery dealers are licensed in 2022; 477 nurseries were licensed in the fiscal year 2021-22. The State Entomologist Office also handles Phytosanitary Certificate Applications for individuals who ship any plant or plant products out of Kentucky, including the international movement of plants and plant products and domestic shipments within the United States. Federal (USDA) certificates are for international shipments and the average number issued (2015 – 2022) is 2,500 per year. Most of the international shipments are kiln dried lumber. State certificates are for moving commodities from state to state; there was an average of 170 State certificates issued per year.

#### Personnel in the Office of the State Entomologist

- Dr. S.R. Palli, State Entomologist
- Mr. Joe Collins, Senior Nursery Inspector
- Mr. Carl Harper, Senior Nursery Inspector
- Dr. Janet Lensing, Cooperative Agricultural Pest Survey (CAPS) Coordinator
- Mr. J.D. Loan, Pest Survey Technician
- Ms. Jennie Condra, Nursery Inspector (Western half Kentucky)
- Mr. Seth Spinner, Spotted Lanternfly Survey & Outreach Coordinator

#### Pest Surveys Conducted in Kentucky in 2022:

- Spongy Moth (formerly European gypsy moth)
- Imported Fire Ant
- Forest Pests
- Corn Commodity
- Soybean Commodity
- Asian Defoliator
- Nursery & Retail
- *Phytophthora ramorum*
- Grape Commodity
- Solanaceous Crops
- Spotted Lanternfly

#### Outreach activities of the Office of the State Entomologist

Personnel engage in multiple outreach events to educate the public and industry about invasive pests, focusing on those that pose the most immediate threat to Kentucky, such as Asian longhorned beetle,

spotted lanternfly, and imported fire ants. Outreach events often center around home and garden shows, nursery and forestry trade shows/ field days and conferences, and day outings at popular tourist locations such as Mammoth Cave National Park. The goal is to increase awareness and identification ability of these pests because early detection is key to successful eradication and mitigation.

Since 2018 personnel have attended 75 separate outreach events reaching nearly 12,000 people. We have developed print ads for billboards, newspapers, magazines, and KY hunting and fishing guides, developed 7 new promotional items to give away, and created 2 informational pamphlets about invasive pests (spotted lanternfly, imported fire ants, emerald ash borer). The State Entomologist's Office has also developed numerous outreach materials promoting education on invasive species, such as i.d. cards, a children's activity book, bookmarks, pens, pencils, erasers, etc. The first emerald ash borer in Kentucky was discovered when a homeowner called the State Entomologist's Office after using one of our identification cards picked up at our booth during an outreach event.

In 2022 we implemented a new citizen scientist program in collaboration with the Department of Entomology Extension. The goal is to educate Kentucky's citizens, primarily Master Gardeners and 4H groups, about the threat from invasive pests and train them to deploy and monitor spongy moth traps. A second citizen science component is aimed at marking tree of heaven locations and spotted lanternfly scouting locations prior to discovery of the spotted lanternfly in Kentucky.

#### **Harrison Garman Entomology Club (Graduate student club, Faculty Advisor: Jonathan Larson)**

The Department of Entomology Graduate Club plays key roles in professional development and makes important contributions enriching the lives of our students. The graduate students elect representatives to standing Departmental committees and one graduate student to attend monthly faculty meetings, making the students an integral part of department governance, and providing a mechanism to promote awareness of important news and developments. Through the club, students are also selected to serve on search committees for faculty and have sat on six searches since 2016. Additionally, the club offers opportunities for students to participate in outreach events and builds opportunities for networking within the department; it also coordinates several social gatherings. The club uses Extension based curricula to perform school visits to K-12 students and volunteers their time at events like the Insect Night Walk, KET Science Day, and visits to the Explorium, the local children's museum. One highlight effort of the club is the Bobby C. Pass Student Choice Speaker, an annual honor bestowed by students onto a visiting scholar they choose to feature in our seminar series. Since 2016 seven honorees have joined us in person or over Zoom. The students also choose an annual winner for the Shelby Stamper Outreach Award, which honors a departmental member who has made significant contributions to our outreach mission; seven awards have been given since 2016.

#### **Emerging Entomologists (Undergraduate student club, Faculty Advisor: J. White)**

Founded in 2020, The Emerging Entomologists undergraduate student club provided a continuous venue for undergraduates with entomological interests to connect and learn about the discipline throughout the pandemic. In addition to monthly meetings (virtual during the pandemic), the group holds insect-



collecting events, hikes, and charity fundraisers, raising funds for the Entomological Society of America's Chrysalis fund.

## **B. Individual Faculty Outreach Projects/ Efforts**

- Healthy Trees – Healthy People (Rieske-Kinney). Outreach and education program to train participants in tree i.d., tree health, and exotic pest detection while encouraging physical activity in selected Lexington city parks. 2016-2019.
- High School Genetics Camp (Teets). Program that is part of Teets' NSF-funded work on the genetics of thermal tolerance. Teets designed and implemented a week-long genetics course for high school students that included molecular techniques (DNA extraction, PCR, sequencing, molecular barcoding), Mendelian genetics, and quantitative genetics, among other topics. The course was taken by 22 students in 2021 and 30 students in 2022.
- Hosted and funded a weekend beekeeping workshop for the university community (Rittschof). Competitive funds obtained from the UK Student Sustainability Council.
- K-12 Insect Presentation (Devries). Basic entomology presentation for preschool children (3-5 years old) including hands-on insect demonstrations.
- Mentoring of high school research students (Teets). Several labs in the department mentor high school research interns from several local programs, including Math Science and Technology Program, Lafayette Pre-Engineering Program, Lafayette Biotechnology Program, and STEAM Academy. These students work in the lab, conduct fieldwork, and some have been coauthors on publications.
- Presentations on honeybee behavior and health to state-wide and regional beekeepers (Rittschof). Over the review period, 31 presentations given by the Rittschof lab to beekeeping clubs, schools, meetings, and workshops.
- Presentations on bee biology and pollination to the lay public (Rittschof). Eight presentations to garden clubs, public science events, and grade schools.
- Presentations and workshops to student organizations and events at the University of Kentucky (Rittschof). Seven presentations to horticulture clubs, neuroscience clubs, and the student body broadly (e.g., participation in the Curiosity Fair).
- University of Kentucky Curiosity Fair (DeVries). Entomological presentation/booth for the University of Kentucky and greater Lexington community focusing on the biology, behavior, and management of insects. 2021.
- Urban Forest Initiative (Rieske-Kinney). Co-founded with FNR and co-lead with LA and Geography, UFI is an interconnected working group that encourages education, engagement, and enhancement of the urban tree canopy. Mentors undergraduate interns (~3/yr since 2014), engages community through tree-centric activities, sponsors Tree Week, TreeCATs (5 wk workshop on urban and community forestry), and seminar series (75-150 community attendees at 1-3 seminars/yr). 2014-present.
- Viruses in Kentucky honeybees – a citizen science approach (Rittschof). Beekeepers across the state (120 hives from 33 beekeepers across 17 counties) applied in-hive nutrition supplements over a one-month period. Members of the Rittschof lab are evaluating viral presence and abundance in samples collected pre- and post- (relative to control) in order to determine whether

nutritional supplementation improves viral response. This project is funded by the Kentucky Agricultural Development Board.

**C. Service to the Profession** (highlights only. See Appendix IV.1 for individual CVs for more complete listing)

Department faculty members contribute extensively to the wider scientific community through a variety of avenues. Several serve or have served in leadership roles in the Entomological Society of America (ESA), the primary professional organization for entomologists globally, and nearly all are active ESA members. Several serve on standing ESA committees (Bessin, DeVries, Palli, Rittschof, White), regularly evaluate student paper contributions (numerous faculty), serve as program/symposium organizers and moderators (Palli, Rieske-Kinney, Rittschof, White), and function as ESA workshop leaders (Larson). Additionally, faculty serve in leadership roles in other professional organizations relevant to their subdiscipline (e.g., Ecological Society of America, Southern Forest Insect Work Conference, International Society of Chemical Ecology). Several faculty members serve in an editorial capacity for professional scientific journals (Bessin, DeVries, Fox, Gonthier, Palli, Rieske-Kinney, Rittschof, Syed, Teets) and most routinely serve as manuscript reviewers across a spectrum of related subdisciplines. Department of Entomology faculty are regularly called upon to serve on grant panels or as ad hoc reviewers for numerous granting agencies (NIH, NSF, Czech Science Foundation, Genome Canada, USDA, and more), provide input on US Endangered Species Act species status assessment reports (Dupuis), serve on Pest Control Advisory Boards, and steering committees. Several faculty have served as outside reviewers for Promotion and Tenure for other institutions (California, Georgia, Florida, Mississippi State, Ohio State, Michigan State, North Carolina State Universities).

**D. Service to the Institution**

Faculty are actively engaged in institutional missions and goals and contribute at the University and College levels.

- University: P&T Area Committees (several faculty); International Advisory Council; University Title IX Hearing Panel; CCS Advisory Committee; Image Core Advisory Committee; University Faculty Senate
- College of Food, Agriculture, and the Environment: Ag BioTech Advisory Committee; CAFE Faculty Council; Extension Area Director Search Committee; International Programs Coordinator; P&T College Committees; P&T Appeals Committee; Pesticide Safety Committee, Search Committees (CAFE Associate Dean for Instruction, Vet Science Department Chair, faculty positions); Curriculum Committee and Arboretum Review Committee

## **VI. DIVERSITY, INCLUSIVITY, AND CIVILITY**

### **A. Promotion of diversity and inclusivity**

As a department, we embrace diversity, inclusivity, and civility, and are committed to creating and maintaining a positive working environment. We are committed to providing employment opportunities to all qualified applicants regardless of economic or social status, and do not discriminate based on race, color, religion, gender, marital status, beliefs, age, national origin, sexual orientation, or physical or mental disability, and maintain as diverse a workforce as possible.

The Department formed the Diversity, Equity and Inclusion committee in August 2020. The committee consists of faculty and student members. The mission of the committee is to promote a diverse and inclusive education and work environment by developing and implementing plans that provide rich diversity-related experiences for all to help ensure their success in an interconnected world. The first initiative of the committee was to promote diversity in our weekly departmental seminars by inviting diverse guests to highlight diverse research and ideas. In February 2021 (Black History Month), the committee invited Dr. Hongmei Li-Byarlay, a Research Assistant Professor of Entomology at Central State University. Dr Li-Byarlay presented a seminar on 'How to build a bee research lab in a new 1890 Land Grant Institution'. She talked about incorporating undergraduates from diverse backgrounds into research and recruiting from historically black colleges and universities (HBCUs). One departmental faculty member serves each year on the college Departmental Representatives Committee, which provides perspective and assistance to the College Office of Diversity, Equity and Inclusion regarding strategic planning and college initiatives.

The Department completes an affirmative action form for each faculty and professional staff search, following the University's policies and guidelines for recruiting and retaining a diverse faculty and staff workforce. When faculty vacancies arise, a Search Committee is appointed to develop a position description that fulfills the needs of the land grant mission, enhances research, extension and/or instructional capacity, and meets the needs of the Department. The position description is advertised widely through relevant professional organizations, at all the land grant universities, and on relevant electronic list serves. The Department seeks input from the Assistant Dean and Director for Diversity to ensure that our faculty search process is inclusive. Search Committee members screen applicants, provide interview recommendations to the Chair and faculty, and the top (2-6) candidates are invited for remote interviews, which are then narrowed down to on-site interviews. The interview process involves a seminar presentation and teaching demonstration (if applicable), and engagement with all faculty, staff, and graduate students in group meetings. Upon completion, the Chair obtains input from staff and students, and faculty discuss candidate qualifications. After reaching a consensus the Chair provides this input and recommendation to the CAFE Deans, and if in agreement, an offer is extended to the candidate. If the candidate does not accept the offer, the Chair solicits input from the faculty regarding the suitability of the other candidates interviewed, and an offer may be extended to a second suitable candidate. If no suitable candidate is found, the search committee may re-advertise the position and the selection process would be re-initiated.

## **B. Civility among faculty, staff, and students**

Results of the 2019 [UK@Work Survey](#) conducted semiannually by the University identified our strengths as: i) a belief in the goals and mission of the University, ii) pride in our association with the University, iii) satisfaction in and understanding of responsibilities, iv) respect from supervisor, and v) a sense of personal accomplishment from work. Our department has exceptional scores relative to College and University scores. Areas for improvement include: i) pay, ii) lack of confidence that surveys lead to positive change, iii) stress influencing effectiveness, iv) timeliness of managerial decisions, and v) faculty and staff retention.

The Chair maintains an open-door policy. During the academic year faculty interact at monthly faculty meetings, and faculty, staff, and students interact at weekly departmental seminars preceded by a coffee social. Covid necessitated pivoting to remote interactions, but the scheduling largely remained intact.

The H. Garman Entomology Club is a professional development and social club, and functions as the voice of ENT graduate students by providing student representatives on standing departmental committees and communicating student concerns with the Chair.

## **C. Stakeholder Engagement**

The University of Kentucky Department of Entomology is Kentucky's sole Entomology Department. We address entomologically related issues ranging from threats to our signature industries and to public health, to concerns from growers and producers, to inquiries regarding household pests and curiosities from hobbyists. We have an inherent responsibility to actively engage in addressing the needs of all our constituents through our research, extension, outreach, and teaching activities to address entomological issues, challenges, and needs as effectively as possible. Our department is nimble; it reflects the integrated complexity of the field of entomology, and faculty are often engaged in research and teaching that transcend subdisciplines and traditional roles.

Research efforts largely focus on improving our knowledge and understanding of complex systems and their insect associates, and often involve investigating how they affect human interests. Our land grant mission demands that we place emphasis on research that has practical management implications for our constituency. The past decades have seen research and extension projects addressing issues associated with our signature industries of horses and bourbon (e.g., Mare Reproductive Loss Syndrome threatening the equine industry, and powderpost beetles and oak timberworms threatening bourbon distilleries). Our programs are addressing public health concerns (ticks, mosquitoes, bedbugs); the consequences of increased globalization (e.g., invasive species biology and mitigation, climate change); and conservation concerns (pollinators, and sustainable food production). New technologies and approaches are under investigation (e.g., gene silencing, gene drives, remote sensing).

Our extension, outreach, and teaching efforts are geared toward delivering knowledge and solutions that address entomologically related challenges affecting Kentucky. Our faculty are nationally recognized for their expertise and value in providing timely information to address challenges and solve problems. Our faculty and staff are also embedded in a network of 120 county extension offices, and interact with

teachers, youth leaders, the public, landowners, county agents, and the pest control industry. We engage with numerous partners in local, state, and federal governments, the private sector, and public organizations. Relevant agencies include the Kentucky Department of Agriculture, Kentucky Division of Forestry, Kentucky Department of Fish and Wildlife Resources, Office of Kentucky Nature Preserves, U.S. Department of Agriculture, U.S. Forest Service, U.S. Fish and Wildlife Service, and the National Park Service. Partnering associations include the Kentucky Pest Control Association, Kentucky Arborists' Association, Kentucky Vegetable Growers Association, Kentucky Cattleman's Association, Kentucky State Nature Preserves Commission, and others. Collectively these entities act as partners in information dissemination to stakeholders. Information dissemination is supported and enhanced by scientific and extension publications and information made readily available through our website, podcasts, and other online outlets, as well as by research presentations given by our faculty. We have fully embraced social communication mechanisms to enhance our outreach capacity. We stay in touch with our alumni and keep them informed of department activities through our social mixer at the annual Entomological Society of America meeting.

## **VII. ADMINISTRATION AND GOVERNANCE**

### **A. Administrative Structure and Effectiveness**

We are one of 14 academic departments in CAFE administered by Dean Nancy Cox. Each department is responsible for programs of research, instruction, and extension. Departments are administered by a Chair who is appointed for a six-year term, subject to renewal following a six-year institutional review. The Chairs report directly to the CAFE Dean, or indirectly through associate deans for faculty, research, extension, and academic programs. Chairs and directors hold monthly meetings with college administration and the Dean meets quarterly with Chairs and program directors. The responsibilities of the Department Chair are described in the Governing Regulations of the university (GR VII.F.2.e).

The Department of Entomology is relatively small; communication and interactions among faculty, staff, and students in the Department are strong. We have monthly faculty meetings during the academic year that include a representative staff and student member. For the past several years we have had an annual retreat each August, during which long-range planning and strategic deliberations take place. Additional strategic planning occurs in standing committees.

The Department has standing committees, directors, and coordinators (Appendix VII) through which much of the department's planning and program development takes place. These committees meet as needed.

- Advisory Committee is composed of four tenured faculty who represent teaching, research and extension and aid the chair in making personnel evaluations and strategic decisions. Two members of the committee are elected by the faculty and the other two are appointed by the Chair.
- Curriculum Committee addresses graduate and undergraduate student and curriculum issues.
- Graduate Program Committee addresses graduate student applications, learning outcomes, and curriculum issues.

- Planning Committee is composed of non-tenured faculty charged with envisioning future faculty hires.
- Diversity and Inclusion Committee

Additionally, we have the following directors/coordinators.

- Awards Coordinator
- Director of Graduate Studies
- Director of Undergraduate Studies
- Director of online MS Program
- Seminar Coordinator organizes the departmental seminar series hosting external speakers and which, importantly, serves as the platform for graduate student proposal seminars and exit seminars, which are requirements of our graduate programs
- Extension Coordinator
- Farm Operations Coordinator
- Greenhouse Coordinator
- Safety Officer

## **B. Governance-Related Policies and Procedures**

The [Department's Rules of Procedures, adopted April 2016](#), reflect the University's Governing Regulations and to help effectively and efficiently achieve the department's goals and objectives. The Chair administers state and federal funds, supports personnel, and physical facilities within the Department. Allocations of funds to support the teaching, research, and extension programs of individual faculty members and extension staff are made annually from state and federal capacity building funds. The Chair distributes available funds to teaching programs, approved research projects of the Kentucky Agricultural Experiment Station, and extension programs. Funds obtained through outside grants to faculty and staff are administered entirely by the grantee(s) within agency and university guidelines. Within the Department, available funds may be used for equipment and facilities needs as appropriate; however, these funds are limited. CAFE also supports equipment purchase based on availability of funds, need, and justification. Major facilities modifications are treated on an as needed basis and support is solicited from all levels of the university. Space is at a premium and is also treated on an as needed basis; the likelihood of obtaining additional space is remote.

The Chair makes recommendations for the initial salaries of new faculty to the Dean, tempered by parity, college policy and available funds. Salary increases are based on an average salary pool based upon legislative allocation and established for the university by the President's office. Based on this target mean, individual salary increases are allocated according to a merit rating scale based on an annual (non-tenured faculty) or biennial (tenured faculty) faculty performance evaluation. CAFE's faculty performance evaluation process allows for a five-rank scale. Raises are assigned to each merit rating to allow for an overall institutional raise at the target mean. Funds are available from the Provost's office and approved by the Dean. The Chair provides input to the process by assigning a merit rating to each faculty member with input from the Advisory Committee based upon the review of the individual faculty-amended Digital Measures performance evaluation document. The documents are then reviewed by the Dean and appropriate Associate Deans, and any discrepancies between their ratings and the Chair's ratings are resolved at a conference. The assignment of the final merit rating lies with the dean. Each faculty member has the right to appeal their merit rating and accompanying salary adjustment.

To address emerging issues and fulfill the land grant mission, entomological research, teaching, and outreach must be of the highest quality in terms of scientific and academic rigor, productive in terms of

measured outputs, and innovative in the use of new scientific, teaching, and communications technologies. The Department of Entomology uses a hierarchy of planning documents to guide their activities. The [University of Kentucky 2021 Strategic Plan](#) provides overall institutional direction for the University, and programs within CAFE and the Department of Entomology are developed within and guided by that plan. The [CAFE Strategic Plan](#) for 2015-2020 developed the college's missions within the context of the University plan. Development of these strategies allows for significant input from administrators, faculty, staff, and students, with the principal driving force identifying the needs of the Commonwealth of Kentucky and opportunities for the University and its programs to address those needs.

Program planning within the Department of Entomology is a product of the faculty with input from staff and students. University Administrative Regulations require us to undergo a Periodic Review every six years, during which a committee of external and internal reviewers make recommendations and priorities are established. Departmental faculty and leadership review these and make suggestions directed towards overall improvement, finally submitting an Implementation Plan to guide initiatives over the six-year cycle until the next review. The Department also uses annual faculty retreats to set overall plans and policies; these are revisited in near-monthly faculty meetings to assess progress and assure relevance.

Curriculum planning is a function of the Curriculum Committee with input from the Directors of Graduate and Undergraduate Studies. Research planning is not a departmental function; the Department weighs in only on the definition of vacant faculty positions and the selection of new faculty. Our philosophy is to select the best faculty who will define the appropriate directions for productive research. Extension planning is a function of the extension faculty and staff, who use a variety of mechanisms to plan and direct overall extension efforts.

## **VIII. BUDGET AND FACILITIES**

### **A. Facilities**

The Department is housed on the second and third floors of Agricultural Science Building - North (AgN), which contains 12 research labs and 45 faculty/staff/student offices, and 1 dedicated classroom. Several labs in AgN have walk-in coolers and there are five quarantine facilities. We have 2 research labs and 4 offices in the Plant Sciences Building, and 5 research labs, 4 offices, and a quarantine facility in the Dimock Animal Pathology Building. The Insect Research Collection is also housed in the Dimock Animal Pathology Building. Since the destruction of the research facility at the UK Princeton Field Station in the December 2021 tornadoes, laboratory and office space for our Princeton personnel have been rented; plans are in the formative stages for replacement facilities. CAFE maintains greenhouse space and Entomology is allotted one full greenhouse. Additionally, we have ample space and infrastructure for field studies at the Spindletop Research Farm, and UK's Princeton Field Station in western KY and Robinson Forest in eastern KY are available for field research. The UK Arboretum, State Botanical Garden of Kentucky, is a 100-acre greenspace located on the main UK campus that can also be used to support limited research and instructional activities.

Although we routinely pass mandatory safety inspections, space quality is an issue. AgN meets safety standards, but climate control is a persistent problem and water leaks are not infrequent. Animal

Pathology contains a considerable amount of low-quality space. It does not meet accessibility standards required by the Americans with Disabilities Act and labs there have substandard fume hoods, which can compromise productivity. Space quality may be a detraction in recruitment and retention of faculty, staff, and students.

## **B. Equipment**

The Department keeps pace with technological developments with sequencing, computer, microscope, video, chromatographic and molecular equipment, to support graduate and undergraduate student research projects. An array of equipment is available to complement studies in molecular biology and physiology, including real-time PCR, a cell culture facility, GC-MS, capillary electrophoresis, SEM, Confocal and Photomicroscopes, scintillation counters, ultracentrifuges, scanners, imagers etc. The University has an advanced genomics technology center. Field-based research and extension programs have permanent field vehicles assigned.

## **C. Budget**

The department personnel and operations are supported using funds from multiple sources. State and mandated funds to support Research, Extension and Instruction. State, Federal capacity funds from HATCH research, McIntire-Stennis, Cooperative extension service and multi-state research make up about 50% of the annual budget of the department and more than 99% of these funds are used for salaries. The rest of the 50% of the annual budget comes from grants from local, state, and federal agencies and private industry. Most of these funds are used to support the salaries of research personnel and operational expenses. As a result of 14.5% reduction in the unit budget in 2020, the entomology department lost almost all operating funds and salary support for a faculty position; one health entomologist position that was approved by the college and university. The operations of the department are funded by faculty salary savings and indirect cost dollars allocated to the department. As shown in Figure 8, the grants awarded to our faculty increased significantly, especially during the past two years, which helped in funding operations of the department. Department retains 50% of the salary savings and indirect cost allocations and distributes the rest of the funds to the PI of the grant that generated these funds. The PIs use these funds to support their programs. There is also an option to use them for funding a Wethington award to the PI.

## **IX. REFLECTION**

Since our 2017 Departmental Review we have undergone extensive personnel changes due to retirement of long-standing faculty. While these retirements have depleted expertise, they've also provided us with the opportunity to enlist energetic, vibrant young faculty replacements to fill the gaps. This cohort of young faculty bring with them progressive, forward-thinking world views that enlist cutting-edge approaches to problem-solving. Furthermore, before the next Departmental Review in 2028 nearly 1/3 of the current faculty will likely retire, creating yet more opportunities for new ideas and new views. We are continuing to evolve to address existing and emerging local, regional, and global challenges. These are exciting times.

## **A. Facilities**



Our department has been generating innovative, high-quality research, extension, and instructional programming to address the needs of Kentucky for over 130 years and is widely recognized for its leadership and excellence. This recognition arises from a rich legacy of vibrant and innovative scholarship driving progressive extension and outreach programming, an innovative and thoughtful educational approach, and strong and stable leadership. However, we recognize that we have specific needs that must be met to continue addressing the entomological challenges of the next decades.

Space quality and quantity continue to be the overarching need and a continual challenge affecting all three mission areas. In spite of recent renovations, office and lab spaces in AgN are plagued with water and climate control issues. The office and lab space assigned to Entomology in the Plant Science Building is inadequate. The Dimock Animal Pathology Building space is suitable for only the coarsest laboratory work. The Department would strongly benefit from consolidation into a modern, well-maintained facility. The research farm lacks a central teaching facility for field-oriented courses.

## **B. Research**

We continue to strive to develop solutions to entomologically related issues through creative synergies between fundamental and applied entomological research. To do so, we must continue to develop expertise in high needs areas, including:

1. Public health and livestock entomology. Public health emergencies are becoming commonplace, as illustrated by the Covid 19 pandemic, the recent global outbreak of bed bugs, and the emergence of vectors and vector-borne diseases, especially ticks and tick-borne illnesses. As a department, we must continue to build capacity to address vectors that transmit human and animal diseases.
2. Climate resilience for food and fiber. Temperature and precipitation extremes and violent weather patterns are becoming the norm, threatening food and fiber production. We must maintain and build expertise for the protection of food and fiber crops, including invasive species mitigation and alleviating insect-related effects of stresses associated with our changing climate. Given the multidisciplinary nature of climate change problems and solutions, this could be a fruitful area for new collaborations with other departments in the College of Agriculture and beyond. This could be a good topic for a targeted short-term funded graduate program, e.g., through a mechanism like the NSF-NRT program.
3. Conservation of flora and fauna. There are pressing needs associated with pollinator and biodiversity declines within Kentucky, regionally, and globally. While we have many faculty with expertise in these areas, they could benefit from improved research infrastructure for field and ecologically oriented work. Beyond shared greenhouses and storage units, there are no field laboratory spaces dedicated to Entomology. However, there are extensive outlying research farms that provide field sites, space to keep animals, and room for new buildings. Several current and arriving faculty work regularly at these locations, but without basic infrastructure like a temperature-controlled building or bathroom facilities. Such facilities are necessary to stage well-controlled experiments on live animals. Such a facility could support not only research efforts, but also outreach, extension, and teaching missions of the Entomology Department and the College of Agriculture more broadly.

4. Collection support. The University of Kentucky Insect Collection (UKIC) houses between 750,000 and 1,000,000 pinned insect specimens, is the largest entomological collection in Kentucky, and is a major collection in the east-central USA. Despite being a major source of historical and contemporary biodiversity data for the state, the last major curation activities before recent years were in the 1980-1990s. With the hire of a new arthropod systematist in 2019, curation activities have been reinvigorated, focused primarily on integration of independent subcollections within the main collection and [digitization and databasing](#) of specimens. Given the current recognition of global insect decline, the UKIC stands as a large sources of comparative biodiversity data, and as a department, we must continue fostering its preservation, curation, and growth.

### **C. Extension**

1. Faculty Extension expertise in livestock entomology. As with research expertise in public health and livestock entomology, extension efforts with livestock entomology and public health must be expanded. Livestock producers face significant issues with pasture fly-associated pink eye of cattle while tick threats are increasing with Asian long-horn tick and the protozoan it can vector that causes bovine anemia. Recent establishment of red imported fire ants in pastures in south central Kentucky also must be addressed. Additionally, the public are experiencing increasing arthropod challenges with the outbreak of bed bugs, and emergence of vectors and vector-borne diseases, particularly ticks and tick-borne illnesses. As a department we must develop effective extension programs to respond to changing human and animal diseases.

2. Extension Associates to lighten the load of extension faculty. Extension faculty are burdened with tasks that could be shifted to associates

3. The Pesticide Applicator Training program requires an inordinate amount of Extension Faculty oversight. In many states, pesticide safety education programs are executed by staff-level specialists with faculty oversight. In order to allow extension faculty to address more critical issues, the college should support the addition of a staff level associate to develop certification and training materials as well as day to day management of the private applicator program.

### **D. Instruction**

We need focused and intentional instructional support to continue making strides in instructional capacity.

1. It is challenging to effectively teach large classes and lab-based classes without teaching assistants. Our department is apportioned limited teaching assistant tuition waivers from the graduate school, and the department must additionally cover all stipend expenses for students who TA. In addition to compromising our teaching mission, the lack of teaching support makes it harder to recruit new faculty to our department, as they face two costs compared to peer institutions, the lack of reliable graduate

student support through TA lines, and an unusually high burden of teaching time and effort compared to an instructor in another unit teaching an equivalent class but with assistance.

2. Our department recently established an online M.S. degree, and other current online courses have proven popular among non-entomology majors across campus and beyond the university. To continue to grow this program, our current faculty needs developmental support, e.g., stipends to cover the time associated with course development or funds to hire TAs or other staff to support asynchronous course development.

3. Related to the above reflection, there is a need to provide more consistent online offerings at the 600-level or above. Support from the college is needed to transition our 600-level graduate courses to high quality, asynchronous courses that can serve our online MS students and students from other programs. Support is also needed so that we can offer these courses more regularly since alternate years are inadequate for online students.

4. Many students (particularly graduate students) in our department have career interests that reflect a combination of research and extension or service-oriented activities. For example, students who are completing a research-oriented Ph.D. may like to apply their degree to a career in environmental management, conservation, or stewardship at the local or national level. To allow these students to be competitive for these positions, we need to improve student training in extension/outreach, specifically increasing involvement from students in current and new extension programs. One barrier to growth involves graduate student funding. If a student is funded from a research grant awarded to their PI, which is typical in our department, it limits their time to participate in non-funded activities, which may include outreach and extension. To address this on a small scale, interested students could be compensated for their participation in extension activities through course credit hours. On a larger scale, collaborative funding efforts that span the research and extension missions could provide a more in-depth opportunity for students to gain extension experience.

5. The faculty consensus is that the current undergraduate AICU-ENT specialization offering is sufficient to serve current student needs. However, the Department has an interest in continuing to grow the undergraduate instructional program and potentially reinstating Entomology as a stand-alone major eventually. Our expectation is that our new large-enrollment 200-level courses will create upward pressure on enrollment in upper division courses and will increase student engagement with the Entomology minor and AICU-ENT major. The faculty see a need for better and more uniform advertisement of the existence of the AICU-ENT major option, and also need for more diverse offerings that would cater specifically to the needs of these students. While the current enrollment isn't sufficient to support development of many new specialty courses, an undergraduate seminar course with rotating topics could augment the breadth of offerings for our entomology-focused undergraduates.

## **E. Summary of needs**

Our most pressing needs in each mission area are:

- Space quality and quantity, on and off campus, across all mission areas
- Research expertise in public health, veterinary and livestock entomology (Research)

- Dedicated (paid) Teaching Assistantships (Instruction)
- Sustained support for course development (Instruction)
- Public health and livestock expertise (Extension)
- Extension Associate support (Extension)
- Support for the Pesticide Applicator Training program (Extension)

As Kentucky's flagship land grant institution, we must protect and enhance our capacity to fulfill the land grant missions of research, instruction, and extension. We must continue to develop and expand expertise and facilities to address emerging issues in our rapidly changing world. We must maintain and increase capacity to educate and train the next generation of scientists to help address these issues. And we must remain true to our extension mission by distributing timely and useful information to our stakeholders who are faced with increasingly complex challenges.

## Entomology Course List

1. ENT 110
2. ABT 201
3. ENT 209
4. ENT 300
5. ABT 301
6. ENT 310
7. ENT 320
8. ENT 340
9. ABT 460 (Spring 2021)
10. ABT 460 (Fall 2022)
11. ABT ENT FOR BIO 461
12. ABT 461G (Spring 2022)
13. ABT 461G (Fall 2022)
14. ENT 502
15. ENT 530 (Fall 2021)
16. ENT 530 (For Canvas)
17. ENT564
18. ENT 595
19. ENT 635
20. ENT 667
21. ENT 670
22. ENT 695
23. ENT 770 (Graduate School and Professional Development)
24. ENT 770 (Grant Writing)
25. ENT 770 (Invisible Itches)
26. ENT 770 (Methods in Extension)
27. ENT 770 (Cultural Entomology)

# ENT 110-210

## Insect Biology

Term: Summer 2022

Credit hours: 3

Meeting days/time/location: Online, no set meeting times

### Instructor Information

**Name:** Nicholas Teets

**Email:** n.teets@uky.edu

**Office:** 317 Plant Sciences Building

**Office phone:** (859) 257-7459

**Office hours:** By appointment for in person meetings; see information for “Virtual office hours” below

1. **Virtual office hours:** There will be live Zoom review sessions at a time to be determined based upon students’ schedules. The Zoom link is: <https://uky.zoom.us/j/83236305194>. These sessions are optional, but you earn two bonus points for each session you attend.
2. **Preferred method of communication:** Email
3. I will respond to any communication within 24 hours during the week, and by the next business day on a weekend.

### Course Description

Overview of the biology of insects. Emphasizes how this enormously abundant and important group of animals has resolved the basic challenges of survival and reproduction. Principles of physiology, behavior, ecology, and evolution are introduced using insects as examples. The roles of both beneficial and detrimental insects will be discussed.

### Course Prerequisites

None

### Required Materials

- Active UK email address
- Reliable computer and internet access
  - Must be able to view lecture recordings, download readings, upload assignments, participate in video conferences (e.g. have a webcam or smart phone), take exams within a timed window, etc.
- Find Live Insects Project
  - Device to make a video recording or picture (smartphone, etc.) and the ability to upload recordings to Canvas.
- Insect Development Experiment
  - Thermometer

Live insects will be mailed to students, so you must provide a valid address when instructed

### Activities Outside of Regular Class Meetings

An optional review session will be held each week on Zoom at a time to be determined based on students’ schedules.

## Technology Requirements

Minimum technical requirements for UK courses and suggested hardware, software, and internet connections are available at [ITS Student Hardware & Software Guidelines](#).

You are required to have a reliable internet connection to participate in this course. Failure to meet deadlines due to poor internet access is not a valid excuse. Likewise, interruptions in a quiz or exam due to poor internet access or an unreliable device are your responsibility, not the instructor's.

If a project deadline is approaching and you are having technical difficulties, email your instructor the files for verification that they were completed on time. Then, assuming the technical difficulties are resolved, you'll have 24 hours to submit the assignment on Canvas. Assignments will not be graded until they are submitted to Canvas.

## Technical Support

For technical/account help, students can contact Information Technology Services by phone 859-218-HELP (4357) and via the [ITS Customer Services](#) page.

## Student Learning Outcomes

Upon completion of this course, the student should be able to:

1. Explain fundamental principles of biology using insects as examples.
2. Describe the significant roles insects play, both positive and negative, in society and in the environment.
3. Identify different types of insects and their characteristics.
4. Execute the scientific method, including development of a hypothesis, collection and analysis of data, and interpretation of results.

## Course Details

### Tentative Course Schedule

### Course Modules

The course is divided into four modules. The titles and descriptions of each module are listed below. Each module, in general, will consist of mini-lectures, short videos to reinforce lecture content, interviews with a local entomologist, reading assignments from the popular media about insects, and Canvas assignments to reinforce concepts. There will be an exam at the end of each module.

1. **Module 1: Insect Taxonomy and Diversity.** Insects are the most diverse and abundant land animals on the planet. At the end of this module students will be able to distinguish insects from other animals, identify insects to the level of order, and describe the features that distinguish various insect groups. **Module 1 assignments and exam due May 25, 2022.**
2. **Module 2: Insect Structure and Function.** The incredible diversity of insects is accompanied by a diversity in structure and function. At the end of this module, students will be able to identify major morphological features of insects, describe the basic internal anatomy and physiology of an insect, and explain some of the unique modifications to structure and function that have occurred during insect evolution. **Module 2 assignments and midterm exam due June 3, 2022.**
3. **Module 3: Insect Ecology and Evolution.** Insects provide numerous essential ecological roles on the planet and have evolved to fill many different ecological niches. At the end of this module, students will be able to describe the key ecological functions of insects and have a basic understanding of evolutionary biology. **Module 3 assignment and exam due June 10, 2022.**

4. **Module 4: Insects and Humans.** Insects interact with humans in many ways and are significantly impact our economy and culture. At the end of this module, students will be able to identify ways in which insects and humans interact (both positively and negatively) and critically think about ways in which insects influence our culture. **Module 4 assignment due June 21, 2022. Final exam is due June 28, 2022.**

### **Your Schedule Each Week**

- Log into Canvas
  - Find PowerPoint lecture handouts with space for notes (or prepare to take your own notes if you'd rather)
  - Watch lectures
  - Watch the Supplemental Videos that accompany each lecture
  - Read any readings that have been assigned
  - Complete assignments and exams by module due date
  - Work on projects throughout the semester
- Check Canvas and email regularly for course announcements.

### ***Course Activities and Exams***

#### **Regular Assignments (10 pts each; 80 pts total):**

There are assignments posted on Canvas that are related to the lectures for each module. These are worth 10 points each. Due dates are listed in the Course Schedule.

#### **Exams (60 pts each; 240 pts total):**

There will be a total of 4 exams worth 60 points each. The date windows are listed in the Course Schedule and must be taken during the open window. The exams will be timed electronically so once you begin, you will have 60 minutes to complete the exam. All exams are open book, but students are expected to complete exams independently with no outside help. The final exam is cumulative but will be heavily weighted towards new material. Due dates are listed in the Course Schedule.

#### **Projects (80 pts total):**

- **Find Five Live Insects Project (30 pts):** Detailed directions will be given later, but you will use a camera or video recording device to record yourself and insects that you find in your home, outside, etc. You will identify the insect in the video and describe where you found it. The quality of the image must be sufficient for the instructor to identify the insect to the level of Order). **Due June 10, 2022 at 11:59 PM**
- **Insect Development Experiment (50 pts):** Detailed directions will be given later, but the instructor will provide you with flies for this assignment. Additionally, you will need a thermometer. You will be given an experimental question, and you will form a hypothesis and conduct an experiment to answer the questions. You will collect data and form conclusions from your experiment. **Due June 21, 2022 at 11:59 PM**

#### **Optional Review Sessions:**

Each week there will be an optional review session where the instructor or TA will review material from class and answer any questions. Students can earn two bonus points for each session attended. The day and time of sessions will be determined at a later date depending on students' schedules. The zoom link for these review sessions is <https://uky.zoom.us/j/83236305194>. You can also earn extra credit by



submitting questions about the course to a discussion forum on Canvas. You will receive one point for each question submitted, for a maximum of two points per week.

**Submission of Assignments**

All assignments will be submitted online via Canvas. Late assignments will receive a 10% deduction for each day they are late. Full credit for late assignments will only be given in the cases of excused absences with documentation.

**Grading Scale**

- 90 – 100% = A
- 80 – 89% = B
- 70 – 79% = C
- 60 – 69% = D
- Below 60% = E

**Midterm Grades**

For undergraduates, midterm grades will be posted in myUK by the deadline established by the University Senate and published in the [Academic Calendar](http://www.uky.edu/registrar/content/academic-calendar). (<http://www.uky.edu/registrar/content/academic-calendar>)

**Attendance Policy/Acceptable Documentation**

For the first excused absence that results in a late assignment, the instructor will not request any documentation. Subsequent excused absences may require documentation, at the instructor’s discretion. Acceptable documentation should include the reason for absence and be signed by a relevant authority.

**Detailed course schedule**

<b>Module 1: Insect Taxonomy and Diversity</b>		
<b>Dates</b>	<b>Topics</b>	<b>Assignments</b>
May 16 to May 25	<ul style="list-style-type: none"> <li>• What is life?</li> <li>• Taxonomy</li> <li>• Intro to arthropods</li> <li>• What is an insect?</li> <li>• Insect life cycle</li> <li>• Springtails, silverfish, and firebrats</li> <li>• Mayflies, damselflies, dragonflies</li> <li>• Orthopteroids, walking sticks, mantids</li> <li>• Cockroaches, termites, and thrips</li> <li>• Neuroptera, Lice, Earwigs, Scorpionflies, Fleas</li> <li>• Hemiptera, Hymenoptera, Coeloptera</li> <li>• Lepidoptera and Diptera</li> </ul>	<ul style="list-style-type: none"> <li>• Posted readings</li> <li>• Work on insect development project</li> <li>• Work on Find Five Live Insects Project</li> <li>• <b>Three quizzes</b></li> <li>• <b>Module 1 Exam</b></li> </ul>

<b>Module 2: Insect Structure and Function</b>		
<b>Dates</b>	<b>Topics</b>	<b>Assignments</b>
May 26 to June 3	<ul style="list-style-type: none"> <li>• External anatomy</li> <li>• Sensory biology</li> <li>• Nervous system</li> <li>• Respiratory and circulatory systems</li> <li>• Digestive and excretory systems</li> <li>• Reproductive systems</li> <li>• Insect diets</li> <li>• Insect defenses</li> <li>• Learning and behavior</li> </ul>	<ul style="list-style-type: none"> <li>• Posted readings</li> <li>• Work on insect development project</li> <li>• Work on Find Five Live Insects Project</li> <li>• <b>Two Quizzes</b></li> <li>• <b>Midterm Exam</b></li> </ul>
<b>Module 3: Insect Ecology and Evolution</b>		
<b>Dates</b>	<b>Topics</b>	<b>Assignments</b>
June 4 to June 10	<ul style="list-style-type: none"> <li>• Evolutionary biology</li> <li>• Unique adaptations</li> <li>• Ecological roles of insects</li> <li>• Pollination</li> <li>• Biological control</li> <li>• Insects and climate change</li> </ul>	<ul style="list-style-type: none"> <li>• Posted readings</li> <li>• Work on insect development project</li> <li>• <b>Quiz</b></li> <li>• <b>Find Five Live Insects Assignment Due June 10</b></li> </ul>
<b>Module 4: Insects and Humans</b>		
<b>Dates</b>	<b>Topics</b>	<b>Assignments</b>
June 11 to June 21	<ul style="list-style-type: none"> <li>• Agricultural pests</li> <li>• Household pests</li> <li>• Disease vectors</li> <li>• Pests of concern to Kentucky</li> <li>• Invasive species</li> <li>• Controlling insect pests</li> <li>• Psychological conditions related to insects</li> <li>• Forensic Entomology</li> <li>• Insects in art and culture</li> <li>• No new material</li> </ul>	<ul style="list-style-type: none"> <li>• Posted readings</li> <li>• <b>Two quizzes (due June 22)</b></li> <li>• <b>Insect Development Project Due June 21</b></li> </ul>
<b>Final Exam Period</b>		
<b>Dates</b>	<b>Topic</b>	
June 27 to June 28	<ul style="list-style-type: none"> <li>• Final exam week</li> </ul>	<b>Final Exam Due June 28 at 11:59 PM</b>

### Academic Policy Statements

Information on excused absences, religious observances, verification of absences, make-up work, excused absences for military duties, unexcused absences, prep week and reading days, accommodation due to disability, and non-discrimination statement and Title IX information can be found on The University Senate's [Academic Policy Statements](#).

## Academic Offenses (Cheating, Plagiarism, and Falsification or Misuse of Academic Records)

### *Senate Rules 6.3.1 ("Plagiarism")*

**Plagiarism:** Per University policy, students shall not plagiarize, cheat, or falsify or misuse academic records. The minimum penalty for a first offense is a zero on the assignment on which the offense occurred. If the offense is considered severe or the student has other academic offenses on their record, more serious penalties, up to suspension from the University may be imposed. A plea of ignorance is not acceptable as a defense against the charge of academic dishonesty.

*Senate Rule 6.3.1* states that all academic work, written or otherwise, submitted by students to their instructors or other academic supervisors, is expected to be the result of their own thought, research, or self-expression. In cases where students feel unsure about a question of plagiarism involving their work, they are obliged to consult their instructors on the matter before submission.

When students submit work purporting to be their own, but which in any way borrows ideas, organization, wording, or content from another source without appropriate acknowledgment of the fact, the students are guilty of plagiarism.

Plagiarism includes reproducing someone else's work (including, but not limited to a published article, a book, a website, computer code, or a paper from a friend) without clear attribution. Plagiarism also includes the practice of employing or allowing another person to alter or revise the work which a student submits as his/her own, whoever that other person may be, except under specific circumstances (e.g. Writing Center review, peer review) allowed by the Instructor of Record or that person's designee. Plagiarism may also include double submission, self-plagiarism, or unauthorized resubmission of one's own work, as defined by the instructor.

Students may discuss assignments among themselves or with an instructor or tutor, except where prohibited by the Instructor of Record (e.g. individual take-home exams). However, the actual work must be done by the student, and the student alone, unless collaboration is allowed by the Instructor of Record (e.g. group projects).

When a student's assignment involves research in outside sources or information, the student must carefully acknowledge exactly what, where and how he/she has employed them. If the words of someone else are used, the student must put quotation marks around the passage in question and add an appropriate indication of its origin. Making simple changes while leaving the organization, content and phraseology intact is plagiaristic. However, nothing in these Rules shall apply to those ideas which are so generally and freely circulated as to be a part of the public domain.

Please note: Any assignment you turn in may be submitted to an electronic database to check for plagiarism.

### *Senate Rules 6.3.2 ("Cheating")*

**Cheating** is defined by its general usage. It includes, but is not limited to, the wrongfully giving, taking, or presenting any information or material by a student with the intent of aiding himself/herself or another on any academic work which is considered in any way in the determination of the final grade. The fact that a student could not have benefited from an action is not by itself proof that the action does not constitute cheating. Any question of definition shall be referred to the University Appeals Board.

### *Senate Rules 6.3.3 ("Misuse of Academic Records")*

**Misuse of academic records:** Maintaining the integrity, accuracy, and appropriate privacy of student academic records is an essential administrative function of the University and a basic protection of all

students. Accordingly, the actual or attempted falsification, theft, misrepresentation or other alteration or misuse of any official academic record of the University, specifically including knowingly having unauthorized access to such records or the unauthorized disclosure of information contained in such records, is a serious academic offense. As used in this context, "academic record" includes all paper and electronic versions of the partial or complete permanent academic record, all official and unofficial academic transcripts, application documents and admission credentials, and all academic record transaction documents. The minimum sanction for falsification, including the omission of information, or attempted falsification or other misuse of academic records as described in this section is suspension for one semester.

### Resources

[Distance Learning Library Services](#)

[Carla Cantagallo](#), Distance Learning Librarian, 859-218-1240

### Diversity, Equity, and Inclusion

*The University of Kentucky is committed to our core values of diversity and inclusion, mutual respect and human dignity, and a sense of community ([Governing Regulations XIV](#)). We acknowledge and respect the seen and unseen diverse identities and experiences of all members of the university community (<https://www.uky.edu/regs/gr14>). These identities include but are not limited to those based on race, ethnicity, gender identity and expressions, ideas and perspectives, religious and cultural beliefs, sexual orientation, national origin, age, ability, and socioeconomic status. We are committed to equity and justice and providing a learning and engaging community in which every member is engaged, heard, and valued.*

*We strive to rectify and change behavior that is inconsistent with our principles and commitment to diversity, equity, and inclusion. If students encounter such behavior in a course, they are encouraged to speak with the instructor of record and/or the [Office of Institutional Equity and Equal Opportunity](#). Students may also contact a faculty member within the department, program director, the director of undergraduate or graduate studies, the department chair, any college administrator, or the dean. All of these individuals are mandatory reporters under University policies.*

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### Student Resources

*The University offers a variety of resources to students. Visit the University Senate's [Resources Available to Students](#) to access that list (<https://www.uky.edu/universitysenate/student-resources>).*

### Course Recordings

The University of Kentucky Code of Student Conduct defines Invasion of Privacy as using electronic or other devices to make a photographic, audio, or video record of any person without their prior knowledge or consent when such a recording is likely to cause injury or distress.

Meetings of this course may be recorded. All video and audio recordings of lecturers and class meetings, provided by the instructors, are for educational use by students in this class only. They are available only through the Canvas shell for this course and are not to be copied, shared, or redistributed.

As addressed in the Code of Student Conduct, students are expected to follow appropriate university policies and maintain the security of linkblue accounts used to access recorded class materials. Recordings may not be reproduced, shared with those not enrolled in the class, or uploaded to other online environments.

If the instructor or a University of Kentucky office plans any other uses for the recordings, beyond this class, students identifiable in the recordings will be notified to request consent prior to such use. In anticipation of such cases, students may be asked to complete an "authorization of use" form by a faculty member.

Video and audio recordings by students are not permitted during the class unless the student has received prior permission from the instructor. Any sharing, distribution, and or uploading of these recordings outside of the parameters of the class is prohibited. Students with specific recording accommodations approved by the Disability Resource Center should present their official documentation to the instructor.

### **Course Copyright**

All original instructor-provided content for this course, which may include handouts, assignments, and lectures, is the intellectual property of the instructor(s). Students enrolled in the course this academic term may use the original instructor-provided content for their learning and completion of course requirements this term, but such content must not be reproduced or sold. Students enrolled in the course this academic term are hereby granted permission to use original instructor-provided content for reasonable educational and professional purposes extending beyond this course and term, such as studying for a comprehensive or qualifying examination in a degree program, preparing for a professional or certification examination, or to assist in fulfilling responsibilities at a job or internship; other uses of original instructor-provided content require written permission from the instructor(s) in advance.

# ENT 209 (001): Bees and People (3 credits)

## Instructor

Dr. Clare C. Rittschof

**Office:** 405 Plant Sciences Building

**Zoom Room:** 762 915 2489

**Office Hours:** virtual, phone, or in-person, please contact the instructor via email to make an appointment

**Email:** [clare.rittschof@uky.edu](mailto:clare.rittschof@uky.edu) (I will respond within one business day)

**Office Phone:** 859-218-3343

### PLEASE READ

The most critical communication between the Instructor and students occurs *during class*. **I expect that you attend class**, and therefore class time is when I will communicate details about how to complete assignments, content for the exams, and updates on course logistics. Some information, like assignment deadlines and the class schedule, are posted on Canvas, but **Canvas is not a substitute for coming to class**. Please attend class, and if you miss a class period, ask a classmate to get caught up on important information. Students that attend class outperform those who do not, often by 2-3 letter grades.

## Teaching Assistants

### Head TA

Wade Pike

**Office hours:** By appointment

**Email:** [wade.pike@uky.edu](mailto:wade.pike@uky.edu)

**\*Please contact Wade Pike about excused absences\***

### Other graduate TAs

Anastasia Weger

**Office hours:** By appointment

**Email:** [anastasia.weger@gmail.com](mailto:anastasia.weger@gmail.com)

### Undergraduate TAs

Olivia Allender

**Office hours:** By appointment

**Email:** [olivia.allender@uky.edu](mailto:olivia.allender@uky.edu)

Kaitlin Butler

**Office hours:** By appointment

**Email:** [kaitlin.butler@uky.edu](mailto:kaitlin.butler@uky.edu)

## Course description

Bees are a charismatic group of insects with important roles in human society. They are critical crop and wild flower pollinators, and have been cultivated for pollination, honey, and wax production for thousands of years. Some bee species live in social groups, including the honey bee, which lives in one of the most complex societies in the animal kingdom. This course will focus on bee biology, diversity, behavior, and basic beekeeping to teach students about scientific approaches in diverse areas of biology. We will also address the ways in which scientific consensus is reached around controversial issues, particularly those that threaten bee populations.

## Prerequisites

None

## Student learning outcomes/course objectives

After completing this course, students will be able to:

1. *Demonstrate* an understanding of methods of inquiry that lead to scientific knowledge
2. *Identify* scientific information and *distinguish* it from pseudoscience
3. *Demonstrate* an understanding of the fundamental principles of relevant areas of biology, including entomology, ecology, behavior, and conservation
4. *Apply* fundamental principles of biology to interpret data and make predictions
5. *Express* how knowledge of bee ecology is changing the way scientists understand the world
6. *Explain* and *evaluate* the interaction of science with society
7. *Design* and *conduct* a scientific experiment, and *analyze* and *interpret* resulting data

## Required materials

### Reading

Suggested Textbook (not required): Honey Bee Biology and Beekeeping (Caron et al. 2013)

There is one required reading during the semester (see below) which will be available as a PDF through Canvas. Other suggested materials will be posted on Canvas.

### Technological requirements

Students must have the technological ability and skill to:

- 1) Access the course Canvas website to submit assignments, access and view videos, view lecture notes and announcements, and view course schedule
- 2) Ability to access Canvas site during class to submit attendance survey
- 3) Communicate with course instructor and TAs through email or Canvas
- 4) Access a device and word processing software that allows the student to generate assignments in an acceptable format for submission on Canvas (.doc, .docx, or .pdf only)
- 5) Access course zoom meetings to view lectures synchronously *if necessary*
- 6) Have audio (minimum) and video (preferred) capabilities for participation during zoom-based

course meetings, should they occur

Technology customer service for technical complaints:

<http://www.uky.edu/UKIT/>

Phone: 859-218-HELP

### Class recording statement

Meetings of this course may be recorded. All video and audio recordings of lecturers and class meetings, provided by the instructors, are for educational use by students in this class only. They are available only through Canvas for this course and are not to be copied, shared, or redistributed.

As addressed in the Student Code of Conduct, students are expected to follow appropriate university policies and maintain the security of linkblue accounts used to access recorded class materials. Recordings may not be reproduced, shared with those not enrolled in the class, or uploaded to other online environments.

If the Instructor or a University of Kentucky office plans any other uses for the recordings, beyond this class, students identifiable in the recordings will be notified to request consent prior to such use. In anticipation of such cases, students may be asked to complete an “authorization of use” form by a faculty member.

Video and audio recordings by students are not permitted during the class unless the student has received prior permission from the instructor. Any sharing, distribution, and or uploading of these recordings outside of the parameters of the class is prohibited. Students with specific recording accommodations approved by the Disability Resource Center should present their official documentation to the instructor.

All content for this course, including handouts, assignments, and lectures are the intellectual property of the Instructor and cannot be reproduced or sold without prior permission from the instructors. A student may use the material for reasonable educational and professional purposes extending beyond this class, such as studying for a comprehensive or qualifying examination in a degree program, preparing for a professional or certification examination, or to assist in fulfilling responsibilities at a job or internship.

### Course Grading

| Assignment                                     | Points |
|------------------------------------------------|--------|
| In-class activity worksheets (8 class periods) | 80     |
| Profile-a-beast infographic                    | 100    |
| Assignment #1: The question                    | 100    |
| Assignment #2: The design                      | 100    |
| Assignment #3: The data                        | 100    |
| Assignment #4: The problems                    | 100    |
| Assignment 1-4 compilation                     | 20     |
| Assignment #5: Peer Review                     | 100    |
| Exam 1                                         | 100    |
| Exam 2                                         | 100    |



|                                                       |                                    |
|-------------------------------------------------------|------------------------------------|
| Exam 3/Class attendance (3 pts/class)                 | 100                                |
| Module extra credit (not required)                    | 50                                 |
| Extra class attendance points possible (not required) | 11                                 |
| <b>Total</b>                                          | <b>1000 (1061 total available)</b> |

## Extra Credit

This course consists of 5 modules (see below). There will be one, 10-point extra credit opportunity per module (50 points total). The deadline for submitting the extra credit is the last day of the appropriate module. Extra credit submissions should be uploaded in the appropriate location on Canvas. In addition, there are 11 available extra attendance points, should you choose to use your attendance grade in place of your final exam (see below). Most exams also contain 3-5 points of extra credit.

## Grading scale

900 ≤ = A  
800-899 = B  
700-799 = C  
600-699 = D  
<600 = E

## Midterm grades

Midterm grades will be posted in myUK by the deadline established in the Academic Calendar:

<http://www.uky.edu/registrar/calendar>

## Final Exam Information

The final exam will occur at the time appointed by the university registrar:

<https://www.uky.edu/registrar/content/schedule-classes-fall>

You may replace your final exam with your course attendance grade (we will do this automatically if you do not attend the final exam).

# Description of course activities and assignments

## Schedule and deadline overview

| Mod | Content Theme | Philosophy Theme | Start Date | Assignment Due Dates | Activities (in-class worksheet) | End Date | Exam #: Date |
|-----|---------------|------------------|------------|----------------------|---------------------------------|----------|--------------|
|-----|---------------|------------------|------------|----------------------|---------------------------------|----------|--------------|

|   |                                           |                                 |        |                      |                                    |        |                         |
|---|-------------------------------------------|---------------------------------|--------|----------------------|------------------------------------|--------|-------------------------|
| 1 | Pollinator natural history                | Biophilia                       | Aug 22 | Sep 12               | Aug 29<br>Sep 2<br>Sep 9<br>Sep 12 | Sep 12 | 1: Sep 26<br>(In class) |
| 2 | Pollination in human-altered environments | Ecosystem services              | Sep 14 | Sep 21               | Sep 16                             | Sep 26 |                         |
| 3 | Beekeeping and honey hunting              | Bees in culture                 | Sep 28 | Oct 10               | Oct 10                             | Oct 10 | 2: Nov 7<br>(In class)  |
| 4 | Honey bee societies                       | The importance of basic science | Oct 12 | Oct 31               | Oct 21                             | Nov 7  |                         |
| 5 | Bee declines                              | Scientific consensus            | Nov 9  | Nov 16 (x2)<br>Dec 2 | Dec 2                              | Dec 7  | 3: Dec 14<br>(1-3 PM)   |

## Class meetings – content and attendance

### Lectures

This course primarily consists of 50-min lectures organized into 5 modules, each with a scientific content and scientific philosophy theme.

Module 1: Pollinator Natural History  
Philosophy theme: Biophilia

Module 2: Pollination in human altered environments  
Philosophy theme: Ecosystem Services

Module 3: Beekeeping and Honey Hunting  
Philosophy theme: Bees in Culture

Module 4: Honey bee Societies  
Philosophy theme: The Importance of Basic Science

Module 5: Bee Declines  
Philosophy theme: Scientific Consensus

### In-class activities and worksheets

8 class periods involve in-class activities and a worksheet that is submitted at the end of class (worth 10 points each). **If you miss class and your absence is unexcused, you will not receive credit for the worksheet.**

Aug 29 – Research Project Brainstorm (at a pollinator garden on campus)  
Sep 2 – Research Project Workshop 1 – Questions/Hypotheses/Predictions  
Sep 9 – Research Project Workshop 2 – Examples of experimental design

Sep 12 – Book Discussion Activity (Asters & Goldenrod, by Robin Wall Kimmerer)  
Sep 16 – Research Project Workshop 3 – Final design and data collection strategy  
Oct 10 – Honey Tasting  
Oct 21 – Research Project Workshop 4 – Data analysis  
Dec 2 – Class Review

### **Attendance policy**

Attendance is not required for this class, but the Instructor will take attendance every period, and *you can replace your final exam with your attendance grade*. The class meets 37 times (not counting review days and exams). You will receive 3 points per day, for 111 total possible points. If you miss no more than 4 classes (attend 33 total), you will receive a 99 as your final exam score.

Attendance is assessed through a Canvas quiz at the beginning of each class period. If you have technical issues, you may also turn in your name to the Head TA.

### **Assignments & Activities**

**Students should consult Canvas for assignment deadlines. All assignments must be submitted through Canvas (in .doc, .docx, .pdf format only)**

#### **In-class activity worksheets (80 points)**

Eight class periods are devoted to in-class activities (see above). These are mostly designed to help you prepare for and complete your independent research project. Each worksheet will be turned in at the end of class and is worth 10 points.

#### **Profile-a-Beast (100 points)**

Students will create an infographic (see Canvas site for template suggestions) for a bee species of their choice, including the taxonomic ranks relevant to it, its scientific and common names, its natural history, and its significance to human agriculture and/or its ecosystem. Students must use (and acknowledge) sources, which can include university cooperative extension pages, scientific articles, and Wikipedia or other encyclopedia sources.

#### **Hands-on Experiment (Independent Research Project) & Associated Assignments (520 points)**

Independently, students will design and conduct an observational experiment outside of class, focused on pollinator biology. Note: these experiments do not require touching bees, and the risk of getting stung is no higher than what would occur during a routine visit to a flower garden. Students with safety concerns should consult the Instructor.

The Instructor will direct students to pollinator habitats on campus, including the Agricultural Science Center North and Barnhart Hall pollinator gardens, and the arboretum. Students may complete their projects at these locations or any other suitable location.

With help from TAs and the instructor, students will devise a research question, hypothesis, predictions, and collect adequate data on independent and dependent variables of their choosing. Topics could include pollinator behavior, insect-plant interactions, pollinator diversity, and pollinator floral preferences, plant fertilization success, among others. Studies involving non-bee pollinator species and other insect species are welcome.

**Minimum data collection requirement:** Students must choose at least one independent variable with two levels, and one dependent variable. They must collect at least 10 data points per level of their independent variable. *Students are advised to collect data before October 1<sup>st</sup> since insects are seasonally active.*

Throughout the semester, students will work on five assignments related to this research project (discussed below). Additional guidance will be provided on Canvas and during class periods. **These assignments are graded largely based on completion, so be sure to address all of the pieces of information in the assignment description.**

### **Assignment #1: The question (100 points)**

In paragraph form:

- 1) Describe the observation that sparked your interest in your research topic
- 2) Explain the question your observation provoked and how it relates to bee biology
- 3) List at least one specific hypothesis related to your question
- 4) List the dependent and independent variables you decided to assess in your experiment, and the levels of your independent variable (you are required to identify one independent variable and one dependent variable, measuring two levels of your independent variable)
- 5) List predictions stemming from your hypothesis. Remember, these are specific to the experiment and data you will collect.

There is no word limit for this assignment

**NOTE: It is recommended that students consult with the instructor about their project ideas for feedback prior to performing the study. We will devote two class periods early in the semester to discussing project ideas and study design.**

### **Assignment #2: The design (100 points).**

Describe your experimental design (also called “Methods”) in detail. You can use **paragraph form, list form, or a combination** of both. Remember to **include photos, diagrams, flow charts, and examples** to help paint a picture of your experimental design for the reader. Pretend you are instructing your friend to go out and *perfectly replicate your experiment*. What would they need to know?

Keep in mind that your classmate, or someone with a similar level of scientific knowledge, should be able to repeat the experiment. However, assume your reader has no background to help them interpret what you are saying, so explain things carefully.

**Be sure to describe the variables you measured and HOW you measured them. Provide an explanation for your choices. Explain how you achieved the required 10 data points for each level of your independent variable.** For example:

- If your response variable was "visitation", did you measure visitation for all insects or just bees? Did the insect have to land on the flower to count as a visitation event, or just get close? Did it matter how long they sat on the flower?
- How did you choose which flowers to watch, and did you watch different flowers on the same plant, different plants, or the same plants at different times of day to achieve appropriate replication?

There is no word limit for this assignment.

### **Assignment #3: The data (100 points).**

Using the examples described in lecture and data analysis primers provided on Canvas, explain your major results using your data. You should present at least 2 graphical representations of your data (e.g., histogram, bar plot, box plot, pie chart). Describe the central tendency and variation in your data. Provide an interpretation of your data. Did the data support your hypothesis?

There is no word limit for this assignment.

**NOTE: I *strongly* recommend that students collect data for their project before October 1<sup>st</sup>, since pollinators are seasonally active. Data collection will likely only take a couple of hours, but troubleshooting could extend this timeframe.**

### **Assignment #4: The problems (100 points).**

This is your chance to think about your experiment, what the data mean, and what you have learned from this process. **All scientific studies have some flaws**, because the real world is complex. The key is to be able to **clearly describe what you can AND what you cannot** conclude from your data.

In **paragraph form**, reflect on your experiment and what you could do differently next time to improve it. Please provide specific examples to the following prompts (that is, start by writing one short paragraph per point below, and then tie these paragraphs together in a single written document):

- 1) What is the "take-home message" from your experiment? How do you interpret the results?
- 2) What problems did you encounter during data collection (did things go smoothly, and if not, why)? What type of "judgement calls" did you have to make while conducting the experiment, and would you choose the same strategy in the future?

3) Were there any limitations you faced because of time, money, logistics, etc.? "In a perfect world" how would you improve this study to have more definitive results?

4) Most experiments have **confounding factors**, or factors other than your independent variable that could explain your results. A confounding factor may make it look like your independent and dependent variable are related, even if they are not. For example, if your independent variable was flower color (red versus yellow), but all of your red flowers were tall plants and all of your yellow flowers were short plants, "plant height" is a confounding factor that could explain any differences (or lack of differences) in visitation that you saw. **What was at least one confounding factor in your experiment?**

5) Hypotheses are general explanations that apply more broadly than a single experiment. Do you think your results could be applied in other locations, contexts, etc.? Why or why not? Does anything about your experiment limit its applicability?

6) Pick at least one item about experimental design and analysis you learned in this course, and talk about how you would use that information to improve your experiment, if you had it to do over again

7) Science is a process in which experiments build on one another. What do you think is the logical next step for future studies based on your findings?

There is no word limit for this assignment.

### **Assignment Compilation (20 points)**

In order for your assignment to be peer reviewed, compile your four assignments into a single document, anonymize the document (remove your name from all pages), and upload it to Canvas. ***Submit this compiled document on the same day you submit your Assignment #4.***

### **Assignment 5: Peer Review (100 points).**

Students will follow a review rubric to provide a critique of a classmate's experiment, assigned anonymously by the Instructor. This will include pointing out aspects of the experiment and write up that were interesting to you and well-explained, whether there were parts you did not understand, if you could repeat the experiment as described, the validity of the data interpretation, whether the experimenter adequately explained the problems with their design, and whether you are convinced they are credible researchers. **Students are encouraged to refer to the review rubric as a checklist while they are putting together their assignments #1-4.**

### **Exams (100 points each)**

There will be two mid-term exams and one final exam based on lecture material. Exams will cover module content as follows: Exam 1: Modules 1 & 2, Exam 2: Modules 3 & 4, Exam 3: Module 5. Exam 3 will also contain 2-3 essay questions that cover the entire scope of the course material (any of the five modules). These questions will be provided to students prior to the exam. All exam questions will be drawn from lecture material and other materials covered during class periods.

Exams 1 and 2 will be administered during class time (in person if possible)

Exam 3 will take place during the assigned final exam period for this course.

*If in-person attendance is prohibited by COVID-19 restrictions*, this course may use LockDown Browser for online exams. Watch this [short video](#) to get a basic understanding of LockDown Browser. A student [Quick Start Guide](#) is also available.

Download and install LockDown Browser from this link:

<https://download.uky.edu/>

To ensure LockDown Browser and the webcam are set up properly, do the following:

- Navigate to the practice quiz “Lockdown Browser Test” on the course Canvas page
- Start the quiz and complete preliminary checks
- Complete and submit the quiz

When taking an online exam that requires LockDown Browser, remember the following guidelines:

- Ensure you're in a location where you won't be interrupted
- Before starting the exam, know how much time is available for it, and that you've allotted sufficient time to complete it
- Remain at your computer for the duration of the test
- If the computer or networking environment is different than what was used previously with the LockDown Browser test, run the checks again prior to starting the test
- Remember that LockDown Browser will prevent you from accessing other websites or applications; you will be unable to exit the test until all questions are completed and submitted

| Targeted learning objectives                               |                                                                                                                                                                                                                                                                                                                                                                                                 |
|------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Assignment                                                 | Objectives                                                                                                                                                                                                                                                                                                                                                                                      |
| Hands-on experiment and Experimental analysis and write-up | <i>Demonstrate</i> an understanding of methods of inquiry that lead to scientific knowledge<br><i>Apply</i> fundamental principles of biology to interpret data and make predictions<br><i>Design</i> and <i>conduct</i> a scientific experiment, and <i>analyze</i> and <i>interpret</i> resulting data                                                                                        |
| Peer review                                                | <i>Identify</i> scientific information and <i>distinguish</i> it from pseudoscience<br><i>Demonstrate</i> an understanding of methods of inquiry that lead to scientific knowledge<br><i>Apply</i> fundamental principles of biology to interpret data and make predictions<br><i>Design</i> and <i>conduct</i> a scientific experiment, and <i>analyze</i> and <i>interpret</i> resulting data |
| Profile a beast                                            | <i>Explain</i> and <i>evaluate</i> the interaction of science with society                                                                                                                                                                                                                                                                                                                      |
| Exams                                                      | <i>Demonstrate</i> an understanding of the fundamental principles of relevant areas of biology, including entomology, ecology, behavior, and conservation<br><i>Express</i> how knowledge of bee ecology is changing the way scientists understand the world<br><i>Explain</i> and <i>evaluate</i> the interaction of science with society                                                      |

## Course schedule

Please see the course Canvas site for most up to date information about assignment deadlines and course activities. Students with problems accessing Canvas should seek help resources here:

<https://www.uky.edu/canvas/>

## Submission of assignments

Assignments must be typed and submitted via Canvas by the date listed in the syllabus. The acceptable document format is Microsoft word or PDF (.doc, .docx, .pdf). If you turn in an assignment late (due to an unexcused absence or any other reason), a **three-point penalty will be given for each calendar day the assignment is late** (see below for exceptions related to excused absences). **Assignments that are more than 10 days late (without an excused absence) will not be graded and the student will receive a zero.**

Assignments will be graded and returned to students as quickly as possible, at the discretion of TAs and the Instructor.

## Attendance policy

Attendance is not required for this class, but I will take attendance every period, and *you can replace your final exam with your attendance grade*. The class meets 37 times (not counting review days and exams). You will receive 3 points per day, for 111 total possible points (that's over 100% on the final!). **Students are responsible for any information they miss when they miss a class period.** The attendance policy below addresses the procedure for assignments missed due to excused absences.



## Excused Absences

See: <https://www.uky.edu/universitysenate/acadpolicy#Excused>

*Senate Rules 5.2.4.2* defines the following as acceptable reasons for excused absences: (a) serious illness, (b) illness or death of family member, (c) University-related trips or activities, (d) interviews for graduate/professional school or full-time employment post-graduation (d) major religious holidays, (e) COVID-19 related quarantine precluding in-person interactions.

If the student misses an assignment deadline or in-class activity/attendance due to an excused absence, the student bears the responsibility of informing the Head TA and providing documentation for the absence **within one week** following the day of the excused absence (except where prior notification is required). No exceptions will be made. **Failure to notify the Head TA and provide documentation within one week of the excused absence will result in zeros for any assignments and activities missed due to absence.** If a student is uncomfortable sharing personal information with the Head TA, the Instructor can be notified instead.

Per *Senate Rule 5.2.4.2*, students missing any graded work due to an excused absence are responsible: for informing the instructor (in our case, the Head TA) about their excused absence within one week following the period of the excused absence (except where prior notification is required); and for making up the missed work. **Assignments due on the day of an excused absence must be turned in prior to the absence if possible, otherwise the assignment is due within one week of the original due date and will be graded without penalty.** Exceptions to this timeline can be accommodated if the student informs the Head TA or Instructor prior to the absence or within one week of the absence.

Students anticipating an absence for a major religious holiday are responsible for notifying the instructor in writing of anticipated absences due to their observance of such holidays no later than the last day in the semester to add a class. Two weeks prior to the absence is reasonable, but should not be given any later. Information regarding major religious holidays may be obtained through the Ombud (859-257-3737, <https://www.uky.edu/universitysenate/acadpolicy#Excused>).

**Students are expected to withdraw from the class if more than 20% of the classes scheduled for the semester are missed (excused) per University policy.**

## Verification of Absences

Students will be asked to verify their absences in order for them to be considered excused. *Senate Rule 5.2.4.2* states that faculty have the right to request “appropriate verification” when students claim an excused absence because of illness or death in the family. Appropriate notification of absences due to University-related trips is required prior to the absence when feasible and in no case more than one week after the absence. Appropriate verification includes: a note from the health care provider, a copy of an obituary or other published information, a note from a coach or leader of a University-related trip.

## Academic integrity

Per University policy, students shall not plagiarize, cheat, or falsify or misuse academic records. Students are expected to adhere to University policy on cheating and plagiarism in all courses. The minimum penalty for a first offense is a zero on the assignment on which the offense occurred. If the offense is considered severe or the student has other academic offenses on their record, more serious penalties, up to suspension from the University may be imposed.

Plagiarism and cheating are serious breaches of academic conduct. Each student is advised to become familiar with the various forms of academic dishonesty as explained in the Code of Student Rights and Responsibilities. Complete information can be found at the following website: <http://www.uky.edu/Ombud>. A plea of ignorance is not acceptable as a defense against the charge of academic dishonesty. It is important that you review this information as all ideas borrowed from others need to be properly credited.

*Senate Rules 6.3.1* (see <http://www.uky.edu/Faculty/Senate/> for the current set of *Senate Rules*) states that all academic work, written or otherwise, submitted by students to their instructors or other academic supervisors, is expected to be the result of their own thought, research, or self-expression. In cases where students feel unsure about a question of plagiarism involving their work, they are obliged to consult their instructors on the matter before submission.

When students submit work purporting to be their own, but which in any way borrows ideas, organization, wording, or content from another source without appropriate acknowledgment of the fact, the students are guilty of plagiarism.

Plagiarism includes reproducing someone else's work (including, but not limited to a published article, a book, a website, computer code, or a paper from a friend) without clear attribution. Plagiarism also includes the practice of employing or allowing another person to alter or revise the work, which a student submits as his/her own, whoever that other person may be. Students may discuss assignments among themselves or with an instructor or tutor, but when the actual work is done, it must be done by the student, and the student alone.

When a student's assignment involves research in outside sources or information, the student must carefully acknowledge exactly what, where and how he/she has employed them. If the words of someone else are used, the student must put quotation marks around the passage in question and add an appropriate indication of its origin. Making simple changes while leaving the organization, content, and phraseology intact is plagiaristic. However, nothing in these Rules shall apply to those ideas, which are so generally and freely circulated as to be a part of the public domain.

Please note: Any assignment you turn in may be submitted to an electronic database to check for plagiarism.

Submitting an assignment that was originally written for another class will be allowed with permission from the instructor only. Without permission, such a submission will be considered plagiarism.

## Accommodations due to disability

If you have a documented disability that requires academic accommodations, please see the instructor as soon as possible during scheduled office hours. **In order to receive accommodations in this course, you must upload a Letter of Accommodation from the Disability Resource Center (DRC) to Canvas. Please note that accommodations must be made known to the Instructor at least 7 days prior to the first exam.** The DRC coordinates campus disability services available to students with disabilities. It is located on the corner of Rose Street and Huguelet Drive in the Multidisciplinary Science Building, Suite 407. You can reach them via phone at (859) 257-2754 and via email at [drc@uky.edu](mailto:drc@uky.edu). Their web address is <http://www.uky.edu/DisabilityResourceCenter>.

## Classroom behavior policies

The Instructor expects respectful interactions during instructional periods. This includes using laptop computers or cell phones *only* to access the course Canvas site or take notes (e.g., for in-person lectures). Please do not privately chat with classmates in-person or over Zoom unless instructed otherwise. **If students are not required to wear masks per university policy, mask usage is still encouraged and would be greatly appreciated.**

## Review of lecture material

Slides and lecture materials will be posted on-line. The instructor will provide a recorded review and the TAs will hold an in-class Q&A period prior to each exam.

## Diversity and inclusion statement

Faculty and staff of the College of Agriculture, Food and Environment (CAFE) are committed to creating an inclusive environment of mutual respect where students are encouraged to achieve their highest potential, regardless of, but not limited to race, ethnicity, gender identity and expression, sexual orientation, national origin, religion, age, ability, and socioeconomic status. The goal is to work together as a diverse group of engaged students, faculty, and staff to ensure all feel welcome, safe, accepted, and included.

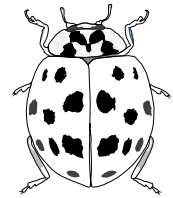
## Emergency statement

*If an emergency arises in this classroom, building or vicinity, your instructor will advise you of actions to follow to enhance your safety. If building evacuation occurs (i.e., fire alarm), follow posted evacuation routes and muster points so the instructor can help ensure their students have evacuated the building safely and they are not hindering emergency personnel access to the building. If you may require assistance during an emergency, notify the instructor at the beginning of the semester. In order to prepare for emergencies while on campus please view the emergency response guidelines at the UK Division of Crisis Management and Emergency Preparedness website: (<http://www.uky.edu/EM/emergency-response-guide.html>). To receive*

*emergency messages, sign up for UK Alert (<http://www.uky.edu/EM/UKAlert>). Always turn cellular phones to silent mode when entering the classroom. If you observe or receive an emergency alert, immediately and calmly inform your instructor.*

# SYLLABUS

## General Entomology (3 credits)



**Lecture** 11:00-11:50AM, Tuesdays Thursdays; **Garrigus 109**. Recordings will be available in Canvas under **Echo360** for synchronous or asynchronous viewing.

**Lab:** 1:00-2:50PM Tuesday or Thursday: nominally **Garrigus 104** (but often outside)

**Zoom:** <https://uky.zoom.us/j/9536400919>

Instructions for connecting to Echo360 and Zoom are available in Canvas.

### I. Contact Information

**Instructor:** Dr. Jen White

**Office Building and Room Number:** Agricultural Sciences Center North (Bldg 0091), room S225-G

**Email:** [jenawhite@uky.edu](mailto:jenawhite@uky.edu)

**Office Phone:** (859) 257-6693

**Office hours:** Mondays 1:00-2:30 in person in S225-G or at Zoom address above. I will also be available at all lab sessions. Students may schedule individual meetings outside regular office hours and lab sessions; please contact me in advance via **email** to schedule a Zoom appointment.

**Preferred Method of Communication:** email, por favor. I will reply within 24 hrs; often much less.

### II. Course Description

Students will learn the fundamentals of insect biology and relationships among insects, plants, and other organisms; identification of commonly encountered insects. Beneficial and detrimental effects of insects are discussed.

### III. Prerequisites

One course in introductory biology

### IV. Student Learning Outcomes:

After completing this course, the students will be able to

- \*Describe basic insect physiology, behavior, and management
- \*Identify common insects to order and/or family
- \*Describe relationships among insects, plants, and other organisms
- \*Contrast positive and negative relationships of insects with humans

### V. Texts:

(rec.): Eaton, ER., and K. Kaufman. 2007. Kaufman Field Guide to the Insects of N. America.

(optional): Gullan, P.J., and P.S. Cranston. 2014. The Insects: An Outline of Entomology, 5th edition.

### VI. Technology requirements:

Many assignments and quizzes will be submitted via Canvas. Ability to take insect pictures in the field via digital camera (e.g. phone) is strongly encouraged, but not required. Access to the free naturalist website [iNaturalist](http://iNaturalist.org) and/or use of the iNaturalist app is required, and students will be expected to create an account on this site to assist with insect identification.

Minimum technical requirements for UK courses and suggested hardware, software, and internet connections are available at [ITS Student Hardware & Software Guidelines](#).

If you have any technical questions or issues please contact me [ [jenawhite@uky.edu](mailto:jenawhite@uky.edu) ] or Brian Lauer (IT Specialist in the Department of Entomology) [ [brian.lauer@uky.edu](mailto:brian.lauer@uky.edu) ].

For help with Canvas, call the Canvas Support Hotline (Students): 1-844-480-0838, or click [Chat with Canvas Support \(Students\)](#)

For account help, contact UK's [Information Technology Customer Services online](#), by [email](#), or by phone at 859-218-HELP (4357)

## VII. Assignments and Learning Activities:

The lecture portion of the course can be attended in person, or will be available in Canvas. There will be two midterm exams and one final exam, all of equal value. The midterm exams will test assimilation of lecture content, and are not cumulative. They will be administered in class as indicated on the lecture schedule. The final exam is cumulative but take-home. This will be an open-internet exam, and students will have at least a week to complete it. The highest two exam scores will contribute toward your final score, the lowest will be dropped.

The laboratory portion of the course emphasizes insect identification. Weekly insect taxonomy modules will be available in Canvas, with associated quizzes and/or activities. In class laboratory activities will include insect collecting trips, field-based insect ecology and behavior exercises, and classroom activities focused on insect curation and identification. The order of classroom versus field activity days may vary, depending on the weather. There will be two insect identification midterms in which arthropods will be identified to order and/or family. Students will also select an insect family that is not otherwise covered in class and prepare a short presentation of the group for the lab. The laboratory final exam will be an open internet identification exercise, and students will have at least a week to complete it.

Finally, a major portion of the grade comes from the insect collection. The collection will be a combination of a physical collection and digital collection, as described in the collection module on Canvas. You will be provided with collecting supplies that will need to be returned by the end of the semester. If you wish to retain your collection after the end of the semester, we'll work out a mechanism for you to keep it. Start collecting as soon as possible - insects become scarce as fall progresses!

## VIII. Assessment:

|             | <u>Lecture</u>          |  | <u>Laboratory</u>             |                         |
|-------------|-------------------------|--|-------------------------------|-------------------------|
| First Exam  | 100 points              |  | Quizzes and Lab Assignments   | 100 points              |
| Second Exam | 100 points              |  | Laboratory Midterm Exams      | 60 points               |
| Final Exam  | 100 points <sup>a</sup> |  | Laboratory Taxon Presentation | 20 points               |
|             |                         |  | Laboratory Final Exam         | 20 points               |
|             |                         |  | Insect Collection             | 100 points <sup>b</sup> |

<sup>a</sup> The Final exam will be take-home and open internet. You will have at least one week to completed it. It will be due at our scheduled finals week exam time, Thursday Dec. 15, 12:30 PM. The lowest of the 3 lecture exam scores will be dropped.

<sup>b</sup> Extra credit (10 points) is available on the Insect Collection. Additional extra credit activities *may* be made available to entire class at instructor's discretion.

**COURSE TOTAL** 500 points

(>449 points = A; 400-449 points = B; 350-399 points = C; 300-349 points = D; <300 points = E)

## IX. Lecture Schedule (timing of individual topics is approximate)

| Date                     |                | Lecture (timing approximate)                                                    | Lab (Tu OR Th); <b>Online module</b> assignments due Friday unless otherwise indicated             |
|--------------------------|----------------|---------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------|
| wk                       | dates          |                                                                                 |                                                                                                    |
| 1                        | 8/23           | Introduction (Module 1)                                                         | Lab: Introduction                                                                                  |
|                          | 8/25           | Insect Systematics (Module 2)                                                   | <b>Online:</b> iNaturalist orientation                                                             |
| 2                        | 8/30<br>9/1    | Structure and Function: External (Mod. 3)                                       | Lab: Outside - Arboretum<br><b>Online:</b> How to collect Insects                                  |
| 3                        | 9/6<br>9/8     | Structure and Function: Internal (Mod. 4)                                       | Lab: Insect curation<br><b>Online:</b> Bug Bits, Insect Pinning                                    |
| 3.5                      | 9/10<br>or 11  | <optional field collecting trip> date dependent on weather                      |                                                                                                    |
| 4                        | 9/13<br>9/15   | Repro Biology: Finding Mates and having babies (Mod. 5)                         | Lab: Outside – campus collecting<br><b>Online:</b> Using Insect Keys                               |
| 5                        | 9/20           | Life Cycles and Metamorphosis (Mod. 6)                                          | Lab: Self-guided – choose new location!                                                            |
|                          | 9/22           | <i>Canned Social Insects lecture (Mod. 13)</i>                                  | <b>Online:</b> Know your Orders                                                                    |
| 6                        | 9/27           | Exam review; Protective Form Color and Behavior (Mod. 7)                        | Lab: Outside - scavenger hunt<br><b>Online:</b> Orthoptera/Odonata;                                |
|                          | 9/29           | <b>First lecture exam, mods. 1-6 (100 pt)</b>                                   | Hemiptera                                                                                          |
| 7                        | 10/4           | Ecology & Behav: Coping w/Environment (Mod. 8)                                  | Lab: DNA extraction, collection workday<br><b>Online:</b> Coleoptera, Social Insects               |
|                          | 10/6           | Ecology & Behav: Insect Pop. Growth (Mod. 9)                                    |                                                                                                    |
| 8                        | 10/11<br>10/13 | Ecology & Behav: What Insects Eat (Mod. 10)<br>Insect Pests: Problems (Mod. 11) | Lab: <b>First lab exam (30 pt)</b>                                                                 |
| 9                        | 10/18<br>10/20 | Mod. 11, continued<br>Insect Pests: Solutions (Mod. 12)                         | Lab: Tour insect collection<br><b>Online:</b> Diptera                                              |
| 10                       | 10/25          | <i>No lecture - Fall break</i>                                                  | Lab: <i>No meeting for Tu</i> ; Th -collection workday                                             |
|                          | 10/27          | Mod. 12, continued                                                              | <b>Online:</b> Hymenoptera                                                                         |
| 11                       | 11/1           | Mod. 12, continued                                                              | Lab: Collection workday                                                                            |
|                          | 11/3           | Beneficial Insects: Pollinators & Biol. Control (Mod. 14)                       | <b>Insect Collection due (100 pt)</b><br><b>Online:</b> Lepidoptera                                |
| 12                       | 11/8<br>11/10  | <i>Election day – canned Phylum Arthropoda (mod. 15)</i>                        | Lab: <i>No meeting for Tu</i> ; Th - extension lab tour                                            |
|                          |                | Exam review; Ametabolous insects (Mod 16)                                       | <b>Online:</b> Other Arthropods, Immature Insects                                                  |
| 13                       | 11/15          | <b>Second lecture exam, mods. 7-14 (100 pt)</b>                                 | Lab: Tu - extension lab tour; Th- <b>Second lab exam (30 pt)</b> <b>Online:</b> molecular ID       |
|                          | 11/17          | Hemimetabolous Insects (Mod. 17)                                                |                                                                                                    |
| 14                       | 11/22          | Mod. 17, continued                                                              | Tu: <b>Second lab exam (30 pt)</b> ; <i>No meeting for Th</i>                                      |
|                          | 11/24          | <i>No lecture - Thanksgiving</i>                                                |                                                                                                    |
| 15                       | 11/29<br>12/1  | Holometabolous Insects (Mod. 18)                                                | <b>Lab: Taxa presentations (20 pt); Insect Collection revision due</b>                             |
| 16                       | 12/6           | Mod. 18, continued                                                              | Tu: lab equipment return, pick up collection; <i>No meeting for Th lab</i>                         |
|                          | 12/8           | <i>No lecture (reading day)</i>                                                 | <b>Online: Lab final due 12/7 (20pt)</b>                                                           |
| Finals week<br>Th Dec 15 |                |                                                                                 | <b>Take home lecture final exam due</b> (if taken; can substitute for either lecture exam; 100 pt) |



## X. Midterm Grades for Undergraduate Students

Midterm grades will be posted in myUK by the deadline established by the University Senate and published in the [Academic Calendar](#).

## XI. Attendance, Unexcused Absences and Late Assignments: (<https://www.uky.edu/universitysenate/acadpolicy> )

Attendance at lecture (in-person or virtually) is expected but not enforced. Students are adults, and do not need to provide excuses for missed lectures. Lecture powerpoint slides and handouts will be available on Canvas, as will recordings of the lectures. Assessment in this course relies heavily on clear understanding of lecture material, nuances of which can sometimes be difficult to glean from posted slides. Students who routinely skip lectures routinely get lower grades.

If a student misses an examination, make-ups will be given **only** in the event of excused absences as defined by the University; it is the student's responsibility to provide the instructor with verification that an absence qualifies as "excused". Academic policies regarding excused absences can be found in the [Senate Rules under "Excused Absences"](#). The Senate Council has interpreted excused absences for the Fall 2021 semester to include an excuse from required in-person interactions if the student has been directed to self-quarantine by the University (including its app), a medical professional, public health professional, or government official.

Weekly quizzes and assignments are due in Canvas by midnight Friday of the week assigned. For larger assignments (Final Insect Collection, Final Taxa Presentation), late work is accepted, but with a 10% penalty per day late. Given potential for Covid-induced chaos, I may change these policies as the course progresses. If so, the policy changes will be posted in Announcements on Canvas.

Title IV financial aid disbursement regulations: *"In order to meet federal regulations, the instructor will monitor student participation in this class through attendance or assignments. Students whose attendance/participation/ engagement cannot be determined one time during the first three weeks of the semester may be dropped from the course. If you will be missing a class period or will not be submitting some assignment during that period, it is your responsibility to notify the instructor, even if the absence or missed assignment is not excused under university rules."*

## XII. COVID-19 policies

All students are strongly encouraged to get vaccinated! We will be adhering to University guidelines regarding masking and distancing. If you need to quarantine due to COVID-19 infection or exposure, contact me for discussion of accommodations.

## XIII. Accommodations Due to Disability:

If you have a documented disability that requires academic accommodations, please see me as soon as possible during scheduled office hours. Please initiate the accommodation process by submitting an online Intake Form (found at <http://www.uky.edu/DisabilityResourceCenter/content/apply-services>) or by contacting the Disability Resource Center (DRC). The DRC coordinates campus disability services available to students with disabilities. DRC staff will discuss possible accommodations with you and provide you with a Letter of Accommodation. Once you receive your Letter of Accommodation, please set up an appointment to see me or stop by during scheduled office hours to discuss how your accommodation will be addressed. The DRC is located on the corner of Rose Street and Huguely Drive in the Multidisciplinary Science Building, Suite 407. You can reach them via phone at (859) 257-2754 and via email at [drc@uky.edu](mailto:drc@uky.edu). Their web address is <http://www.uky.edu/StudentAffairs/DisabilityResourceCenter/>.



## XIV. Academic integrity: (<https://www.uky.edu/universitysenate/ao>)

Per university policy, students shall not plagiarize, cheat, or falsify or misuse academic records. Students are expected to adhere to University policy on cheating and plagiarism in all courses. The minimum penalty for a first offense is a zero on the assignment on which the offense occurred. If the offense is considered severe or the student has other academic offenses on their record, more serious penalties, up to suspension from the university may be imposed.

Plagiarism and cheating are serious breaches of academic conduct. Each student is advised to become familiar with the various forms of academic dishonesty as explained in the [Code of Student Rights and Responsibilities](#). Complete information can be found on the [Academic Ombud](#) page. A plea of ignorance is not acceptable as a defense against the charge of academic dishonesty. It is important that you review this information as all ideas borrowed from others need to be properly credited.

All academic work, written or otherwise, submitted by students to their instructors or other academic supervisors, is expected to be the result of their own thought, research, or self-expression. In cases where students feel unsure about a question of plagiarism involving their work, they are obliged to consult their instructors on the matter before submission.

When students submit work purporting to be their own, but which in any way borrows ideas, organization, wording, or content from another source without appropriate acknowledgment of the fact, the students are guilty of plagiarism.

Plagiarism includes reproducing someone else's work (including, but not limited to a published article, a book, a website, computer code, or a paper from a friend) without clear attribution. Plagiarism also includes the practice of employing or allowing another person to alter or revise the work which a student submits as his/her own, whoever that other person may be, except under specific circumstances (e.g. Writing Center review or peer review) allowed by the Instructor of Record or that person's designee. Plagiarism may also include double submission, self-plagiarism, or unauthorized resubmission of one's own work, as defined by the instructor.

Students may discuss assignments among themselves or with an instructor or tutor, except where prohibited by the Instructor of Record (e.g. individual take-home exams). However, the actual work must be done by the student, and the student alone, unless collaboration is allowed by the Instructor of Record (e.g. group projects).

When a student's assignment involves research in outside sources or information, the student must carefully acknowledge exactly what, where and how he/she has employed them. If the words of someone else are used, the student must put quotation marks around the passage in question and add an appropriate indication of its origin. Making simple changes while leaving the organization, content, and phraseology intact is plagiaristic. However, nothing in these Rules shall apply to those ideas, which are so generally and freely circulated as to be a part of the public domain.

Please note: Any assignment you turn in may be submitted to an electronic database to check for plagiarism.

Cheating is defined by its general usage. It includes, but is not limited to, the wrongfully giving, taking, or presenting any information or material by a student with the intent of aiding himself/herself or another on any academic work which is considered in any way in the determination of the final grade. The fact that a student could not have benefited from an action is not by itself proof that the action does not constitute cheating. Any question of definition shall be referred to the University Appeals Board.

Maintaining the integrity, accuracy, and appropriate privacy of student academic records is an essential administrative function of the University and a basic protection of all students. Accordingly, the actual or attempted falsification, theft, misrepresentation or other alteration or misuse of any official academic record of the University, specifically including knowingly having unauthorized access to such records or the unauthorized disclosure of information contained in such records, is a serious academic offense. As used in this context, "academic record" includes all paper and electronic versions of the partial or complete permanent academic record, all official and unofficial academic transcripts, application documents and admission credentials, and all academic record transaction documents. The minimum sanction for falsification, including the omission of information, or attempted falsification or other misuse of academic records as described in this section is suspension for one semester.

## XV. Non-discrimination Statement and Title IX Information

In accordance with federal law, UK is committed to providing a safe learning, living, and working environment for all members of the University community. The University maintains a comprehensive program which protects all

members from discrimination, harassment, and sexual misconduct. For complete information about UK's prohibition on discrimination and harassment on aspects such as race, color, ethnic origin, national origin, creed, religion, political belief, sex, and sexual orientation, please see [the electronic version of UK's Administrative Regulation 6:1 \("Policy on Discrimination and Harassment"\)](https://www.uky.edu/regs/ar6-1) (<https://www.uky.edu/regs/ar6-1>). In accordance with Title IX of the Education Amendments of 1972, the University prohibits discrimination and harassment on the basis of sex in academics, employment, and all of its programs and activities. Sexual misconduct is a form of sexual harassment in which one act is severe enough to create a hostile environment based on sex and is prohibited between members of the University community and shall not be tolerated. For more details, please see [the electronic version of Administrative Regulations 6:2 \("Policy and Procedures for Addressing and Resolving Allegations of Sexual Assault, Stalking, Dating Violence, Domestic Violence, and Sexual Exploitation"\)](https://www.uky.edu/regs/ar6-2) (<https://www.uky.edu/regs/ar6-2>). Complaints regarding violations of University policies on discrimination, harassment, and sexual misconduct are handled by the Office of Institutional Equity and Equal Opportunity (Institutional Equity), which is located in 13 Main Building and can be reached by phone at (859) 257-8927. You can also visit [Institutional Equity's website](https://www.uky.edu/eeo) (<https://www.uky.edu/eeo>).

Faculty members are obligated to forward any report made by a student related to discrimination, harassment, and sexual misconduct to the Office of Institutional Equity. Students can confidentially report alleged incidences through the [Violence Intervention and Prevention Center](https://www.uky.edu/vipcenter) (<https://www.uky.edu/vipcenter>), [Counseling Center](https://www.uky.edu/counselingcenter) (<https://www.uky.edu/counselingcenter>), or [University Health Service](https://ukhealthcare.uky.edu/university-health-service/student-health) (<https://ukhealthcare.uky.edu/university-health-service/student-health>).

Reports of discrimination, harassment, or sexual misconduct may be made to Institutional Equity [here](#).

## XVI. Class Recording Notification

The University of Kentucky Student Code of Conduct defines Invasion of Privacy as using electronic or other devices to make a photographic, audio, or video record of any person without their prior knowledge or consent when such a recording is likely to cause injury or distress.

Meetings of this course will be recorded. All video and audio recordings of lecturers and class meetings, provided by the instructors, are for educational use by students in this class only. They are available only through the Canvas shell for this course and are not to be copied, shared, or redistributed.

As addressed in the Student Code of Conduct, students are expected to follow appropriate university policies and maintain the security of linkblue accounts used to access recorded class materials. Recordings may not be reproduced, shared with those not enrolled in the class, or uploaded to other online environments.

If the instructor or a University of Kentucky office plans any other uses for the recordings, beyond this class, students identifiable in the recordings will be notified to request consent prior to such use. In anticipation of such cases, students may be asked to complete an "authorization of use" form by a faculty member.

Video and audio recordings by students are not permitted during the class unless the student has received prior permission from the instructor. Any sharing, distribution, and or uploading of these recordings outside of the parameters of the class is prohibited. Students with specific recording accommodations approved by the Disability Resource Center should present their official ocumentation to the instructor.

All content for this course, including handouts, assignments, and lectures are the intellectual property of the instructors and cannot be reproduced or sold without prior permission from the instructors. A student may use the material for reasonable educational and professional purposes extending beyond this class, such as studying for a comprehensive or qualifying examination in a degree program, preparing for a professional or certification examination, or to assist in fulfilling responsibilities at a job or internship.

**The faculty and staff of the College of Agriculture, Food and Environment (CAFE) are committed to creating an inclusive learning environment of mutual respect where all members of our community are able to fully engage, belong, and succeed as their full selves. We support students, faculty, and staff in all of their identities, such as race, ethnicity, gender identity and expression, perspectives, beliefs, sexual orientation, national origin, religious belief, age, ability, and socioeconomic status. We work together as a diverse group of engaged students, faculty, and staff to ensure we all feel welcome, safe, accepted, and included. We are looking forward to learning and growing with you. Your suggestions about how to improve this course to be more inclusive and equitable are welcome.**

# Course syllabus: Ent 310 Insect pests of field crops

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**Fall 2019**

**Instructor: Dr. David Gonthier**

**University of Kentucky**

**Office: Room S-327A, Ag North**

**Phone: (859) 257 9364**

**Email: Gonthier.david@uky.edu**

**Time:**

Lecture: MW 12:00pm – 12:50pm| Agricultural Science Building North Rm. N10 LEC

Laboratory: W 1pm – 2:50pm| Garrigus Bldg Rm. 104

Office hours: M 1pm-2pm, T

Required text: No required text. All materials will be provided on Canvas or in class.

**Course description:**

After completing this course, you should be able to:

- Recognize beneficial and harmful arthropods and explain their biology and ecology
- Characterize and assess types of plant injury associated with potential pests
- Understand and describe issues of sustainability in pest management

**No Prerequisites:**

ENT 310 is aimed at students in fields in the applied plant sciences, entomology, agricultural education, natural resources, biology, or anyone interested in insects affecting crops. There are no prerequisites, but understanding of college-level biology is expected. Prior entomological background is unnecessary.

**Grading**

| <u>Activity</u>              | <u>Value</u>   | <u>Points</u> |
|------------------------------|----------------|---------------|
| 2 Exams                      | (2 x 200 each) | 400           |
| 2 Lab exams                  | (2 x 150 each) | 300           |
| Arthropod collection         |                | 200           |
| In class & lab participation |                | 100           |
| Total                        |                | 1000          |

**Grading scale**

A =1000 to 900 points

B = 899 to 800 points

C = 799 to 700 points

D = 699 to 600 points

E < 600 points

**Grading breakdown**

**Lecture exams** - multiple-choice, matching, fill in the blank, pictures, short paragraphs, etc. Students will be given 45 minutes to complete lecture exams.

**Lab exams** –questions based on identifying specimens, samples, etc. covered in lecture and lab. Students will be given 2 hours to complete lab exams.

**Lab work** – Laboratory activities aim to help you understand the topics that we are covering by providing hands on experiences in the lab or field.

**Arthropod collection** – Collections will be graded starting on December 4<sup>th</sup>, with a maximum of 200 points (1/5 of your overall grade). The accuracy of your identifications and the accompanying written statements, as well as the neatness of your collection will make up your grade. Points will be deducted if specimens are not correctly identified to order or common name, if any of the written statements are incorrect or incomplete, or if the instructor has to struggle to understand the organization of your collection.

**In-class and lab participation:** Students are expected to participate and engage in class and laboratory activities by attending class periods, discussing materials, asking questions, sharing knowledge and sharing their writing assignments. Four written reflections will be part of your participation grade. These reflections will highlight things learned in the course, challenges, likes and dislikes, and topics or directions to take later on in the course. Reflections will be ½ page to a page of text.

**Canvas** – check regularly for relevant information and your grades.

## **Course Policies**

### **Attendance Policy**

Attendance and participation in all classes and discussions are expected.

### **Excused Absences**

Students need to notify the professor of absences prior to class when possible. S.R. 5.2.4.2 defines the following as acceptable reasons for excused absences: (a) serious illness, (b) illness or death of family member, (c) University-related trips, (d) major religious holidays, and (e) other circumstances found to fit “reasonable cause for nonattendance” by the professor.

Students anticipating an absence for a major religious holiday are responsible for notifying the instructor in writing of anticipated absences due to their observance of such holidays no later than the last day in the semester to add a class.

Students are expected to withdraw from the class if more than 20% of the classes scheduled for the semester are missed (excused or unexcused) per university policy.

### **Verification of Absences**

Students may be asked to verify their absences in order for them to be considered excused. Senate Rule 5.2.4.2 states that faculty have the right to request “appropriate verification” when students claim an excused absence because of illness or death in the family. Appropriate notification of absences due to university-related trips is required prior to the absence.

### **Academic Integrity**

Per university policy, students shall not plagiarize, cheat, or falsify or misuse academic records. Students are expected to adhere to University policy on cheating and plagiarism in all courses. The minimum penalty for a first offense is a zero on the assignment on which the offense occurred. If the offense is considered severe or the student has other academic offenses on their record, more serious penalties, up to suspension from the university may be imposed.

Plagiarism and cheating are serious breaches of academic conduct. Each student is advised to become familiar with the various forms of academic dishonesty as explained in the Code of Student Rights and Responsibilities. Complete information can be found at the following website: <http://www.uky.edu/Ombud>. A plea of ignorance is not acceptable as a defense against the charge of academic dishonesty. It is important that you review this information as all ideas borrowed from others need to be properly credited.

Part II of *Student Rights and Responsibilities* (available online <http://www.uky.edu/StudentAffairs/Code/part2.html>) states that all academic work, written or otherwise, submitted by students to their instructors or other academic supervisors, is expected to be the result of their own thought, research, or self-expression. In cases where students feel unsure about the question of plagiarism involving their own work, they are obliged to consult their instructors on the matter before submission.

When students submit work purporting to be their own, but which in any way borrows ideas, organization, wording or anything else from another source without appropriate acknowledgement of the fact, the students are guilty of plagiarism. Plagiarism includes reproducing someone else’s work, whether it be a published article, chapter of a book, a paper from a friend or some file, or something similar to this. Plagiarism also includes the practice of employing or allowing another person to alter or revise the work, which a student submits as his/her own, whoever that other person may be.

When a student’s assignment involves research in outside sources of information, the student must carefully acknowledge exactly what, where and how he/she employed them. If the words of someone else are used, the student must put quotation marks around the passage in question and add an appropriate indication of its origin. Making simple changes while leaving the organization, content and phraseology intact is plagiaristic. However, nothing in these Rules shall apply to those ideas which are so generally and freely circulated as to be a part of the public domain (Section 6.3.1).

**Please note:** Any assignment you turn in may be submitted to an electronic database to check for plagiarism.

**Accommodations due to disability:**

If you have a documented disability that requires academic accommodations, please see me as soon as possible during scheduled office hours. In order to receive accommodations in this course, you must provide me with a Letter of Accommodation from the Disability Resource Center (Suite 407 Multidisciplinary Science Bldg, 257-2754) for coordination of campus disability services available to students with disabilities.

**Emergency Procedures**

If an emergency arises in this classroom, building or vicinity, your instructor will advise you of actions to follow to enhance your safety. If a situation requires emergency shelter (i.e., during a severe weather event), the nearest shelter location is in the Ag North Building – cross-corridor on the second floor. If building evacuation occurs (i.e., fire alarm), follow posted evacuation routes and assemble at the Ag North Building sign at the intersection of Limestone and Cooper, so the instructor can help ensure their students have evacuated the building safely and they are not hindering emergency personnel access to the building.

To prepare for emergencies while on campus please continue to the below links for detailed emergency response guidelines: the UK Division of Crisis Management & Preparedness website (<http://www.uky.edu/EM/emergency-response-guide.html>) and the College of Agriculture, Food and Environment (<http://www.ca.uky.edu/>). To receive emergency messages, sign up for UK Alert (<http://www.uky.edu/EM/UKAlert>). Always turn cellular phones to silent mode when entering the classroom. If you observe or receive an emergency alert, immediately and calmly inform your instructor.

**Schedule:**

| Ent 310 |     |     | Course field crop entomology  |                            |           |
|---------|-----|-----|-------------------------------|----------------------------|-----------|
| Date    | Day |     | Lecture (Ag science N Rm N10) | Lab (Garrigus Bldg Rm 104) | Due dates |
| Aug     | 26  | Mon | Introduction to course        |                            |           |
| Aug     | 28  | Wed |                               | Field Trip – North Farm    |           |
| Aug     | 28  | Wed |                               | Field Trip – North Farm    |           |
| Sep     | 2   | Mon | Labor day - Academic Holiday  |                            |           |
| Sep     | 4   | Wed |                               | Field trip tobacco/alfalfa |           |
| Sep     | 4   | Wed |                               | Field trip tobacco/alfalfa |           |

|     |    |     |                                    |                                         |
|-----|----|-----|------------------------------------|-----------------------------------------|
| Sep | 9  | Mon | Metamorphosis & growth             |                                         |
| Sep | 11 | Wed |                                    | Field trip Hemp                         |
| Sep | 11 | Wed |                                    | Field trip Hemp                         |
|     |    |     | Reproduction & Population dynamics |                                         |
| Sep | 16 | Mon |                                    |                                         |
| Sep | 18 | Wed |                                    | Field trip: Euro-corn borer             |
| Sep | 18 | Wed |                                    | Field trip: Euro-corn borer             |
| Sep | 23 | Mon | Borers                             |                                         |
| Sep | 25 | Wed |                                    | Lecture: insect basics                  |
| Sep | 25 | Wed |                                    | Class and order lab                     |
| Sep | 30 | Mon | Soil arthropods: nematodes         |                                         |
| Oct | 2  | Wed |                                    | Soil insects 1                          |
| Oct | 2  | Wed |                                    | Soil insects                            |
| Oct | 7  | Mon | Defoliators 1                      |                                         |
| Oct | 9  | Wed |                                    | Defoliators 2                           |
| Oct | 9  | Wed |                                    | Defoliators                             |
| Oct | 14 | Mon | <b>Lecture Exam 1</b>              | <b>Lecture exam 1</b>                   |
| Oct | 16 | Wed |                                    | Sap feeders / disease vectors           |
| Oct | 16 | Wed |                                    | Sap feeders                             |
| Oct | 21 | Mon | Fall Break                         |                                         |
| Oct | 23 | Wed |                                    | Silk and seed feeders                   |
| Oct | 23 | Wed |                                    | Silk and seed feeders                   |
| Oct | 28 | Mon | Review for lab exam                |                                         |
| Oct | 30 | Wed |                                    | <b>Lab Exam 1</b>                       |
| Oct | 30 | Wed |                                    | <b>Lab exam 1</b>                       |
| Nov | 4  | Mon | Pollinators                        |                                         |
| Nov | 6  | Wed |                                    | Beneficial Insects                      |
| Nov | 6  | Wed |                                    | Beneficial insects                      |
| Nov | 11 | Mon | Seed treatments                    |                                         |
| Nov | 13 | Wed |                                    | Collections overview                    |
| Nov | 13 | Wed |                                    | work on collections                     |
| Nov | 18 | Mon | Insecticides                       |                                         |
| Nov | 20 | Wed |                                    | Work on collections                     |
| Nov | 20 | Wed |                                    | Economic thresholds/Work on collections |
| Nov | 25 | Mon | Bt Crops – Resistance Management   |                                         |
| Nov | 27 | Wed | No class thanksgiving              |                                         |
| Nov | 27 | Wed | No class thanksgiving              |                                         |

|     |    |     |                                      |                       |                       |
|-----|----|-----|--------------------------------------|-----------------------|-----------------------|
| Dec | 2  | Mon | Cultural controls                    |                       |                       |
| Dec | 4  | Wed |                                      | Integrated Management | <b>Collection due</b> |
| Dec | 4  | Wed |                                      | Work on collections   |                       |
| Dec | 9  | Mon | Final exam review/ course evaluation |                       |                       |
| Dec | 11 | Wed |                                      | <b>Lab final</b>      | <b>Lab final</b>      |
| Dec | 11 | Wed |                                      | <b>Lab final</b>      |                       |
| Dec | 16 | Mon | <b>Final Exam (3:30pm)</b>           |                       | <b>Final exam</b>     |



**Entomology 320**  
**Horticultural Entomology**  
**Fall 2022**

**Course Syllabus**

**Professor:** Dr. David Gonthier  
Assistant professor of Entomology  
Office: S-327A Ag Sci. Bldg. N.  
Tel: (859) 257-9364 (office); email: [gonthier.david@uky.edu](mailto:gonthier.david@uky.edu)  
Zoom meeting room: <https://uky.zoom.us/j/6441261889>

Lecture: Monday and Wednesday 11am – 11:50am in Rm. S-221 Ag. Sci. Bldg. N.  
Laboratory: Wednesday 3pm – 4:50pm in Rm. 106 Garrigus Building

**Teaching Assistants:** Ryan Kuesel (PhD student), Kathleen Fiske (PhD student), Alexis Gauger (MS student), will also assist at times in the lab. They can help you with questions about the insect collection assignment, or if you need additional collecting supplies.

**Gonthier office hours**

You may arrange to discuss course material in person or via zoom, please email to schedule a meeting (Zoom meeting room: <https://uky.zoom.us/j/6441261889>).

**Course Objectives:**

This introductory entomology course focuses on the diagnosis and management of insects affecting agronomic crops, vegetable crops, fruit crops, and greenhouse and urban landscapes (trees, shrubs, & turf, and households). While the course will focus on arthropods that cause significant economic damage, it also explores beneficial species like natural enemies of pests, plant pollinators and their biology. It provides an overview of insect biology and ecology, different management strategies to limit economic damage, and the ecological consequences of those strategies. Lecture topics are supplemented with weekly lab sessions.

**No Prerequisites:**

ENT 320 is aimed at students in fields in the applied plant sciences, entomology, agricultural education, natural resources, biology, or anyone interested in insects affecting urban landscapes, turfgrass, and horticultural crops. There are no prerequisites, but understanding of college-level biology is expected. Prior entomological background is unnecessary.

**Required readings**

Whitney Cranshaw and David Shetlar. 2018. Garden Insects of North America. Second Edition. Princeton University Press, Princeton, NJ.

\*Freely available online at the UKY library, but I'd recommend buying it (<\$15 used). I will also have copies available to checkout.

Short readings will be assigned throughout the semester from the above book and various other sources that will be posted to CANVAS. These will complement or expand upon lecture topics and will be covered on exams.

## Examinations and Grading:

Letter grades in this course will be determined in the following manner:

### Grading

|                              |      |
|------------------------------|------|
| Attendance and participation | 15%  |
| Lecture exam #1              | 10%  |
| Lecture exam #2              | 10%  |
| Lab Practical #1             | 15%  |
| Lab Practical #2             | 15%  |
| Insect Collection            | 25%  |
| Class Project                | 10%  |
| Total                        | 100% |

### Letter grade

|         |   |
|---------|---|
| 90-100% | A |
| 80-89%  | B |
| 70-79%  | C |
| 60-69%  | D |
| <60%    | E |

**There will be no final exam!**

### Attendance and participation

**Regular, on-time attendance is expected.** You cannot learn if you are not there! Students are responsible for material covered during class sessions. **Please email me ahead of time to let me know if you must miss class** for excused reasons. See additional materials for what UK defines as an excused and unexcused absence. Attendance and participation will also be part of your grade (150 points). I will track your attendance and each unexcused absence from a lecture will count for 15-point deduction of your attendance and participation grade. Each unexcused absence from a lab will count for 30-point deduction of your attendance and participation grade.

### Midterm Lecture exams

Midterm lecture exams will reflect material from lectures. Midterm lecture exam #1 will cover the material presented in roughly the first half of the semester. Midterm lecture exam #2 will cover the material presented in roughly the second half of the semester. Exams will mostly be composed of multiple choice, fill in the blank, true/false and short answer questions. However, there may be 1 or 2 long essays.

### Laboratory practical

In addition to lecture exams, there will be two laboratory practical exams. These will mainly test student abilities to identify important insect anatomical features, identification of arthropods to order, and identification of important arthropods in horticulture systems.

**Make up exams** are not ordinarily given except for UK-approved absences. See additional materials for what UK defines as an excused and unexcused absence. **Because of the set-up time, missed lab exams cannot be made up.**

### **Insect collection**

The purpose of the collection is to develop your ability to find and diagnose insect pests and their damage to cultivated plants (trees, shrubs, herbaceous ornamentals, turf, vegetables, fruits, etc.) in the field. **Collection Requirement, Part 1:** Each student should “collect” (via **digital photos**) and identify 40 different horticulturally-relevant insects, mites and/or other invertebrate pests (or in a few cases, beneficial insects). You may also submit photos of pest damage as part of your collection so long as you identify the particular pest responsible for it. No credit will be lost for poor-quality photos so long as the pest or pest damage they depict is recognizable to your expert instructors. **Collection Requirement, Part 2:** In addition, your 40 specimens must fill 30 ecological or damage categories as outlined below. Each photo specimen, consisting of one or more images, should be “pasted” on a separate PowerPoint template page [see examples in accompanying handout]. Include the following information:

- a. Specimen number (1 to 40)
- b. Date "collected" and name of collector (in most cases, that will be you)
- c. Common name of the pest (e.g., “cabbage looper”, “annual cicada”)
- d. Insect order (if an insect) to which the pest belongs
- e. Habitat collected from; for example: "under sod", "on bean leaves", "in squash vine"
- f. Damage: describe briefly, including which life stage(s) are involved
- g. Suggested management: Suggest one means by which a grower or homeowner might manage or control the pest. Be specific – don’t just say “spray an insecticide”. If it’s a minor pest, you can say “Control usually unnecessary”

### **Class garden project**

The purpose of the class garden project is to learn how an experiment is conducted, results compared, and conclusions made. We will plant an experiment to compare the effect of different organic compliant organic pest management techniques to see which work the best. You will have a short report to complete and turn in later in the semester. See details in accompanying handout.

### **Extra credit opportunities**

From time to time there may be extra credit assignments, these will be sporadic and unannounced. So, come to class!

### **Class fees: None!**

### **Emergency Procedures (UK Policy)**

“If an emergency arises in this classroom, building or vicinity your instructor will advise you of actions to follow to enhance your safety. If a situation requires emergency shelter (i.e., during a severe weather event), the nearest shelter location is the hallway outside our classroom. If building evacuation occurs (i.e., fire alarm), follow posted evacuation routes and assemble at Ag

Alumni Plaza (between Ag. N and Garrigus) so the instructor can help ensure their students have evacuated the building safely and they are not hindering emergency personnel access to the building. If you may require assistance during an emergency, notify the instructor at the beginning of the semester. In order to prepare for emergencies while on campus please continue to the below links for detailed emergency response guidelines: the UK Division of Crisis Management & Preparedness website (<http://www.uky.edu/EM/emergency-response-guide.html>) and the College of Agriculture, Food and Environment (<http://www.ca.uky.edu/>). To receive emergency messages, sign up for UK Alert (<http://www.uky.edu/EM/UKAlert>). Always turn cellular phones to silent mode when entering the classroom. If you observe or receive an emergency alert, immediately and calmly inform your instructor.”

## Additional information

Please find the full senate-approved academic policies [here](#).

### Excused Absences (Senate Rules 5.2.4.2)

Senate Rules 5.2.4.2 defines the following as acceptable reasons for excused absences: (a) significant illness, (b) death of a family member, (c) trips for members of student organizations sponsored by an educational unit, trips for University classes, and trips for participation in intercollegiate athletic events, (d) major religious holidays, (e) interviews for graduate/professional school or full-time employment post-graduation, and (f) other circumstances found to fit “reasonable cause for nonattendance” by the instructor of record. Students should notify the professor of absences prior to class when possible. If you have been directed to self-quarantine by the University (including its app), a medical professional, public health professional, or government official, this also counts as an excused absence for *in-person* meetings.

If a course syllabus requires specific interactions (e.g., with the instructor or other students), in situations where a student’s total EXCUSED absences exceed 1/5 (or 20%) of the required interactions for the course, the student shall have the right to request and receive a “W,” or the Instructor of Record may award an “I” for the course if the student declines a “W.” (Senate Rules 5.2.4.2.1)

### Verification of Absences (Senate Rules 5.2.4.2.1 - 6)

Students may be asked to verify their absences in order for them to be considered excused. *Senate Rule 5.2.4.2* states that faculty have the right to request appropriate verification when students claim an excused absence due to: significant illness; death in the household, trips for classes, trips sponsored by an educational unit and trips for participation related to intercollegiate athletic events; and interviews for full-time job opportunities after graduation and interviews for graduate and professional school. (Appropriate notification of absences due to University-related trips is required prior to the absence when feasible and in no case more than one week after the absence.)

### Religious Observances (Senate Rules 5.2.4.2.4)

Students anticipating an absence for a major religious holiday are responsible for notifying the instructor in writing of anticipated absences due to their observance of such holidays. Please check the course syllabus for the notification requirement. If no requirement is specified, two weeks prior to the absence is reasonable and should not be given any later. Information regarding major religious holidays may be obtained through [the Ombud’s website](#) or calling 859-257-3737.

### Make-Up Work (Senate Rule 5.2.4.2)

Students missing any graded work due to an excused absence are responsible: for informing the Instructor of Record about their excused absence within one week following the period of the excused absence (except where prior notification is required); and for making up the missed work. The instructor must give the student an opportunity to make up the work and/or the exams missed

due to the excused absence, and shall do so, if feasible, during the semester in which the absence occurred. The instructor shall provide the student with an opportunity to make up the graded work and may not simply calculate the student's grade on the basis of the other course requirements, unless the student agrees in writing.

#### **Excused Absences and W/I, All Students (Senate Rule 5.2.4.2.3.1)**

If a student has excused absences for more than one-fifth of the required interactions for a course, the student can request a "W." If the student declines a "W," the Instructor of Record may award an "I" for the course.

#### **Excused Absences Due to Military Duties (Senate Rule 5.2.4.2.3.1)**

If a student must be absent for one-fifth or less of the required course interactions (e.g., class meetings) due to military duties, the following procedure apply:

1. Once a student is aware of a call to duty, the student shall provide a copy of the military orders to the Director of the Veterans Resource Center. The student shall also provide the Director with a list of her/his courses and instructors.
2. The Director will verify the orders with the appropriate military authority and on behalf of the military student, notify each Instructor of Record via Department Letterhead as to the known extent of the absence.
3. The Instructor of Record shall not penalize the student's absence in any way and shall provide accommodations and timeframes so that the student can make up missed assignments, quizzes, and tests in a mutually agreed upon manner.

#### **Non-Discrimination Statement and Title IX Information**

UK is committed to providing a safe learning, living, and working environment for all members of the University community. The University maintains a comprehensive program which protects all members from discrimination, harassment, and sexual misconduct. For complete information about UK's prohibition on discrimination and harassment on aspects such as race, color, ethnic origin, national origin, creed, religion, political belief, sex, and sexual orientation, please see [the electronic version of UK's Administrative Regulation 6:1 \("Policy on Discrimination and Harassment"\)](#). In accordance with Title IX of the Education Amendments of 1972, the University prohibits discrimination and harassment on the basis of sex in academics, employment, and all of its programs and activities. Sexual misconduct is a form of sexual harassment in which one act is severe enough to create a hostile environment based on sex and is prohibited between members of the University community and shall not be tolerated. For more details, please see [the electronic version of Administrative Regulations 6:2 \("Policy and Procedures for Addressing and Resolving Allegations of Sexual Assault, Stalking, Dating Violence, Domestic Violence, and Sexual Exploitation"\)](#). Complaints regarding violations of University policies on discrimination, harassment, and sexual misconduct are handled by the Office of Institutional Equity and Equal Opportunity (IEEO), which is located in 13 Main Building and can be reached by phone at (859) 257-8927. You can also visit [the IEEO's website](#).

Faculty members are obligated to forward any report made by a student related to IEEO matters to the Office of Institutional Equity and Equal Opportunity. Students can *confidentially* report alleged incidences through the Violence Intervention and Prevention Center, Counseling Center, or University Health Services.

#### **Academic Integrity- Prohibition on Plagiarism (Senate Rules 6.3.1)**

Per University policy, students shall not plagiarize, cheat, or falsify or misuse academic records. Students are expected to adhere to University policy on cheating and plagiarism in all courses. The minimum penalty for a first offense is a zero on the assignment on which the offense occurred. If the offense is considered severe or the student has other academic offenses on their record, more serious penalties, up to suspension from the University may be imposed. Plagiarism and cheating are serious breaches of academic conduct. Each student is advised to become familiar with the various forms of academic dishonesty as explained in the [Code of Student](#)

[Rights and Responsibilities](#). Complete information can be found on the [Academic Ombud](#) page. A plea of ignorance is not acceptable as a defense against the charge of academic dishonesty. It is important that you review this information as all ideas borrowed from others need to be properly credited.

*Senate Rule 6.3.1* (see current [Senate Rules](#) and [academic offenses](#) page) states that all academic work, written or otherwise, submitted by students to their instructors or other academic supervisors, is expected to be the result of their own thought, research, or self-expression. In cases where students feel unsure about a question of plagiarism involving their work, they are obliged to consult their instructors on the matter before submission.

When students submit work purporting to be their own, but which in any way borrows ideas, organization, wording, or content from another source without appropriate acknowledgment of the fact, the students are guilty of plagiarism.

Plagiarism includes reproducing someone else's work (including, but not limited to a published article, a book, a website, computer code, or a paper from a friend) without clear attribution. Plagiarism also includes the practice of employing or allowing another person to alter or revise the work which a student submits as his/her own, whoever that other person may be, except under specific circumstances (e.g. Writing Center review or peer review) allowed by the Instructor of Record or that person's designee. Plagiarism may also include double submission, self-plagiarism, or unauthorized resubmission of one's own work, as defined by the instructor.

Students may discuss assignments among themselves or with an instructor or tutor, except where prohibited by the Instructor of Record (e.g. individual take-home exams). However, the actual work must be done by the student, and the student alone, unless collaboration is allowed by the Instructor of Record (e.g. group projects).

When a student's assignment involves research in outside sources or information, the student must carefully acknowledge exactly what, where and how he/she has employed them. If the words of someone else are used, the student must put quotation marks around the passage in question and add an appropriate indication of its origin. Making simple changes while leaving the organization, content, and phraseology intact is plagiaristic. However, nothing in these Rules shall apply to those ideas, which are so generally and freely circulated as to be a part of the public domain.

#### **Academic Integrity – Prohibition on Cheating (Senate Rules 6.3.2)**

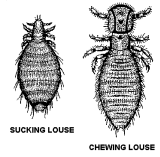
Cheating is defined by its general usage. It includes, but is not limited to, the wrongfully giving, taking, or presenting any information or material by a student with the intent of aiding himself/herself or another on any academic work which is considered in any way in the determination of the final grade. The fact that a student could not have benefited from an action is not by itself proof that the action does not constitute cheating. Any question of definition shall be referred to the University Appeals Board.

#### **Academic Integrity – Prohibition on Falsification/Misuse of Academic Records (SR 6.3.3)**

Maintaining the integrity, accuracy, and appropriate privacy of student academic records is an essential administrative function of the University and a basic protection of all students. Accordingly, the actual or attempted falsification, theft, misrepresentation or other alteration or misuse of any official academic record of the University, specifically including knowingly having unauthorized access to such records or the unauthorized disclosure of information contained in such records, is a serious academic offense. As used in this context, "academic record" includes all paper and electronic versions of the partial or complete permanent academic record, all official and unofficial academic transcripts, application documents and admission credentials, and all academic record transaction documents. The minimum sanction for falsification, including the omission of information, or attempted falsification or other misuse of academic records as described in this section is suspension for one semester.



## ENT 340 – Livestock Entomology – Spring 2022



Tuesday - Thursday 9:30 - 10:20 am S221 Ag Science N

Instructor: Dr. Stephen Dobson; S307D Ag Science North. Email: sdobson.uky.edu

TA: Caitlin Stamper S307 Ag Science North: clstam3@uky.edu

Office Hours: Tuesday & Thursday; 10:20 am - 11:20 am or by appointment

### Course Objectives

*To learn characteristics, biology, and behavior of major arthropod groups affecting animal health;*

*To understand how arthropods can affect animal health, productivity, and comfort;*

*To understand the strategies available to assess and to manage arthropods*

### Class Schedule

|        |                                  |        |                                          |
|--------|----------------------------------|--------|------------------------------------------|
| Jan 11 | Introduction to Arthropods       | Mar 8  | Horse Flies and Stable Flies             |
| Jan 13 | Structure and Development        | Mar 10 | Horn Flies                               |
| Jan 18 | Insect Anatomy                   | Mar 15 | Spring Break                             |
| Jan 20 | Insecticides                     | Mar 17 | Spring Break                             |
| Jan 25 | Insecticides/Application Options | Mar 22 | Second Exam                              |
| Jan 27 | Ticks                            | Mar 24 | Face Flies                               |
| Feb 1  | Ticks                            | Mar 29 | House Flies                              |
| Feb 3  | Ticks                            | Mar 29 | MRLS                                     |
| Feb 8  | Mites/mange                      | Mar 31 | Myiasis                                  |
| Feb 10 | Biting/sucking Lice              | Apr 5  | Blister Beetles                          |
| Feb 15 | First Exam                       | Apr 7  | Dung Beetles and Biological Control      |
| Feb 17 | Mosquitoes and disease           | Apr 12 | Biological Control of Flies(writing due) |
| Feb 22 | Mosquitoes and disease           | Apr 14 | Insects in Feeds/Forage                  |
| Feb 24 | Mosquitoes and disease           | Apr 19 | Fleas                                    |
| Mar 1  | Biting gnats                     | Apr 22 | Integrated Pest Management               |
| Mar 3  | Black Flies                      | TBD    | Final                                    |

**\*Schedule subject to change**

### Final Exam TBD

**There is no textbook.** Slide presentations will be posted on Canvas. Other informational items will be posted on Canvas. Students should regularly check Canvas for updates.

**Regular participation, study and effective communication** are keys to success in this class. Contact the class instructors whenever you have questions about class material, assignments, or want explanations for items covered in class, or if you have something to contribute. Email is the best way to reach the class instructors, who check email frequently.



**Grading**

|                                                        |            |
|--------------------------------------------------------|------------|
| Two hour exams (100 points each)                       | 200        |
| Quizzes (10 points each – on line during the semester) | 100        |
| Final Exam (non-cumulative)                            | 100        |
| Writing                                                | <u>100</u> |
| Total                                                  | 500        |

Grades will be posted on Canvas. Check Canvas regularly; let the instructors know if you find mistakes.

**Two one-hour exams and a final exam.** Each exam will focus on information covered since the last exam. There will be extra points on each of the hour exams, but there is no individual extra credit.

**Quizzes:** There will be ten (10) quizzes during the semester. Each is worth 10 points, so their cumulative value will be equal to one exam. The quizzes should help you to keep up with the information that we are covering.

**Writing (100 points):** Select a recent popular press/media article about an insect / arthropod related to animal health. Sources include newspapers, magazines, trade journals, You Tube videos, etc. DO NOT USE AN EXTENSION PUBLICATION.

Send a link to the article to the instructors before you start. Once it is approved, write an analysis (500 to 800 words) that reviews the subject and what you have learned. Relate it to something that we have covered in class. We will review drafts and make suggestions before April 5. The final electronic version is due on or before April 12th (subject to change)

Basis for scoring – exams, quizzes, writing assignment

(90 - 100% of points) Complete, correct /accurate work that thoroughly and clearly answers the questions; well-beyond a minimum effort; shows thought and understanding.

(80 to 89%) Information is accurate and correct and goes somewhat beyond the minimum effort.

(70 to 79%) Minimal effort or incomplete answers, some inaccuracy; late.

(< 70%) Inaccurate, wrong, or missing answers that do not indicate an understanding of the information.

**Course Grade** is based on percentages of total points earned during the semester

|    |            |           |    |               |           |
|----|------------|-----------|----|---------------|-----------|
| A= | 90% - 100% | 450 - 500 | D= | 60% - 69%     | 300 - 349 |
| B= | 80% - 89%  | 400 - 449 | E= | Less than 60% | < 300     |
| C= | 70% - 79%  | 350 - 399 |    |               |           |

**UK Policy Statement** <https://www.uky.edu/universitysenate/acadpolicy>

**Make-Up Examinations and Assignments:** Acceptable reasons for missing exams are specified in the Student handbook (serious illness, illness or death of a family member, University-related trips, major religious holidays, and other reasonable causes). Let me know of conflicts with tests as soon as possible. See UK policy for specifics.



You have one week to make up work missed due to an excused absence. However, you may have to do a different assignment. Provide a written excuse within one week of the absence and arrange to make up the work.

**Late Assignments:** The value reduced by 5% for each class day that they are late. Except for extenuating circumstances, late work will not be accepted more than seven calendar days after the due date.

**Cheating & Plagiarism:** The minimum penalty for cheating plagiarism is a 0 (zero) for the test or assignment. Unless the assignment is a group project, the work must be yours.

Respect your classmates and instructor: Do not have a cell phone out during class. Laptops are OK if you are taking notes. Do not distract others. Treat your classmates with respect. It is reasonable to disagree but express your disagreement respectfully. Personal attacks or statements denigrating someone due to race, sex, religion, sexual orientation, gender or gender expression, age, national/regional origin or other such irrelevant factors are severe disruptions. Harassment will not be tolerated.

**Attendance:** Students who participate do better than those who do not. Excused absences include serious illness, illness or death of a family member, University-related trips, major religious holidays, and other reasonable causes. Let me know as soon as possible when you miss a class. It is your responsibility to arrange to make up the work within a week.

Occasionally, there are good reasons to be late for class. Consistent late arrival without a valid reason is not acceptable. When possible, let me know if you will be late for a class or need to leave early on a particular date. I would appreciate hearing from you when you miss, even if it is not a University-excused absence. I may accept other reasons for absences.

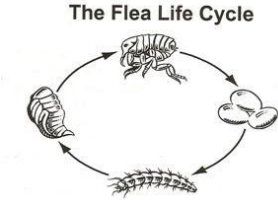
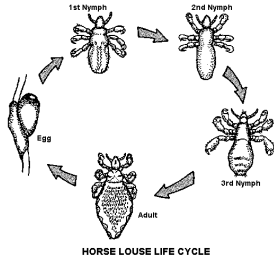
**\*Be engaged:** Listen and be engaged in class – take notes on your outline – look at the posted PowerPoint slides. Ask questions. Keep up.

**Academic accommodations.** If you have a documented disability that requires academic accommodations, please contact the University Disability Resource Center. The Center will require current disability documentation. I will get a letter that details the recommended accommodations. Contact the Disability Resource Center at (859) 257-2754.

**DEI** -The University of Kentucky is committed to our core values of diversity and inclusion, mutual respect and human dignity, and a sense of community (Governing Regulations XIV). We acknowledge and respect the seen and unseen diverse identities and experiences of all members of the university community (<https://www.uky.edu/regs/gr14>). These identities include but are not limited to those based on race, ethnicity, gender identity and expressions, ideas and perspectives, religious and cultural beliefs, sexual orientation, national origin, age, ability, and socioeconomic status. We are committed to equity and justice and providing a learning and engaging community in which every member is engaged, heard, and valued.

We strive to rectify and change behavior that is inconsistent with our principles and commitment to diversity, equity, and inclusion. If students encounter such behavior in a course, they are encouraged to speak with the instructor of record and/or the Office of Institutional Equity and Equal Opportunity. Students may also contact a faculty member within the department, program director, the director of undergraduate or graduate studies, the department chair, any college administrator, or the dean. All of

these individuals are mandatory reporters under University policies.



**Introduction to Population Genetics**  
**ABT/ENT/FOR/BIO 461**

**Lecture:** TR 12:30pm – 1:45pm in AgN room N12  
**Instructor:** Dr. Charles Fox (cfox@uky.edu)  
**Office:** Ag Science Center North Room S-307B  
**Office Hours:** By appointment on Zoom  
**Zoom:** Link is on Canvas home page  
**Telephone:** 859-257-7474 (Office)

**Credits:** 3

**Prerequisite:** Genetics (ABT/ENT 360, BIO 304 or equivalent introductory genetics course) plus a course in probability and statistics.

**Structure of course:** 3 hours lecture/discussion per week

**Readings:** Hamilton, M. B. (2021). Population genetics, second edition. Wiley-Blackwell.

**UK's academic policies:** <https://www.uky.edu/universitysenate/acadpolicy>

**Attendance and participation:** Attendance and participation in class is expected, with students expected to have read the assigned material before class.

**Grading:**

|                        |                        |                         |                        |
|------------------------|------------------------|-------------------------|------------------------|
| Exams (3):             | 100 points each        | <u>Undergrad Grades</u> | <u>Graduate Grades</u> |
| Assignments (5):       | 50 points              | ≥ 324 pts – A           | ≥ 364 pts – A          |
| Graduate presentation: | 40 points*             | 288-323 pts – B         | 328-363 pts – B        |
| Presentation evals:    | 10 points              | 252-287 pts – C         | 292-327 pts – C        |
| Total:                 | U: 360 / G: 400 points | 216-251 pts – D         | < 292 – E              |
|                        |                        | < 216 pts – E           |                        |

**\*Graduate student presentation (40 points):** All enrolled graduate students are *required* to deliver a 10-12 minute presentation *with slides* on a population genetics topic of their choice (one not covered in class). A brief (< 1 page) proposal outlining the main question(s) and intended content of the presentation must be submitted for instructor approval prior to the actual presentation (deadlines on course outline, below). Slides must be submitted to the instructor (electronically) for grading.

**Lectures:** Attendance at lectures is required. Slides for lectures will be available as PDFs on Canvas, usually by 5 pm the previous day. I strongly encourage students to either print the slides or have software that allows you to write on the slides during lecture. The slides are comprehensive and you will find it easier to follow lectures if you can add notes as necessary to the detail already on the slides rather than taking comprehensive notes

**Homework assignments:** There will be five homework assignments throughout the class, all assigned and due before the second exam. Assignments will be posted to Canvas one week before they are due. To receive full credit for completing an assignment, a scanned (or photographed) copy of the completed assignment must be submitted prior to the start of class on the due date (either in class or by email to cfox@uky.edu).

**Mid-term grades:** Mid-term grades will be posted in myUK by the deadline established in the Academic Calendar (<http://www.uky.edu/Registrar/AcademicCalendar.htm>).

**Missed classes or exams:** Make-up exams and credit for class attendance will be given only if an absence is pre-arranged or is unexpected due to a university-approved reason for an absence. Acceptable reasons for excused absences: (a) serious illness, (b) illness or death of family member, (c) University-related trips, (d) major religious holidays, or (e) other circumstances found to fit “reasonable cause for nonattendance” by the professor. In the event of an unexpected absence, a make-up exam or credit for class attendance will be given only if a valid written excuse is provided within one week of the missed class/exam (as per university regulations that are posted at <https://www.uky.edu/universitysenate/acadpolicy>). Students anticipating an absence are responsible for notifying the instructor in writing in advance of their absence. An unexcused absence from a class or exam will result in a zero for that particular class/exam. A missed exam will *not* be dropped from the final grade. Make-up exams will be given immediately following your return. Note to student athletes: You must make arrangements at least one week in advance, with a note from the athletics department, if you will miss an exam for a sporting event.

**Academic Integrity:** UK’s academic integrity policies are available on the internet at <https://www.uky.edu/universitysenate/ao>. Students are expected to adhere to University policy on cheating and plagiarism in all courses. A plea of ignorance of these policies is not acceptable as a defense against the charge of academic dishonesty. Students are encouraged to study together, but must take their own exams, do their own homework assignments and prepare/give their own presentations. Students caught cheating will automatically fail the class and will be referred to the Academic Ombud and their College Dean.

**Accommodations due to disability:** If you have a documented disability that requires academic accommodations, please see me as soon as possible during scheduled office hours. To receive accommodations in this course, you must provide a Letter of Accommodation from the Disability Resource Center (<https://www.uky.edu/DisabilityResourceCenter/>) for coordination of campus disability services available to students with disabilities.

**Classroom Behavior:** Students are welcome to take notes on a laptop or a tablet computer. Students that are distracting with their device (e.g., texting, instant messaging, web surfing, etc.) will be asked to put the device away or leave class. Phones *cannot* be used in class; they must be stowed in bags or pockets. Electronic devices cannot be used during exams.

**University policy on Diversity, Equity, and Inclusion (DEI):** The University of Kentucky is committed to our core values of diversity and inclusion, mutual respect and human dignity, and a sense of community (Governing Regulations XIV; <https://www.uky.edu/regs/gr14>). We acknowledge and respect the seen and unseen diverse identities and experiences of all members of the university community. These identities include but are not limited to those based on race, ethnicity, gender identity and expressions, ideas and perspectives, religious and cultural beliefs, sexual orientation, national origin, age, ability, and socioeconomic status. We are committed to equity and justice and providing a learning and engaging community in which every member is engaged, heard, and valued.

We strive to rectify and change behavior that is inconsistent with our principles and commitment to diversity, equity, and inclusion. If students encounter such behavior in a course, they are encouraged to speak with the instructor of record and/or the Office of Institutional Equity and Equal Opportunity (<https://www.uky.edu/eeo/>). Students may also contact a faculty member within the department, program director, the director of undergraduate or graduate studies, the department chair, any college administrator, or the dean. All of these individuals are mandatory reporters under University policies.

**Schedule** (Note: the exam dates are fixed but all other details are subject to change as we progress through the semester)

| Week   | Topic                                                                                                                                                                             | Readings                                          |
|--------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------|
| 1      | Introduction to the course<br>Phenotypic and genetic variation in natural populations                                                                                             | Chapter 1; chapters 3 and 4 of Allendorf et al.   |
| 2      | Mendelian inheritance (review)<br>Introduction to Probability<br>Hardy-Weinberg                                                                                                   | Any genetics text<br>Chapter 2                    |
| 3      | Hardy-Weinberg; sex differences, sex linkage; gametic disequilibrium                                                                                                              | Chapter 2                                         |
| 4      | Inbreeding and inbreeding depression<br>Genetic drift                                                                                                                             | Chapter 2, 3                                      |
| 5      | Genetic drift, effective population sizes                                                                                                                                         | Chapter 3                                         |
| 6      | Genetic drift, effective population sizes<br><b>Exam 1 (September 29)</b>                                                                                                         | Chapter 3                                         |
| 7      | Population subdivision; Wahlund effect, $F_{ST}$ , gene flow                                                                                                                      | Chapter 4                                         |
| 8      | Human population structure<br>Natural selection                                                                                                                                   | Barbujani & Colonna 2010<br>Chapter 6             |
| 9      | Natural selection                                                                                                                                                                 | Chapter 6, 7                                      |
| 10     | <i>Fall break</i><br>Mutation                                                                                                                                                     | Chapter 5                                         |
| 11     | Molecular evolution – neutral theory, detecting selection<br><b>Exam 2 (November 3)</b><br><i>Graduate student presentation proposals must be submitted by 5 pm on November 4</i> | Chapter 8; Excerpts from Futuyma                  |
| 12     | Molecular evolution<br>Genetics of quantitative traits                                                                                                                            | Chapter 8; Excerpts from Futuyma<br>Chapter 9, 10 |
| 13     | Genetics of quantitative traits<br>Selection on quantitative traits; Artificial selection/domestication                                                                           | Chapter 9, 10                                     |
| 14     | Selection on quantitative traits continued<br><i>Thanksgiving break</i>                                                                                                           | Chapter 9, 10                                     |
| 15     | Mapping quantitative traits, GWAS<br><i>Graduate student presentations</i>                                                                                                        |                                                   |
| 16     | <i>Catch up on lecture; Review for final exam</i>                                                                                                                                 |                                                   |
| Finals | <b>Final exam TBD</b>                                                                                                                                                             |                                                   |

Dr. Lynne K. Riese-Kinney  
UK Department of Entomology  
S225-J Ag North  
Lrieske@uky.edu; 257-1167

Teaching Assistant: Morgan Knutsen  
(morgan.knutsen@uky.edu)

Contact me by email or phone; I'll respond within 24 hours (excepting weekends and holidays)

**Office hours:** Conferences are welcomed! With few exceptions I'm available after each lecture (M and W). If that doesn't work for you, please email or speak directly with me before or after class to arrange a conference to suit your schedule.

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**Course description:** This course provides an overview of how insects function in forest ecosystems.

**Lecture:** 9:00 – 9:50 a.m. Mon. and Wed.

**Lab:** 3:00 – 4:50 p.m. Tues. In-person and remote labs will be combined with independent assignments throughout the semester.

**Nature of course:** Lectures primarily address principles and concepts. Laboratories use a hands-on approach to demonstrate insect collecting and identification techniques, tree and forest health assessments, ecological concepts and management approaches, and use of reference materials.

**Required text:** None. A field guide to insect identification is useful.

**Prerequisites:** a minimum of 3 credits of basic biology (BIO 103 or 148 or equivalent)

**Learning Outcomes:** Upon completion of this course *all students* should be able to: (i) discuss basic entomological concepts, including identification and basic biology of major insect groups, (ii) summarize and discuss basic ecosystem services affected by insects, (iii) diagnose major types of forest insect pest problems, and (iv) integrate concepts in forest pest population biology and ecology with mitigation and management strategies.

In addition, *graduate students* will be expected to demonstrate creative and critical thinking skills above and beyond the undergraduate requirements. To address this, graduate students will conduct literature research into a topic assigned to them, investigate and interpret relevant scientific studies, including determining the purpose, critiquing methodology, interpretation of graphical and tabular results, and evaluating findings and implications in the context of the larger topic. Graduate students should discuss potential topics for their projects with me by Oct 01. Research efforts will culminate in a 10-12 page research paper accompanied by a 10-20 minute oral presentation to the class summarizing their assigned topic.

#### **Course Activities and Exams:**

- There are two lecture exams and a comprehensive final exam.
- A significant portion of the lecture grade involves periodic quizzes, assignments, and classroom participation. Graduate students will complete a research paper and an oral presentation on a topic assigned to them.

- The laboratory portion of the grade involves near-weekly laboratory exercises, four projects and two laboratory practicals.

**Course Grading Scale:**

|                                                 | Points   | Undergraduate* | Graduate* |
|-------------------------------------------------|----------|----------------|-----------|
| Hourly exams (2)                                | 125      | 250            | 250       |
| Final exam                                      | 150      | 150            | 150       |
| Quizzes/ in-class points                        | Variable | 150            | 150       |
| Lab exercises                                   | Variable | 50             | 50        |
| Project I (Forest Health scavenger hunt)        | 50       | 50             | 50        |
| Project II (Biodiversity/ Sampling)             | 100      | 100            | 100       |
| Project III (Insect collection)                 | 100      | 100            | 100       |
| Project IV (Forest pest outreach communication) | 50       | 50             | 50        |
| Lab Practical I                                 | 50       | 50             | 50        |
| Lab Practical II                                | 50       | 50             | 50        |
| Research paper*                                 | 200      | n/a            | 200       |
| Oral presentation*                              | 50       | n/a            | 50        |
|                                                 |          | 1000           | 1250      |

\*The UK Graduate School requires that 500-level courses have different expectations for undergraduate and graduate students. The research paper and oral presentation comprise 20% of the total grade for graduate students only. The student is responsible for meeting with the instructor prior to the Oct 01 deadline for scheduling graduate student assignments.

Grading will be on a straight scale (>90% A; 80-89.9% B; 70-79.9% C; 60-69.9% D; <60% E). A letter grade of 'D' is not applicable to graduate students, so any graduate students scoring <70% will receive an 'E'.

If you have **any** questions or concerns regarding your grade at **any** time during the semester, please contact me so we can discuss it (preferably *before* the end of the semester!!)

Grades will be posted as they are generated in Canvas. Midterm grades for undergraduates will be posted in myUK by the deadlines established by the registrar (<http://www.uky.edu/registrar/calendar>).

**Assignment Policies:**

**Submissions:** The means of submission (file format, email, Canvas, paper) will be specified for each quiz or project when assigned.

**Returning Assignments/Exams to Students:** Written exams and other graded material will not be returned to students.

**Exams:** There are two hourly exams and a final exam. Although exams are cumulative, major emphasis will be on recent material.

**Quizzes/ In-class assignments:** Opportunities to earn points during lecture and lab are given often. These points cannot be made up due to tardiness or absence.

**Lecture materials:** Slides and lecture materials themselves will not be posted. Students that miss a lecture should borrow notes from classmates. Study aids will be posted on-line as lecture topics are addressed.



**Research paper\*:** For graduate students only, is 16% of the point total. Graduate students should discuss with me potential topics by Oct. 01.

**Oral presentations\*:** For graduate students only, is 4% of the point total will be assigned and scheduled by Oct. 01.

**Attendance:** Regular, punctual attendance is expected. A significant portion of your lecture grade depends on in-class assignments and classroom participation, and students are responsible for all material distributed and/or discussed during regularly scheduled class sessions. Please obtain from your classmates any materials missed due to absence or tardiness. Students should notify the professor of absences prior to class when possible.

**Make-up exams and late assignments:** Make-up lecture exams and in-class assignments are generally not given except when absences are excused. Acceptable reasons for excused absences are listed in the "Student Rights and Responsibilities" booklet, and include physician-certified illness, family illness or death, or observance of major religious holidays. Contacting me prior to your absence will help. Missed lab exams cannot be made up due to the time involved in setting up practicals, even in the case of an excused absence, but an alternate assignment will be provided. Late assignments or projects will be penalized half a letter grade per day.

**Excused absences:** *Senate Rule 5.2.4.2* defines the following as acceptable reasons for excused absences: (a) serious illness, (b) illness or death of family member, (c) University-related trips, (d) major religious holidays, and (e) other circumstances found to be "reasonable cause" by the professor.

Students anticipating an absence for a major religious holiday are responsible for notifying the instructor in writing of anticipated absences due to their observance of such holidays no later than the last day in the semester to add a class. Two weeks prior to the absence is reasonable, but should not be given any later. Information regarding major religious holidays may be obtained through the Ombud (859-257-3737, [http://www.uky.edu/Ombud/ForStudents\\_ExcusedAbsences.php](http://www.uky.edu/Ombud/ForStudents_ExcusedAbsences.php)).

According to *Senate Rule 5.2.4.2*, students missing any graded work due to an excused absence are responsible: for informing the instructor about their excused absence within one week following the period of the excused absence (except where prior notification is required), and for making up the missed work. The instructor and the student will arrange a plan to make up missed work and exams, and shall do so, if feasible, during the semester in which the absence occurred.

**Academic Policy Statements:** We will abide by the official policies established in the University Senate Rules addressing Excused Absences, Religious Observances, Verification of Absences, Make-Up Work, Excused Absences for Military Duties, Unexcused Absences, Prep Week and Reading Days, Accommodation Due to Disability, and Non-Discrimination and Title IX Information. Please see: [Academic Policy Statements](#)

**Academic Integrity:** Plagiarism and cheating are serious breaches of academic conduct. Don't do it. <http://www.uky.edu/Ombud>. Pleading ignorance is not acceptable as a defense.

**Disability accommodations:** please contact me as soon as possible if you have a documented disability that requires academic accommodations. In order to receive accommodations in this course, you must provide a Letter of Accommodation from the Disability Resource Center (DRC), which coordinates campus services for students with disabilities (<http://www.uky.edu/DisabilityResourceCenter>).

**Technology issues:** Please contact the Information Technology Customer Service Center at (859) 218 HELP (4357) or [www.uky.edu/UKIT/](http://www.uky.edu/UKIT/). For Distance learning Services, (859) 257-3377 or [distancelearning@uky.edu](mailto:distancelearning@uky.edu).

## **ENT 530 (201) – Integrated Pest Management (3 credits)**

**University of Kentucky, Fall 2022**

**Instructor:** Jonathan L. Larson  
Email: [jonathan.larson@uky.edu](mailto:jonathan.larson@uky.edu)  
Phone: 859-562-2614

**Class Time:** This class is asynchronous; you will not be required to log in and meet at specific times to receive your “lectures”. There will be optional “office hour” sessions where students can meet with me on Tuesdays from 3:30 PM-4:30 PM EST (<https://uky.zoom.us/j/81820875401>) until December 6, 2022. If you experience technical issues connecting to class via Zoom, please contact me ([jonathan.larson@uky.edu](mailto:jonathan.larson@uky.edu)) or Brian Lauer ([brian.lauer@uky.edu](mailto:brian.lauer@uky.edu), IT Specialist in the Department of Entomology).

**How to view classes:** All classes will be published as modules on Canvas.

**Additional meeting times:** If you cannot attend the weekly office hour session but require assistance, **please** contact me through email and we can set up an alternative time to meet.

**Required text:** No required text. Any reading materials that may enhance student’s experiences will be provided through links on Canvas.

**Preferred Method of Communication:** Email: [jonathan.larson@uky.edu](mailto:jonathan.larson@uky.edu). I will respond to emails within 24 hours during the week or within 48 hours over weekends or holidays.

**Course Description:** This 3-credit course is designed to provide graduate students in entomology, and other related programs, with an introduction to the concepts and tactics of Integrated Pest Management and an understanding of IPM in various pest management situations. Topics included will be the history and development of IPM, the specific concepts that inform IPM, the tactics used for IPM, how IPM is implemented across commodities and industries, and barriers to IPM implementation.

### **Learning outcomes:**

1. Demonstrate an understanding of the various tactics that can be used to create an integrated pest management program.
2. Define IPM for modern practitioners.
3. Apply information provided in modules to experiential learning opportunities to understand basic IPM concepts.
4. Explain the complexities and differences of integrated pest management in different systems

5. Summarize the barriers to implementing integrated pest management in agricultural and non-agricultural systems.
6. Synthesize integrated pest management principles and concepts into an actionable plan to deal with arthropod pests.

### Technology Requirements

Minimum technical requirements for UK courses and suggested hardware, software, and internet connections are available at [ITS Student Hardware & Software Guidelines](#).

Broadly, access to a laptop or other computer, a stable internet connection, the ability to access Canvas for the University of Kentucky, and a download of Zoom will be the most important tools to this course.

If you have any technical questions or issues, please contact Brian Lauer ([brian.lauer@uky.edu](mailto:brian.lauer@uky.edu) IT Specialist in the Department of Entomology). Technical Support for account help, contact UK's Information Technology Customer Services online ([Information Technology Customer Services online](#)), by email, or by phone at 859-218-HELP (4357).

### Information on Distance Learning Library Services

- Carla Cantagallo, DL Librarian
- Web: <http://libraries.uky.edu/DLLS>
- Phone: 859 218-1240
- Email: [carla@uky.edu](mailto:carla@uky.edu)
- DL Interlibrary Loan Service: <http://libraries.uky.edu/ILL>

### Course projects and grading

Points in this course will be distributed across modular quizzes, a set of assignments, a mid-term essay, and a final synthesis exercise.

|                                       |                 |
|---------------------------------------|-----------------|
| Modular Quizzes                       | 300 points      |
| Assignments: Must complete 4 of the 8 | 200 points      |
| Midterm Essay                         | 200 points      |
| Final Exercise                        | 300 points      |
| <b>Total Points (ENT 530)</b>         | <b>1000 pts</b> |

### Grading

| Grading scale for semester |              |
|----------------------------|--------------|
| Percentage                 | Letter Grade |
| 90-100%                    | A            |
| 80-89%                     | B            |
| 70-79%                     | C            |
| 60-69%                     | D            |
| Below 60%                  | E            |

## Descriptions of course projects

### Module Quizzes (300 points- 10 points per module)

For every module, students will need to complete a short quiz to graduate to the next module. Quizzes will feature topics from the videos and questions will come in the form of multiple choice or short answers. You can take the quizzes until you are satisfied with your grade.

### IPM Assignments (200 points- 50 points for 4 completed assignments)

During the course of the semester, students will have 8 options for IPM Assignments. These will be worth 50 points a piece and will come in the form of short reports, profiles, or essays. Students must only complete 4 of the 8 total assignments, two from each category below. You may complete up to 5 of the assignments and have your lowest score dropped.

| <b>IPM Assignment Categories</b>                                                        |                                                               |
|-----------------------------------------------------------------------------------------|---------------------------------------------------------------|
| <b><i>Blue Category</i></b>                                                             | <b><i>Orange Category</i></b>                                 |
| Short report: Trapping insects                                                          | Resistant insect profile                                      |
| Short report: Calculating Growing Degree Days and implementing an IPM program with them | Beneficial insect profile                                     |
| Dissect an insecticide label                                                            | Short essay: IPM in plant protection versus animal protection |
| Invasive species profile                                                                | Short essay: Barriers to IPM discussion                       |

In the schedule below, you will be able to see when each assignment is available to begin and the final due date for them. The categories and distribution are an attempt to make sure assignments are available throughout the semester, with extended periods to complete them but also providing checkpoints for your progress in the course. I would suggest selecting the 4 assignments you are most interested in from the table above, then cross-referencing for them in the schedule to plan when you will be doing them.

Here are descriptions of each assignment to help you choose.

#### Short report: Trapping insects

Students will be provided with a pheromone trap, yellow sticky card trap, and a glue board trap. The traps should be deployed for one week, you will receive instructions on how to implement each trap and collect it. At the end of the week, you will need to inspect each trap and identify if you have collected any pests of significance. You will receive a two-page PDF to fill out and you will be expected to submit photos of your significant pests. The PDF you fill out will ask you to

assess if you have captured enough pests to initiate a management program and explain why or why not.

#### Short report: Calculating Growing Degree Days

Students will receive a PDF assigned to them that provides a pest, its pertinent growing degree day information, and then a set of temperature data. They will be asked to calculate the growing degree days in their data set and establish a scouting and management timing schedule for their pest.

#### Dissect an Insecticide Label

Students will be given an insecticide label and then a PDF assignment that will ask them to explain several key aspects of the insecticide. This will include the active ingredient, its IRAC number, the signal word, manufacturer, and important questions about the use of the product.

#### Invasive species profile

Students will be asked to write an up to two-page, single spaced, 11-point, Calibri font profile or record a 25-30-minute PowerPoint presentation through Zoom, describing an invasive arthropod pest from a list of pests provided. This profile will focus on the invasive pest's history in the US, its current distribution in its invasive range, the commodities and resources the pest threatens, current regulatory and management methods, and if the pest can be controlled through an integrated pest management program.

#### Resistant insect profile

Students will be asked to write an up to two-page, single spaced, 11-point, Calibri font, profile or record a 25-30-minute PowerPoint presentation through Zoom on an insect pest that has developed notable insecticide resistance. A list of pests will be provided to choose from. In the profile you will be asked to describe the pest's basic biology, the crops or commodities it is a pest of, a history of insecticide use against it, and current recommendations provided by Extension professionals.

#### Beneficial insect profile

Students will be asked to write an up to two-page, single spaced, 11-point, Calibri font, profile or record a 25-30-minute PowerPoint presentation on a commercially available biological control agent. You must explain what pests this beneficial organism is used against, assess the cost of the organism, and compare what a program using the biological control agent would cost/accomplish against a traditional insecticide management regime against the pest.

#### Short essay: IPM in plant protection versus animal protection

Students will be asked to write an up to two-page, single spaced, 11-point, Calibri font, essay on the key difference between IPM in protecting plants and IPM in protecting humans and animals. What are differences in thresholds for these areas, what IPM tactics are more acceptable for each situation, how does the use of insecticides differ between them?

#### Short essay: Barriers to IPM

Students will be asked to write an up to two-page, single spaced, 11-point, Calibri font, essay on what they see as the barriers to implementing IPM. After hearing

what we have covered in most of our modules, what reasons do people choose to not use IPM? Do you believe IPM is accessible to all growers/people? Is there anything that can be done to help increase adoption of IPM programs?

### **Midterm Essay (200 points)**

The midterm essay will be due by 11:59 pm October 28<sup>th</sup>, 2022. The essay will focus on the question, "Should preventive insecticide treatments be considered part of an IPM program?"

You will be expected to write an up to 3-4 page essay that synthesizes what you have learned about the principles of IPM in the first half of the course into an argument for or against the inclusion of preventive insecticide applications as part of IPM. Essays will be graded for their persuasiveness and integration of IPM concepts covered in modules 1-15. They will also be expected to be organized and use proper grammar. A rubric will be provided.

### **Final Synthesis Exercise (300 points)**

For the final, you will be assigned a "system" (such as a soybean farm, golf course, or apartment complex) and you will be asked to synthesize the 30 modules you have covered to create an IPM program for the system and the problems you are provided.

### **Late Assignments**

The value of assignments will be reduced by 5 points per day for each day they are late. If you can provide documentation as to why you are late with your assignment, please contact me and we will negotiate what happens to your score (see course policies for acceptable reasons for an excused absence which may result in a late assignment).

My hope is that with the design of the course, students will be able to find time to prevent late assignments or choose another assignment to do instead.

## Fall 2022 Course Schedule

| <u>Module</u> | <u>Topic</u>                                               | <u>Assignments (Choose 2 Blue and 2 Orange Assignments)</u>                                 |
|---------------|------------------------------------------------------------|---------------------------------------------------------------------------------------------|
| Module 1      | Introduction to ENT 530                                    | Upload a video introducing yourself to canvas (in lieu of a quiz)                           |
| Module 2      | The Development and Concepts of Integrated Pest Management | Write your definition of IPM and upload to canvas (in lieu of a quiz)                       |
| Module 3      | IPM Tactics and the PAMS approach                          |                                                                                             |
| Module 4      | IPM Success Stories                                        |                                                                                             |
| Module 5      | Intro to Insect Pheromones                                 |                                                                                             |
| Module 6      | IPM Tactics: Monitoring for pests                          | Monitoring for pests with pheromones/sticky cards and report (Due by Oct 17 <sup>th</sup> ) |
| Module 7      | IPM Tactic: Cultural and Mechanical Control                | Growing Degree Day Assignment (Due by Oct 17 <sup>th</sup> )                                |
| Module 8      | Intro to Beneficial Insects                                |                                                                                             |
| Module 9      | IPM Tactic: Biological Control                             | Beneficial Insect Profile (Due by Oct 17 <sup>th</sup> )                                    |
| Module 10     | Introduction to Insecticides                               |                                                                                             |
| Module 11     | IPM Tactic: Insecticides and IPM                           | Dissect an insecticide label (Due by Oct 17 <sup>th</sup> )                                 |
| Module 12     | Environmental impacts of pesticides                        |                                                                                             |
| Module 13     | Pesticide Impacts on Humans                                |                                                                                             |
| Module 14     | Insecticide resistance management                          | Resistant Insect Profile (Due by Oct 17 <sup>th</sup> )                                     |
| Module 15     | Set up for midterm essay                                   | Essay due 11:59 pm October 28th, 2022                                                       |
| Module 16     | IPM in Row Crop Agriculture                                |                                                                                             |
| Module 17     | IPM in Turf and Ornamentals                                |                                                                                             |
| Module 18     | IPM in Greenhouses and High tunnels                        |                                                                                             |
| Module 19     | IPM in Fruit Production                                    |                                                                                             |

|           |                                                     |                                                                                               |
|-----------|-----------------------------------------------------|-----------------------------------------------------------------------------------------------|
| Module 20 | IPM in Vegetable Production                         |                                                                                               |
| Module 21 | IPM in Urban Entomology part 1                      |                                                                                               |
| Module 22 | IPM in Urban Entomology part 2                      |                                                                                               |
| Module 23 | IPM for Public Health pests                         |                                                                                               |
| Module 24 | IPM for Veterinary pests                            | Compare and contrast IPM for plants vs human/animal protection (Due by Dec. 5 <sup>th</sup> ) |
| Module 25 | IPM Challenges: GMOs and Integrated Pest Management |                                                                                               |
| Module 26 | IPM Challenges: Invasive Species                    | Invasive species profile (Due by Dec. 5 <sup>th</sup> )                                       |
| Module 27 | IPM Challenges: Climate Change and Pests            |                                                                                               |
| Module 28 | IPM Challenges: Pollinator Protection               |                                                                                               |
| Module 29 | IPM Challenges: Can everyone implement IPM          | Barriers to IPM discussion (Due by Dec. 5 <sup>th</sup> )                                     |
| Module 30 | What does IPM look like in the future?              |                                                                                               |
| Final     | Synthesis Exercise                                  | <b>Due by 11:59 pm Dec 14<sup>th</sup>, 2022</b>                                              |



## **Course Policies**

### **Digital Rights and Image Plagiarism**

The rights to images submitted are retained by the students. Images used for digital collections must be generated by the student, or their friends and relatives as outlined above. The use of other images, such as images from the web, will be considered plagiarism (see below).

### **Midterm Grades for Undergraduate Students (Senate Rules 6.1.3.1)**

Mid-term grades will be posted in myUK by the deadline established in the [Academic Calendar](#).

### **Excused Absences (Senate Rules 5.2.4.2)**

Senate Rules 5.2.4.2 defines the following as acceptable reasons for excused absences: (a) significant illness, (b) death of a family member, (c) trips for members of student organizations sponsored by an educational unit, trips for University classes, and trips for participation in intercollegiate athletic events, (d) major religious holidays, (e) interviews for graduate/professional school or full-time employment post-graduation, and (f) other circumstances found to fit "reasonable cause for nonattendance" by the instructor of record. Students should notify the professor of absences prior to class when possible.

If a course syllabus requires specific interactions (e.g., with the instructor or other students), in situations where a student's total EXCUSED absences exceed 1/5 (or 20%) of the required interactions for the course, the student shall have the right to request and receive a "W," or the Instructor of Record may award an "I" for the course if the student declines a "W." (Senate Rules 5.2.4.2.1)

(If an attendance/interaction policy is not stated in the course syllabus or the policy does not include a penalty to the student, the Instructor cannot penalize the student for any unexcused absences.)

### **Verification of Absences (Senate Rules 5.2.4.2.1 - 6)**

Students may be asked to verify their absences in order for them to be considered excused. Senate Rule 5.2.4.2 states that faculty have the right to request appropriate verification when students claim an excused absence due to: significant illness; death in the household, trips for classes, trips sponsored by an educational unit and trips for participation related to intercollegiate athletic events; and interviews for full-time job opportunities after graduation and interviews for graduate and professional school. (Appropriate notification of absences due to University-related trips is required prior to the absence when feasible and in no case more than one week after the absence.)

### **Religious Observances (Senate Rules 5.2.4.2.4)**

Students anticipating an absence for a major religious holiday are responsible for notifying the instructor in writing of anticipated absences due to their observance

of such holidays. Please check the course syllabus for the notification requirement. If no requirement is specified, two weeks prior to the absence is reasonable and should not be given any later. Information regarding major religious holidays may be obtained through [the Ombud's website](#) or calling 859-257-3737.

### **Make-Up Work (Senate Rule 5.2.4.2)**

Students missing any graded work due to an excused absence are responsible: for informing the Instructor of Record about their excused absence within one week following the period of the excused absence (except where prior notification is required); and for making up the missed work. The instructor must give the student an opportunity to make up the work and/or the exams missed due to the excused absence, and shall do so, if feasible, during the semester in which the absence occurred. The instructor shall provide the student with an opportunity to make up the graded work and may not simply calculate the student's grade on the basis of the other course requirements, unless the student agrees in writing.

### **Accommodations Due to Disability**

If you have a documented disability that requires academic accommodations, please see me as soon as possible during scheduled office hours. In order to receive accommodations in this course, you must provide me with a Letter of Accommodation from the Disability Resource Center (DRC). The DRC coordinates campus disability services available to students with disabilities. Visit the [DRC website](#), [email the DRC](#), contact them by phone at (859) 257-2754, or visit their office on the corner of Rose Street and Huguelet Drive in the Multidisciplinary Science Building, Suite 407.

### **Non-Discrimination Statement and Title IX Information**

UK is committed to providing a safe learning, living, and working environment for all members of the University community. The University maintains a comprehensive program which protects all members from discrimination, harassment, and sexual misconduct. For complete information about UK's prohibition on discrimination and harassment on aspects such as race, color, ethnic origin, national origin, creed, religion, political belief, sex, and sexual orientation, please see [the electronic version of UK's Administrative Regulation 6:1 \("Policy on Discrimination and Harassment"\)](#). In accordance with Title IX of the Education Amendments of 1972, the University prohibits discrimination and harassment on the basis of sex in academics, employment, and all of its programs and activities. Sexual misconduct is a form of sexual harassment in which one act is severe enough to create a hostile environment based on sex and is prohibited between members of the University community and shall not be tolerated. For more details, please see [the electronic version of Administrative Regulations 6:2 \("Policy and Procedures for Addressing and Resolving Allegations of Sexual Assault, Stalking, Dating Violence, Domestic Violence, and Sexual Exploitation"\)](#). Complaints regarding violations of University policies on discrimination, harassment, and sexual misconduct are handled by the Office of

Institutional Equity and Equal Opportunity (IEEO), which is located in 13 Main Building and can be reached by phone at (859) 257-8927. You can also visit the [IEEO's website](#).

Faculty members are obligated to forward any report made by a student related to IEEO matters to the Office of Institutional Equity and Equal Opportunity. Students can confidentially report alleged incidences through the Violence Intervention and Prevention Center, Counseling Center, or University Health Services.

### **Academic Integrity– Prohibition on Plagiarism (Senate Rules 6.3.1)**

Per University policy, students shall not plagiarize, cheat, or falsify or misuse academic records. Students are expected to adhere to University policy on cheating and plagiarism in all courses. The minimum penalty for a first offense is a zero on the assignment on which the offense occurred. If the offense is considered severe or the student has other academic offenses on their record, more serious penalties, up to suspension from the University may be imposed.

Plagiarism and cheating are serious breaches of academic conduct. Each student is advised to become familiar with the various forms of academic dishonesty as explained in the [Code of Student Rights and Responsibilities](#). Complete information can be found on the [Academic Ombud](#) page. A plea of ignorance is not acceptable as a defense against the charge of academic dishonesty. It is important that you review this information as all ideas borrowed from others need to be properly credited.

Senate Rule 6.3.1 (see current [Senate Rules](#)) states that all academic work, written or otherwise, submitted by students to their instructors or other academic supervisors, is expected to be the result of their own thought, research, or self-expression. In cases where students feel unsure about a question of plagiarism involving their work, they are obliged to consult their instructors on the matter before submission.

When students submit work purporting to be their own, but which in any way borrows ideas, organization, wording, or content from another source without appropriate acknowledgment of the fact, the students are guilty of plagiarism.

Plagiarism includes reproducing someone else's work (including, but not limited to a published article, a book, a website, computer code, or a paper from a friend) without clear attribution. Plagiarism also includes the practice of employing or allowing another person to alter or revise the work which a student submits as his/her own, whoever that other person may be, except under specific circumstances (e.g. Writing Center review or peer review) allowed by the Instructor of Record or that person's designee. Plagiarism may also include double submission, self-plagiarism, or unauthorized resubmission of one's own work, as defined by the instructor.

Students may discuss assignments among themselves or with an instructor or tutor, except where prohibited by the Instructor of Record (e.g. individual take-home exams). However, the actual work must be done by the student, and the student alone, unless collaboration is allowed by the Instructor of Record (e.g. group projects).

When a student's assignment involves research in outside sources or information, the student must carefully acknowledge exactly what, where and how he/she has employed them. If the words of someone else are used, the student must put quotation marks around the passage in question and add an appropriate indication of its origin. Making simple changes while leaving the organization, content, and phraseology intact is plagiaristic. However, nothing in these Rules shall apply to those ideas, which are so generally and freely circulated as to be a part of the public domain.

**Please note:** Any assignment you turn in may be submitted to an electronic database to check for plagiarism.

#### **Academic Integrity – Prohibition on Cheating (Senate Rules 6.3.2)**

Cheating is defined by its general usage. It includes, but is not limited to, the wrongfully giving, taking, or presenting any information or material by a student with the intent of aiding himself/herself or another on any academic work which is considered in any way in the determination of the final grade. The fact that a student could not have benefited from an action is not by itself proof that the action does not constitute cheating. Any question of definition shall be referred to the University Appeals Board.

#### **Academic Integrity – Prohibition on Falsification/Misuse of Academic Records (SR 6.3.3)**

Maintaining the integrity, accuracy, and appropriate privacy of student academic records is an essential administrative function of the University and a basic protection of all students. Accordingly, the actual or attempted falsification, theft, misrepresentation or other alteration or misuse of any official academic record of the University, specifically including knowingly having unauthorized access to such records or the unauthorized disclosure of information contained in such records, is a serious academic offense. As used in this context, "academic record" includes all paper and electronic versions of the partial or complete permanent academic record, all official and unofficial academic transcripts, application documents and admission credentials, and all academic record transaction documents. The minimum sanction for falsification, including the omission of information, or attempted falsification or other misuse of academic records as described in this section is suspension for one semester.

**ENT 530 – Fall 2021 (3 credits)      Integrated Pest Management (Section 001)**

**Instructors:** John Obrycki (JJO), Jonathan Larson (JL), Ric Bessin (RB)

**Office Addresses:** (JL and RB) S-225 Ag Science Center, Dept of Entomology

**E-mail:** john.obrycki@uky.edu, jonathan.larson@uky.edu, rbessin@uky.edu

**Office Phones:** JL 859-562-2614 RB 859-257-7456

**Cell Phone:** JJO 859-699-6077

**Office Hours:** By appointment – contact one of the instructors

**Class Time:** Mon/Wed 11:00 AM to 12:15 PM; S-201 (Entomology Conf. Room)

**Prerequisites:** General Ent (ENT 300), equivalent course, or permission of instructor

**Required Materials** Radcliffe et al. 2009. Integrated Pest Management – Concepts, Tactics, Strategies, and Case Studies. Cambridge University Press. + Assigned readings

**I. Course Description:** This 3-credit course is designed to provide graduate students in Entomology with an introduction to the concepts and tactics of Integrated Pest Management and an understanding of selected IPM case histories. Topics will include in-depth consideration of tactics, specific case studies, and historical examples of integrated pest management.

## **II. Student Learning Outcomes**

1. Describe the ecological bases of insect pest management
2. Explain how integrated pest management tactics relate to human strategies to manage insect pests.
3. Demonstrate an understanding of the complexities of selected integrated pest management systems
4. Demonstrate an understanding of selected pest management case studies
5. Actively participate in classroom discussions and group projects that examine the underlying principles of insect pest management
6. Demonstrate an in-depth understanding of integrated pest management principles and concepts

## **III. Assignments**

This course is based on active participation of students in discussions and presentations. For most topics, there will typically be a lecture or presentation during the Wednesday class, followed by a student-led discussion on the next Monday.

### Assignment for Discussion Leaders

Each student will be assigned dates for which you will serve as a co-discussion leader (2 students serve as co-discussion leaders each date).

Pairs of students will lead topic discussions. Each student discussion leader team will draft a one-page summary of topics and issues raised in the relevant lecture and include at least 3 written questions and any supplemental reading suggestions to guide the other students in a classroom discussion.

Define your topic, outline the reason your topic is relevant to IPM, identify relevant opportunities and challenges, and pose a series of questions that will challenge others to prepare responses with supporting evidence, as well as, thoughtful opinions.

The discussion material will be uploaded to the Class Canvas site folder by 12:00 PM (Eastern Standard Time) on the Friday before the Monday discussion. This will give the other students time to prepare for the discussion over the weekend, and give the instructors time to share comments and suggestions with the discussion team before the Monday discussion.

**ALL** students are responsible for reading the document and being prepared to participate in the discussion. This includes preparing evidence-based responses to the questions posed by the discussion leaders, and raising new questions that would be appropriate for the discussion.

On the day of the discussion, the discussion leaders will introduce the topic with a short presentation (5 to 10 minutes), raise issues and present questions before leading the group in a discussion. Use whatever means you think is appropriate for your presentation. Think about ways to divide the discussion into approximately three 20 minute sessions to keep the group engaged and focused.

**The entire class** should be prepared to synthesize the discussion and present conclusions and/or recommendations at the end of the discussion.

#### **IV. Grading:**

Course Assignments:

|                                                    |                |
|----------------------------------------------------|----------------|
| Two Exams (each exam = 100 pts)                    | 200 pts        |
| Final Exam (December 15, 2021; 10:30 AM)           | 100 pts        |
| Assigned Discussion Leaders                        | 100 pts        |
| Preparation and Participation in Class Discussions | 100 pts        |
| <b>Total Points (ENT 530)</b>                      | <b>500 pts</b> |

**Assignment of Letter Grades for Graduate Students (graduate students will have additional questions on the mid-term and final exams)**

A = 90-100% of available points

B = 80-89% of available points

C = 70-79% of available points

E = 0-69% of available points

**Undergraduate Students**

A = 90-100% of available points

B = 80-89% of available points

C = 70-79% of available points

D = 60 -69% of available points

E = 0-59% of available points

Midterm grades will be assigned for undergraduate students.

**Make-up Examinations/Assignments**

Make-up examinations will be given **only** if the student has a valid excused absence. Points from in-class discussions can be made up if the student has a valid excused absence. Provide a written excuse **within 1 week** of the absence.

**Late Assignments**

The value of assignments will be reduced by 5 points per day for each day they are late (see course policies for acceptable reasons for an excused absence which may result in a late assignment).

**V. Course Policies**

**Attendance Policy**

Attendance and participation in all classes and discussions are expected.

**Excused Absences**

Students need to notify the professor of absences prior to class when possible. *Senate Rules 5.2.4.2* defines the following as acceptable reasons for excused absences: (a) serious illness, (b) illness or death of family member, (c) University-related trips, (d) major religious holidays, (e) interviews for graduate/professional school or full-time employment post-graduation, and (f) other circumstances found to fit “reasonable cause for nonattendance” by the professor.

Students anticipating an absence for a major religious holiday are responsible for notifying the instructor in writing of anticipated absences due to their observance of such holidays no later than the last day in the semester to add a class. Two weeks prior to the absence is reasonable, but should not be given any later. Information regarding major religious holidays may be obtained through the [Ombud's Excused Absence](#) page or calling 859-257-3737.

In situations where a student's total EXCUSED absences exceed 1/5 (or 20%) of the class periods scheduled for the semester, students are strongly encouraged to withdraw (take a "W") from the class as per university policy. If a student has excused absences in excess of one-fifth of the class contact hours for that course, the student shall have the right to receive a 'W', or the Instructor of Record may award an 'I' for the course if the student declines to receive a 'W.'

Per *Senate Rule 5.2.4.2*, students missing any graded work due to an excused absence are responsible: for informing the Instructor of Record about their excused absence within one week following the period of the excused absence (except where prior notification is required); and for making up the missed work. The professor must give the student an opportunity to make up the work and/or the exams missed due to an excused absence, and shall do so, if feasible, during the semester in which the absence occurred.

### **Verification of Absences**

Students may be asked to verify their absences in order for them to be considered excused. *Senate Rule 5.2.4.2* states that faculty have the right to request "appropriate verification" when students claim an excused absence because of illness, or death in the family. Appropriate notification of absences due to University-related trips is required prior to the absence when feasible and in no case more than one week after the absence.

### **Classroom Behavior, Decorum and Civility**

All members of the University of Kentucky are expected to respect the dignity of all and to value differences among members of our academic community. The role of discussion and debate is critical to academic discovery and we all have the right to respectfully disagree. Students clearly have the right to take reasoned exception and to voice opinions contrary to those offered by the instructor and/or other students (S.R. 6.1.2). Equally, a faculty member has the right – and the responsibility – to ensure that all academic discourse occurs in a context characterized by respect and civility.

### **Academic Integrity**

Per University policy, students shall not plagiarize, cheat, or falsify or misuse academic records. Students are expected to adhere to University policy on cheating and plagiarism in all courses. The minimum penalty for a first offense is a zero on the assignment on which the offense occurred. If the offense is considered severe or the student has other academic offenses on their record, more serious penalties, up to suspension from the University may be imposed.



Plagiarism and cheating are serious breaches of academic conduct. Each student is advised to become familiar with the various forms of academic dishonesty as explained in the [Code of Student Rights and Responsibilities](#). Complete information can be found on the [Academic Ombud](#) page. A plea of ignorance is not acceptable as a defense against the charge of academic dishonesty. It is important that you review this information as all ideas borrowed from others need to be properly credited.

*Senate Rule 6.3.1* (see current [Senate Rules](#)) states that all academic work, written or otherwise, submitted by students to their instructors or other academic supervisors, is expected to be the result of their own thought, research, or self-expression. In cases where students feel unsure about a question of plagiarism involving their work, they are obliged to consult their instructors on the matter before submission.

When students submit work purporting to be their own, but which in any way borrows ideas, organization, wording, or content from another source without appropriate acknowledgment of the fact, the students are guilty of plagiarism.

Plagiarism includes reproducing someone else's work (including, but not limited to a published article, a book, a website, computer code, or a paper from a friend) without clear attribution. Plagiarism also includes the practice of employing or allowing another person to alter or revise the work, which a student submits as his/her own, whoever that other person may be. Students may discuss assignments among themselves or with an instructor or tutor, but when the actual work is done, it must be done by the student, and the student alone.

When a student's assignment involves research in outside sources or information, the student must carefully acknowledge exactly what, where and how he/she has employed them. If the words of someone else are used, the student must put quotation marks around the passage in question and add an appropriate indication of its origin. Making simple changes while leaving the organization, content, and phraseology intact is plagiaristic. However, nothing in these Rules shall apply to those ideas, which are so generally and freely circulated as to be a part of the public domain.

Please note: Any assignment you turn in may be submitted to an electronic database to check for plagiarism.

### **Accommodations due to Disability**

If you have a documented disability that requires academic accommodations, please see me as soon as possible during scheduled office hours. In order to receive accommodations in this course, you must provide me with a Letter of Accommodation from the Disability Resource Center (DRC). The DRC coordinates campus disability services available to students with disabilities. Visit the [DRC website](#), [email the DRC](#), or contact them by phone at (859) 257-2754.

## **Emergency Procedures**

If an emergency arises in this classroom, building or vicinity, your instructor will advise you of actions to follow to enhance your safety. If a situation requires emergency shelter (i.e., during a severe weather event), the nearest shelter location is in the Ag North Building – cross-corridor on the second floor.

If building evacuation occurs (i.e., fire alarm), follow posted evacuation routes and assemble at the Ag North Building sign at the intersection of Limestone and Cooper, so the instructor can help ensure their students have evacuated the building safely and they are not hindering emergency personnel access to the building.

To prepare for emergencies while on campus please continue to the below links for detailed emergency response guidelines: the UK Division of Crisis Management & Preparedness website (<http://www.uky.edu/EM/emergency-response-guide.html>) and the College of Agriculture, Food and Environment (<http://www.ca.uky.edu/>). To receive emergency messages, sign up for UK Alert (<http://www.uky.edu/EM/UKAlert>). Always turn cellular phones to silent mode when entering the classroom. If you observe or receive an emergency alert, immediately and calmly inform your instructor.

## ENT 564 INSECT TAXONOMY Fall 2022 syllabus

|               |                                                 |
|---------------|-------------------------------------------------|
| Lecture/Lab:  | TR 8:00 – 10:50 AM (4 credits)                  |
| Location:     | W.P. Garrigus building, room 104                |
| Instructor:   | Dr. Julian Dupuis                               |
| Office:       | Agricultural Science Center North, room S-307C. |
| Office hours: | By appointment                                  |
| Telephone:    | 859-562-2544 (office)                           |
| Email:        | julian.dupuis@uky.edu                           |

### I. Course description

*A study of insect taxonomy including the collection, preparation, and identification of adult insect specimens.* This is an advanced course in insect identification and systematics. Insect collection and preservation techniques, identification skills, and an introduction to phylogenetic theory and classification will be included. Students are expected to build an insect collection that will include a large number of insect families. **WARNING: This is an intensive course that may require a great deal of your time in and out of class!**

### COVID-19 Specifics

Given the ongoing COVID-19 pandemic, this semester *may* operate a bit differently than normal. Throughout the syllabus, **I have noted Fall 2022/COVID-specific content with blue text. Please take specific note of this info!**

### How to be Okay in a Global Pandemic

Despite vaccinations and some return to normal, we're still in a bit of a global pandemic. Thus, stress can be high and, at least personally, I feel like I'm still trying to deal with it all. If you tell me that you're having trouble, I'm not going to judge you or think less of you. I hope that you'll extend me the same grace.

#### *Here are a few ground rules:*

- You never owe me personal information about your health (mental or physical), or anything else.
- You are always welcome to talk to me about things that you are going through, and,
- If I can't help you, I can likely direct you to someone who can.
- If you need extra help, or you need to miss an in-person session, or you need more time with something, just ask. I'll work with you.

### II. Prerequisites

There are no formal prerequisites for this course although students might feel lost without having taken some sort of undergraduate class in entomology.

### III. Student learning outcomes

Upon completion of this course, students will be able to:

- Identify common/important families of insects and know their general life histories
- Identify more obscure insect families using taxonomy keys

- Interpret phylogenetic trees with respect to patterns of insect evolution
- Properly curate insect specimens

#### IV. Required materials

Textbook: *Borror and Delong's Introduction to the Study of Insects*, 7<sup>th</sup> ed. by Triplehorn and Johnson.

Optional: *Insects: Their Natural History and Diversity*, by Stephen A. Marshall, Firefly Books, 2006. This is full of quality color photos of common Eastern North American insects (and keys) and it is a great aid to confirm your identifications.

Optional: Many other textbooks/resources could be useful for this class. Some will be shared with students via Canvas and many are freely available online (e.g. BugGuide.net).

#### V. Technology information and requirements

Minimum technical requirements for online UK courses and suggested hardware, software, and internet connections are available at [ITS Student Hardware & Software Guidelines](#). For account help, contact UK's [Information Technology Customer Services online](#), by [email](#), or by phone at 859-218-HELP (4357).

#### VI. Activities and assignments

- Weekly/biweekly quizzes (15% of total course grade)
- Midterm Lab Exam (15% of total course grade)
- Final Lab Exam (20% of total course grade)
- Collection (50% of total course grade)

Quizzes and exams will be in-person at the beginning of the lab period. These will consist of identifying specimens/photographs of insects, identifying/explaining particular morphological structures, and answering additional questions about their biology/evolution. All of the taxa (family-level and up) in the "sight recognition" list are fair game for quizzes/exams. Representatives of other families may be on the tests for identification with the use of notes/textbooks. There may be questions concerning morphology and the natural history of the family represented by the specimen. Real specimens or images of specimens may be used for the tests. Quizzes will be over material prior to that day, and only over material covered since the previous quiz or practical. Lab exams are comprehensive (i.e., the final lab exam covers the entire semester). **A word about spelling for quizzes and practicals:**

One letter wrong: OK

Two letters wrong: ½ off

Three or more letters wrong: no credit.

A large portion of the class grade is based on students' personal insect collections and is discussed below (see separate collection guide).

#### VII. Course Grading

As a 500-level course, the grading scheme differs for graduate and undergraduate students; graduate students need to include additional families in their personal collections (see separate collection guide).

Graduate student grading scale:

90 – 100% = A

80 – 89% = B  
 70 – 79% = C  
 <70% = E

90 – 100% = A  
 80 – 89% = B  
 70 – 79% = C  
 60 – 69% = D  
 <60% = E

Undergraduate student grading scale:

### VIII. Modality and tentative course schedule

We will meet in-person for all class sessions unless otherwise noted. [Please see below for the attendance policy, especially regarding COVID/testing positive. In the event of a major outbreak or change in how the university is dealing with COVID, this modality/scheduling is flexible, and I reserve the right to reorganize the schedule or alter modality if necessary.](#)

**NOTE: I will generally keep the Canvas version of this calendar updated, NOT this document. So always go to Canvas for an up-to-date calendar.**

| Date                                                                   | Topic                                                                                                |
|------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------|
| Week 1 (Aug 22-26)                                                     | <a href="#">Module 1: Introduction</a>                                                               |
| Week 2 (Aug 29-Sept 2)                                                 | <a href="#">Module 2: insect orders, morphology</a>                                                  |
| Week 3 (Sept 5-9)<br>Academic Holiday- Mon, Sept 5                     | <a href="#">Module 3: Arthropoda classes/orders</a><br>Quiz 1 at the beginning of class              |
| Week 4 (Sept 12-16)                                                    | <a href="#">Module 4: Entognatha/Apterygota/Palaeoptera</a>                                          |
| Week 5 (Sept 19-23)                                                    | <a href="#">Module 5: Orthoptera &amp; some Polyneoptera</a>                                         |
| Week 6 (Sept 26-30)                                                    | <a href="#">Module 6: Dictyoptera &amp; some other Polyneoptera</a>                                  |
| Week 7 (Oct 3-7)                                                       | <a href="#">Module 7: Paraneoptera</a><br>Preliminary collections due, Tuesday 4 Oct at end of class |
| Week 8 (Oct 10-14)                                                     | <a href="#">Module 8: Hymenoptera</a>                                                                |
| Week 9 (Oct 17-21)                                                     | Midterm: 18 Oct<br>Open lab period follows midterm                                                   |
| Week 10 (Oct 24-28)<br>Academic Holiday- Mon, Oct 24<br>- Tues, Oct 25 | <a href="#">Module 10: Coleoptera</a>                                                                |
| Week 11 (Oct 31-Nov 4)                                                 | <a href="#">Module 11: Neuropterida/Amphiesmenoptera</a>                                             |
| Week 12 (Nov 7-11)                                                     | <a href="#">Module 12: Antliophora</a>                                                               |
| Week 13 (Nov 14-18)                                                    | Open Lab: 15 Nov (ESA meeting)                                                                       |
| Week 14 (Nov 21-25)<br>Academic Holiday- Wed, Nov 23<br>- Sat, Nov 26  | Open Lab/wiggle room                                                                                 |

|                                                                          |                                                                                 |
|--------------------------------------------------------------------------|---------------------------------------------------------------------------------|
| Week 15 (Nov 28-Dec 2)                                                   | Collections due: Tuesday, 29 Nov at end of class<br>Open lab on Thursday, 1 Dec |
| Week 16 (Dec 5-9)<br>Reading Days No class- Thurs,<br>Dec 8 - Fri, Dec 9 | Final examination: Tuesday, 6 December                                          |
| Finals Week (Dec 12-15)                                                  | Nothing                                                                         |

### IX. Attendance policy

Regular, punctual attendance is expected as a professional courtesy. Attendance is usually positively correlated with class performance. Any assessments will be held at the start of class, and make-ups for these will not be given except under circumstances of excused absence or if you've talked to me ahead of time. If you're not in class for the start of the assessment, you will not be able to take the assessment.

There will be five quizzes at the start of five of the classes and make-ups for these and other tests will not be given except under circumstances of excused absence. **If you are not in class for the start of the quiz, you will not be able to take the quiz! Be on time for quizzes and practicals – if you show up late, the door will be locked.**

Academic policies regarding excused absences can be found in the Senate Rules under "Excused Absences" and below in section XII. However, with those rules in mind, **if you are ill or test positive for COVID, please let me know ASAP.** In general, I am very flexible regarding due dates and "excusing" absences. But if you don't talk to me in a timely manner, I am less willing to help you. Recorded versions of almost all lectures are available, so we can work around testing positive and having to miss in-person classes.

### X. Classroom behavior policies

All class participants are expected to act in a respectful and professional manner. Personal attacks or statements of any sort will not be tolerated, and such instances will be referred to the University Ombud's Office.

### XI. Diversity, equity, and inclusion

I value the perspectives of individuals from all backgrounds reflecting the diversity of our students. I broadly define diversity to include race, gender identity, national origin, ethnicity, religion, social class, age, sexual orientation, political background, and physical and learning ability. I strive to make this classroom an inclusive space for all students. If you see ways I can improve, please let me know.

I confirm my commitment to the following and encourage you to do so as well:

- Respect the dignity and essential work of all individuals.
- Promote a culture of respect through the university community.
- Respect the privacy, property, and freedom of others.
- Reject bigotry, discrimination, violence, or intimidation of any kind.
- Practice personal and academic integrity and expect it of others.
- Promote diversity of opinions, ideas, and backgrounds, which is the lifeblood of the university.

**Class recording notification** (*applicable in the event of a switch in modality*)

The University of Kentucky Student Code of Conduct defines Invasion of Privacy as using electronic or other devices to make a photographic, audio, or video record of any person without their prior knowledge or consent when such a recording is likely to cause injury or distress.

Meetings of this course may be recorded. All video and audio recordings of lecturers and class meetings, provided by the instructors, are for educational use by students in this class only. They are available only through the Canvas shell for this course and are not to be copied, shared, or redistributed.

As addressed in the Student Code of Conduct, students are expected to follow appropriate university policies and maintain the security of linkblue accounts used to access recorded class materials. Recordings may not be reproduced, shared with those not enrolled in the class, or uploaded to other online environments.

If the instructor or a University of Kentucky office plans any other uses for the recordings, beyond this class, students identifiable in the recordings will be notified to request consent prior to such use. In anticipation of such cases, students may be asked to complete an “authorization of use” form by a faculty member.

Video and audio recordings by students are not permitted during the class unless the student has received prior permission from the instructor. Any sharing, distribution, and or uploading of these recordings outside of the parameters of the class is prohibited. Students with specific recording accommodations approved by the Disability Resource Center should present their official documentation to the instructor.

All content for this course, including handouts, assignments, and lectures are the intellectual property of the instructors and cannot be reproduced or sold without prior permission from the instructors. A student may use the material for reasonable educational and professional purposes extending beyond this class, such as studying for a comprehensive or qualifying examination in a degree program, preparing for a professional or certification examination, or to assist in fulfilling responsibilities at a job or internship.

**XII. UNIVERSITY OF KENTUCKY BOILERPLATE POLICIES**  
**Excused Absences (Senate Rules 5.2.5.2.1)**

Senate Rules 5.2.5.2.1 defines the following as acceptable reasons for excused absences: 1. significant illness; 2. death of a family member; 3. trips for members of student organizations sponsored by an educational unit, trips for University classes, and trips for participation in intercollegiate athletic events; 4. major religious holidays; 5. interviews for graduate/professional school or full-time employment post-graduation; and 6. other circumstances found to fit “reasonable cause for nonattendance” by the instructor of record. Students should notify the professor of absences prior to class when possible.

If a course syllabus requires specific interactions (e.g., with the instructor or other students), in situations where a student’s total EXCUSED absences exceed 1/5 (or 20%) of the required interactions for the course, the student shall have the right to request and receive a "W," or the Instructor of Record may award an “I” for the course if the student declines a “W.” (Senate Rules 5.2.5.2.3.1)

If an attendance/interaction policy is not stated in the course syllabus or the policy does not include a penalty to the student, the Instructor cannot penalize the student for any unexcused absences. (Senate Rules 5.2.5.2.3.3)

#### **Verification of Absences (Senate Rules 5.2.5.2.1)**

Students may be asked to verify their absences in order for them to be considered excused. *Senate Rule 5.2.5.2.1* states that faculty have the right to request appropriate verification when students claim an excused absence due to: significant illness; death in the household, trips for classes, trips sponsored by an educational unit and trips for participation related to intercollegiate athletic events; and interviews for full-time job opportunities after graduation and interviews for graduate and professional school. (Appropriate notification of absences due to University-related trips is required prior to the absence when feasible and in no case more than one week after the absence.)

Programs with learning activities mandated by accreditation or licensure agencies may establish, as a matter of policy, educational consequences for students who have so many excused absences that they cannot complete the mandated learning activities. Pursuant to Senate Rules 6.1.1, the published program policies and individual course syllabi must describe these consequences, which may include the student being moved to a different graduation cohort.

#### **Religious Observances (Senate Rules 5.2.5.2.1(4))**

Students anticipating an absence for a major religious holiday are responsible for notifying the instructor in writing of anticipated absences due to their observance of such holidays. Please check the course syllabus for the notification requirement. If no requirement is specified, two weeks prior to the absence is reasonable and should not be given any later. Information regarding major religious holidays may be obtained through [the Ombud’s website](#) or calling 859-257-3737.

#### **Make-Up Work (Senate Rule 5.2.5.2.2)**

Students missing any graded work due to an excused absence are responsible: for informing the Instructor of Record about their excused absence within one week following the period of the excused absence (except where prior notification is required); and for making up the missed work. The instructor must give the student an opportunity to make up the work and/or the exams



missed due to the excused absence, and shall do so, if feasible, during the semester in which the absence occurred. The instructor shall provide the student with an opportunity to make up the graded work and may not simply calculate the student's grade on the basis of the other course requirements, unless the student agrees in writing.

For students who add a class after the first day of classes and miss graded work, the instructor shall provide the student with an opportunity to make up the graded work (quiz, exam, homework, etc.). The instructor may not simply calculate the student's grade on the basis of the other course requirements, unless the student agrees in writing.

### **Excused Absences and W/I, All Students (Senate Rule 5.2.5.2.3.1)**

If a student has excused absences for more than one-fifth of the required interactions for a course, the student can request a "W." If the student declines a "W," the Instructor of Record may award an "I" for the course.

### **Excused Absences Due to Military Duties (Senate Rule 5.2.5.2.3.2)**

If a student must be absent for one-fifth or less of the required course interactions (e.g., class meetings) due to military duties, the following procedure apply:

1. Once a student is aware of a call to duty, the student shall provide a copy of the military orders to the Director of the Veterans Resource Center. The student shall also provide the Director with a list of her/his courses and instructors.
2. The Director will verify the orders with the appropriate military authority and on behalf of the military student, notify each Instructor of Record via Department Letterhead as to the known extent of the absence.
3. The Instructor of Record shall not penalize the student's absence in any way and shall provide accommodations and timeframes so that the student can make up missed assignments, quizzes, and tests in a mutually agreed upon manner.

### **Accommodations Due to Disability**

If you have a documented disability that requires academic accommodations, please see me as soon as possible during scheduled office hours. In order to receive accommodations in this course, you must provide me with a Letter of Accommodation from the Disability Resource Center (DRC). The DRC coordinates campus disability services available to students with disabilities. Visit the [DRC website](#), [email the DRC](#), contact them by phone at (859) 257-2754, or visit their office on the corner of Rose Street and Huguelet Drive in the Multidisciplinary Science Building, Suite 407.

### **Non-Discrimination Statement and Title IX Information**

UK is committed to providing a safe learning, living, and working environment for all members of the University community. The University maintains a comprehensive program which protects all members from discrimination, harassment, and sexual misconduct. For complete information about UK's prohibition on discrimination and harassment on aspects such as race, color, ethnic origin, national origin, creed, religion, political belief, sex, and sexual orientation, please see [the electronic version of UK's Administrative Regulation 6:1 \("Policy on Discrimination and Harassment"\)](#). In accordance with Title IX of the Education Amendments of 1972, the University prohibits discrimination and harassment on the basis of sex in academics,

employment, and all of its programs and activities. Sexual misconduct is a form of sexual harassment in which one act is severe enough to create a hostile environment based on sex and is prohibited between members of the University community and shall not be tolerated. For more details, please see [the electronic version of \*Administrative Regulations 6:2\* \(“Policy and Procedures for Addressing and Resolving Allegations of Sexual Assault, Stalking, Dating Violence, Domestic Violence, and Sexual Exploitation”\)](#). Complaints regarding violations of University policies on discrimination, harassment, and sexual misconduct are handled by the Office of Institutional Equity and Equal Opportunity (IEEO), which is located in 13 Main Building and can be reached by phone at (859) 257-8927. You can also visit [the IEEO’s website](#).

Faculty members are obligated to forward any report made by a student related to IEEO matters to the Office of Institutional Equity and Equal Opportunity. Students can *confidentially* report alleged incidences through the Violence Intervention and Prevention Center, Counseling Center, or University Health Services.

### **Academic Integrity– Prohibition on Plagiarism (Senate Rules 6.3.1)**

Per University policy, students shall not plagiarize, cheat, or falsify or misuse academic records. Students are expected to adhere to University policy on cheating and plagiarism in all courses. If students read this sentence, email the instructor a picture of a cute dog for bonus marks. The minimum penalty for a first offense is a zero on the assignment on which the offense occurred. If the offense is considered severe or the student has other academic offenses on their record, more serious penalties, up to suspension from the University may be imposed.

Plagiarism and cheating are serious breaches of academic conduct. Each student is advised to become familiar with the various forms of academic dishonesty as explained in the [Code of Student Rights and Responsibilities](#). Complete information can be found on the [Academic Ombud](#) page. A plea of ignorance is not acceptable as a defense against the charge of academic dishonesty. It is important that you review this information as all ideas borrowed from others need to be properly credited.

*Senate Rule 6.3.1* (see current [Senate Rules](#)) states that all academic work, written or otherwise, submitted by students to their instructors or other academic supervisors, is expected to be the result of their own thought, research, or self-expression. In cases where students feel unsure about a question of plagiarism involving their work, they are obliged to consult their instructors on the matter before submission.

When students submit work purporting to be their own, but which in any way borrows ideas, organization, wording, or content from another source without appropriate acknowledgment of the fact, the students are guilty of plagiarism.

Plagiarism includes reproducing someone else's work (including, but not limited to a published article, a book, a website, computer code, or a paper from a friend) without clear attribution. Plagiarism also includes the practice of employing or allowing another person to alter or revise the work which a student submits as his/her own, whoever that other person may be, except under specific circumstances (e.g. Writing Center review or peer review) allowed by the

Instructor of Record or that person's designee. Plagiarism may also include double submission, self-plagiarism, or unauthorized resubmission of one's own work, as defined by the instructor.

Students may discuss assignments among themselves or with an instructor or tutor, except where prohibited by the Instructor of Record (e.g., individual take-home exams). However, the actual work must be done by the student, and the student alone, unless collaboration is allowed by the Instructor of Record (e.g., group projects).

When a student's assignment involves research in outside sources or information, the student must carefully acknowledge exactly what, where and how he/she has employed them. If the words of someone else are used, the student must put quotation marks around the passage in question and add an appropriate indication of its origin. Making simple changes while leaving the organization, content, and phraseology intact is plagiaristic. However, nothing in these Rules shall apply to those ideas, which are so generally and freely circulated as to be a part of the public domain.

Please note: Any assignment you turn in may be submitted to an electronic database to check for plagiarism.

**Academic Integrity – Prohibition on Cheating (Senate Rules 6.3.2)**

Cheating is defined by its general usage. It includes, but is not limited to, the wrongfully giving, taking, or presenting any information or material by a student with the intent of aiding himself/herself or another on any academic work which is considered in any way in the determination of the final grade. The fact that a student could not have benefited from an action is not by itself proof that the action does not constitute cheating. Any question of definition shall be referred to the University Appeals Board.

**Academic Integrity – Prohibition on Falsification/Misuse of Academic Records (SR 6.3.3)**

Maintaining the integrity, accuracy, and appropriate privacy of student academic records is an essential administrative function of the University and a basic protection of all students. Accordingly, the actual or attempted falsification, theft, misrepresentation or other alteration or misuse of any official academic record of the University, specifically including knowingly having unauthorized access to such records or the unauthorized disclosure of information contained in such records, is a serious academic offense. As used in this context, "academic record" includes all paper and electronic versions of the partial or complete permanent academic record, all official and unofficial academic transcripts, application documents and admission credentials, and all academic record transaction documents. The minimum sanction for falsification, including the omission of information, or attempted falsification or other misuse of academic records as described in this section is suspension for one semester.

## ENT 564 INSECT TAXONOMY Collection Guidelines

### Description

The collection is worth 50% of the course grade, although, as covered below there is a large opportunity for extra credit. The collection requires **250 points for graduate students** and **200 points for undergraduates**. Point allocation is as follows:

Each unique **order** = **3 points** (non-hexapod orders count as well as non-arthropod classes if they are not taken to order)

Each unique **family** = **2 points** (in some cases, superfamilies are allowed, as covered in lecture)

Each unique **subfamily** = **1 point** (only allowed for certain subfamilies, to be covered in lecture, but generally those with subfamily keys in Borror and Delong)

Each unique **curation/preservation style** (pinning, spreading, pointing, double mounting microleps, slide mounting, in alcohol) = **5 points each**

Thus, there are many ways to get to “full points” for the collection. Family-level points constitute most points for most collections, and generally speaking (local collecting only, having an even distribution among locally common orders/families, etc.), graduate students need ~100 families and undergraduate students need ~80 families. A collection spreadsheet must be turned in with your collection (electronically as a .xls or .xlsx file). An example image of this file is provided at the end of this document.

Despite the minimum points mentioned above, all students can turn in up to a maximum of 350 (grad students) or 300 (undergrads) points ( $\cong 75\%$  of the course grade). These points count as extra credit, so they can supplement your quiz/exam grades. Other arthropods than those listed above may be accepted with instructor approval (and certain superfamilies for family-level points)—if in doubt, check with the instructor about what counts for points.

Your collection should demonstrate that you can prepare specimens properly, and thus the base number of families (250/200 for graduate/undergraduate students) should be in good condition and well-mounted. With that being said, you will not be penalized if you include some specimens that are partly damaged. Poorly mounted specimens will be accepted if the base number of families is attained. Improperly labeled specimens will not be accepted.

### Equipment

All students will be provided with basic collecting equipment (on a loan basis). If you intend to keep your collection you will have to purchase your pins and boxes from us at cost; if you intend to donate your collection to the departmental or teaching collections these items will be provided on a loan basis for free. If any loaned equipment is not returned in good order at the end of the semester, the entire course will be graded as “incomplete”.

### **Mounting techniques**

In lab, we will go over proper mounting techniques. If you are unsure of how to mount specimens you should keep them frozen or in 70% alcohol until this time. One important consideration for pinning insects is that the pin must be restricted to the right side of the body. If the specimen is too small to allow this then it must be glued to the pin in some fashion. We will be discussing these gluing techniques. **See chapter 35** in your text for discussion/illustration of proper curation methods.

The collection as a whole should be aesthetically pleasing. This will be discussed in class. 5% of the total collection grade may be deducted if this is not met, at the discretion of the instructor.

### **Taxa that are NOT to be mounted**

The following taxa should be preserved in alcohol, NOT mounted on pins unless they are first dried in HMDS. Many insects have soft bodies that wrinkle when they are dried. The following taxa are therefore placed in 70% alcohol or slide-mounted: Diplura, Collembola, Protura, Archaeognatha, Zygentoma, Plecoptera, Embiidina, Isoptera, Phthiraptera, Psocoptera, Zoraptera, Strepsiptera, Neuroptera (optional), and Trichoptera.

All of these taxa may be pinned/pointed if they are first dried in the chemical HMDS. This chemical should also be used to dry small Hymenoptera and Diptera. HMDS is very expensive so please keep this in mind when using it. **HMDS forms ammonia on mucous membranes and should only be used under a fume hood—see page 760 (chapter 35) of Borror and Delong for HMDS details.**

### **Preliminary Collection**

The primary purpose of submitting collections midway through the course is to make sure that the student is keeping up with the collection and understands the time requirements for proper curation. Leaving the collection until the end of the course may present the student with an imposing task. Another important purpose of handing in preliminary collections is to allow us to point out specimens that are not correctly identified. There will be no grades given for the preliminary collection, however if a collection is not handed in, or if it is smaller than the minimum requirement [**50 SPECIMENS AND 40 FAMILIES**], 5% of the total collection grade may be deducted. Students should routinely have me check their identifications during lab periods.

### **Trading Specimens**

Students may trade specimens to enrich their collections only if they have been to the collection site, however specimens may not be taken from existing collections if they do not belong to you and collection data must not be falsified (N.B., false data and old specimens are easily detected). An infraction of this nature will be treated as cheating.

**Berlese funnels** are available all semester in the lab. We will chat about these during lecture.

Good luck and happy hunting.

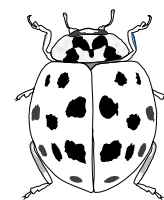
|    | A             | B                    | C                         | D                                  | E             | F                | G         |
|----|---------------|----------------------|---------------------------|------------------------------------|---------------|------------------|-----------|
| 1  | NAME:         | Template McTempleton |                           |                                    |               |                  |           |
| 2  |               |                      |                           | *or non-hexapod<br>arthropod class |               |                  |           |
| 3  | order         | family               | subfamily (if applicable) | order points*                      | family points | subfamily points | total     |
| 4  | Coleoptera    | Meloidae             |                           | 3                                  | 2             |                  | 5         |
| 5  |               | Lucanidae            |                           |                                    | 2             |                  | 2         |
| 6  |               | Scarabaeidae         | Cetoniinae                |                                    | 2             | 1                | 3         |
| 7  |               | Staphylinidae        |                           |                                    | 2             |                  | 2         |
| 8  |               | Mordellidae          |                           |                                    | 2             |                  | 2         |
| 9  |               | Haliplidae           |                           |                                    | 2             |                  | 2         |
| 10 |               | Cerambycidae         | Lepiturnae                |                                    | 2             | 1                | 3         |
| 11 |               |                      | Lamiinae                  |                                    |               | 1                | 1         |
| 12 |               |                      | Lepiturnae                |                                    |               | 1                | 1         |
| 13 |               | Chrysomelidae        | Galerucinae               |                                    | 2             | 1                | 3         |
| 14 |               |                      | Cassidinae                |                                    |               | 1                | 1         |
| 15 |               |                      | Criocerinae               |                                    |               | 1                | 1         |
| 16 | Plecoptera    |                      |                           | 3                                  |               |                  | 3         |
| 17 | Microcoryphia | Machilidae           |                           | 3                                  | 2             |                  | 5         |
| 18 | Diptera       | Scatopsidae          |                           | 3                                  | 2             |                  | 5         |
| 19 |               | Dolichopodidae       |                           |                                    | 2             |                  | 2         |
| 20 |               | Trichoceridae        |                           |                                    | 2             |                  | 2         |
| 21 |               | Drosophilidae        |                           |                                    | 2             |                  | 2         |
| 22 |               | Culicidae            |                           |                                    | 2             |                  | 2         |
| 23 | Chilopoda     |                      |                           | 3                                  |               |                  | 3         |
| 24 | Platydesmida  |                      |                           | 3                                  |               |                  |           |
| 25 | Protura       |                      |                           | 3                                  |               |                  |           |
| 26 | Lepidoptera   | Pieridae             |                           | 3                                  | 2             |                  | 5         |
| 27 |               | Pyralidae            |                           |                                    | 2             |                  | 2         |
| 28 |               | Sphingidae           |                           |                                    | 2             |                  | 2         |
| 29 |               | Noctuidae            |                           |                                    | 2             |                  | 2         |
| 30 |               |                      |                           |                                    |               | <b>TOTAL:</b>    | <b>61</b> |

**Example collection spreadsheet.** Note the following:

- “Order points” can also count towards non-hexapod arthropod classes that are not taken to order. E.g., row 23 Chilopoda (centipedes) is a class, but since no specimens are taken to order within that class, you can count 3 points for Chilopoda; row 24 Platydesmida (an order within Diplopoda, the millipedes) takes a millipede to order level, so no points can be claimed for Diplopoda in that case.
- Some insect orders are difficult to get to family (e.g., Plectoptera, Ephemeroptera), so if no family points are claimed, then just order points can be claimed (row 16).
- Subfamily points (column D) are only applicable for certain families, generally those covered in Borror and DeLong, but a few are acceptable that are not covered in B&D. If in doubt, check with the instructor whether subfamilies will count for a given family.

# Course: ENT595-201

## Advanced General Entomology



Term: Fall 2022

Credit hours: 3 credits

### Meetings:

Lecture: Can be viewed synchronously at 11:00-11:50AM (Eastern Time) Tuesdays & Thursdays or asynchronously in Canvas under **Echo360**

Lab: Entirely asynchronous via laboratory modules in Canvas

Discussion: 5:00-6:00PM (Eastern Time) Tuesdays via Zoom @ <https://uky.zoom.us/j/9536400919>

Instructions for connecting to Echo360 and Zoom are available in Canvas.

### Instructor Information

Name: Dr. Jen White

Email: [jenawhite@uky.edu](mailto:jenawhite@uky.edu) This is my preferred method of communication. You can expect a response from me within 24hrs (often much faster) during the work week, and within 48hrs over the weekend.

Office and room: Agricultural Sciences Center North (Bldg 0091), room S225-G

Office phone: (859) 257-6693 (I am rarely in my office, but calls go to voicemail, which I will see via email)

Virtual office hrs: 6:00-7:00PM (Eastern time) Tuesdays, or by appointment (schedule via email)

### Course Description

Students will learn the fundamentals of insect biology, including relationships among insects, plants, and other organisms. Beneficial and detrimental interactions with humans will be highlighted. Students will learn to identify commonly encountered insects and to curate a physical insect collection. Students will undertake a guided independent project that allows them in-depth exploration of an aspect of arthropod biology that interests them.

### Course Prerequisites

One course in introductory biology. Students that have already received credit for General Entomology (ENT300 or BIO300) may not receive credit for this section of ENT595.

### Required Materials

#### Texts:

(optional): Eaton, ER., and K. Kaufman. 2007. Kaufman Field Guide to the Insects of N. America.

(optional): Gullan, P.J., and P.S. Cranston. 2014. The Insects: An Outline of Entomology, 5th edition.

#### Collection/Curation gear:

Students will either need to borrow or buy equipment for the collection and curation of insects.

Arrangements to ship loaner or purchased equipment to DL students will be made as needed.

### Associated Expenses

Depending on circumstances, students may need to purchase collection/curation gear, or pay to ship borrowed gear to/from the University of Kentucky. Students that are reasonably local may arrange to pick up and drop off gear at no charge.

### Activities Outside of Regular Class Meetings

Because the lab for this class is virtual, students will be expected to spend 2-3 hrs per week in self-guided activities related to insect collection, insect identification, and an independent project.

## Skill and Technology Requirements

Students will need computer and internet to access course material via Canvas, and class discussions via Zoom. Students will also need to be able to take and transmit insect pictures via a digital camera (e.g. phone). Access to the free naturalist website [iNaturalist](#) and/or use of the iNaturalist app is required, and students will be expected to create an account on this site to assist with insect identification.

Minimum technical requirements for UK courses and suggested hardware, software, and internet connections are available at [ITS Student Hardware & Software Guidelines](#).

If you have any technical questions or issues please contact me [[jenawhite@uky.edu](mailto:jenawhite@uky.edu)] or Brian Lauer (IT Specialist in the Department of Entomology) [[brian.lauer@uky.edu](mailto:brian.lauer@uky.edu)].

For help with Canvas, call the Canvas Support Hotline (Students): 1-844-480-0838, or click [Chat with Canvas Support \(Students\)](#)

*For technical assistance, contact the Information Technology Customer Service Center at <http://www.uky.edu/UKIT/> or 859-218-HELP (4357)*

## Student Learning Outcomes

After completing this course, the student will be able to:

- Identify locally abundant insects
- Categorize arthropods from at least 24 Orders and 55 Families
- Describe interactions, both positive and negative, among insects and with humans
- Describe basic insect physiological systems, and how they differ from vertebrates
- Design and implement an independent project. Depending on the nature of the project selected, this will include interpretation of scientific literature, quantifying and statistically analyzing entomological data, oral and written presentation of the project, and critical assessment of project implementation (e.g. what would you do differently).

## Course Details

### Course Activities and Exams

The lecture portion of the course will be available in Canvas for synchronous or asynchronous viewing. There will be two midterm exams and one final exam, all of equal value. The midterm exams will assess assimilation of lecture content, and are not cumulative. They will be administered via Zoom during the Discussion session as indicated on the lecture schedule. Lecture midterm exams are not time limited, and students may start early or stay late as needed to ensure they have adequate time for the exam. The final exam is cumulative but take-home. This will be an open-internet exam, and students will have at least a week to complete it. The highest two exam scores will contribute toward your final score, the lowest will be dropped.

The laboratory portion of the course emphasizes insect identification. Weekly insect taxonomy modules will be available in Canvas, with associated online quizzes and/or activities. There will be two proctored insect identification midterms, administered during the discussion Zoom session. Students will also select an insect family that is not otherwise covered in class and prepare a short presentation of the group for the Zoom discussion section. The laboratory final exam will be an open internet identification exercise, and students will have at least a week to complete it.

A major portion of the grade comes from the insect collection. The collection will be a combination of a physical collection and digital collection, as described in the collection module on Canvas. Students may purchase and/or borrow collecting supplies; borrowed supplies will need to be returned by the end of the semester. Start collecting as soon as possible - insects become scarce as fall progresses!

Advanced Entomology students will also be expected to design and execute an independent project, likely an observational field experiment or a literature review. The project will include an oral presentation and a written paper as described in the independent project rubric. The expectations for the paper differ for undergraduates versus graduate students taking the course: undergraduate papers will need to be a minimum of 5 pages



(excluding references), graduate papers will need to be a minimum of 10 pages (excluding references) for full credit.

### Assessments and Grading

| <u>Lecture</u> |                         | <u>Laboratory</u>             |                         |
|----------------|-------------------------|-------------------------------|-------------------------|
| First Exam     | 100 points              | Quizzes and Lab Assignments   | 100 points              |
| Second Exam    | 100 points              | Laboratory Midterm Exams      | 60 points               |
| Final Exam     | 100 points <sup>a</sup> | Laboratory Taxon Presentation | 20 points               |
|                |                         | Laboratory Final Exam         | 20 points               |
|                |                         | Insect Collection             | 100 points <sup>b</sup> |
|                |                         | Independent Project           | 100 points              |

<sup>a</sup> The Final exam will be take-home and open internet. You will have at least one week to completed it. It will be due at our scheduled finals week exam time, [Thursday Dec. 15, 12:30 PM]. The lowest of the 3 lecture exam scores will be dropped.

<sup>b</sup> Extra credit (10 points) is available on the Insect Collection. Additional extra credit activities **may** be made available to entire class at instructor's discretion.

**COURSE TOTAL = 600 points**

| <u>Undergraduates</u> |   | <u>Graduates</u> |   |
|-----------------------|---|------------------|---|
| 540 or higher         | A | 540 or higher    | A |
| 480-539               | B | 480-539          | B |
| 420-479               | C | 420-479          | C |
| 360-419               | D | 419 or lower     | E |
| 359 or lower          | E |                  |   |

### Midterm Grades

For undergraduates, midterm grades will be posted in myUK by the deadline established by the University Senate and published in the [Academic Calendar](http://www.uky.edu/registrar/content/academic-calendar). (<http://www.uky.edu/registrar/content/academic-calendar>)

### Attendance Policy/Acceptable Documentation

Virtual viewing of lectures is expected but not enforced. Lecture powerpoint slides and handouts will be available on Canvas, as will recordings of the lectures. Assessment in this course relies heavily on clear understanding of lecture material, nuances of which can sometimes be difficult to glean from posted slides. Students who routinely skip viewing lectures routinely get lower grades.

If a student misses an examination, make-ups will be given **only** in the event of excused absences as defined by the University; it is the student's responsibility to provide the instructor with verification that an absence qualifies as "excused." Academic policies regarding excused absences can be found in the [Senate Rules under "Excused Absences."](#)

Weekly quizzes and assignments are due in Canvas by midnight Friday of the week assigned. For larger assignments (Insect Collection, Final Taxa Presentation, Independent Project Paper), late work is accepted, but with a 10% penalty per day late. Given potential for Covid-induced chaos, I may change these policies to be more lenient as the course progresses. If so, the policy changes will be posted in Announcements on Canvas.

Title IV financial aid disbursement regulations: *"In order to meet federal regulations, the instructor will monitor student participation in this class through attendance or assignments. Students whose attendance/participation/engagement cannot be determined one time during the first three weeks of the semester may be dropped from the course. If you will be missing a class period or will not be submitting some assignment during that period, it is your responsibility to notify the instructor, even if the absence or missed assignment is not excused under university rules."*

### Tentative Course Schedule

| Wk                             | date  | Lecture (timing approximate)                                       | Discussion                                                                                                          |
|--------------------------------|-------|--------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------|
| 1                              | 8/23  | Introduction (Module 1)                                            | Introduction                                                                                                        |
|                                | 8/25  | Insect Systematics (Module 2)                                      |                                                                                                                     |
| 2                              | 8/30  | Structure and Function: External (Mod. 3)                          | Collection/Curation/Project discussion                                                                              |
|                                | 9/1   | Mod. 3, continued                                                  |                                                                                                                     |
| 3                              | 9/6   | Structure and Function: Internal (Mod. 4)                          | <b>Project pitches (10 pt)</b>                                                                                      |
|                                | 9/8   | Mod. 4, continued                                                  |                                                                                                                     |
| 4                              | 9/13  | Repro Biology: Finding Mates (Mod. 5)                              | Intro to library/citation resources<br><b>F 9/16: Project prospectus due (10 pt)</b>                                |
|                                | 9/15  | Repro Biology: Having Babies (Mod. 5)                              |                                                                                                                     |
| 5                              | 9/20  | Life Cycles and Metamorphosis (Mod. 6)                             | Project updates, Review for exam                                                                                    |
|                                | 9/22  | Canned lecture on Social Insects (Mod 13)                          |                                                                                                                     |
| 6                              | 9/27  | Exam Review; Protective Form Color and Behavior (Mod. 7)           | <b>First lecture exam, Mods 1-6 (100 pt)</b>                                                                        |
|                                | 9/29  | <i>No lecture (exam administration for in-person class)</i>        |                                                                                                                     |
| 7                              | 10/4  | Ecology & Behav.: Coping with Environment (Mod. 8)                 | Collection consults; lab exam review<br><b>F 10/7: Project waypoint1 due (10 pt)</b>                                |
|                                | 10/6  | Ecology & Behav.: Insect Pop. Growth (Mod. 9)                      |                                                                                                                     |
| 8                              | 10/11 | Ecology & Behav.: What Insects Eat (Mod. 10)                       | <b>First lab exam (30 pt)</b>                                                                                       |
|                                | 10/13 | Insect Pests: Problems (Mod. 11)                                   |                                                                                                                     |
| 9                              | 10/18 | Mod. 11, continued                                                 | Project updates; Excel/statistics disc.                                                                             |
|                                | 10/20 | Insect Pests: Solutions (Mod. 12)                                  |                                                                                                                     |
| 10                             | 10/25 | <i>No lecture - fall break</i>                                     | No meeting                                                                                                          |
|                                | 10/27 | Mod. 12, continued                                                 |                                                                                                                     |
| 11                             | 11/1  | Mod. 12, continued                                                 | Hot topics in entomology disc.<br><b>Insect Collection due (100 pt)</b>                                             |
|                                | 11/3  | Beneficial Insects: Pollinators & Biol. Control (Mod. 14)          |                                                                                                                     |
| 12                             | 11/8  | <i>Election day – canned lecture on Phylum Arthropoda (Mod.15)</i> | No meeting; <b>F 11/11 draft Project waypoint 2 due (10 pt)</b>                                                     |
|                                | 11/10 | Exam Review; Ametabolous Insects (Mod. 16)                         |                                                                                                                     |
| 13                             | 11/15 | <i>No lecture (exam administration for in-person class)</i>        | <b>Second Lecture Exam, mods 7-14 (100 pt)</b>                                                                      |
|                                | 11/17 | Hemimetabolous Insects (Mod. 17)                                   |                                                                                                                     |
| 14                             | 11/22 | Mod 17, continued                                                  | <b>Second Lab Exam (30 pt)</b><br><b>F 11/25: Taxa presentation draft due (2 pt)</b>                                |
|                                | 11/24 | <i>No lecture - Thanksgiving</i>                                   |                                                                                                                     |
| 15                             | 11/29 | Holometabolous Insects (Mod. 18)                                   | <b>Taxa presentations (18 pt); Insect Collection Revision due;</b><br><b>F 12/2: Ind. Project paper due (50 pt)</b> |
|                                | 12/1  |                                                                    |                                                                                                                     |
| 16                             | 12/6  | Mod 18, continued                                                  | <b>Ind. Project presentations (10 pt)</b><br><b>W 12/7: Virtual Lab Final due (20 pt)</b>                           |
|                                | 12/8  | <i>Reading day, no class</i>                                       |                                                                                                                     |
| Finals week<br><b>Th 12/15</b> |       |                                                                    | <b>Take home lecture final exam due (if taken; can substitute for either lecture exam; 100 pt)</b>                  |

## Assignment Policies

### Assignment Submissions

Proctored exams taken during discussion sections will be submitted via email; all other assignments will be submitted via Canvas.

### Returning Assignments to Students

Except the final lecture and lab exams, all assignments and exams will be returned to students for review, usually within one week. For the final exams, students may review their exams by appointment on request.

### Late Assignments

For routine weekly assignments that are submitted in Canvas, students may request late submission, which will be granted without penalty or need for an excuse. Life happens. However, please do not abuse this policy; it's not good for timely/consistent grading, and deadlines are designed to keep you on track for completion of course material. For proctored exams, an acceptable university excuse (as outlined by [current university senate rules](#)) will need to be provided.

### Assignments Due during Prep Week

A course with a lab component may schedule the lab practical of the course during Prep Week if the lab portion does not also require a final examination during finals week. In this course, the take-home lab final is due during prep week rather than finals week.

## Academic Policy Statements

In addition to information about excused absences, the Senate's [Academic Policy Statements](#) (<https://www.uky.edu/universitysenate/acadpolicy>) provide information on UK policies regarding prep week and reading days, accommodations due to disability, non-discrimination and Title IX, and regular and substantive interactions.

## Academic Offenses (Cheating, Plagiarism, and Falsification or Misuse of Academic Records)

Academic dishonest is not tolerated. Please see the UK [Rules Regarding Academic Offenses](#) (<https://www.uky.edu/universitysenate/ao>) to review rules and consequences.

## Resources

Distance Learning services: [distancelearning@uky.edu](mailto:distancelearning@uky.edu); 859-257-3377

[Carla Cantagallo](#), Distance Learning Librarian, 859-218-1240

[Distance Learning Library Services](#)

DL Interlibrary Loan Service: <http://libraries.uky.edu/dlls>

[Tutoring and Coaching Resources](#)

Other [Resources Available to Students](#)

***If you have a documented disability that requires academic accommodations, please see me as soon as possible during scheduled office hours. In order to receive accommodations in this course, you must provide me with a Letter of Accommodation from the Disability Resource Center (DRC). The DRC coordinates campus disability services available to students with disabilities. It is located on the corner of Rose Street and Huguelet Drive in the Multidisciplinary Science Building, Suite 407. You can reach them via phone at (859) 257-2754 and via email at [drc@uky.edu](mailto:drc@uky.edu). Their web address is [uky.edu/DisabilityResourceCenter/](http://uky.edu/DisabilityResourceCenter/).***

## Course Recordings

The University of Kentucky Code of Student Conduct defines Invasion of Privacy as using electronic or other devices to make a photographic, audio, or video record of any person without their prior knowledge or consent when such a recording is likely to cause injury or distress.

Meetings of this course may be recorded. All video and audio recordings of lecturers and class meetings, provided by the instructors, are for educational use by students in this class only. They are available only through the Canvas shell for this course and are not to be copied, shared, or redistributed.

As addressed in the Code of Student Conduct, students are expected to follow appropriate university policies and maintain the security of linkblue accounts used to access recorded class materials. Recordings may not be reproduced, shared with those not enrolled in the class, or uploaded to other online environments.

If the instructor or a University of Kentucky office plans any other uses for the recordings, beyond this class, students identifiable in the recordings will be notified to request consent prior to such use. In anticipation of such cases, students may be asked to complete an “authorization of use” form by a faculty member.

Video and audio recordings by students are not permitted during the class unless the student has received prior permission from the instructor. Any sharing, distribution, and or uploading of these recordings outside of the parameters of the class is prohibited. Students with specific recording accommodations approved by the Disability Resource Center should present their official documentation to the instructor.

### Course Copyright

All original instructor-provided content for this course, which may include handouts, assignments, and lectures, is the intellectual property of the instructor(s). Students enrolled in the course this academic term may use the original instructor-provided content for their learning and completion of course requirements this term, but such content must not be reproduced or sold. Students enrolled in the course this academic term are hereby granted permission to use original instructor-provided content for reasonable educational and professional purposes extending beyond this course and term, such as studying for a comprehensive or qualifying examination in a degree program, preparing for a professional or certification examination, or to assist in fulfilling responsibilities at a job or internship; other uses of original instructor-provided content require written permission from the instructor(s) in advance.

### Diversity, Equity, and Inclusion

**The faculty and staff of the College of Agriculture, Food and Environment (CAFE) are committed to creating an inclusive learning environment of mutual respect where all members of our community are able to fully engage, belong, and succeed as their full selves. We support students, faculty, and staff in all of their identities, such as race, ethnicity, gender identity and expression, perspectives, beliefs, sexual orientation, national origin, religious belief, age, ability, and socioeconomic status. We work together as a diverse group of engaged students, faculty, and staff to ensure we all feel welcome, safe, accepted, and included. We are looking forward to learning and growing with you. Your suggestions about how to improve this course to be more inclusive and equitable are welcome.**

**Insect Physiology**  
**ENT 635/BIO 635**  
**Spring 2022**

**Lectures:** MW 10.30-12.00 Noon  
**Laboratory:** M 1-4 PM  
**Instructors:** S.R. Palli  
**Teaching Assistant:** JinMo Koo  
**Offices:** Ag Science Center North S-225  
**Office Hours:** Wed 12-2 pm or by appointment  
**Telephones:** 859-257-3160  
**E-mails:** rpalli@uky.edu; hemosu1710@uky.edu

**Text:** None. Readings will be assigned from textbooks and the primary literature.

**Suggested reference books:**

Physiological systems in insects, M.J. Klowden, 2013, 3rd Edition, Academic Press.  
Online access to this book is available through [UK libraries](#).

Insect physiology and biochemistry, J.L.Nation, 2015, 3<sup>rd</sup> Edition, CRC Press.

The insects structure and function, R.F.Chapman, 2013, 5th Edition, Cambridge University Press.

**Student Learning Outcomes**

After completing this course, the student will be familiar with

1. Central themes in insect physiology
2. Vocabulary and intellectual framework of insect physiology
3. Insect internal morphology
4. Some of the techniques used in insect physiology, biochemistry and molecular biology.

**Prerequisites:** Consent of instructor

**Attendance:** Attendance at all class meetings is required. Exams will be based on material presented in class.

**Grading:**

**1. Midterm and final (150 each):** Closed-book short answer written exams covering the first half of the course (Mid-term) and the second half of the course (Final) will be conducted.

**2. Class attendance and participation in the discussion (100 points):** Active participation in class discussion is required to get the full benefit from this class. Students are expected to read assigned papers and participate in the discussion actively. About 10 recent articles published in insect physiology will be discussed during

lecture periods. Each student will be graded based on their preparation and participation in the discussion of each paper discussed.

**3. Laboratory Exercises, Lab reports and final lab exam (200 points):**

**Lab reports (150 points):** Complete laboratory exercises and submit a 2-3 page summary of laboratory exercise that includes;

Introduction: Introduction to experiment and purpose.

Material and Methods: Details of procedures.

Results: Should include data, drawings and pictures.

Discussion: Interpretation of results.

**Final lab exam (50 points):** Oral final lab exam of 20 min for each student conducted by instructor and TA to test student learning outcomes.

**Potential points:**

|                                                         |            |
|---------------------------------------------------------|------------|
| <b>Midterm Exam</b>                                     | <b>150</b> |
| <b>Final Exam</b>                                       | <b>150</b> |
| <b>Class attendance and participation in discussion</b> | <b>100</b> |
| <b>Laboratory exercises, reports and exam</b>           | <b>200</b> |
| <b>Total:</b>                                           | <b>600</b> |

**Grades will be awarded based on the following scale:**

**90 % or greater – A**

**80% to 89.9% – B**

**70% to 79.9% – C**

**60% to 69.9% – D**

**Less than 60 % – E**

If grades are lower than I consider appropriate, I may impose a curve that results in higher grades. However, I will not impose a curve that results in lower grades than students earn using the scale indicated above.

**Missed Exams or Late lab reports:** Make-up exams will be given or late reports accepted only if an absence is pre-arranged (at least one week in advance) or if a valid doctor's or mortician's excuse is provided. An unexcused absence will result in a zero for that exam or project. Acceptable reasons for missing exams are specified in the Student Rights and Responsibilities handbook (serious illness, illness or death of a family member, University-related trips, major religious holidays, and other reasonable causes. Let me know of conflicts with tests as soon as possible.

**Cheating & Plagiarism:** The minimum penalty for cheating plagiarism is a 0 (zero) for the test or report. Plagiarism includes reproducing someone else's work (including, but not limited to a published article, a book, a website, computer code, or a paper from a

friend) without clear attribution. Plagiarism also includes the practice of employing or allowing another person to alter or revise the work, which a student submits as his/her own, whoever that other person may be.

When a student's assignment involves research in outside sources or information, the student must carefully acknowledge exactly what, where and how he/she has employed them. If the words of someone else are used, the student must put quotation marks around the passage in question and add an appropriate indication of its origin. Making simple changes while leaving the organization, content, and phraseology intact is plagiaristic. However, nothing in these Rules shall apply to those ideas, which are so generally and freely circulated as to be a part of the public domain.

**Academic accommodations:** If you have a documented disability that requires academic accommodations, please contact the University Disability Resource Center. The Center will require current disability documentation. I will get a letter that details the recommended accommodations. Contact the Disability Resource Center at (859) 257- 2754.

If an **emergency** arises in this classroom, building or vicinity, your instructor will advise you of actions to follow to enhance your safety. If a situation requires emergency shelter (i.e., during a severe weather event), the nearest shelter location is Primary Safe Place(s):Floor 2 Hallway C200, between the two major groupings of classrooms in the center of the area, away from windows. Also, the areas just inside the entryways of both the men's and women's restrooms. Secondary Safe Place(s):Floor 2 All classrooms on either side of hallways UC201 and UC202 . These are listed as secondary because there is concern that many of these rooms will be locked a majority of the time. If building evacuation occurs (i.e., fire alarm), follow posted evacuation routes and assemble at the front entrance of Ag. North, so the instructor can help ensure their students have evacuated the building safely and they are not hindering emergency personnel access to the building. If you may require assistance during an emergency, notify the instructor at the beginning of the semester. In order to prepare for emergencies while on campus please view the emergency response guidelines at the UK Division of Crisis Management and Emergency Preparedness website: (<http://www.uky.edu/EM/emergency-response-guide.html>). To receive emergency messages, sign up for UK Alert (<http://www.uky.edu/EM/UKAlert>). Always turn cellular phones to silent mode when entering the classroom. If you observe or receive an emergency alert, immediately and calmly inform your instructor.

### **Diversity, Equity, and Inclusion (DEI)**

The University of Kentucky is committed to our core values of diversity and inclusion, mutual respect and human dignity, and a sense of community (Governing Regulations XIV). We acknowledge and respect the seen and unseen diverse identities and experiences of all members of the university community (<https://www.uky.edu/regs/gr14>). These identities include but are not limited to those based on race, ethnicity, gender identity and expressions, ideas and perspectives, religious and cultural beliefs, sexual

orientation, national origin, age, ability, and socioeconomic status. We are committed to equity and justice and providing a learning and engaging community in which every member is engaged, heard, and valued. We strive to rectify and change behavior that is inconsistent with our principles and commitment to diversity, equity, and inclusion. If students encounter such behavior in a course, they are encouraged to speak with the instructor of record and/or the Office of Institutional Equity and Equal Opportunity. Students may also contact a faculty member within the department, program director, the director of undergraduate or graduate studies, the department chair, any college administrator, or the dean. All these individuals are mandatory reporters under university policies.

## LECTURE AND LAB SCHEDULE

| Lecture# | Date   | Subject                                                | Lab                                                |
|----------|--------|--------------------------------------------------------|----------------------------------------------------|
|          | 10-Jan | Introduction                                           | Introduction to lab safety etc. (S201)             |
| 1        | 12-Jan | Physiological Systems-Male Reproduction                |                                                    |
| 2        | 19-Jan | Physiological Systems-Female Reproduction              |                                                    |
| 3        | 24-Jan | Physiological Systems Fertilization and Vitellogenesis | Dissection of female and male reproductive systems |
| 4        | 26-Jan | Embryonic Development                                  |                                                    |
| 5        | 31-Jan | Embryonic Development                                  | Lab work                                           |
| 6        | 2-Feb  | Embryonic Development                                  |                                                    |
| 7        | 7-Feb  | Post Embryonic Development-Integument                  | Lab work                                           |
| 8        | 9-Feb  | Post Embryonic Development-Molting                     |                                                    |
| 9        | 14-Feb | Post Embryonic Development-Endocrinology               | Lab work                                           |
| 10       | 16-Feb | Post Embryonic Development-Metamorphosis               |                                                    |
| 11       | 21-Feb | Physiological Systems-Digestive System                 | Lab work                                           |
| 12       | 23-Feb | Physiological Systems-Nutrition                        |                                                    |
| 13       | 28-Feb | Physiological Systems-Excretory System                 | Dissection of digestive and excretory systems      |
| 14       | 2-Mar  | Physiological Systems-Circulatory System               |                                                    |
|          | 7-Mar  | Review                                                 | Lab work                                           |
|          | 9-Mar  | Midterm (covers Lectures 1-14)                         |                                                    |
|          | 14-Mar | No class Spring break                                  |                                                    |
|          | 16-Mar | No class Spring break                                  |                                                    |



|    |         |                                          |                                                   |
|----|---------|------------------------------------------|---------------------------------------------------|
| 15 | 21-Mar  | Physiological Systems-Nervous System     | Lab work                                          |
| 16 | 23-Mar  | Physiological Systems-Nervous System     |                                                   |
| 17 | 28-Mar  | Physiological Systems-Sensory System     | Lab work                                          |
| 18 | 30-Mar  | Insecticides                             |                                                   |
| 19 | 4-Apr   | Physiological Systems-Immune System      | Dissection of nervous system                      |
| 20 | 6-Apr   | Physiological Systems-Respiratory System |                                                   |
| 21 | 11-Apr  | Physiological Systems–Muscular System    | Dissection of Circulatory and Respiratory systems |
| 22 | 13-Apr  | Physiological Systems - Photoperiodism   |                                                   |
| 23 | 18-Apr  | Physiological Systems-Behavior           | Lab work                                          |
| 24 | 20-Apr  | Physiological Systems-Communication      |                                                   |
| 25 | 25-Apr  | Insecticide Resistance                   | Lab Exam                                          |
| 26 | 27-Apr  | Review                                   |                                                   |
|    | 1-4 May | Final                                    | Final (covers Lectures 15-24)                     |

**Lectures are held in S221 Ag. Science N**  
**Lab work will be done in S224 Ag. Science N**  
**Dissections are done in Garrigus 104**

**Invasive Species, ENT/FOR/BIO 667**  
**T & Th 9:30 - 10:45 am, Fall 2021**

Dr. Lynne K. Rieske-Kinney  
Department of Entomology  
University of Kentucky  
113 Animal Pathology OR  
S-225J Ag North  
lrieske@uky.edu, 257-1167

**Office hours:** Conferences are welcomed and will be arranged to suit your schedule. Please telephone, email, or speak directly with me before or after class so we can arrange a convenient time for you.

**Objectives:** In this course we'll examine the circumstances that allow an introduced organism to become invasive, examine specific introductions (past and present) threatening our resources, and investigate approaches mitigating steps to reduce the incidence and impact of invasive species. Our purpose is to develop insight in to the biology and ecology of biological invasions so as to gain an understanding of current and emerging means of minimizing their impact.

**Nature:** This is a 3 credit graduate level course consisting of two 1¼ hr lectures/ presentations/ discussions weekly.

The first portion of the semester consists of lectures covering historical faunal realms prior to human intervention; economic and political forces that set the stage for species invasions; the biology and ecology of invasive species and invasiveness; the susceptibility to and risks of invasions; and consequences of invasion. We will cover intentional and accidental invasions of various taxa, including arthropods, vertebrates, plants, pathogens, etc., the extent and impact of these introductions, and the ecological and economic costs associated with managing them. Each topic will be accompanied by a general reading and a more in-depth reading of original research, coupled with discussion.

During the second portion of the semester students will research and present case studies covering invasive species impacting various systems. Examination of specific cases will include marine, aquatic, and forest systems, both of which are at the forefront of invasive species introductions. Case studies of agroecosystems will provide opportunities to examine invasive species threats to manipulated systems, which themselves are often comprised of introduced (and sometimes invasive) species. We will also cover the areas of invasive threats to animal and human health, and threats to biological diversity and ecosystem conservation. Working in small groups, students will research their assigned topics, present their findings, and act as discussion leaders.

Students will be expected to approach their system from a holistic perspective, examining its historic and current structure, its current status, and its current and future susceptibility to and risk of invasion by various taxa. Students should utilize the concepts that have been discussed in class, including an overview of the biology and ecology of the system, and how emerging technologies can/ are being used to mitigate invasions in their system. Presenters will work as a group to develop an in-depth, cohesive presentation and will be expected to have solid enough background knowledge to lead the class through the topic. Presenters will also provide an appropriate reading assignment of 1-3 papers, chosen with and approved by me, for the class one week in advance. This portion of the course will emphasize discussion and participation. In the class session following their presentation, each student will hand in a paper synthesizing their presentation and the class discussion.

Example timeline for student projects (hypothetical, with presentation date of Week 6):

|                                  |                                      |
|----------------------------------|--------------------------------------|
| Topic assigned                   | Week 2                               |
| Research topic                   | Weeks 2-5                            |
| Meet to discuss paper choices    | Week 4                               |
| Papers assigned to class         | Week 5                               |
| Student group presentation       | Week 6                               |
| Writing synthesis (individually) | class session following presentation |

This is an example only. Actual topics and dates will be determined by the end of the second week of class.

|                 |     |                                                                        |
|-----------------|-----|------------------------------------------------------------------------|
| <b>Grading:</b> | 30% | Participation in class activities (discussions, activities, practicum) |
|                 | 25% | Group presentation/discussion of case study                            |
|                 | 10% | Writing assignment synthesizing discussion of case study               |
|                 | 15% | Midterm take home exam                                                 |
|                 | 20% | Final exam                                                             |

**Scientific publishing: Process and ethics**  
**ENT 670**

**Class meeting:** TR, 12:30-1:45  
**Instructor:** Dr. Charles Fox (cfox@uky.edu)  
**Office:** Ag Science Center North Room S-307B  
**Office hours:** By appointment via zoom  
**Telephone:** 859-257-7474 (Office)

**Course description:** An introduction to scientific publishing, including types of scientific journals, choosing where to publish, the structure of scientific papers, the peer review process, data management and archiving, post-publication promotion of research, metrics of scientific impact such as impact factors and altmetrics, and publication ethics.

**Credits:** 2

**Prerequisite:** Graduate student in a science discipline

**Structure of course:** 3 hours discussion/activities per week

**Readings:** The readings will be circulated by email (as links to online documents) to the class email list. Readings will include papers from the scientific literature, editorials, and a variety of blog posts. Students are expected to read the *required* readings before class, and are encouraged to read the recommended readings.

**Learning outcomes:**

- Students will be able to distinguish types of scientific publications and metrics of scientific impact, and be able choose an appropriate outlet for their scientific publications.
- Students will appreciate the process of scientific publication and peer review, and be able to critically evaluate the issues facing modern publishing, including different models of peer review and different publication models (e.g., open access versus subscription journals).
- Students will appreciate the issues surrounding data management and accessibility, be able to access publicly-archived datasets, and be able to choose an appropriate data depository for their own datasets.
- Students will critically evaluate the major ethical issues relating to scientific publication, and be able to critically and objectively evaluate cases of potential scientific and publication misconduct.

**Grading:**

|                                 |            |                                      |
|---------------------------------|------------|--------------------------------------|
| Class attendance/participation: | 200 points | <u>Grades (% of available points</u> |
| Supplemental readings:          | 100 points | <u>excluding extra credit)</u>       |
| Assignments:                    | 100 points | > 92% – A                            |
|                                 |            | 85-91.9% – B                         |
| Total:                          | 400 points | 75-84.9% – C                         |
|                                 |            | Below 70% – E                        |

**Attendance and participation:** Attendance and participation in class is required. Class sessions will be primarily discussion, with students expected to have read the assigned material before class and

participate in discussions. Missing class, coming to class unprepared, or failing to contribute to our discussion will reduce your participation grade by up to 10 points per class period.

**Supplemental readings:** Students will be assigned topics for which they are responsible for reading supplemental materials (in addition to the assigned readings) and integrating these supplemental materials into the class discussion. The instructor will provide guidance on which materials to read for each topic, but students are also expected to take initiative to find additional materials that contribute to the topic of discussion. The number of times each student is responsible for supplemental materials depends on enrollment in the class, but is expected to ~once every two or three class periods throughout the semester.

**Assignments:** Students will be assigned a variety of short projects. Projects vary (see course outline), and include things such as obtaining citation reports from JCR or Google Scholar, critiquing a manuscript title, abstract and introduction, investigating journal or granting agency data management/archiving requirements, and many others.

**University of Kentucky academic policies:** You can find the complete list of UK's academic policies here ( <https://www.uky.edu/universitysenate/acadpolicy> ), the rules regarding academic offenses here ( <https://www.uky.edu/universitysenate/ao> ), and the university's statement on diversity, equity and inclusion here ( <https://www.uky.edu/universitysenate/syllabus-dei> ).

**Missed classes:** If an absence from class is due to a university-approved reason for an absence, credit for class attendance will be given only if the student pre-arranges the absence or provides a valid written excuse within one week of the missed class. As per university regulations (<https://www.uky.edu/ombud/absences-excused>) acceptable reasons for excused absences: (a) serious illness, (b) illness or death of family member, (c) University-related trips, (d) major religious holidays, or (e) other circumstances found to fit "reasonable cause for nonattendance" by the professor. An unexcused absence from class will result in a zero for that particular class/assignment.

**Cheating:** Academic integrity policies have been provided to every student by the university and are available at <https://www.uky.edu/ombud/academic-offense-information>. Per university policy, students shall not plagiarize, cheat, or falsify or misuse academic records. Students are expected to adhere to University policy on cheating and plagiarism in all courses. Students are encouraged to study together, but must take their own exams prepare/give their own presentations. Students caught cheating will automatically fail the class and will be referred to the Academic Ombud and their College Dean.

**Accommodations due to disability:** If you have a documented disability that requires academic accommodations, please see me as soon as possible during scheduled office hours. To receive accommodations in this course, you must provide a Letter of Accommodation from the Disability Resource Center (Room 2, Alumni Gym, 257-2754, email address: [jkarnes@email.uky.edu](mailto:jkarnes@email.uky.edu)) for coordination of campus disability services available to students with disabilities.

| Date                          | Topic                                                                                                                                                                                                                                       | Assignments                                                                                                                                                                                                                                  |
|-------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| January 11<br>January 13      | Introduction/organizational meeting<br>Choosing a journal (types of scientific outlets/journals, journal metrics)                                                                                                                           | <ul style="list-style-type: none"> <li>- Journal metrics</li> <li>- Journal citation reports (JCR), Google scholar and other metrics</li> </ul>                                                                                              |
| January 18<br>January 20      | Open access vs subscription models for journals; how do we pay for scientific publishing<br>Writing a paper for broad interest journals (Titles, Abstracts, Introductions and Discussion sections) – General discussion                     | <ul style="list-style-type: none"> <li>- Open access versus subscription model</li> <li>- Identify examples of good/bad titles &amp; abstracts</li> </ul>                                                                                    |
| January 25<br><br>January 27  | Discussion of student titles/abstracts/outlines<br><br>The peer review process                                                                                                                                                              | <ul style="list-style-type: none"> <li>- Write a title, abstract and outline of the introduction for your own research project</li> <li>- Guidelines for authors for journals in your research area</li> </ul>                               |
| February 1<br>February 3      | Behind the scenes at journals – <b>Jennifer Meyer and Rowena Gordon (British Ecological Society)</b><br>Bias in peer review; Alternative peer review models                                                                                 |                                                                                                                                                                                                                                              |
| February 8<br><br>February 10 | Panel of journal editors<br><b>Sheena Cotter (Ecological Entomology)</b><br><b>Nate Sanders (Journal of Animal Ecology)</b><br><b>Brian Inouye (Ecological Monographs)</b><br>Writing a manuscript review; Responding to manuscript reviews | <ul style="list-style-type: none"> <li>- Reviewing a manuscript</li> <li>- Responding to reviewer comments</li> </ul>                                                                                                                        |
| February 15<br>February 17    | Promoting research: Press releases and interacting with the media – <b>Katie Pratt (UK Ag Communications)</b><br>Promoting research: Social media, blogging – <b>Jonathan Larson (UK Entomology)</b>                                        | <ul style="list-style-type: none"> <li>- Write a lay summary for a journal or a trade</li> <li>- Science blogs</li> </ul>                                                                                                                    |
| February 22<br>February 24    | Data archiving and open data – <b>Daniella Lowenberg (California Digital Libraries; Dryad data repository)</b><br>Open data discussion                                                                                                      | <ul style="list-style-type: none"> <li>- Journal and granting agency data policies</li> <li>- Identify online repositories for archiving your thesis data, pros and cons of each</li> <li>- Access data from at least one archive</li> </ul> |

|                      |                                                                                                                                                                                                                                             |                                                                                                     |
|----------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------|
| March 1              | Archiving research outputs other than data; University archives –<br><b>Ruth Bryan (UK libraries)</b>                                                                                                                                       |                                                                                                     |
| March 3              | Writing your results section to make your results and data reusable<br>– <b>Julia Koricheva (Royal Holloway University)</b>                                                                                                                 |                                                                                                     |
| March 8              | Publication and reporting bias in science; The P-value; P-hacking<br>Writing results to be evidence-based – <b>Bob O’Hara (Norwegian</b>                                                                                                    |                                                                                                     |
| March 10             | <b>University of Science and Technology)</b>                                                                                                                                                                                                |                                                                                                     |
| March 15, 17         | <i>Spring break</i>                                                                                                                                                                                                                         |                                                                                                     |
| March 22             | <i>No class – ESA Central Branch meeting</i>                                                                                                                                                                                                |                                                                                                     |
| March 24             | Replication/reproducibility of science                                                                                                                                                                                                      |                                                                                                     |
| March 29             | The future of scientific publishing – <b>Tim Vines (DataSeer, The</b>                                                                                                                                                                       |                                                                                                     |
| March 31             | <b>Scholarly Kitchen)</b><br>The future of scientific publishing (preregistration, blind analysis,<br>the future/end of journals)                                                                                                           |                                                                                                     |
| April 5<br>April 7   | Publication ethics: Plagiarism, attribution/citation,<br>duplicate/redundant publication<br>Publication ethics: Authorship, conflicts of interest, editor and<br>reviewer ethics                                                            | - All students must take and pass UK’s <i>Responsible<br/>Conduct in Research</i> course (via CITI) |
| April 12<br>April 14 | Conflicts of interest in research and science outreach<br>Catch up                                                                                                                                                                          |                                                                                                     |
| April 19<br>April 21 | Retraction of papers<br>Retraction for misconduct (Definitions of misconduct, cultural<br>perspectives on ethics; types of misconduct, image<br>manipulation); Self-retraction, corrections, and improving the<br>quality of the literature | - COPE<br>- Identify/discuss examples of retracted papers and/or<br>other ethics sanctions          |
|                      | Ethics case studies                                                                                                                                                                                                                         |                                                                                                     |
| April 26             | Open discussion – review of the semester                                                                                                                                                                                                    |                                                                                                     |

**Commented [FCW1]:** Add an entire class on P-values, banning P-values, and writing results to be more evidence based

**Commented [FCW2]:** This didn't work.

**Commented [FCW3]:** Ethics case studies took 3 classes. Would have been better to compress to fewer examples in just two days

**Commented [FCW4]:** Make sure to have at least two days at end of semester for topics chosen by student, either new topics we haven't discussed or revisiting/extending topics we have discussed

**Introduction to Insect Physiology and Toxicology  
Spring 2022**

**Instructor:** S.R. Palli  
**Office:** Ag Science Center North S-225  
**Virtual office Hours:** Wednesdays 12.00-2.00 pm or by appointment  
**Telephone:** 859-257-3160  
**E-mail:** rpalli@uky.edu

**Required Textbook:** None.

**Suggested reference books:**

Physiological systems in insects, M.J. Klowden, 2013, 3rd Edition, Academic Press.  
Online access to this book is available through [UK libraries](#).  
Insect physiology and biochemistry, J.L.Nation, 2015, 3<sup>rd</sup> Edition, CRC Press.  
The insects structure and function, R.F.Chapman, 2013, 5th Edition, Cambridge University Press.

**Student Learning Outcomes**

After completing this course, the student will be familiar with

1. Central themes in insect physiology
2. Vocabulary and intellectual framework of insect physiology
3. Central themes in insect toxicology
4. Vocabulary and intellectual framework of insect toxicology

**Prerequisites:** Consent of instructor

**Grading:**

**1. Midterm and final (200):** Closed-book short answer written exams covering first half of the course (Mid-term) and second half of the course (Final) will be conducted.

**2. Quizzes and participation in virtual discussion (200 points):** One quiz will be given after completion of each module. Virtual discussions will be held on Canvas among students and instructor through virtual chat and weekly live group discussions.

**Potential points:**

|                                                |            |
|------------------------------------------------|------------|
| <b>Midterm Exam</b>                            | <b>100</b> |
| <b>Final Exam</b>                              | <b>100</b> |
| <b>Quizzes and participation in discussion</b> | <b>200</b> |
| <b>Total:</b>                                  | <b>400</b> |

**Grades will be awarded based on the following scale:**

- 90 % or greater – A**
- 80% to 89.9% – B**
- 70% to 79.9% – C**
- 60% to 69.9% – D**
- Less than 60 % – E**



If grades are lower than I consider appropriate, I may impose a curve that results in higher grades. However, I will not impose a curve that results in lower grades than students earn using the scale indicated above.

**Virtual office hours:** The instructor will be available on Zoom on Wednesdays 12-2 pm or by appointment. Zoom

link: <https://uky.zoom.us/j/7162035731?pwd=TTI3d2NSeFJMUUJoNmRxb0c2cWR2Zz09>

Password: Friday

**Missed Exams:** Make-up exams will be given only if an absence is pre-arranged (at least one week in advance) or if a valid doctor's or mortician's excuse is provided. An unexcused absence will result in a zero for that exam or project. Acceptable reasons for missing exams are specified in the Student Rights and Responsibilities handbook (serious illness, illness or death of a family member, University-related trips, major religious holidays, and other reasonable causes. Let me know of conflicts with tests as soon as possible.

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**Academic accommodations:** If you have a documented disability that requires academic accommodations, please contact the University Disability Resource Center. The Center will require current disability documentation. I will get a letter that details the recommended accommodations. Contact the Disability Resource Center at (859) 257- 2754.

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director of undergraduate or graduate studies, the department chair, any college administrator, or the dean. All of these individuals are mandatory reporters under University policies.

## Modules

| Module | Target completion week | Subject                            | Quizzes, Midterm and final due dates                 |
|--------|------------------------|------------------------------------|------------------------------------------------------|
| 1      | 10-21-Jan              | Introduction and Reproduction      | 24-Jan                                               |
| 2      | 24 Jan-4-Feb           | Embryonic Development              | 7-Feb                                                |
| 3      | 7-18-Feb               | Postembryonic Development          | 21-Feb                                               |
| 4      | 21-25 Feb              | Digestive System                   | 28-Feb                                               |
| 5      | 28-Feb-Mar-4           | Excretory and Circulatory Systems  | 7-Mar                                                |
|        | 7-11-Mar               | Review for midterm and midterm     | Midterm covers modules 1-5, due March 13             |
| 6      | 21 Mar-1 Apr           | Nervous and Sensory Systems        | 28-Mar                                               |
| 7      | 4-8 Apr                | Immune and Respiratory Systems     | 4-Apr                                                |
| 8      | 11-15-Apr              | Muscular System and Photoperiodism | 11-Apr                                               |
| 9      | 18-22Apr               | Behavior and Communication         | 18-Apr                                               |
| 10     | 18-25 Apr              | Insecticides Resistance            | 25-Apr                                               |
|        | 27 Apr                 | Review for final                   |                                                      |
|        | 1-4-May                | Final exam                         | Final covers modules 6-10, due May 4 <sup>th</sup> . |

## ENT 770: Graduate School and Professional Development

Meeting time: Fridays at 1:30 to 3:00 p.m.

Meeting place: S-201 AGN

Zoom connection:

<https://uky.zoom.us/j/85395080640?pwd=cGtGWfVla0ZTMVd0QW1nU200R2tsUT09>

**Instructor:** Charles Fox  
**Office:** Ag Science Center North N-307B  
**Office Hours:** By appointment  
**Telephone:** 859-904-9404  
**E-mail:** [cfox@uky.edu](mailto:cfox@uky.edu)  
**Textbook:** None. Some small projects/readings will be assigned.  
**Course description:** This seminar introduces the Department of Entomology, the careers available in the field, and some tools-of-the trade.

| Date / Location          | Topic                                                                                                                                                                                                                                                                                                                                                                                                                                |
|--------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| August 26<br>AgN S201    | Introduction to the Department<br><b>Dr. Reddy Palli</b> , Department Chair<br><b>Tymory Stanton</b> , Business Officer<br><b>Jessica Alkenbrack</b> , Administrative Support<br><b>Sarah Habel</b> , Human Resources Coordinator<br><b>Brian Lauer</b> , IT Support<br><b>Dr. Tonja Fisher</b> , Director on online MS Program<br><b>Charles Fox</b> , Director of Graduate Studies<br>The Syllabus. The Graduate Student Handbook. |
| September 2<br>AgN S201  | Faculty Group I,<br><b>Dr. Stephen Dobson</b><br><b>Dr. Julian Dupuis</b><br><b>Dr. David Gonthier</b><br><b>Dr. Zain Syed</b><br>Dr. Dobson will start the session on entrepreneurial opportunities                                                                                                                                                                                                                                 |
| September 9<br>AgN S201  | Faculty Group II,<br><b>Dr. Nick Teets</b><br><b>Dr. Zach DeVries</b><br><b>Dr. Nathan Haan</b><br><b>Dr. Clare Rittschof</b>                                                                                                                                                                                                                                                                                                        |
| September 16<br>AgN S201 | Faculty Group III, Extension Entomology<br><b>Dr. Ric Bessin</b><br><b>Dr. Jonathan Larson</b><br><b>Dr. Raul Villanueva</b><br>Dr. Bessin will start the session on Extension mission of the department                                                                                                                                                                                                                             |
| September 23<br>AgN S201 | Individual development plans<br><b>Dr. Reddy Palli</b><br>Completion of the survey at <a href="http://myidp.sciencecareers.org">myidp.sciencecareers.org</a> <b>before</b> class is required                                                                                                                                                                                                                                         |

|                                |                                                                                                                                                                                                                                                                                   |
|--------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| September 30<br>AgN S201       | Scientific presentations<br><b>Dr. Lynne Rieske-Kinney</b>                                                                                                                                                                                                                        |
| October 7<br>AgN S201          | Student-initiated grants<br><b>Dr. Jen White</b>                                                                                                                                                                                                                                  |
| October 14<br>AgN S201         | Scientific publications<br><b>Dr. Charles Fox</b><br>Take online CITI RCR course before class                                                                                                                                                                                     |
| October 21<br>Zoom             | Diverse careers with an MS degree<br><b>Alexandra Blevins</b> , Kentucky Division of Forestry<br><b>Daniel Hemmann</b> , Area Curator, John Ball Zoological Garden                                                                                                                |
| October 28<br>Zoom             | Careers in the Military, <b>Captain Dr. Paul Lenhart</b> , US Army<br>Hosted by <b>Jen White</b>                                                                                                                                                                                  |
| November 4<br>Zoom             | Diverse careers with the federal government<br><b>Dr. Junwei "Jerry" Zhu</b> USDA, ARS, Agroecosystem Management<br><b>Dr. Rodney Cooper</b> , USDA ARS, Temperate Tree, Fruit and Vegetable Research<br><b>Dr. Tom Coleman</b> , Forest Service, Slow the Spread Program         |
| November 11<br>AgN S201        | Preparing your CV<br><b>Dr. Xuguo "Joe" Zhou</b>                                                                                                                                                                                                                                  |
| November 18<br>Zoom            | Expectations at teaching-focused universities vs. research-focused universities<br><b>Dr. Randy Hunt</b> , Indiana University Southeast<br><b>Dr. James Wagner</b> , Transylvania University                                                                                      |
| November 25<br><i>No class</i> | <i>Thanksgiving break</i>                                                                                                                                                                                                                                                         |
| December 2<br>Zoom             | Diverse careers in industry, pest control, and consulting<br><b>Dr. Adam Baker</b> , Davey Tree Expert Company<br><b>Dr. Mark Goodman</b> , Plunkett's Pest Control Company<br><b>Dr. Jennifer Gordon</b> , Bug Lessons Consulting<br><b>Dr. Phil Crain</b> , Corteva Agriscience |

**Attendance:** Attendance at all class meetings is required.

**Grading:** Your grade in this seminar will be based on attendance (10 pts per meeting) and participation (10 pts per meeting). There are 14 meetings, and thus 280 pts.

| <u>Letter grade</u> | <u>Percent of available points</u> |
|---------------------|------------------------------------|
| A                   | 90% or better                      |
| B                   | 80 to 89.9%                        |
| C                   | 70 to 79.9%                        |
| E                   | 69.9% or below                     |

**Academic Policies (follow these links for additional information):**

- [Excused Absences and Acceptable Excuses](#)
- [Religious Observances](#)
- [Verification of Absences](#)
- [Make-Up Work](#)

In the case that you have a valid excused absence, a video recording of the missed session will be available. Viewing that video will count towards attendance. A make-up assignment would also be substituted for the participation score.

- [Excused Absences for Military Duties](#)
- [Unexcused Absences](#)
- [Prep Week and Reading Days](#)
- [Accommodation Due to Disability](#)
- [Non-Discrimination Statement and Title IX Information](#)

**Face Covering:**

Masks are no longer required inside of all University of Kentucky indoor spaces, but I ask that you wear a mask for in-person sessions to ensure that all of our guests feel comfortable in the classroom.

**Class Recording Notification:**

The University of Kentucky Student Code of Conduct defines Invasion of Privacy as using electronic or other devices to make a photographic, audio, or video record of any person without their prior knowledge or consent when such a recording is likely to cause injury or distress.

**Meetings of this course will be recorded.** All video and audio recordings of lecturers and class meetings, provided by the instructors, are for educational use by students in this class only. They are available only through the Canvas shell for this course and are not to be copied, shared, or redistributed.

**Diversity, Equity, and Inclusion:**

The University of Kentucky is committed to our core values of diversity and inclusion, mutual respect and human dignity, and a sense of community (Governing Regulations XIV; <https://www.uky.edu/regs/gr14>). We acknowledge and respect the seen and unseen diverse identities and experiences of all members of the university community. These identities include but are not limited to those based on race, ethnicity, gender identity and expressions, ideas and perspectives, religious and cultural beliefs, sexual orientation, national origin, age,

ability, and socioeconomic status. We are committed to equity and justice and providing a learning and engaging community in which every member is engaged, heard, and valued.

We strive to rectify and change behavior that is inconsistent with our principles and commitment to diversity, equity, and inclusion. If students encounter such behavior in a course, they are encouraged to speak with the instructor of record and/or the Office of Institutional Equity and Equal Opportunity (<https://www.uky.edu/eoo/>). Students may also contact a faculty member within the department, program director, the director of undergraduate or graduate studies, the department chair, any college administrator, or the dean. All of these individuals are mandatory reporters under University policies.

**Visitor contact information:**

Entomology faculty/staff email addresses are available at

<http://entomology.ca.uky.edu/people/faculty> and

<http://entomology.ca.uky.edu/people/staff>

Jessica Bessin <jessica.bessin@uky.edu>

Daniel Hemmann <DHemmann@jbzoo.org>

Randy Hunt <rhunt01@ius.edu>

Jerry Zhu (Junwei) <jerry.zhu@usda.gov>

Rodney Cooper <rodney.cooper@usda.gov>

Tom Coleman <tom.coleman@usda.gov>;

Paul Lenhart <paul.a.lenhart2.mil@mail.mil>

Adam Baker <Adam.Baker@davey.com>

Mark Goodman <mhgoodman@gmail.com>

Jennifer Gordon <jgord13@gmail.com>

Philip Crain <philip.crain@corteva.com>

Alexandra Blevins <alexandra.blevins@ky.gov>

James Wagner <jwagner@transy.edu>

**ENT 770: Methods in Extension  
Course Syllabus – Spring 2022**

**Course Instructor:**

|                                                                                                                                     |
|-------------------------------------------------------------------------------------------------------------------------------------|
| Jonathan Larson<br>Office: S-225M Ag North<br>Email: jonathan.larson@uky.edu<br>Phone: 859-562-2614<br>Office Hours: by appointment |
|-------------------------------------------------------------------------------------------------------------------------------------|

**Meeting Place and Time: Tuesdays at 3-4 pm Eastern time**

*Both sections meet weekly (unless otherwise stated in the schedule)*

**Section 002**-In person meetings in room A5 of Ag Science North

**Section 202**-Please note, reliable internet access is required for this section.

Section 202 students need to access the Zoom link below

<https://uky.zoom.us/j/88066693738?pwd=R0NvWmVFaXE2TXJ5VGFCskt2bnFPZz09>

Passcode: 099158

You can view the videos asynchronously in Section 202 and still receive full credit for attendance.

**Course Materials & Communication:** The materials for this course will be minimal. Students should be prepared to use their own laptops/computers for writing and digital media creation. Students should also be prepared to use their personal cell phones for video, photo, and audio recording.

**Overview:** Cooperative Extension is over 100 years old in the United States. Originally aimed at “extending” the agricultural knowledge developed on land-grant university campuses to citizens of their respective states. Extension has expanded to include youth education through 4-H, nutritional education, and more. Extension is a career path for entomologists to consider but normally there is very little training in a graduate entomology program on how to prepare for what that career path entails. This course will be a primer on how to design your own Extension program and what the first and final steps are in that process. Extension programs may also utilize a number of tools to maximize their potential reach. Our one-hour credit seminar this semester will expose you to some of these tools and provide basic education on creating and publishing with them.

**Student Learning Outcomes:** Students who participate in this course will be able to:

1. Formulate a basic Extension program, describe the intent of the program, and design the needed steps for it to be successful.
2. Utilize a variety of Extension tools to reach the stated outcomes of their Extension program.
3. Be able to conceptualize the need for assessment of Extension programs and how to accomplish assessment.

**Weekly Schedule**

| Date | Week # | Topic                                                                                                                                                       |
|------|--------|-------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1-11 | 1      | <b>Introduction to Extension</b><br><i>What is Extension, the history of the Cooperative Extension program, and how do we build a modern Extension plan</i> |

|                                             |        |                                                                                                                                                                                                           |
|---------------------------------------------|--------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1-18                                        | 2      | <b>Working Session</b><br>Designing your theoretical Extension program for the semester                                                                                                                   |
| 1-25                                        | 3      | <b>Guest lecture from an Extension agent and an Extension specialist</b><br>Perspectives on joining Extension, what to consider when training for a career in Extension, and advice for building programs |
| 2-1                                         | 4      | <b>Creating traditional Extension publications (fact sheets)</b><br>Process, design, and utility                                                                                                          |
| 2-8                                         | 5      | <b>NO CLASS</b>                                                                                                                                                                                           |
| 2-15                                        | 6      | <b>Working Session</b><br>1 hour for writing a traditional factsheet                                                                                                                                      |
| 2-22                                        | 7      | <b>Producing Extension Video and Podcast Materials</b><br>Tools for recording, editing, and posting of materials                                                                                          |
| 3-1                                         | 8      | <b>Working Session</b><br>1 hour for recording and/or editing of audio-visual materials                                                                                                                   |
| 3-8                                         | 9      | <b>Social Media and Extension</b><br>Twitter, Facebook, TikTok, and more will be discussed as avenues of Extension                                                                                        |
| 3-15                                        | 10     | <b>Working Session</b><br>1 hour for generating social media plans and posts                                                                                                                              |
| 3-22                                        | 11     | <b>SPRING BREAK WEEK</b>                                                                                                                                                                                  |
| 3-29                                        | 12     | <b>Translating Science into Infographics</b><br>What is an infographic and how can you use them for Extension?                                                                                            |
| 4-5                                         | 13     | <b>Working Session</b><br>1 hour for creating an infographic factsheet                                                                                                                                    |
| 4-12                                        | 14     | <b>Guest Lecture: How to Assess and Why it is Paramount to Success</b><br>Dr. Jarrod Penn of LSU will join us over Zoom                                                                                   |
| 4-19                                        | 15     | <b>Working Session</b><br>1 hour for finalizing your Extension products                                                                                                                                   |
| 4-26                                        | 16     | <b>Working Session</b><br>1 hour for finalizing your Extension products                                                                                                                                   |
| <b>5-3<br/>Date to<br/>be<br/>confirmed</b> | FINALS | <b>Extension Product Showcase</b><br>Final session will be for students to show off and discuss their Extension products they have built and explain how they enhance their Extension program             |

**Grading:** Your grade will be based on your attendance weekly sessions (both lecture and working sessions) and on your completion of two Extension products to showcase.

#### Points

Attendance- 100

-Every unexcused absence subtracts 10 points

Final Products (x2)- 100 (50 points apiece)

Total: 200 points

Grading Scale is as follows

A: 100-89.9%    B: 89.8-79.9    C: 79.8-69.9%    D: 69.8-59.9%    F: <59.8%



**Attendance:** Attendance of all class meetings in person or via Zoom is required. If you are unexpectedly unable to attend a scheduled lecture due to an excused absence (outlined below) please alert Dr. Larson through email. Contact should occur within 48 hours of the missed class in order to receive a recording of the session for you to view.

**Excused Absences:** Academic policies regarding excused absences can be found in the Senate Rules under "Excused Absences". In the case that you have a valid excused absence, your grade will be re-distributed for the remaining class days.

**Academic Accommodations:** If you have a documented disability that requires academic accommodations, please contact the instructor(s) as soon as possible. Please initiate the accommodation process by submitting an online Intake Form (found at <http://www.uky.edu/DisabilityResourceCenter/content/apply-services>) or by contacting the Disability Resource Center (DRC). The DRC coordinates campus disability services available to students with disabilities. DRC staff will discuss possible accommodations with you and provide you with a Letter of Accommodation. Once you receive your Letter of Accommodation, please set up an appointment to discuss how your accommodation will be addressed. The DRC is located on the corner of Rose Street and Huguelet Drive in the Multidisciplinary Science Building, Suite 407. You can reach them via phone at (859) 257-2754 and via email at [drc@uky.edu](mailto:drc@uky.edu). Web address <http://www.uky.edu/StudentAffairs/DisabilityResourceCenter/>.

**Class Recording Notification:** Recordings will be made of this course in case of the event a student is unable to attend the session. These recordings will not be distributed to anyone other than class participants. The University of Kentucky Student Code of Conduct defines Invasion of Privacy as using electronic or other devices to make a photographic, audio, or video record of any person without their prior knowledge or consent when such a recording is likely to cause injury or distress.

**Cheating and Plagiarism:** The University's minimum penalty for cheating or plagiarism is a failing grade in the class.

**Emergency (only if we have any in person sessions):** If an emergency arises in this classroom, building or vicinity, your instructor will advise you of actions to follow to enhance your safety. If a situation requires emergency shelter (i.e., during a severe weather event), the nearest shelter location is Primary Safe Place(s): Floor 2 Hallway C200, between the two major groupings of classrooms in the center of the area, away from windows. Also, the areas just inside the entryways of both the men's and women's restrooms. Secondary Safe Place(s): Floor 2 All classrooms on either side of hallways UC201 and UC202 . These are listed as secondary because there is concern that many of these rooms will be locked a majority of the time. If building evacuation occurs (i.e., fire alarm), follow posted evacuation routes and assemble at the front entrance of Ag. North, so the instructor can help ensure their students have evacuated the building safely and they are not hindering emergency personnel access to the building. If you may require assistance during an emergency, notify the instructor at the beginning of the semester. In order to prepare for emergencies while on campus please view the emergency response guidelines at the UK Division of Crisis Management and Emergency Preparedness website: (<http://www.uky.edu/EM/emergency-response-guide.html>). To receive emergency messages, sign up for UK Alert (<http://www.uky.edu/EM/UKAlert>). Always turn cellular phones to silent mode when entering the classroom. If you observe or receive an emergency alert, immediately and calmly inform your instructor.

**Face Covering/Distancing Policy:** The Senate Council endorses the following recommended syllabus statements for faculty teaching face-to-face courses.

- In accordance with University guidelines, students must wear UK-approved face coverings in the classroom and academic buildings (e.g., faculty offices, laboratories, libraries, performance/design studios, and common study areas where students might congregate). If UK-approved face coverings are not worn over the nose and mouth, students will be asked to leave the classroom.
- Students should complete their daily online wellness screening before accessing university facilities and arriving to class.
- Students should not move chairs or barriers in classrooms and should socially distance at all times, leaving a six (6) foot radius from other people. Masks and hand sanitizer can be found {specific location in building} if needed.
- Students should leave enough space when entering and exiting a room. Students should not crowd doorways at the beginning or end of class.
- The instructor may choose to remove a mask when pedagogically necessary at the front of the classroom and behind a clear barrier. The instructor's mask will be replaced when it is no longer necessary to have it removed, or when the class meeting is complete.

**ENT 770: Invisible itches  
Course Syllabus – Spring 2021**

**Course Instructors:**

|                                                                                                                                                            |                                                                                                                                              |
|------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------|
| Jonathan Larson (Extension entomology)<br>Office: S-225M Ag North<br>Email: jonathan.larson@uky.edu<br>Phone: 859-562-2614<br>Office Hours: by appointment | Zach DeVries (Urban entomology)<br>Office: S-225H Ag North<br>Email: zdevries@uky.edu<br>Phone: 859-562-2856<br>Office Hours: by appointment |
|------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------|

**Meeting Place and Time:** Please note, reliable internet access is required for this course.

All classes will take place via zoom

(<https://uky.zoom.us/j/82653615569?pwd=eDRUU3JVRjRHT1V1bE9wT0dNM3hvZz09>).

We will be meeting weekly on Mondays from Jan.25, 2021 through May-3, 2021 at 1 pm (E) until 2 pm (E).

If you can't get the link to work, open (or download) Zoom and enter the following meeting code and password:

Meeting code- **826 5361 5569**

Passcode- **877369**

**Course Materials & Communication:** There will be assigned readings before certain sessions (outlined in the schedule below). These will be freely available through Blackboard or Canvas and we will alert you to their being uploaded and available.

**Overview:** Extension professionals and entomologists are often sought out for help in dealing with arthropod pest issues. In many cases, the problem and solution are straightforward, where the pest is identified and appropriate control measures are recommended. Unfortunately, there are also many instances where extension professionals and entomologists are confronted with clients who believe they are infested with insects or mites, despite no supporting evidence. This situation can be extremely emotional for the client and distressing to the entomologist/extension professional attempting to help. This seminar will explore invisible itches and their possible causes, as well as equip attendees with knowledge on how to best help the sufferer while also protecting themselves. Attendees will receive traditional lectures on the different elements of "invisible itches" and also participate in case studies, where each attendee will read and evaluate real cases of "invisible itches" and present their proposed plan to solve the problem.

**Student Learning Outcomes:** Students who work successfully in this course will:

1. Distinguish between cases that involve actual arthropods and those that are delusory.
2. Implement methods of education that help the client and protect themselves from harm.
3. Articulate to clients what the situation is that they are facing, without escalating the matter.

**Weekly Schedule**

| Date | Week # | Topic                                                                                                                                                                                                                                                                                                      |
|------|--------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1-25 | 1      | <b>Introduction</b><br><i>Reading:</i> Hinkle, N. C. (2000). <a href="https://ent.uga.edu/content/dam/caes-subsite/entomology/documents/publications/hinkle-publications/delusory.pdf">https://ent.uga.edu/content/dam/caes-subsite/entomology/documents/publications/hinkle-publications/delusory.pdf</a> |

|            |    |                                                                                                                                                                                                                  |
|------------|----|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 2-1        | 2  | <b>Case Studies:</b> Drs. Larson and DeVries will cover what they expect from each case study review                                                                                                             |
| 2-8        | 3  | <b>"The Infested Mind" by Jeffrey Lockwood (Larson)</b><br><i>Reading:</i> We will be reading Chapter 6 "The Terrible Trio: Imagining Insects into our Lives" from <i>The Infested Mind</i> by Jeffrey Lockwood. |
| 2-15       | 4  | <b>Case Studies:</b> Differentiating hallucinations, illusions, and delusions                                                                                                                                    |
| 2-22       | 5  | <b>Bed bugs (DeVries)</b><br><i>Reading:</i> We will be reading Chapter 13 "Mental Health Impacts" from <i>Advances in the Biology and Management of Modern Bed Bugs</i>                                         |
| 3-1        | 6  | <b>Case Studies:</b> Cases which may be complicated by bed bug issues                                                                                                                                            |
| 3-8        | 7  | <b>Mites and delusional parasitosis</b><br><i>Reading:</i> The Year of the Mite chapter                                                                                                                          |
| 3-15       | 8  | <b>Case Studies: Mites or no mites?</b>                                                                                                                                                                          |
| 3-22       | 9  | <b>The psychology of delusory parasitosis (Guest lecture: Dr. Hawthorne)</b>                                                                                                                                     |
| 3-29       | 10 | <b>Case Studies:</b> Integrating the psychological information                                                                                                                                                   |
| 4-5        | 11 | <b>Safety and legal issues pertaining to delusional parasitosis (DeVries)</b>                                                                                                                                    |
| 4-12       | 12 | <b>Case Studies:</b> Picking up on warning signs                                                                                                                                                                 |
| 4-19       | 13 | <b>Extension Therapy (Larson)</b>                                                                                                                                                                                |
| 4-26       | 14 | <b>Case Studies:</b> How to respond without escalating the situation                                                                                                                                             |
| <b>5-3</b> | 15 | <b>Panel discussion, advice from professionals around the country</b>                                                                                                                                            |

**Grading:** Your grade will be based on your attendance of the weekly sessions, your participation in discussions during case studies, and on your presentation two (2) case studies as assigned.

#### Points

Attendance 100

Discussion 50

Presentations 50 (25 points apiece)

Total: 200 points

Grading Scale is as follows

A: 100-89.9%    B: 89.8-79.9    C: 79.8-69.9%    D: 69.8-59.9%    F: <59.8%

**Attendance:** Attendance of all class meetings via Zoom is required. If you are unable to attend a scheduled lecture due to an excused absence (outlined below) please alert either Dr. Larson or Dr. DeVries by contacting them through email. You must contact one or both of the professors within 24 hours of the missed class in order to receive a recording of the session for you to view. If you have missed a discussion session where the class has covered case studies, you will not be required to watch those sessions but will instead need to prepare written responses to the cases that were presented that week and turn them in by Monday at noon of the following week (if you missed the session on February 1, you would be required to turn them in by noon on February 8).

**Excused Absences:** Academic policies regarding excused absences can be found in the Senate Rules under "Excused Absences". In the case that you have a valid excused absence, your grade will be re-distributed for the remaining class days.

**Academic Accommodations:** If you have a documented disability that requires academic accommodations, please contact the instructor(s) as soon as possible. Please initiate the accommodation process by submitting an online Intake Form (found at <http://www.uky.edu/DisabilityResourceCenter/content/apply-services>) or by contacting the Disability Resource Center (DRC). The DRC coordinates campus disability services available to students with disabilities. DRC staff will discuss possible accommodations with you and provide you with a Letter of Accommodation. Once you receive your Letter of Accommodation, please set up an appointment to discuss how your accommodation will be addressed. The DRC is located on the corner of Rose Street and Huguelet Drive in the Multidisciplinary Science Building, Suite 407. You can reach them via phone at (859) 257-2754 and via email at [drc@uky.edu](mailto:drc@uky.edu). Web address <http://www.uky.edu/StudentAffairs/DisabilityResourceCenter/>.

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**Face Covering/Distancing Policy (only if we have any in person meetings):** The Senate Council endorses the following recommended syllabus statements for faculty teaching face-to-face courses.

- In accordance with University guidelines, students must wear UK-approved face coverings in the classroom and academic buildings (e.g., faculty offices, laboratories, libraries, performance/design studios, and common study areas where students might congregate). If UK-approved face coverings are not worn over the nose and mouth, students will be asked to leave the classroom.

- Students should complete their daily online wellness screening before accessing university facilities and arriving to class.
- Students should not move chairs or barriers in classrooms and should socially distance at all times, leaving a six (6) foot radius from other people. Masks and hand sanitizer can be found {specific location in building} if needed.
- Students should leave enough space when entering and exiting a room. Students should not crowd doorways at the beginning or end of class.
- The instructor may choose to remove a mask when pedagogically necessary at the front of the classroom and behind a clear barrier. The instructor's mask will be replaced when it is no longer necessary to have it removed, or when the class meeting is complete.<sup>4</sup>

## **Ent 770: Grant-Writing Seminar**

Instructors: Nick Teets [n.teets@uky.edu](mailto:n.teets@uky.edu)  
317 Plant Sciences Building  
Office hours: by appointment on Zoom

Jen White [jenawhite@uky.edu](mailto:jenawhite@uky.edu)  
S-225G Ag Science Ctr N  
Office hours: by appointment at <https://uky.zoom.us/j/9536400919>

### **Course Description:**

This course will provide students with an introduction to the art of scientific grant writing. Topics include identifying appropriate grant programs, developing a competitive proposal, and finer points of scientific writing. The course is primarily discussion-based and will provide lots of opportunity for peer-to-peer feedback.

### **Class Delivery**

All classes will meet on Zoom at <https://uky.zoom.us/j/83233024322>. For part of the course, the class will be divided into two groups that meet alternate weeks. Details will be provided by the instructors.

### **Course Materials:**

All materials for the course will be provided by the instructors through Canvas and email.

### **Student Learning Outcomes:**

Upon completion of this course, students should be able to:

1. Identify appropriate grant programs to support their research and/or education.
2. Prepare the various sections of a grant proposal, as well as the supplementary documents that typically accompany a proposal.
3. Critically evaluate their own writing and the writing of others to identify issues with content, structure, and clarity.
4. Explain the general process of applying for a grant, receiving feedback, and administering a grant after it is funded.

### **Grading:**

Grades will be awarded based on the following scale:

A = 90% and above

B = 80-89%

C = 70%-79%

D = 60%-69%

E = less than 60%

The evaluation for the course is 50% class participation and 50% written assignments. Written assignments are primarily evaluated for effort and attention to instructions. Unexcused late assignments will be deducted 5% of the total score for each day late, at the discretion of the instructor.

**Course Outline** (Group 1 meets Fridays at 9 AM. Group 2 Meets Fridays at 12 PM)

| Date   | Topic                                                                                                                                                                                    | Before class                                                                                           |
|--------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------|
| Jan 29 | Introduction to grant proposal structure<br>Finding and reading RFAs<br>Concept maps and logic models                                                                                    | Glance over RFAs                                                                                       |
| Feb 5  | Specific Aims<br>Maximizing your Overview and Objectives                                                                                                                                 | Glance over successful proposal examples<br>Read example overviews and objectives                      |
| Feb 12 | Providing constructive feedback, writing reviews<br>Touting yourself (without braggin') in personal statements/job apps.                                                                 | Read Schimel Chs 1-6<br>Review example proposal<br>Read <i>Botham and Evans</i> article on fellowships |
| Feb 19 | Pitch your Idea! Group 1                                                                                                                                                                 | <b>Group 1: submit idea pitches by Feb 12</b><br>Read Group 1 idea pitches                             |
| Feb 26 | Pitch your Idea! Group 2                                                                                                                                                                 | <b>Group 2: submit idea pitches by Feb 19</b><br>Read Group 2 idea pitches,<br>Read Schimel Chs 7-9    |
| Mar 5  | Panel digest (what happens behind closed doors)                                                                                                                                          | Read Schimel Chs 10-13                                                                                 |
| Mar 12 | <b>Group 1 discussion</b>                                                                                                                                                                | <b>Group 1: distribute first drafts by Mar 5</b><br>Read material from your group                      |
| Mar 19 | <b>Group 2 discussion</b>                                                                                                                                                                | <b>Group 2: distribute first drafts by Mar 12</b><br>Read material from your group                     |
| Mar 26 | <b>No class – Academic Holiday</b>                                                                                                                                                       |                                                                                                        |
| Apr 2  | Effective use of figures and tables<br>In class writing/editing/reviewing exercises<br>Common grammatical/structural pitfalls                                                            | Read Schimel Chs 14-16, 18                                                                             |
| Apr 9  | Budgets/ the form side of life<br>Assessing fit, broader impacts,                                                                                                                        | Look at example full proposal(s)                                                                       |
| Apr 16 | <b>Group 1 discussion</b>                                                                                                                                                                | <b>Group 1: distribute “final” drafts by April 9</b>                                                   |
| Apr 23 | <b>Group 2 discussion</b>                                                                                                                                                                | <b>Group 2: distribute "final" drafts by April 16</b>                                                  |
| Apr 30 | What happens after you get your grant?<br>Door 1: Try try again; interpreting reviews, revision and resubmission<br>Door 2: OMG, now you have to do it.<br>Realities of grant management |                                                                                                        |



Pitch your idea! = 1.5 page Overview and Objectives to convey your concept. Can be accompanied by diagrams. Be creative!

Text: Writing Science, Joshua Schimel

### **Expectations:**

Extensive time outside of class hours will be required for you to be successful in this course. Indicated reading and written assignments should be completed before class to facilitate fruitful, productive discussions during class. We also expect students to be kind and respectful when providing feedback to their peers. Sharing one's writing can be a daunting task, so constructive yet considerate feedback will make the class more enjoyable for all.

### **Course Policies:**

#### Student Conduct:

Students are expected to abide by the student code of conduct as described by the office of student affairs (<http://www.uky.edu/StudentAffairs/Code/>). This class aims to be a safe and accepting environment for all, and actions that prevent that will not be tolerated.

#### Excused Absences and Verification of Absences:

You will only be able to make up assignments with an excused absence as defined by the University in Senate Rule 5.2.4.2 (see [www.uky.edu/ombud/excused-absences](http://www.uky.edu/ombud/excused-absences)). Documentation will be required and must be provided within one week following the excused absence.

If you know ahead of time that you will be missing a class period, we strongly encourage you to notify us prior to the day of the class. In the case of excused absences, arrangements may be made to complete any in-class work or quizzes outside of class time.

#### Accommodations Due to Disability:

To receive accommodations for this course, you must provide a Letter of Accommodation from the Disability Resource Center (DRC). You can reach them at 859-257-2754 or [drc@uky.edu](mailto:drc@uky.edu). Visit [www.uky.edu/StudentAffairs/DisabilityResourceCenter](http://www.uky.edu/StudentAffairs/DisabilityResourceCenter) for more information. Please contact me if you need assistance with this process.

### **Academic Honesty:**

It is your responsibility to familiarize yourself with the definitions of and sanctions for cheating and plagiarism at the University of Kentucky. Information on plagiarism at the University of Kentucky can be found at the following site: <http://www.uky.edu/Ombud/Plagiarism.pdf>.

While we encourage you to work together outside of class, we expect that each student will be solely responsible for the content of their assignments.

**The first cheating/plagiarism infraction will result in zero credit for the assignment/quiz/exam. Any second infraction will incur an E (failing) grade for the course.**

Rules governing cheating and plagiarism are in accord with Section VI of the code of student conduct (<http://www.uky.edu/StudentAffairs/Code/part2.html>).

### **Class Recording Notification**

The University of Kentucky Student Code of Conduct defines Invasion of Privacy as using electronic or other devices to make a photographic, audio, or video record of any person without their prior knowledge or consent when such a recording is likely to cause injury or distress.

Meetings of this course may be recorded. All video and audio recordings of lecturers and class meetings, provided by the instructors, are for educational use by students in this class only. They are available only through the Canvas shell for this course and are not to be copied, shared, or redistributed.

As addressed in the Student Code of Conduct, students are expected to follow appropriate university policies and maintain the security of linkblue accounts used to access recorded class materials. Recordings may not be reproduced, shared with those not enrolled in the class, or uploaded to other online environments.

If the instructor or a University of Kentucky office plans any other uses for the recordings, beyond this class, students identifiable in the recordings will be notified to request consent prior to such use. In anticipation of such cases, students may be asked to complete an “authorization of use” form by a faculty member.

Video and audio recordings by students are not permitted during the class unless the student has received prior permission from the instructor. Any sharing, distribution, and or uploading of these recordings outside of the parameters of the class is prohibited. Students with specific recording accommodations approved by the Disability Resource Center should present their official documentation to the instructor.

All content for this course, including handouts, assignments, and lectures are the intellectual property of the instructors and cannot be reproduced or sold without prior permission from the instructors. A student may use the material for reasonable educational and professional purposes extending beyond this class, such as studying for a comprehensive or qualifying examination in a degree program, preparing for a professional or certification examination, or to assist in fulfilling responsibilities at a job or internship.

## ENT 770: Graduate School and Professional Development

Meeting time: Fridays at 1:30 to 3:00 p.m.

Meeting place: S-201 AGN

Zoom connection:

<https://uky.zoom.us/j/85395080640?pwd=cGtGWfVla0ZTMVd0QW1nU200R2tsUT09>

**Instructor:** Charles Fox  
**Office:** Ag Science Center North N-307B  
**Office Hours:** By appointment  
**Telephone:** 859-904-9404  
**E-mail:** cfox@uky.edu  
**Textbook:** None. Some small projects/readings will be assigned.  
**Course description:** This seminar introduces the Department of Entomology, the careers available in the field, and some tools-of-the trade.

| Date / Location          | Topic                                                                                                                                                                                                                                                                                                                                                                                                                                |
|--------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| August 26<br>AgN S201    | Introduction to the Department<br><b>Dr. Reddy Palli</b> , Department Chair<br><b>Tymory Stanton</b> , Business Officer<br><b>Jessica Alkenbrack</b> , Administrative Support<br><b>Sarah Habel</b> , Human Resources Coordinator<br><b>Brian Lauer</b> , IT Support<br><b>Dr. Tonja Fisher</b> , Director on online MS Program<br><b>Charles Fox</b> , Director of Graduate Studies<br>The Syllabus. The Graduate Student Handbook. |
| September 2<br>AgN S201  | Faculty Group I,<br><b>Dr. Stephen Dobson</b><br><b>Dr. Julian Dupuis</b><br><b>Dr. David Gonthier</b><br><b>Dr. Zain Syed</b><br>Dr. Dobson will start the session on entrepreneurial opportunities                                                                                                                                                                                                                                 |
| September 9<br>AgN S201  | Faculty Group II,<br><b>Dr. Nick Teets</b><br><b>Dr. Zach DeVries</b><br><b>Dr. Nathan Haan</b><br><b>Dr. Clare Rittschof</b>                                                                                                                                                                                                                                                                                                        |
| September 16<br>AgN S201 | Faculty Group III, Extension Entomology<br><b>Dr. Ric Bessin</b><br><b>Dr. Jonathan Larson</b><br><b>Dr. Raul Villanueva</b><br>Dr. Bessin will start the session on Extension mission of the department                                                                                                                                                                                                                             |
| September 23<br>AgN S201 | Individual development plans<br><b>Dr. Reddy Palli</b><br>Completion of the survey at <a href="http://myidp.sciencecareers.org">myidp.sciencecareers.org</a> <b>before</b> class is required                                                                                                                                                                                                                                         |

|                                |                                                                                                                                                                                                                                                                                   |
|--------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| September 30<br>AgN S201       | Scientific presentations<br><b>Dr. Lynne Rieske-Kinney</b>                                                                                                                                                                                                                        |
| October 7<br>AgN S201          | Student-initiated grants<br><b>Dr. Jen White</b>                                                                                                                                                                                                                                  |
| October 14<br>AgN S201         | Scientific publications<br><b>Dr. Charles Fox</b><br>Take online CITI RCR course before class                                                                                                                                                                                     |
| October 21<br>Zoom             | Diverse careers with an MS degree<br><b>Alexandra Blevins</b> , Kentucky Division of Forestry<br><b>Daniel Hemmann</b> , Area Curator, John Ball Zoological Garden                                                                                                                |
| October 28<br>Zoom             | Careers in the Military, <b>Captain Dr. Paul Lenhart</b> , US Army<br>Hosted by <b>Jen White</b>                                                                                                                                                                                  |
| November 4<br>Zoom             | Diverse careers with the federal government<br><b>Dr. Junwei "Jerry" Zhu</b> USDA, ARS, Agroecosystem Management<br><b>Dr. Rodney Cooper</b> , USDA ARS, Temperate Tree, Fruit and Vegetable Research<br><b>Dr. Tom Coleman</b> , Forest Service, Slow the Spread Program         |
| November 11<br>AgN S201        | Preparing your CV<br><b>Dr. Xuguo "Joe" Zhou</b>                                                                                                                                                                                                                                  |
| November 18<br>Zoom            | Expectations at teaching-focused universities vs. research-focused universities<br><b>Dr. Randy Hunt</b> , Indiana University Southeast<br><b>Dr. James Wagner</b> , Transylvania University                                                                                      |
| November 25<br><i>No class</i> | <i>Thanksgiving break</i>                                                                                                                                                                                                                                                         |
| December 2<br>Zoom             | Diverse careers in industry, pest control, and consulting<br><b>Dr. Adam Baker</b> , Davey Tree Expert Company<br><b>Dr. Mark Goodman</b> , Plunkett's Pest Control Company<br><b>Dr. Jennifer Gordon</b> , Bug Lessons Consulting<br><b>Dr. Phil Crain</b> , Corteva Agriscience |

**Attendance:** Attendance at all class meetings is required.

**Grading:** Your grade in this seminar will be based on attendance (10 pts per meeting) and participation (10 pts per meeting). There are 14 meetings, and thus 280 pts.

| <u>Letter grade</u> | <u>Percent of available points</u> |
|---------------------|------------------------------------|
| A                   | 90% or better                      |
| B                   | 80 to 89.9%                        |
| C                   | 70 to 79.9%                        |
| E                   | 69.9% or below                     |

**Academic Policies (follow these links for additional information):**

- [Excused Absences and Acceptable Excuses](#)
- [Religious Observances](#)
- [Verification of Absences](#)
- [Make-Up Work](#)

In the case that you have a valid excused absence, a video recording of the missed session will be available. Viewing that video will count towards attendance. A make-up assignment would also be substituted for the participation score.

- [Excused Absences for Military Duties](#)
- [Unexcused Absences](#)
- [Prep Week and Reading Days](#)
- [Accommodation Due to Disability](#)
- [Non-Discrimination Statement and Title IX Information](#)

**Face Covering:**

Masks are no longer required inside of all University of Kentucky indoor spaces, but I ask that you wear a mask for in-person sessions to ensure that all of our guests feel comfortable in the classroom.

**Class Recording Notification:**

The University of Kentucky Student Code of Conduct defines Invasion of Privacy as using electronic or other devices to make a photographic, audio, or video record of any person without their prior knowledge or consent when such a recording is likely to cause injury or distress.

**Meetings of this course will be recorded.** All video and audio recordings of lecturers and class meetings, provided by the instructors, are for educational use by students in this class only. They are available only through the Canvas shell for this course and are not to be copied, shared, or redistributed.

**Diversity, Equity, and Inclusion:**

The University of Kentucky is committed to our core values of diversity and inclusion, mutual respect and human dignity, and a sense of community (Governing Regulations XIV; <https://www.uky.edu/regs/gr14>). We acknowledge and respect the seen and unseen diverse identities and experiences of all members of the university community. These identities include but are not limited to those based on race, ethnicity, gender identity and expressions, ideas and perspectives, religious and cultural beliefs, sexual orientation, national origin, age,

ability, and socioeconomic status. We are committed to equity and justice and providing a learning and engaging community in which every member is engaged, heard, and valued.

We strive to rectify and change behavior that is inconsistent with our principles and commitment to diversity, equity, and inclusion. If students encounter such behavior in a course, they are encouraged to speak with the instructor of record and/or the Office of Institutional Equity and Equal Opportunity (<https://www.uky.edu/eoo/>). Students may also contact a faculty member within the department, program director, the director of undergraduate or graduate studies, the department chair, any college administrator, or the dean. All of these individuals are mandatory reporters under University policies.

**Visitor contact information:**

Entomology faculty/staff email addresses are available at

<http://entomology.ca.uky.edu/people/faculty> and

<http://entomology.ca.uky.edu/people/staff>

Jessica Bessin <jessica.bessin@uky.edu>

Daniel Hemmann <DHemmann@jbzoo.org>

Randy Hunt <rhunt01@ius.edu>

Jerry Zhu (Junwei) <jerry.zhu@usda.gov>

Rodney Cooper <rodney.cooper@usda.gov>

Tom Coleman <tom.coleman@usda.gov>;

Paul Lenhart <paul.a.lenhart2.mil@mail.mil>

Adam Baker <Adam.Baker@davey.com>

Mark Goodman <mhgoodman@gmail.com>

Jennifer Gordon <jgord13@gmail.com>

Philip Crain <philip.crain@corteva.com>

Alexandra Blevins <alexandra.blevins@ky.gov>

James Wagner <jwagner@transy.edu>

**Course: ENT 770 -004 & -203**  
**Title: CULTURAL ENTOMOLOGY**

Term: Fall, 2022

Credit hours: 1

Meeting days/time/location: Tuesday, 3:30-5:00pm, Agricultural Science Center North, Rm S-221

### **Instructor Information**

Name: **Xuguo “Joe” Zhou**

Email: **xuguo Zhou@uky.edu**

Office building and room number: **Agricultural Science Center North, Rm. S-225D**

Office phone: **(859) 257-3125**

Office hours: **by appointment**

Virtual office hours: **by appointment**

### **Course Description**

Humans have been co-evolving with insects long before we became *Homo sapiens*. Insects, on the other hand, have shaped our society both culturally and historically. Known as a symbol of royalty, resurrection, and eternal cycle of life, ancient Egyptians worship the scarab beetle. Pre-Columbian Mayan and Aztec cultures decorate wood, feathers, and clothing with scale-insect dyes and lacquers. In China, cricket fighting, originated from the royal court, has been a popular sport for nearly two millenniums. This class is intended to inspire students, Entomology major or none major, to see insects through art, science, history, and culture lens. This course should further students' experience with Entomology, enhance their appreciation for the insect diversity as it relates to diverse cultures, art, and science.

### **Course Prerequisites**

None.

### **Required Materials**

None.

### **Associated Expenses**

There are no anticipated expenses for this course beyond tuition.

### **Activities Outside of Regular Class Meetings**

None.

### **Skill and Technology Requirements**

No special skills or technological requirements are anticipated for this course.

### **Student Learning Outcomes**

#### ***Learning Outcomes***

Upon successful completion of this course, students will be able to:

1. Write a paper that is essentially free of mechanical errors (grammar, punctuation, spelling, and syntax) and awkwardness, using a style that is appropriate to the purpose and audience.
2. Demonstrate an ability to discover, evaluate, and clearly present evidence in support of an argument in the subject area and utilize documentation that conforms to the formats and the citation conventions of the subject area.
3. Be aware that composing a successful text frequently takes multiple drafts, with varying degrees of focus on generating, revising, editing, and proofreading.
4. Write a capable, interesting essay about a complex issue (discipline-specific) for a general university audience.

### *Course Objectives*

1. Discuss the general aspects of Cultural Entomology.
2. Demonstrate an ability to acquire and evaluate scientific literature (especially primary literature) that is relevant to a specific topic of interest.
3. Orally present relevant background information and tell a story of the influences of insects on our society, culturally and historically.
4. Write a review article.

### *Course Format*

The course is comprised of (guest) lectures on how insects have shaped our society historically and culturally and will provide you with the topics/tools to produce an oral presentation and a mini review, in some cases, a peer-reviewed journal article (depending on your interest and effort).

### **Course Details**

#### *Course Activities and Exams (there are no midterms or exams)*

Grades will be based on assignments, class attendance, and participation. All assignments, whether submitted as hardcopy or electronic documents, must be available to the instructor by the due date and time. There are penalties for late submissions (see Policies section). Please see below under Grading for a description of required activities for the course along with deadlines.

Note that most written assignments will be submitted electronically as specified by the instructor. For MS-Word documents, use 1-inch margin on all sides, 1.5- or 2-line spacing (unless otherwise indicated), 12-point font size, and a header or footer on all pages showing page number (bottom, centered) and student's name (upper right-hand corner). Late submissions will be penalized as outlined in the "Policies" section.

#### **Tentative Topics\* for Cultural Entomology Seminar**

1. Role of Insects in Ancient Human History
2. Role of Insects in Modern Human History
3. Insect in Greek and Roman Antiquity
4. Insects in the Renaissance
5. History of Medical Entomology
6. Insects in Warfare (impact on WWII, Desert Storm, etc.; use of insects as weapons)
7. Insects as Food
8. Medicinal Uses of Insects (maggot therapy, etc.)



9. Forensic Entomology (use of insects in solving of crimes)
10. Insects in Mythology and Religion
11. Insects in Art and Music
12. Insects as Symbols
13. Insects in Poetry and Literature
14. Insects in Film (show videotape clips and discuss perceptions and attitudes)
  - a. Insects in Horror Movies
15. Insects in Children's Book
16. Insects in Popular Folklore
17. Insects in Romance
18. Insects in Gambling
19. Insects in Fashion
20. Insects in Architecture
21. Insects on Street Sign
22. Insects in Science (biomimetics or biomimicry)
23. Insects in Science (e.g. bioindicator such as monarch butterfly issues associated with Bt crops)

“\*”: You may combine some of the above topics or develop your own topic after consultation with me.

### **Oral Presentation**

I am expecting each presenter to give a PowerPoint presentation of at least 30 minutes on the topic of her/his choice. For the remainder of the 90 min-period, the presenter could:

1. Continue to lecture (i.e., give a presentation lasting longer than 30 min.)
2. Lead the group in discussion of one or more selected articles (electronic copies should be sent to the Cultural Entomology mailing list at the preceding week's session)
3. Conduct demonstrations (put on an insect-inspired dress), bring items for show & tell, etc.
4. Lead the class in any other activity pertaining to your topic (view videotape clips, read entomological poetry, taste freshly baked insect cookies, etc.)

The rest of the time, participants will comprise the "audience", asking questions, providing discussion, and critiquing the seminars of your colleagues. Your presentation should be illustrated with an appropriate assortment of slides, artifacts, audiotapes, videotapes, live demonstrations, "show and tell" objects, or other audiovisual aids. You should strive to make it as interesting, informative, and entertaining as possible. Be enthusiastic! Be outrageous! Have some fun! Let's think outside the box for a day. How you choose to handle your session is up to you.

### **Mini Review**

A 4–5-page standard literature review is required. The main goal of this part of assignment is to document the cultural entomological research you conducted in this course. Based on your personal interests and your time, we can potentially expand your reviews into a peer-reviewed journal article.

**Grading Scale**

|                     |                   |
|---------------------|-------------------|
| Attendance          | 10                |
| Class participation | 10                |
| Topic-of-choice     | 5                 |
| Oral presentation   | 35                |
| Peer evaluation     | 15                |
| Mini review         | 25                |
| <b>Total</b>        | <b>100 points</b> |

Letter grades will be based on the percentage of total points earned.

90% and above = A

80% to 89% = B

70% to 79% = C

60% to 69% = D

59% and below = E

**Midterm Grades**

*While there are no midterm exams in this course, I may post your grade to date in the class based on the assignments you have presented and that have been graded up to that point.*

**Grading Policies**

To pass the course, you must submit all formal assignments (in draft and final form) and earn a grade of C or higher on each. Assignments other than the formal writing enter into the final grade determination *only if you have achieved grades of C or higher on graded assignments*. Any major assignment that receives a D or below must be revised to reflect competency and resubmitted. You may resubmit such assignments 2 times. If you fail to achieve a C grade on the final version of any major writing assignment, you will receive a failing grade for the course.

At the discretion of the instructor, students who fail to achieve competency may receive I (incomplete) grades, but in no case may a student whose writing fails to reach the level of C (competent) receive a passing grade in a course that satisfies the University Writing Requirement.

**Plagiarism**

Part II of *Student Rights and Responsibilities* (6.3.1; online at <http://www.uky.edu/StudentAffairs/Code/part2.html>) states that all academic work, written or otherwise, submitted by students to their instructors or other academic supervisors, is expected to be the result of their own thought, research, or self-expression. In cases where students feel unsure about a question of plagiarism involving their work, they are obliged to consult their instructors on the matter before submission. When students submit work purporting to be their own, but which in any way borrows ideas, organization, wording or anything else from another source without appropriate acknowledgment of the fact, the students are guilty of plagiarism.

Plagiarism includes reproducing someone else's work, whether it is a published article, chapter of a book, a paper from a friend or some file, or whatever. Plagiarism also includes the practice of employing or allowing another person to alter or revise the work which a student submits as his/her own, whoever that other person may be. Students may discuss assignments

among themselves or with an instructor or tutor, but when the actual work is done, it must be done by the student, and the student alone.

When a student's assignment involves research in outside sources or information, the student must carefully acknowledge exactly what, where and how he/she has employed them. If the words of someone else are used, the student must put quotation marks around the passage in question and add an appropriate indication of its origin. Making simple changes while leaving the organization, content and phraseology intact is plagiaristic. However, nothing in these Rules shall apply to those ideas which are so generally and freely circulated as to be a part of the public domain.

### *Attendance Policy/Acceptable Documentation*

Formal written excuses, consistent with University regulations (SR: 5.2.4.1 and 5.2.4.2), will be required for each absence. University policies for excused absences are specified on the web page entitled Student Rights and Responsibilities  
<http://www.uky.edu/StudentAffairs/Code/part2.html>:

1. Students must notify the instructor of their absence prior to the absence or within **one week** after the absence.
2. Students must submit any written documentation supporting their excused absence within **one week** after the absence.
3. Absences for major religious holidays require **advance** written notification.

## Assignment Policies

### *Assignment Submissions*

Please submit all written assignments via Canvas. If you have any problems, please email me at [xuguozhou@uky.edu](mailto:xuguozhou@uky.edu).

### *Returning Assignments to Students*

I will provide comments and suggestions for your assignments in a timely fashion. If you feel that there has been an excessive delay in receiving your assignment back from me, e-mail me to determine the status of your assignment.

### *Late Assignments*

I will consider good reasons to request short extensions on assignments. However, if you submit assignments late, without first contacting me, you should expect a reduction of grade at the rate of 5% per day that the assignment is late. Per the [University Senate Rules](https://www.uky.edu/universitysenate/rules-regulations), within some guidelines late assignments must always be accepted for excused absences. (<https://www.uky.edu/universitysenate/rules-regulations>). Late work **not** previously excused will not be graded.

### *Assignments Due during Prep Week*

None.

## Academic Policy Statements

The University of Kentucky Senate has organized the academic policy of this institution. The full text can be found here:

[Academic Policy Statements](https://www.uky.edu/universitysenate/acadpolicy), (<https://www.uky.edu/universitysenate/acadpolicy>)

Snippets of the text can be found using the links below:

1. [Excused Absences and Acceptable Excuses](#)
2. [Religious Observances](#)
3. [Verification of Absences](#)
4. [Make-Up Work](#)
5. [Excused Absences for Military Duties](#)
6. [Unexcused Absences](#)
7. [Prep Week and Reading Days](#)
8. [Accommodation Due to Disability](#)
9. [Non-Discrimination Statement and Title IX Information](#)

### Academic Offenses (Cheating, Plagiarism, and Falsification or Misuse of Academic Records)

**Cheating and Plagiarism:** The Senate of the University of Kentucky has provided clear instructions in a link at <https://www.uky.edu/universitysenate/ao>. The minimum penalty for an academic offense, such as cheating or plagiarism, is a "0" on the assignment. Repeated offenses will result in more serious penalties. Students should be aware that failure of the course, suspension and dismissal from the University are also possible sanctions associated with either of these academic offenses.

For clarity, plagiarism is defined under *Senate Rules 6.3.1* ("Plagiarism") in the link provided above.

If there is any doubt in the student's mind of whether work to be submitted might be construed as plagiarized material, the student should consult with the instructor well before the deadline for submission of the assignment. It is the student's responsibility to write and present material that is free of plagiarism.

### Resources

The University of Kentucky offers a variety of resources to students. There is a comprehensive list of these resources available at the University Senate's [Resources Available to Students](https://www.uky.edu/universitysenate/student-resources) at: (<https://www.uky.edu/universitysenate/student-resources>).

These include:

1. [Bias Incident Support Services](#)
2. [Counseling Center](#)
3. [Disability Resource Center](#)
4. [Libraries](#)
5. [Martin Luther King Center](#)
6. [Non-Discrimination / Title IX](#)
7. [Office of LGBTQ\\* Resources](#)
8. [Veterans Resource Center](#)

## 9. [Violence Intervention and Prevention \(VIP\) Center](#)

### Diversity, Equity, and Inclusion

The University of Kentucky is committed to our core values of diversity and inclusion, mutual respect and human dignity, and a sense of community ([Governing Regulations XIV](#)). We acknowledge and respect the seen and unseen diverse identities and experiences of all members of the university community (<https://www.uky.edu/regs/gr14>). These identities include but are not limited to those based on race, ethnicity, gender identity and expressions, ideas and perspectives, religious and cultural beliefs, sexual orientation, national origin, age, ability, and socioeconomic status. We are committed to equity and justice and providing a learning and engaging community in which every member is engaged, heard, and valued.

We strive to rectify and change behavior that is inconsistent with our principles and commitment to creating a safe, equitable, and anti-racist environment. If students encounter such behavior in a course, they are encouraged to speak with the instructor of record or the [college's diversity officer](#), who is charged with addressing concerns about diversity, equity, and inclusiveness ([uky.edu/inclusiveexcellence/college-diversity-inclusion-officers](http://uky.edu/inclusiveexcellence/college-diversity-inclusion-officers)). Students may also contact a faculty member within the department, program director, the director of undergraduate or graduate studies, the department chair, or the dean. To submit an official report of bias, hatred, racism, or identity-based violence, visit the Bias Incident Support Services [website](#) (<https://www.uky.edu/biss/report-bias-incident>).

### Classroom Behavior Policies

The expectation is that all students will be present and seated by the beginning of class and that all students will remain until the end of the scheduled class period. Students who expect to be late or need to leave class early for valid reasons must notify the instructor prior to the class period. Students who habitually arrive late or leave before the class period ends will be warned by the instructor. If the behavior persists, a 5% deduction will be applied to the student's overall grade at the end of the course.

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to the A-6 Classroom of Ag Science Center North. If building evacuation occurs (i.e., fire alarm), follow posted evacuation routes and assemble at the Greenhouse building just east of Ag North so the instructor can help ensure their students have evacuated the building safely and they are not hindering emergency personnel access to the building. If you may require assistance during an emergency, notify the instructor at the beginning of the semester. In order to prepare for emergencies while on campus please continue to the below links for detailed emergency response guidelines: the UK Division of Crisis Management & Preparedness website (<http://www.uky.edu/EM/emergency-response-guide.html>) and the College of Agriculture, Food and Environment (<http://www.ca.uky.edu/>). To receive emergency messages, sign up for UK Alert (<http://www.uky.edu/EM/UKAlert>). Always turn cellular phones to silent mode when entering the classroom. If you observe or receive an emergency alert, immediately and calmly inform your instructor.

If you become aware of gunfire occurring in or near the building, remain in the classroom and lock or barricade the door(s). Stay away from windows. Hide under a desk or in the corner. **Do not unlock the door for anyone.** A UK Police Officer or other official will unlock the door and provide instructions once the situation is resolved.

### Course Recordings – Synchronous and Asynchronous lecture delivery

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Meetings of this course may be recorded. All video and audio recordings of lecturers and class meetings, provided by the instructors, are for educational use by students in this class only. They are available only through the Canvas shell for this course and are not to be copied, shared, or redistributed.

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### Course Copyright

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and professional purposes extending beyond this course and term, such as studying for a comprehensive or qualifying examination in a degree program, preparing for a professional or certification examination, or to assist in fulfilling responsibilities at a job or internship; other uses of original instructor-provided content require written permission from the instructor(s) in advance.

### Tentative Course Schedule\*

| Period                                                          | Date  | Topic(s)                                                                                                                                                                                                                                                                                   | Assignments     | Items Due              |
|-----------------------------------------------------------------|-------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------|------------------------|
| 1                                                               | 8-23  | Organization/Introduction                                                                                                                                                                                                                                                                  | Topic-of-choice | ---                    |
| 2                                                               | 8-30  | Cricket fight – a game for the royals (Joe Zhou, Department of Entomology, UK)                                                                                                                                                                                                             |                 |                        |
| September 5 - Labor Day                                         |       |                                                                                                                                                                                                                                                                                            |                 |                        |
| 5                                                               | 9-6   | Insects as agents of historical change (Ellen Klinger, Assistant Professor, Department of Entomology, The Ohio State University).                                                                                                                                                          |                 | Topic-of-choice is due |
|                                                                 | 9-13  | Insects in music videos (Joe Coelho, Professor, Department of Biology, Quincy University)                                                                                                                                                                                                  |                 |                        |
| 7                                                               | 9-20  | Fireflies in art: emphasis on Japanese woodblock prints from the Edo, Meiji, and Taishō periods (Deirdre A. Prischmann-Voldseth, Professor/Entomology, North Dakota State University)                                                                                                      |                 |                        |
| 8                                                               | 9-27  | Build a better presentation: tips for effective communication (Jonathan Larson, Assistant Professor, Department of Entomology, UK); Leaf masquerade mimicry in <i>Kallima</i> butterflies (Wei Zhang, Principal Investigator, Peking-Tsinghua Center for Life Sciences, Peking University) |                 |                        |
| 9                                                               | 10-4  | Insects in fashion (Tierney Brosius, Associate Professor, Department of Biology, Augustana College)                                                                                                                                                                                        |                 |                        |
| 10                                                              | 10-11 | O Dell, Jr., Kenneth                                                                                                                                                                                                                                                                       | Peer Evaluation | Peer Evaluation        |
| 11                                                              | 10-18 | Grady, Benjamin Ronald                                                                                                                                                                                                                                                                     | Peer Evaluation | Peer Evaluation        |
| October 24-25 - Monday and Tuesday - Fall Break (Midterm Grade) |       |                                                                                                                                                                                                                                                                                            |                 |                        |
| 12                                                              | 11-1  | Proctor, Jordyn Dawn                                                                                                                                                                                                                                                                       | Peer Evaluation | Peer Evaluation        |
| 13                                                              | 11-8  | Weger, Anastasia                                                                                                                                                                                                                                                                           | Peer Evaluation | Peer Evaluation        |
| November 13-16 - Open Week (ESA Meeting)                        |       |                                                                                                                                                                                                                                                                                            |                 |                        |
| 14                                                              | 11-22 | Ritter, Hannah Leigh                                                                                                                                                                                                                                                                       | Peer Evaluation | Peer Evaluation        |
| November 23-26 - Wednesday through Saturday - Thanksgiving      |       |                                                                                                                                                                                                                                                                                            |                 |                        |
| 15                                                              | 11-29 | Lucero, Isabelle Maria                                                                                                                                                                                                                                                                     | Peer Evaluation | Peer Evaluation        |
| 16                                                              | 12-15 | MINI REVIEW DUE (Final Grade will be posted by 12/19/21)                                                                                                                                                                                                                                   |                 |                        |

“\*”: This schedule is flexible; I also reserve the right to reorganize the schedule if necessary.

**Important Dates:** Class Meeting Dates: 8/22- 12/19/2022; Attendance Verification: 9/6 - 9/12/2022; Midterm Grading: 10/10 - 10/24/2022; and Final Grading: 12/5 - 12/19/2022.

**Deadlines:** Add Course: 8/26/2022; Change Grading Option: 9/9/2022; Drop Course Without W: 9/9/2022; Drop Course With W: 11/2/2022



**Course: ABT 201-001****Title: SCIENTIFIC METHOD IN BIOTECHNOLOGY**

Term: Spring, 2022

Credit hours: 1

Meeting days/time/location: Wednesday, 1:00-1:50 pm, Agricultural Science Center North, Rm N-12

**Instructor Information**

Name: Xuguo “Joe” Zhou

Email: xuguo Zhou@uky.edu

Office building and room number: Agricultural Science Center North, Rm. S-225D

Office phone: (859) 257-3125

Office hours: by appointment

Virtual office hours: by appointment

**Course Description****Overview**

This course introduces scientific research, writing and presentations emphasizing agricultural and medical biotechnology and related areas.

**Description**

A course designed to acquaint students with common experimental methods and techniques used in biotechnology. Students will be exposed to research programs that embody basic scientific reasoning, experimental strategies, the role biotechnology plays in society, and careers in biotechnology and science in general. Presentations will be delivered by individuals recognized for their scientific endeavors as well as in some cases the role they have played as research mentors for ABT students.

Students will use a collection of objective evaluation tools to assess the relative merits of individual programs as exemplified by publications, competitive funding, and societal contributions. Each student will be required to provide one written evaluation using the aforementioned tools. In addition, this course meets part of the University's upper division writing requirement (ABT 201 and ABT 301 together meet the upper division writing or composition/communication requirement, GCCR). A detailed description of the writing requirement is below. The class will provide the student with the basic skills needed for objective evaluation of research programs that might be of interest to them as an environment for completion of their ABT 395/399 requirement. It also introduces by example and assignment the scientific writing and presentation skills that are essential for success in the discipline.

**Course Prerequisites**

This is a writing-intensive course approved to partially fulfill the upper tier of the graduation writing requirement (GCCR). To receive GCCR credit for this course, you must have successfully completed the first-year writing requirement (CIS/WRD 110 and 111 or their equivalent) and have completed at least 30 hours of coursework. Please contact me if you have any questions.



### Required Materials

None.

### Associated Expenses

There are no anticipated expenses for this course beyond tuition.

### Activities Outside of Regular Class Meetings

None.

### Skill and Technology Requirements

Ability to access databases such as PubMed, Web of Science, and Journal Citation Reports as well as some granting agency databases. All are free for public use or available for free through UK. *For technical/account help, students can contact Information Technology Services by phone 859-218-HELP (4357) and via the [ITS Customer Services](https://www.uky.edu/its/customer-support-student-it-enablement/customer-services) page.* (<https://www.uky.edu/its/customer-support-student-it-enablement/customer-services>)

### Student Learning Outcomes

1. Write a paper that is essentially free of mechanical errors (grammar, punctuation, spelling, and syntax) and awkwardness, using a style that is appropriate to the purpose and audience.
2. Demonstrate an ability to discover, evaluate, and clearly present evidence in support of an argument in the subject area and utilize documentation that conforms to the formats and the citation conventions of the subject area.
3. Be aware that composing a successful text frequently takes multiple drafts, with varying degrees of focus on generating, revising, editing, and proofreading.
4. Write a capable, interesting essay about a complex issue (discipline-specific) for a general university audience.

### Course Details

#### *Course Activities and Exams*

There are no exams in this course. Please see below under Grading for a description of required activities for the course along with deadlines.

#### *Grading*

|                                       |                   |
|---------------------------------------|-------------------|
| Attendance                            | 10 points         |
| Class participation                   | 5 points          |
| CV Assignment                         | 10 points         |
| Critique of presentation              | 10 points         |
| Paper topic/justification/citations   | 10 points         |
| Paper draft                           | 20 points         |
| Final paper (25) and peer review (10) | 35 points         |
| <b>Total</b>                          | <b>100 points</b> |

Letter grades will be based on the percentage of total points earned.

|   |            |
|---|------------|
| A | 89.5-100%  |
| B | 79.5-89.4% |
| C | 69.5-79.4% |

|   |            |
|---|------------|
| D | 59.5-69.4% |
| E | <59.4%     |

*Class Attendance (10 pts):* Success in college and at work requires consistent and reliable effort. I place great emphasis on identifying speakers representing a range of subject areas and material. To understand the biotechnology field, you require this breadth of experience. Therefore, I expect attendance and class participation. **One unexcused absence is allowed. An unexcused absence will cost 5 points up to 10 pts total.** There is no penalty if you have an acceptable excuse for absence. If you know you will be absent, please let me know ahead of time. Attendance will be recorded by you signing in each meeting. It is your responsibility to sign the attendance sheet. Hand sanitizer will be available for you should you not have your own pen.

*Class participation (5 pts):* Class participation points will be awarded by you asking questions of the speakers. You will need to ask at least three questions during the semester and can only get credit for one question per speaker (thus, you need to ask at least one question of three different speakers – Of course you can ask more!).

*CV assignment (10 pts):* Each student is required to submit their CV following a standard format, which will be provided by our class email (ABT201-L@lsv.uky.edu). **The CV is due on February 16, 2022.**

*Critique of presentations (10pts):* Each student is required to evaluate one speaker presentation. The evaluation should include a brief synopsis of the research interests of the speaker and an evaluation of productivity and quality of the research program. You will need to do some background review of the speaker and will be directed to tools to accomplish this task. You will also be provided with a sample review. **This is due by April 27, 2022.** If you want feedback, critique needs to be submitted during, not the end of the semester.

*Term paper (topic/justification/citations – 10 pts; draft – 20 pts; peer review – 10 pts; final paper – 25 pts):* In this course, students will be required to write a minimum 1500 words (excluding references) of formal writing, **a term paper**, that is drafted, peer reviewed, and revised before grading by the instructor (**minimum of 1500 words is REQUIRED excluding references– word count should be listed on the cover page**). An additional page may be used for references and should **NOT** be included in the word count. **A minimum of five (5) references from the peer reviewed literature are required for the final paper.** Double space, one-inch margins and maximum size 12-point font, Times New Roman are acceptable. If you have questions about your topic, please contact the instructor. Your paper topic, one to two sentences explaining the significance of the topic, and three (of the five required) relevant citations formatted correctly are due to Dr. Zhou by **March 9, 2022**. The final version of term paper, along with a one-page written evaluation of one of the speaker's research program, will fulfill the writing requirement for ABT201. The formal paper for ABT201 may focus on one of the presentations or may address other current issues or research questions in science. Statements must be appropriately documented by references from the literature. **Web references should not be used.** Please note: ABT301 must also be completed to fulfill the GCCR.

***Draft-and-review process:***

Writing and revision of drafts is essential to effective composition and scientific writing. Scientific writing also differs from some other styles of composition in that it contains highly technical language with scientists placing great emphasis on precise, clear, and concise writing. To be successful at effective writing, you will need to write and revise your draft yourself, before giving it to your reviewer. You want to provide your reviewer with a well-written cohesive document on which they can provide further suggestions. You will be randomly assigned a classmate as your peer reviewer (a buddy system) and you two will be reviewing each other's term papers. If you have any suggestions regarding the assigned pairing, please let me know before February 2, 2022.

When you submit your paper on Canvas, please name the draft as: **Author name\_draft**. Please name the edited files as **Author name\_reviewer name**. Please name the final revised paper as: **Author name\_FINAL**.

*What should you cover in your term paper?:* You may discuss any scientific issue or research area of interest to you in your paper. You may also choose to write on one of the faculty that present a seminar about their research program. If you choose the later, your paper should provide a biography on the presenter (not more than one of the five pages) and a synopsis of the research program including a discussion about why the research is important. Please include your opinion on possible future directions for the research, and/or comment on a project that you would like to pursue in the presenter's lab. Regardless of whether you write about a presenter's program or on another scientific issue of interest to you, please remember that your paper should be written for a general university audience and should demonstrate an ability to clearly present and evaluate evidence. Also important is a discussion about why the research area is important (why should funding agencies give you taxpayer money for the research?).

### ***Grading Policies***

To pass the course, you must submit all formal assignments (in draft and final form) and earn a grade of C or higher on each. Assignments other than the formal writing enter into the final grade determination *only if you have achieved grades of C or higher on graded assignments*. Any major assignment that receives a D or below must be revised to reflect competency and resubmitted. You may resubmit such assignments 2 times. If you fail to achieve a C grade on the final version of any major writing assignment, you will receive a failing grade for the course.

At the discretion of the instructor, students who fail to achieve competency may receive I (incomplete) grades, but in no case may a student whose writing fails to reach the level of C (competent) receive a passing grade in a course that satisfies the University Writing Requirement.

### ***Plagiarism***

Part II of *Student Rights and Responsibilities* (6.3.1; online at <http://www.uky.edu/StudentAffairs/Code/part2.html>) states that all academic work, written or otherwise, submitted by students to their instructors or other academic supervisors, is expected to be the result of their own thought, research, or self-expression. In cases where students feel unsure about a question of plagiarism involving their work, they are obliged to consult their instructors on the matter before submission. When students submit work purporting to be their own, but which in any way borrows ideas, organization, wording or anything else from another source without appropriate acknowledgment of the fact, the students are guilty of plagiarism.

Plagiarism includes reproducing someone else's work, whether it is a published article, chapter of a book, a paper from a friend or some file, or whatever. Plagiarism also includes the practice of employing or allowing another person to alter or revise the work which a student submits as his/her own, whoever that other person may be. Students may discuss assignments among themselves or with an instructor or tutor, but when the actual work is done, it must be done by the student, and the student alone.

When a student's assignment involves research in outside sources or information, the student must carefully acknowledge exactly what, where and how he/she has employed them. If the words of someone else are used, the student must put quotation marks around the passage in question and add an appropriate indication of its origin. Making simple changes while leaving the organization, content and phraseology intact is plagiaristic. However, nothing in these Rules shall apply to those ideas which are so generally and freely circulated as to be a part of the public domain.

### ***Midterm Grades***

*For undergraduates, midterm grades will be posted in myUK by the deadline established by the University Senate and published in the [Academic Calendar](#). (<http://www.uky.edu/registrar/content/academic-calendar>)*

### ***Attendance Policy/Acceptable Documentation***

Please see above, "Attendance" for the policy. Allowable excused absences are detailed at <https://www.uky.edu/universitysenate/acadpolicy#Excused>

## **Assignment Policies**

### ***Assignment Submissions***

Please submit all written assignments via Canvas. If you have any problems, please email me.

### ***Returning Assignments to Students***

All comments on assignments will be available through email. While I will provide brief comments on the draft term paper, most comments should be from your peer reviewer. I will not comment in detail on the final term paper, but should you have questions or desire more feedback, please contact me.

### ***Late Assignments***

I will consider good reasons to request short extensions on assignments. However, if you submit assignments late, without first contacting me, you should expect a reduction of grade at the rate of 5% per day that the assignment is late. Per the [University Senate Rules](#), within some guidelines late assignments must always be accepted for excused absences. (<https://www.uky.edu/universitysenate/rules-regulations>).

### ***Assignments Due during Prep Week***

none

## **Academic Policy Statements**

Please see the Senate's [Academic Policy Statements](#), <https://www.uky.edu/universitysenate/acadpolicy>

## Academic Offenses (Cheating, Plagiarism, and Falsification or Misuse of Academic Records)

Please refer to [Rules Regarding Academic Offenses](https://www.uky.edu/universitysenate/ao), <https://www.uky.edu/universitysenate/ao>

## Resources

University of Kentucky home page: <http://www.uky.edu/>

RePORTER (NIH): <http://projectreporter.nih.gov/reporter.cfm>

NSF: <http://www.nsf.gov/awardsearch/>

CRIS: <https://cris.nifa.usda.gov/>

ISI Web of Knowledge: Go to UK libraries: <http://libraries.uky.edu/>; click database tab; click “W”; select “web of science” or “J” for Journal Citation Reports. At some point you will have to log in with UK ID and password.

Pubmed.gov: <https://pubmed.ncbi.nlm.nih.gov/>

Ag. Biotech home page: <http://abt.ca.uky.edu/>

The Robert E. Hemenway Writing Center: <https://wrd.as.uky.edu/writing-center>

## Diversity, Equity, and Inclusion

*The University of Kentucky is committed to our core values of diversity and inclusion, mutual respect and human dignity, and a sense of community ([Governing Regulations XIV](#)). We acknowledge and respect the seen and unseen diverse identities and experiences of all members of the university community (<https://www.uky.edu/regs/gr14>). These identities include but are not limited to those based on race, ethnicity, gender identity and expressions, ideas and perspectives, religious and cultural beliefs, sexual orientation, national origin, age, ability, and socioeconomic status. We are committed to equity and justice and providing a learning and engaging community in which every member is engaged, heard, and valued.*

*We strive to rectify and change behavior that is inconsistent with our principles and commitment to creating a safe, equitable, and anti-racist environment. If students encounter such behavior in a course, they are encouraged to speak with the instructor of record or the [college's diversity officer](#), who is charged with addressing concerns about diversity, equity, and inclusiveness ([uky.edu/inclusiveexcellence/college-diversity-inclusion-officers](http://uky.edu/inclusiveexcellence/college-diversity-inclusion-officers)). Students may also contact a faculty member within the department, program director, the director of undergraduate or graduate studies, the department chair, or the dean. To submit an official report of bias, hatred, racism, or identity-based violence, visit the Bias Incident Support Services [website](#) (<https://www.uky.edu/biss/report-bias-incident>).*

## Student Resources

*The University offers a variety of resources to students. Visit the University Senate's [Resources Available to Students](#) to access that list (<https://www.uky.edu/universitysenate/student-resources>).*

*These include:*

[Bias Incident Support Services](#)  
[Counseling Center](#)  
[Disability Resource Center](#)  
[Libraries](#)  
[Martin Luther King Center](#)  
[Non-Discrimination / Title IX](#)  
[Office of LGBTQ\\* Resources](#)  
[Veterans Resource Center](#)  
[Violence Intervention and Prevention \(VIP\) Center](#)

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entering the classroom. If you observe or receive an emergency alert, immediately and calmly inform your instructor.

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**TENTATIVE COURSE SCHEDULE (ABT 201-001, Spring 2022)**

| <b>Period</b>                                                                    | <b>Date</b> | <b>Guest Speaker</b>                                   | <b>Research Topic/Interest</b>                                                                    | <b>Assignment</b>               |
|----------------------------------------------------------------------------------|-------------|--------------------------------------------------------|---------------------------------------------------------------------------------------------------|---------------------------------|
| 1                                                                                | 1-12        | Joe Zhou, Entomology                                   | Introduction/CV                                                                                   |                                 |
| 2                                                                                | 1-19        | Nick Teets, Entomology                                 | Entomology from Kentucky to Antarctica: how do insects deal with extreme heat and cold?           |                                 |
| 3                                                                                | 1-26        | Sharyn Perry, Plant and Soil Sciences                  | On being a MADS-scientist: plant development and MADS-box genes                                   |                                 |
| 4                                                                                | 2-2         | Paul Vincelli, Plant Pathology                         | Promoting dialogue on controversial topics, with a focus on GE crops.                             |                                 |
| 5                                                                                | 2-9         | Eva Goellner, Toxicology and Cancer Biology            | How DNA repair fits into cancer research and environmental science?                               |                                 |
| 6                                                                                | 2-16        | Jessica Blackburn, Molecular and Cellular Biochemistry | Zebrafish transgenic model for drug screening in pediatric cancer.                                | CV                              |
| 7                                                                                | 2-23        | Austin Merchant, Entomology                            | Termite brain atlas: from Beijing to Lexington to Kyoko                                           |                                 |
| <b>March 2: Open Week</b>                                                        |             |                                                        |                                                                                                   |                                 |
| 8                                                                                | 3-9         | Olga Tsyusko, Plant and Soil Sciences                  | Environmental toxicity of nanomaterials and their potential applications                          | Topics/justifications/citations |
| <b>March 14: Midterm of 2022 Spring Semester - end of ninth week of classes</b>  |             |                                                        |                                                                                                   |                                 |
| <b>March 16: Spring Break</b>                                                    |             |                                                        |                                                                                                   |                                 |
| 9                                                                                | 3-23        | Analia Loria, Pharmacology and Nutritional Sciences    | Early life stress effects on cardiovascular diseases in mice models                               |                                 |
| 10                                                                               | 3-30        | Luke Bradley, Neuroscience                             | Alternative scaffolds for protein and peptide engineering                                         |                                 |
| 11                                                                               | 4-6         | Wei Ren, Plant and Soil Sciences                       | Climate Change & Agriculture: Quantifying Climate-Smart-Agriculture Management at Multiple Scales | Draft (term paper)              |
| 12                                                                               | 4-13        | Carlos M. Rodriguez Lopez, Horticulture                | Epigenetics, from environmental sex determination to biomarkers of wine quality                   | Peer review (term paper)        |
| 13                                                                               | 4-20        | Rebecca Dutch, Molecular and Cellular Biochemistry     | Research at UK on COVID-19                                                                        |                                 |
| 14                                                                               | 4-27        | Mixer                                                  | Welcome suggestions for the faculty member you want to invite                                     | Critique of presentation        |
| <b>May 4: Final version of term paper (Final Grade will be posted by 5/9/22)</b> |             |                                                        |                                                                                                   |                                 |

“\*”: This schedule is flexible; I also reserve the right to reorganize the schedule if necessary. Please note that some assignments may be due on days OTHER than Wednesday.

**Important Dates:** Class Meeting Dates: 1/10/2022 - 5/6/2022; Attendance Verification: 1/25/2022 - 1/31/2022; Midterm Grading: 2/28/2022 - 3/14/2022; and Final Grading: 4/25/2022 - 5/9/2022.



**Course: ABT 301-003****Title: WRITING AND PRESENTATION IN THE LIFE SCIENCES**

Term: Fall, 2022

Credit hours: 2

Meeting days/time/location: Monday and Wednesday, 9:00-9:50am, Agricultural Science Center North, Rm S-221

**Instructor Information**

Name: **Xuguo "Joe" Zhou**

Email: **xuguo Zhou@uky.edu**

Office building and room number: **Agricultural Science Center North, Rm. S-225D**

Office phone: **(859) 257-3125**

Office hours: **by appointment**

Virtual office hours: **by appointment**

**Course Description**

This class is intended to refine skills in communicating and evaluating science-based knowledge. Specific focus is given to the agricultural, biological, and biomedical sciences. One major goal is to facilitate the writing of an Agricultural Biotechnology Independent Research Proposal. In the process, students will learn how to evaluate relevant literature, think about science and the scientific process, and communicate scientific results and implications. This course should further the students' experience with science, enhance their appreciation for the scientific process, and what it means to conduct scientific research.

The specific goals for students are:

- Addressing the questions, "What is 'science'?" and "What is involved in planning a scientific investigation?"
- Reading and evaluating the science of others, with specific reference to the skills needed to communicate experimental design, results, and data interpretation.
- Orally presenting scientific research methods and results.
- Writing a research proposal and learning how to write effective scientific reports, papers, and a curriculum vitae (your written profile to the world).

**Course Prerequisites**

This is a communication-intensive course approved to fulfill the University's Graduation Composition and Communication Requirement (GCCR). To receive credit for this course, you must have:

- (i) successfully completed the first-year writing requirement (CIS/WRD 110 and 111),
- (ii) completed at least 30 hours of coursework, and
- (iii) successfully completed ABT 201.

One of the requirements to obtain an Agricultural Biotechnology degree is the successful completion of an independent research project (through either ABT 395, 396, or ABT 399). *ABT 301 is specifically intended for ABT students who are either actively engaged in research in a lab or are in the process of formulating a research project with their mentor, with whom they*

*have already entered into an agreement. **Much of the course is structured around the preparation and presentation of a formal research proposal, so it is essential that all students have a faculty research mentor identified BEFORE class commences.***

*It is the responsibility of each student to identify a research mentor and a research project. If you have not already identified a mentor, you should drop this course! You may take it next semester.*

- An e-mail address issued by the University of Kentucky
  - Note that all electronic communications with the instructor should be via the student's uky.edu address or by zoom.
- Good familiarity with:
  - Microsoft Word
  - Microsoft Powerpoint
  - Microsoft Excel or another program for preparing graphs.
- EndNote is a reference management system free to UK students. You will use this to prepare your proposals and to execute one of your assignments. We will have two lectures on its download (where to get it) and its installation and use.

### Required Materials

None.

### Associated Expenses

There are no anticipated expenses for this course beyond tuition.

### Activities Outside of Regular Class Meetings

The class will usually meet in room **Rm. S221**, Agricultural Science Center North although there are three, consecutive exceptions when the three Library Resources and EndNote lectures are given. These lectures will be presented in the Agricultural Library on the ground floor of Agricultural Science Center North.

### Skill and Technology Requirements

No special skills or technological requirements are anticipated for this course.

### Student Learning Outcomes

#### LEARNING OUTCOMES

Upon successful completion of this course, students will be able to:

1. Write a paper that is essentially free of mechanical errors (grammar, punctuation, spelling, and syntax) and awkwardness, using a style that is appropriate to the purpose and audience.
2. Demonstrate an ability to discover, evaluate, and clearly present evidence in support of an argument in the subject area and utilize documentation that conforms to the formats and the citation conventions of the subject area.
3. Be aware that composing a successful text frequently takes multiple drafts, with varying degrees of focus on generating, revising, editing, and proofreading.

4. Write a capable, interesting essay about a complex issue (discipline-specific) for a general university audience.

### **COURSE OBJECTIVES**

- Discuss the general aspects of scientific inquiry.
- Demonstrate an ability to acquire and evaluate scientific literature (especially primary literature) that is relevant to a specific field of interest.
- Orally present relevant background information and describe a proposed research project effectively.
- Write a formal research project proposal incorporating output from a variety of software packages (Word, Powerpoint, Excel, EndNote).

### **COURSE FORMAT**

The course is comprised of lectures on what will be expected for your research presentations and your research proposals and will provide you with the tools to produce both a meaningful research presentation and a logical, clear, and well-structured research proposal for use in ABT 395, 396, or 399.

### **Course Details**

#### *Course Activities. (There are no midterms or exams).*

Grades will be based on assignments, class attendance, and participation. All assignments, whether submitted as hardcopy or electronic documents, must be available to the instructor by the due date and time. There are penalties for late submissions (see Policies section).

*Note that failure to submit the "Final Proposal" on time will result in automatic failure of the course. This is a consequence of the fact that the course partially fulfills the upper division composition and communication requirement (see below).*

Note that most written assignments will be submitted electronically as specified by the instructor. **For MS-Word documents, use 1-inch margin on all sides, 1.5- or 2-line spacing (unless otherwise indicated), 12-point font size, and a header or footer on all pages showing page number (bottom, centered) and student's name (upper right-hand corner).** Late submissions will be penalized as outlined in the "Policies" section.

- **Assignments: Proposal Title, Library Exercise, Data Handling Exercise, and ABT CV (30 points)**

Unless otherwise stated, submissions must be as MS-Word files.

- **Assignment I: Proposal title; mentor's information; literature citations (5 points)**
  - A descriptive and focused proposal title (even if tentative) must be provided.
  - Your name and e-mail address must be provided. You must electronically (scan or otherwise) sign the document.
  - Your research mentor's name, department, and e-mail address must be provided. They must electronically (scan or otherwise) sign the document.

- Literature citations relevant to the proposed project must be provided.
- Citations (five in total) must be from the primary scientific literature.
- Citations must come from at least three different scientific journals.
- Use a standard citation format that includes all authors, year of publication, full article title, journal name, journal volume, and inclusive page numbers. You will be graded on the accuracy with which you follow the format style.

The template for this cover page is provided, in Word format, in Canvas under “Assignments”. This will also be the first page of your Draft and Final Research Proposal. Save it in a folder in which you will work on your Research Proposal in its various forms. Include it as the first page of your draft and final proposal submissions.

○ **Assignment II: Library Information Literacy Exercise (10 points)**

- Mr. Jason Keinsley will take us through this exercise either in person or by zoom.
- The database exercise must be completed and submitted electronically according to the deadline provided in the calendar above.
- You must download and SUCCESSFULLY install EndNote on your personal computers. This is free for UK students.
- Literature citations relevant to your proposed project must be provided **USING ENDNOTE** (citations provided type out by you are not acceptable).
- Citations (three in total) must be from the primary scientific literature.
- Citations must come from *three different* scientific journals. i.e. each citation, pertaining to your research project, will come from a different journal.
- Choose in EndNote, a standard journal citation format that includes all authors, year of publication, full article title, journal name, journal volume, and inclusive page numbers.

You will use EndNote or similar citation management program, throughout your careers. You will use it to develop your References cited section of your research proposal, both draft and final. You must get familiar using it and now is that time.

○ **Assignment III: ABT CV assignment (10 points)**

- Each student will submit an up-to-date draft (5 points) and final (5 points) curriculum vitae (CV) following the guidelines that have been established for the Agricultural and Medical Biotechnology CV Project.

○ **Assignment IV: Data Handling Assignment based on lectures (5 points)**

- An assignment focused on presenting data using tables and graphs based on the lectures will be submitted to me, preferably in MS-Word format.

● **Presentations (40 points)**

- Each student will make a practice (10 points) and a formal (15 points) oral presentation of their research proposal.

- A practice and a formal session will be scheduled by the instructor. Students are welcome to invite their research mentor to either in person or by zoom to actually or virtually, respectively, attend the presentations.
- **The PowerPoint file for the draft (practice) presentation must be provided to the instructor prior to the practice session.** This can be accomplished by sending the file as an e-mail attachment to xuguozhou@uky.edu. This file will assist the instructor in providing constructive comments about the presentation. *In addition, the student should bring a copy of the file on a USB drive on the day of the presentation so you can present it to your evaluators.*
- **Each student can meet with me either in person or virtually after the practice round to review performance and slides should you wish. Let me know and I will set up a time and/or a zoom link.**
- The PowerPoint file for the actual (formal) presentation must be provided to the instructor which will assist me in providing constructive comments about the presentation.
- *Practice Presentation = 10 points*
- *Final Presentation = 15 points*

- **Peer evaluation of presentations (10 points)**

- The practice (5 points) and formal (5 points) presentations of each student will receive comprehensive peer evaluations by the same peer evaluators. Ideally, every student in the class will critique two practice and two formal presentations in total. This is predicated on there being an even number of students in the course. The evaluators must attend both the practice and formal presentations of the student they will be evaluating.
- Evaluations are due electronically *within 48 hours* following the presentations and must follow the format provided in the Presentation Evaluation Form.
- The evaluation of the practice presentation should focus on the specific strengths and weaknesses of the presentation.
- The evaluation of the formal presentation should focus on the **relative improvement** over the practice presentation. *The improvement and level of effort made in revising practice slides is an important consideration.*
- Peer evaluations will not be used to assign a grade for the presentation, so be completely honest and critical, but in a constructive way.
- Peer evaluations will be graded on their thoroughness. Student evaluations should not be so general and vague that they are of little value to the presenter; they should make specific comments and recommendations.

- **Peer questions after the Formal presentations (5 points)**

- Each student will provide up to five questions for the formal presentation.

- **Research Proposal (30 points)**

- Each student will write a research proposal outlining the project they plan to conduct for ABT 395/399.
- The proposal must be prepared using the prescribed format.

- Each student will submit to the instructor an electronic file of the proposal first draft on or before the due date (see calendar above). This file will be distributed to two fellow students for peer review. The instructor will also provide a written review. Draft proposals should then be revised based on the review comments received from the instructor and the peer reviewers.
- The final version of the research proposal, revised based on the comments received from the three edits of the draft, is due by the date noted in the Calendar above.
- *Draft = 10 points*
- *Final Proposal = 15 points.*

***Note that failure to submit the "Final Research Proposal" on time will result in an automatic zero for the assignment.*** This is a consequence of the fact that the course partially fulfills the upper division-writing requirement (see below).

**• Peer reviews of ABT proposals (5 points)**

- The draft proposals will be provided to the same two peer reviewers who graded the practice presentations. All reviews are to be submitted to the instructor so that they can be made available to the author by two weeks before the due date for the final draft.
- Reviews should be constructive in nature.

**Total: 100 possible points**

**Bonus Points (5 points)**

You can earn a five bonus points by the following three ways:

1. Actively participate in class discussions;
2. Keep a perfect attendance record; and/or
3. Attend ABT395/99 presentations\*.

**“\*”: ABT395/99 ATTENDANCE:** What is ABT 301 preparing you for? It has provided you with a research plan that, if executed well, will make your time spent learning how to do research a valuable experience. Eventually then, you will have to report not on what you plan to do, but what you have done and how that worked out. What have you learned? This is ABT 395/396 and will take the form of a seminar where you will speak, much as you have done here in your presentations, about your results. What better way to prepare yourself for what is imminent than to attend some of your seniors' presentations? Especially since you will receive 5 bonus points toward your final ABT 301 003 grade to do so!

***Grading Scale***

90% and above = A  
 80% to 89% = B  
 70% to 79% = C  
 60% to 69% = D  
 59% and below = E

***Midterm Grades***

*While there are no midterm exams in this course, I may post your grade to date in the class based on the assignments you have presented and that have been graded up to that point.*

### ***Attendance Policy/Acceptable Documentation***

Formal written excuses, consistent with University regulations (SR: 5.2.4.1 and 5.2.4.2), will be required for each absence. University policies for excused absences are specified on the web page entitled Student Rights and Responsibilities

<http://www.uky.edu/StudentAffairs/Code/part2.html>:

- Students must notify the instructor of their absence prior to the absence or within **one week** after the absence.
- Students must submit any written documentation supporting their excused absence within **one week** after the absence.
- Absences for major religious holidays require **advance** written notification.

## **Assignment Policies**

### ***Assignment Submissions***

Your assignments will be submitted to me electronically, either by e-mail ([xuguo Zhou@uky.edu](mailto:xuguo Zhou@uky.edu)) or using Canvas. Both your Draft and your Finalized Research Proposals, written in Word, will be submitted on-line through Canvas where the program TurnItIn will examine each and alert you to problems. If you do not use Word as your writing software, you must tell me in advance so I can alter the program to allow submissions from your word handling software of choice.

### ***Returning Assignments to Students***

I will provide comments and suggestions for your assignments in a timely fashion. If you feel that there has been an excessive delay in receiving your assignment back from me, e-mail me ([xuguo Zhou@uky.edu](mailto:xuguo Zhou@uky.edu)) to determine the status of your assignment.

### ***Late Assignments***

Per the [University Senate Rules](#), within some guidelines late assignments must always be accepted for excused absences. (<https://www.uky.edu/universitysenate/rules-regulations>). Late work **not** previously excused will not be graded.

### ***Assignments Due during Prep Week***

Note that in Spring 2021, the University Senate changed the phrase "Dead Week" to "Prep Week." Given the current enrollment for this fall semester (4 students), we will use December 6<sup>th</sup> (Monday) and 8<sup>th</sup> (Wednesday) during the Prep Week for individual consultations (by appointment).

## **Academic Policy Statements**

The University of Kentucky Senate has organized the academic policy of this institution. The full text can be found here:

[Academic Policy Statements](https://www.uky.edu/universitysenate/acadpolicy), (<https://www.uky.edu/universitysenate/acadpolicy>)



Snippets of the text can be found using the links below:

- [Excused Absences and Acceptable Excuses](#)
- [Religious Observances](#)
- [Verification of Absences](#)
- [Make-Up Work](#)
- [Excused Absences for Military Duties](#)
- [Unexcused Absences](#)
- [Prep Week and Reading Days](#)
- [Accommodation Due to Disability](#)
- [Non-Discrimination Statement and Title IX Information](#)

### Academic Offenses (Cheating, Plagiarism, and Falsification or Misuse of Academic Records)

**Cheating and Plagiarism:** The Senate of the University of Kentucky has provided clear instructions in a link at <https://www.uky.edu/universitysenate/ao>. The minimum penalty for an academic offense, such as cheating or plagiarism, is a "0" on the assignment. Repeated offenses will result in more serious penalties. Students should be aware that failure of the course, suspension and dismissal from the University are also possible sanctions associated with either of these academic offenses.

For clarity, plagiarism is defined under *Senate Rules 6.3.1* ("Plagiarism") in the link provided above.

If there is any doubt in the student's mind of whether work to be submitted might be construed as plagiarized material, the student should consult with the instructor well before the deadline for submission of the assignment. It is the student's responsibility to write and present material that is free of plagiarism.

### Resources

The University has a variety of resources that you may find useful during the progress of this course. These include UK's [Distance Learning Library Services](#), [Tutoring and Coaching Resources](#), and proctoring information. ([https://libraries.uky.edu/page.php?lweb\\_id=1020](https://libraries.uky.edu/page.php?lweb_id=1020), <https://www.uky.edu/studentacademicsupport/free-tutoring-and-coaching-resources>).

### Diversity, Equity, and Inclusion

*The University of Kentucky is committed to our core values of diversity and inclusion, mutual respect and human dignity, and a sense of community ([Governing Regulations XIV](#)). We acknowledge and respect the seen and unseen diverse identities and experiences of all members of the university community (<https://www.uky.edu/regs/gr14>). These identities include but are not limited to those based on race, ethnicity, gender identity and expressions, ideas and perspectives, religious and cultural beliefs, sexual orientation, national origin, age, ability, and socioeconomic status. We are committed to equity and justice and providing a learning and engaging community in which every member is engaged, heard, and valued.*

*We strive to rectify and change behavior that is inconsistent with our principles and commitment to creating a safe, equitable, and anti-racist environment. If students encounter such behavior in*



a course, they are encouraged to speak with the instructor of record or the [college's diversity officer](#), who is charged with addressing concerns about diversity, equity, and inclusiveness ([uky.edu/inclusiveexcellence/college-diversity-inclusion-officers](http://uky.edu/inclusiveexcellence/college-diversity-inclusion-officers)). Students may also contact a faculty member within the department, program director, the director of undergraduate or graduate studies, the department chair, or the dean. To submit an official report of bias, hatred, racism, or identity-based violence, visit the Bias Incident Support Services [website](#) (<https://www.uky.edu/biss/report-bias-incident>).

## STUDENT RESOURCES

The University of Kentucky offers a variety of resources to students. There is a comprehensive list of these resources available at the University Senate's [Resources Available to Students](#) at: (<https://www.uky.edu/universitysenate/student-resources>).

These include:

- [Bias Incident Support Services](#)
- [Counseling Center](#)
- [Disability Resource Center](#)
- [Libraries](#)
- [Martin Luther King Center](#)
- [Non-Discrimination / Title IX](#)
- [Office of LGBTQ\\* Resources](#)
- [Veterans Resource Center](#)
- [Violence Intervention and Prevention \(VIP\) Center](#)

## Classroom Behavior Policies

The expectation is that all students will be present and seated by the beginning of class and that all students will remain until the end of the scheduled class period. Students who expect to be late or need to leave class early for valid reasons must notify the instructor prior to the class period. Students who habitually arrive late or leave before the class period ends will be warned by the instructor. If the behavior persists, a 5% deduction will be applied to the student's overall grade at the end of the course.

**Cell phones and texting/e-mail in class:** Please remember to turn your cell phone **to silent mode** while in class. Please do **NOT** send or read text or e-mail messages while in class, or read the newspaper, do other homework, surf the Internet or listen to music. We have many guest speakers who are very enthusiastic to visit with you and these types of activities would be disrespectful to the speaker and would distract from their lectures and your participation.

**Classroom Decorum:** All class participants are encouraged to voice their opinions regarding material presented in class. All discourse will be carried out in a respectful and professional manner. Personal attacks or denigrating statements of any sort will not be tolerated, and such instances will be referred to the University Ombud's Office.

## Emergency Preparedness

***Classroom Safety:*** In advance of inclement weather you are strongly urged to sign for the UK Emergency Alert system, which will alert you to campus delays, closings, and emergency events (see links below). If an emergency arises in this classroom, building or vicinity, your instructor will advise you of actions to follow to enhance your safety. If a situation requires emergency shelter (i.e., during a severe weather event), the nearest shelter location is in the hallways leading to the A-6 Classroom of Ag Science Center North. If building evacuation occurs (i.e., fire alarm), follow posted evacuation routes and assemble at the Greenhouse building just east of Ag North so the instructor can help ensure their students have evacuated the building safely and they are not hindering emergency personnel access to the building. If you may require assistance during an emergency, notify the instructor at the beginning of the semester. In order to prepare for emergencies while on campus please continue to the below links for detailed emergency response guidelines: the UK Division of Crisis Management & Preparedness website (<http://www.uky.edu/EM/emergency-response-guide.html>) and the College of Agriculture, Food and Environment (<http://www.ca.uky.edu/>). To receive emergency messages, sign up for UK Alert (<http://www.uky.edu/EM/UKAlert>). Always turn cellular phones to silent mode when entering the classroom. If you observe or receive an emergency alert, immediately and calmly inform your instructor.

If you become aware of gunfire occurring in or near the building, remain in the classroom and lock or barricade the door(s). Stay away from windows. Hide under a desk or in the corner. **Do not unlock the door for anyone.** A UK Police Officer or other official will unlock the door and provide instructions once the situation is resolved.

### Course Recordings – Synchronous and Asynchronous lecture delivery

The University of Kentucky Code of Student Conduct defines Invasion of Privacy as using electronic or other devices to make a photographic, audio, or video record of any person without their prior knowledge or consent when such a recording is likely to cause injury or distress.

Meetings of this course may be recorded. All video and audio recordings of lecturers and class meetings, provided by the instructors, are for educational use by students in this class only. They are available only through the Canvas shell for this course and are not to be copied, shared, or redistributed.

As addressed in the Code of Student Conduct, students are expected to follow appropriate university policies and maintain the security of linkblue accounts used to access recorded class materials. Recordings may not be reproduced, shared with those not enrolled in the class, or uploaded to other online environments.

If the instructor or a University of Kentucky office plans any other uses for the recordings, beyond this class, students identifiable in the recordings will be notified to request consent prior to such use. In anticipation of such cases, students may be asked to complete an “authorization of use” form by a faculty member.

Video and audio recordings by students are not permitted during the class unless the student has received prior permission from the instructor. Any sharing, distribution, and or uploading of these recordings outside of the parameters of the class is prohibited. Students with specific recording accommodations approved by the Disability Resource Center should present their official documentation to the instructor.

### Course Copyright

All original instructor-provided content for this course, which may include handouts, assignments, and lectures, is the intellectual property of the instructor(s) or guest lecturers. Students enrolled in the course this academic term may use the original instructor/guest lecturer-provided content for their learning and completion of course requirements this term, but such content must not be reproduced or sold. Students enrolled in the course this academic term are hereby granted permission to use original instructor-provided content for reasonable educational and professional purposes extending beyond this course and term, such as studying for a comprehensive or qualifying examination in a degree program, preparing for a professional or certification examination, or to assist in fulfilling responsibilities at a job or internship; other uses of original instructor-provided content require written permission from the instructor(s) in advance.

**Tentative Course Schedule\***

| Period                                                          | Date  | Topic(s)                                                               | Assignments                                                        | Items Due                                       |
|-----------------------------------------------------------------|-------|------------------------------------------------------------------------|--------------------------------------------------------------------|-------------------------------------------------|
| 1                                                               | 8-22  | Organization/Introduction                                              | Proposal title, mentor info, and citations of five relevant papers | ---                                             |
| 2                                                               | 8-24  | Scientific Method and Communication                                    | ---                                                                | ---                                             |
| 3                                                               | 8-29  | Literature search; Reading papers; Plagiarism                          | ---                                                                | ---                                             |
| 4                                                               | 8-31  | Data Handling                                                          | Data-handling Exercise                                             | ---                                             |
| September 5 - Labor Day                                         |       |                                                                        |                                                                    |                                                 |
| 5                                                               | 9-7   | Data Handling/Curriculum Vitae                                         | ---                                                                | Proposal title, mentor info, and five citations |
| 6                                                               | 9-12  | Research Paper                                                         | ---                                                                | ---                                             |
| 7                                                               | 9-14  | Research Paper                                                         | CV assignment                                                      | Data-handling Exercise                          |
| 8                                                               | 9-19  | Research Paper (Guest Speaker: Dr. Clare C. Rittschof)                 |                                                                    |                                                 |
| 9                                                               | 9-21  | Library Resources (Jason Keinsley)                                     | Library Resource Exercise                                          | ---                                             |
| 10                                                              | 9-26  | EndNote session I (Jason Keinsley)                                     | ---                                                                | ---                                             |
| 11                                                              | 9-28  | EndNote session II (Jason Keinsley)                                    | ---                                                                | Library Resource Exercise                       |
| 12                                                              | 10-3  | Presentation (Guest Speaker: Dr. Jonathan Larson)                      |                                                                    |                                                 |
| 13                                                              | 10-5  | Oral Presentation                                                      | ---                                                                | First Draft of CV                               |
| 14                                                              | 10-10 | Oral Presentation                                                      | ---                                                                | ---                                             |
| 15                                                              | 10-12 | Research Proposal                                                      | ---                                                                | ---                                             |
| 16                                                              | 10-17 | Research Proposal                                                      | ---                                                                | Final Version of CV                             |
| 17                                                              | 10-19 | Research Proposal (Guest Speaker: Dr. Nick Teets)                      |                                                                    |                                                 |
| October 24-25 - Monday and Tuesday - Fall Break (Midterm Grade) |       |                                                                        |                                                                    |                                                 |
| 18                                                              | 10-26 | Practice Presentation                                                  | Peer Evaluation                                                    | Evaluators must attend                          |
| 19                                                              | 10-31 | Practice Presentation                                                  | Peer Evaluation                                                    | Evaluators must attend                          |
| 20                                                              | 11-2  | Practice Presentation                                                  | Peer Evaluation                                                    | Evaluators must attend                          |
| 21                                                              | 11-7  | Practice Presentation                                                  | Peer Evaluation                                                    | Evaluators must attend                          |
| 22                                                              | 11-9  | Formal Presentation                                                    | Peer Evaluation                                                    | Draft of Research Proposal<br>All must attend   |
| November 13-16 - Open Days, ESA Annual Meeting                  |       |                                                                        |                                                                    |                                                 |
| 23                                                              | 11-21 | Formal Presentation                                                    | Peer Evaluation                                                    | All must attend                                 |
| November 23-26 - Wednesday through Saturday - Thanksgiving      |       |                                                                        |                                                                    |                                                 |
| 24                                                              | 11-28 | Formal Presentation                                                    | Peer Evaluation                                                    | Peer Review of Proposals<br>All must attend     |
| 25                                                              | 11-30 | Formal Presentation                                                    | Peer Evaluation                                                    | All must attend                                 |
| 26                                                              | 12-5  | Consultation by appointment                                            | ---                                                                | ---                                             |
| 27                                                              | 12-15 | FINAL VERSION OF PROPOSAL DUE (Final Grade will be posted by 12/19/21) |                                                                    |                                                 |

“\*”: This schedule is flexible; I also reserve the right to reorganize the schedule if necessary.

**Important Dates:** Class Meeting Dates: 8/22- 12/19/2022; Attendance Verification: 9/6 - 9/12/2022; Midterm Grading: 10/10 - 10/24/2022; and Final Grading: 12/5 - 12/19/2022.

**Deadlines:** Add Course: 8/26/2022; Change Grading Option: 9/9/2022; Drop Course Without W: 9/9/2022; Drop Course With W: 11/2/2022

# ABT 460

## Introduction to Molecular Genetics

Term: Fall 2022

Credit hours: 3

Meeting time: Monday/Wednesday 2:00 – 3:15 PM

Location: Agricultural Science Center North, Room N10

### Instructor Information

Name: Nick Teets

Email: n.teets@uky.edu

Office building and room number: Room 317 Plant Sciences Building

Office phone: (859) 257-7459

Office hours: Review session times to be determined, and you can email me to set up appointments for individuals or small groups. I'm happy to meet in person or over Zoom. Walk-ins are also welcome anytime I'm in my office!

### Course Description

ABT 460 provides students with an introduction to the molecular mechanisms underlying DNA replication, gene expression, and genome maintenance in prokaryotic and eukaryotic systems. This knowledge of molecular genetics will be applied to issues of development, evolution, disease, and biotechnology.

### Course Prerequisites

ABT/ENT 360 or BIO304 or consent of instructor.

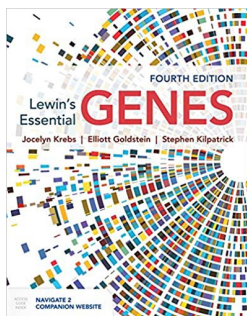
### Required Materials

There are no required materials for this course. Lecture slides will contain all the information covered on exams. The following textbook is recommended as a reference, and much of the information and graphics in lecture comes directly from the textbook:

Lewin's Essential Genes (4th edition)

Jocelyn E. Krebs, Elliot S. Goldstein, Stephen Kilpatrick

ISBN-13: 9781284173130



### Activities Outside of Regular Class Meetings

There are no required activities outside of class meetings. We will schedule optional review sessions based on the class's availability. These sessions will be held twice weekly, and the format (in person or on Zoom) will be decided by a class poll. We will likely do one session in person and one on Zoom to accommodate everyone's preferences. If it's impossible to find times that work for everyone, individuals or groups of students are welcome to schedule meetings with me outside of class to review materials.

### Skill and Technology Requirements

For the Biotechnology Bonanza assignment (see below), students will need to conduct a literature search and identify appropriate sources for their topic. General instructions will be provided in class.

### Student Learning Outcomes

Upon completion of this course, students should be able to:

1. Explain the fundamental concepts of DNA replication and gene expression at the molecular level.
2. Describe the fundamental differences between prokaryotic and eukaryotic molecular genetics.
3. Explain how genome structure and gene expression regulation contribute to the evolution of complex traits and disease states.
4. Apply understanding of molecular genetics and molecular biology techniques to solve real-world problems.

### Course Details

#### *Tentative Course Schedule*

| Date   | Topic                                | Optional Readings           |
|--------|--------------------------------------|-----------------------------|
| Aug 22 | Course Introduction (*pre-recorded!) | Chapter 1                   |
| Aug 24 | Chemical Structure of DNA            | Chapters 3-4                |
| Aug 29 | Genes and Genomes                    | Chapters 5-6                |
| Aug 31 | Genome structure and evolution       | Chapters 5-6                |
| Sep 5  | No class, Labor Day                  | NA                          |
| Sep 7  | Chromosomes and chromatin            | Chapters 7-8                |
| Sep 12 | DNA sequencing and analysis          | NA                          |
| Sep 14 | DNA Replication                      | Chapters 9-10               |
| Sep 19 | DNA Replication                      | Chapters 11-12              |
| Sep 21 | <b>Exam 1</b>                        | *Covers material up to 9/14 |
| Sep 26 | Recombination                        | Chapter 13                  |
| Sep 28 | DNA Repair                           | Chapter 14                  |
| Oct 3  | Mobile and extrachromosomal DNA      | Chapter 15                  |
| Oct 5  | Prokaryotic Transcription            | Chapter 16                  |
| Oct 10 | Eukaryotic Transcription             | Chapter 17                  |
| Oct 12 | <b>Exam 2</b>                        | *Covers Material up to 10/5 |
| Oct 17 | RNA splicing and processing          | Chapter 18                  |
| Oct 19 | mRNA stability and processing        | Chapter 19                  |
| Oct 24 | No class, Fall Break                 | NA                          |
| Oct 26 | Translation                          | Chapter 21                  |
| Oct 31 | Prokaryotic gene regulation          | Chapter 23                  |

|                                                                                          |                                    |                             |
|------------------------------------------------------------------------------------------|------------------------------------|-----------------------------|
| Nov 2                                                                                    | Eukaryotic gene regulation         | Chapter 25                  |
| Nov 7                                                                                    | Epigenetics                        | Chapter 26                  |
| Nov 9                                                                                    | Noncoding and regulatory RNA       | Chapters 27-28              |
| Nov 14                                                                                   | <b>Exam 3</b>                      | *Covers material up to 11/7 |
| Nov 16                                                                                   | Genome editing and gene drive      | NA                          |
| Nov 21                                                                                   | Genetics of cancer                 | NA                          |
| Nov 23                                                                                   | No class, Thanksgiving break       | NA                          |
| Nov 28                                                                                   | Genetics and human medicine        | NA                          |
| Nov 30                                                                                   | Viral genetics                     | NA                          |
| Dec 5                                                                                    | Molecular genetics and agriculture | NA                          |
| Dec 7                                                                                    | Final exam review                  | NA                          |
| <b>Final Exam: Monday, December 12, 3:30 PM in N10 Agricultural Science Center North</b> |                                    |                             |

### **Course Activities and Exams**

| <b>Assignment</b>                           | <b>Percent of final grade</b> |
|---------------------------------------------|-------------------------------|
| Exam 1                                      | 20                            |
| Exam 2                                      | 20                            |
| Exam 3                                      | 20                            |
| Final Exam                                  | 20                            |
| Quizzes, problem sets, in-class assignments | 15                            |
| “Biotechnology Bonanza” assignment          | 5                             |

#### Exams:

Each exam will test your knowledge of the materials covered in lectures, assigned readings, and other course materials (these may include videos, podcasts, website content, or information provided in other media). Exams will be “closed book,” although you are permitted one sheet of handwritten notes (front and back). Exams will consist of a mixture of questions, including short answer, essay, drawing/diagramming processes, multiple choice, and matching. The first three exams will not cover materials from previous sections (i.e. exam 2 will only cover materials introduced after exam 1), while the final exam will be partially cumulative. The final exam will include two sections, one that covers materials introduced after exam 3, and a comprehensive section that will test your knowledge of the course materials as a whole.

#### Quizzes and problem sets:

Short quizzes and assignments will be given periodically to help you keep up with material. These quizzes may be unannounced, so it is important to show up to class. I will also periodically give credit for completing problem sets taken from the textbook and elsewhere – these will likely be done in groups to facilitate class discussion. These exercises will vary in terms of their point value, but together will comprise 15% of your grade. Note that unexcused absences will preclude your ability to complete in-class assignments.

#### “Biotechnology Bonanza” Assignment:

Biotechnology is an active area of research that is changing daily. Thus, it is important to keep up with the scientific literature to learn new developments in your field. For the “Biotechnology Bonanza” assignment, we will spend the last 15-20 minutes of class discussing a modern method in biotechnology. Students will take turns leading these discussions (likely in groups, depending on class size). The students will select a primary research article that features this technology and distribute it to the class

the week before their presentation, and on the day of the discussion the students will give a short presentation and lead a discussion of the paper and biotechnology technique. I will provide an example for the first Biotechnology Bonanza assignment.

### ***Grading Scale***

Grades will be awarded based on the following scale:

A = 90% and above  
B = 80-89%  
C = 70%-79%  
D = 60%-69%  
E = less than 60%

If the occasion arises that exam scores are significantly lower than expected, I may apply a curve to increase scores for that particular exam.

### ***Midterm Grades***

For undergraduates, midterm grades will be posted in myUK by the deadline established by the University Senate and published in the [Academic Calendar](http://www.uky.edu/registrar/content/academic-calendar). (<http://www.uky.edu/registrar/content/academic-calendar>)

### ***Attendance Policy/Acceptable Documentation***

Attendance is not part of your grade in ABT 460, although quizzes and in-class assignments can occur at any times, so if you have an unexcused absence you will lose these points. Each student will be given one “freebie” absence where they can miss class for any reason and still make up assignments, with the exception of exams (see below). After this first absence, documentation will be required for the absence to be considered excused.

Aside from the first absence, you will only be able to make up assignments or take a makeup exam with an excused absence as defined by the University in Senate Rule 5.2.5.2.1 (see [www.uky.edu/ombud/excused-absences](http://www.uky.edu/ombud/excused-absences)). Documentation will be required and must be provided within one week following the excused absence.

If you know ahead of time that you will be missing a class period, I encourage you to notify me prior to the day of the class. In the case of excused absences, arrangements may be made to complete any in-class work or quizzes outside of class time.

Make-up exams can be arranged in the case of documented, University-excused absences.

## **Assignment Policies**

### ***Assignment Submissions***

In class assignments and exams will be collected by the instructor in class. Out of class assignments will be submitted through the course Canvas page.

### ***Late Assignments***



For excused absences, the instructor will work with you to establish a reasonable timeline for turning in late assignments. For all other late assignments, 10% of the point total will be deducted for each day the assignment is late.

## Academic Policy Statements

**Excused Absences:** *Senate Rules 5.2.5.2.1* defines the following as acceptable reasons for excused absences: (a) significant illness, (b) death of a family member, (c) trips for members of student organizations sponsored by an educational unit, trips for University classes, and trips for participation in intercollegiate athletic events, (d) major religious holidays, (e) interviews for graduate/professional school or full-time employment post-graduation, and (f) other circumstances found to fit “reasonable cause for nonattendance” by the instructor of record. Students should notify the professor of absences prior to class when possible.

If a course syllabus requires specific interactions (e.g., with the instructor or other students), in situations where a student’s total EXCUSED absences exceed 1/5 (or 20%) of the required interactions for the course, the student shall have the right to request and receive a “W,” or the Instructor of Record may award an “I” for the course if the student declines a “W.” (*Senate Rules 5.2.5.2.3.1*)

**Religious Observances:** Students anticipating an absence for a major religious holiday are responsible for notifying the instructor in writing of anticipated absences due to their observance of such holidays. *Senate Rules 5.2.5.2.1(4)* requires faculty to include any notification requirements within the syllabus. If no requirement is specified, two weeks prior to the absence is reasonable and should not be given any later. Information regarding major religious holidays may be obtained through [the Ombud’s website](#) or calling 859-257-3737.

**Verification of Absences:** Students may be asked to verify their absences in order for them to be considered excused. *Senate Rule 5.2.5.2.1* states that faculty have the right to request appropriate verification when students claim an excused absence due to: significant illness; death in the household, trips for classes, trips sponsored by an educational unit and trips for participation related to intercollegiate athletic events; and interviews for full-time job opportunities after graduation and interviews for graduate and professional school. (Appropriate notification of absences due to University-related trips is required prior to the absence when feasible and in no case more than one week after the absence.)

**Make-Up Work:** Students missing any graded work due to an excused absence are responsible: for informing the Instructor of Record about their excused absence within one week following the period of the excused absence (except where prior notification is required); and for making up the missed work. The instructor must give the student an opportunity to make up the work and/or the exams missed due to the excused absence, and shall do so, if feasible, during the semester in which the absence occurred. The instructor shall provide the student with an opportunity to make up the graded work and may not simply calculate the student's grade on the basis of the other course requirements, unless the student agrees in writing. According to *SR 5.2.5.2.2*, if a student adds a class after the first day of classes and misses graded work, the instructor must provide the student with an opportunity to make up any graded work.

**Excused Absences for Military Duties:** If a student is required to be absent for one-fifth or less of the required course interactions (e.g., class meetings) due to military duties, the following procedure (per SR 5.2.5.2.3.2) shall apply:

1. Once a student is aware of a call to duty, the student shall provide a copy of the military orders to the Director of the Veterans Resource Center. The student shall also provide the Director with a list of his/her courses and instructors.
2. The Director will verify the orders with the appropriate military authority, and on behalf of the military student, notify each Instructor of Record via Department Letterhead as to the known extent of the absence.
3. The Instructor of Record shall not penalize the student's absence in any way and shall provide accommodations and timeframes so that the student can make up missed assignments, quizzes, and tests in a mutually agreed upon manner.

**Unexcused Absences:** If an attendance/interaction policy is not stated in the course syllabus or the policy does not include a penalty to the student, the instructor cannot penalize a student for any unexcused absences. (SR 5.2.5.2.3.3)

**Prep Week and Reading Days:** Per *Senate Rules 5.2.5.6*, the last week of instruction of a regular semester is termed "Prep Week." This phrase also refers to the last three days of instruction of the summer session and winter intersession. The Prep Week rule applies to ALL courses taught in the fall semester, spring semester, and summer session, including those taught by distance learning or in a format that has been compressed into less than one semester or session. This rule does not apply to courses in professional programs in colleges that have University Senate approval to have their own calendar.

Make-up exams and quizzes are allowed during Prep Week. In cases of "Take Home" final examinations, students shall not be required to return the completed examination before the regularly scheduled examination period for that course. No written examinations, including final examinations, may be scheduled during the Prep Week. No quizzes may be given during Prep Week. No project/lab practicals/paper/presentation deadlines or oral/listening examinations may fall during the Prep Week unless it was scheduled in the syllabus AND the course has no final examination (or assignment that acts as a final examination) scheduled during finals week. (A course with a lab component may schedule the lab practical of the course during Prep Week if the lab portion does not also require a Final Examination during finals week.) Class participation and attendance grades are permitted during Prep Week. The *Senate Rules* permit continuing into Prep Week regularly assigned graded homework that was announced in the class syllabus.

For fall and spring semester, the Thursday and Friday of Prep Week are study days (i.e. "Reading Days"). There cannot be any required "interactions" on a Reading Day. "Interactions" include participation in an in-class or online discussion, attendance at a guest lecture, or uploading an assignment. See *Senate Rules 9.1* for a more complete description of required interactions.

**Accommodations Due to Disability:** In accordance with federal law, if you have a documented disability that requires academic accommodations, please inform your instructor as soon as possible during scheduled office hours. In order to receive accommodations in a course, you must provide your instructor with a Letter of Accommodation from the Disability Resource Center (DRC). The DRC coordinates campus disability services available to students with disabilities. It is located on the corner of Rose Street and Huguelet Drive in the Multidisciplinary Science Building, Suite 407. You can reach

them via phone at (859) 257-2754, [via email \(drc@uky.edu\)](mailto:drc@uky.edu) or visit their [website](http://uky.edu/DisabilityResourceCenter) (uky.edu/DisabilityResourceCenter). DRC accommodations are not retroactive and should therefore be established with the DRC as early in the semester as is feasible.

**Non-discrimination and Title IX policy:** In accordance with federal law, UK is committed to providing a safe learning, living, and working environment for all members of the University community. The University maintains a comprehensive program which protects all members from discrimination, harassment, and sexual misconduct. For complete information about UK's prohibition on discrimination and harassment on aspects such as race, color, ethnic origin, national origin, creed, religion, political belief, sex, and sexual orientation, please see [the electronic version of UK's Administrative Regulation 6:1 \("Policy on Discrimination and Harassment"\)](https://www.uky.edu/regs/ar6-1) (<https://www.uky.edu/regs/ar6-1>). In accordance with Title IX of the Education Amendments of 1972, the University prohibits discrimination and harassment on the basis of sex in academics, employment, and all of its programs and activities. Sexual misconduct is a form of sexual harassment in which one act is severe enough to create a hostile environment based on sex and is prohibited between members of the University community and shall not be tolerated. For more details, please see [the electronic version of Administrative Regulations 6:2 \("Policy and Procedures for Addressing and Resolving Allegations of Sexual Harassment Under Title IX and Other Forms of Sexual Misconduct"\)](https://www.uky.edu/regs/sites/www.uky.edu/regs/files/files/ar/ar_6.2-in...) ([https://www.uky.edu/regs/sites/www.uky.edu/regs/files/files/ar/ar\\_6.2-in...](https://www.uky.edu/regs/sites/www.uky.edu/regs/files/files/ar/ar_6.2-in...)). Complaints regarding violations of University policies on discrimination, harassment, and sexual misconduct are handled by the Office of Institutional Equity and Equal Opportunity (Institutional Equity), which is located in 13 Main Building and can be reached by phone at (859) 257-8927. You can also visit [Institutional Equity's website](https://www.uky.edu/eeo) (<https://www.uky.edu/eeo>).

Faculty members are obligated to forward any report made by a student related to discrimination, harassment, and sexual misconduct to the Office of Institutional Equity. Students can confidentially report alleged incidences through the [Violence Intervention and Prevention Center](https://www.uky.edu/vipcenter) (<https://www.uky.edu/vipcenter>), [Counseling Center](https://www.uky.edu/counselingcenter) (<https://www.uky.edu/counselingcenter>), or [University Health Service](https://ukhealthcare.uky.edu/university-health-service/student-health) (<https://ukhealthcare.uky.edu/university-health-service/student-health>). Reports of discrimination, harassment, or sexual misconduct may be made via the [Institutional Equity's website](https://www.uky.edu/eeo) (<https://www.uky.edu/eeo>); at that site, click on "Make a Report" on the left-hand side of the page.

**Regular and Substantive Interaction:** All credit-bearing courses must support regular and substantive interaction (RSI) between the students and the instructor, regardless of the course's delivery mode (e.g., in-person, hybrid, or online). Courses satisfy this requirement when course participants meet regularly as prescribed in SR 10.6, and the Instructor of Record substantively interacts with students in at least two of the following ways: provides direct instruction; assesses students' learning; provides information or responds to students' questions; and facilitates student discussions. Some exceptions allowed as per SACSCOC. For further information about the RSI requirement, see the [Compliance Resources](#) link on the Teaching, Learning and Academic Innovation Compliance page.

### Academic Offenses (Cheating, Plagiarism, and Falsification or Misuse of Academic Records)

**Plagiarism:** Per University policy, students shall not plagiarize, cheat, or falsify or misuse academic records. The minimum penalty for a first offense is a zero on the assignment on which the offense occurred. If the offense is considered severe or the student has other academic offenses on their record, more serious penalties, up to suspension from the University may be imposed. A plea of ignorance is not acceptable as a defense against the charge of academic dishonesty.

*Senate Rule 6.3.1* states that all academic work, written or otherwise, submitted by students to their instructors or other academic supervisors, is expected to be the result of their own thought, research, or self-expression. In cases where students feel unsure about a question of plagiarism involving their work, they are obliged to consult their instructors on the matter before submission.

When students submit work purporting to be their own, but which in any way borrows ideas, organization, wording, or content from another source without appropriate acknowledgment of the fact, the students are guilty of plagiarism.

Plagiarism includes reproducing someone else's work (including, but not limited to a published article, a book, a website, computer code, or a paper from a friend) without clear attribution. Plagiarism also includes the practice of employing or allowing another person to alter or revise the work which a student submits as his/her own, whoever that other person may be, except under specific circumstances (e.g. Writing Center review, peer review) allowed by the Instructor of Record or that person's designee. Plagiarism may also include double submission, self-plagiarism, or unauthorized resubmission of one's own work, as defined by the instructor.

Students may discuss assignments among themselves or with an instructor or tutor, except where prohibited by the Instructor of Record (e.g. individual take-home exams). However, the actual work must be done by the student, and the student alone, unless collaboration is allowed by the Instructor of Record (e.g. group projects).

When a student's assignment involves research in outside sources or information, the student must carefully acknowledge exactly what, where and how he/she has employed them. If the words of someone else are used, the student must put quotation marks around the passage in question and add an appropriate indication of its origin. Making simple changes while leaving the organization, content and phraseology intact is plagiaristic. However, nothing in these Rules shall apply to those ideas which are so generally and freely circulated as to be a part of the public domain.

Please note: Any assignment you turn in may be submitted to an electronic database to check for plagiarism.

**Cheating** is defined by its general usage. It includes, but is not limited to, the wrongfully giving, taking, or presenting any information or material by a student with the intent of aiding himself/herself or another on any academic work which is considered in any way in the determination of the final grade. The fact that a student could not have benefited from an action is not by itself proof that the action does not constitute cheating. Any question of definition shall be referred to the University Appeals Board.

**Misuse of academic records:** Maintaining the integrity, accuracy, and appropriate privacy of student academic records is an essential administrative function of the University and a basic protection of all students. Accordingly, the actual or attempted falsification, theft, misrepresentation or other alteration or misuse of any official academic record of the University, specifically including knowingly having unauthorized access to such records or the unauthorized disclosure of information contained in such records, is a serious academic offense. As used in this context, "academic record" includes all paper and electronic versions of the partial or complete permanent academic record, all official and unofficial academic transcripts, application documents and admission credentials, and all academic record transaction documents. The minimum sanction for falsification, including the omission of information, or attempted falsification or other misuse of academic records as described in this section is suspension for one semester.

## Resources

For a list of academic resources and support available to UK students, please visit <https://www.uky.edu/studentacademicsupport/about-us>. For a list of other resources available to students, please visit <https://www.uky.edu/universitysenate/student-resources>.

## Diversity, Equity, and Inclusion

The University of Kentucky is committed to our core values of diversity and inclusion, mutual respect and human dignity, and a sense of community ([Governing Regulations XIV](#)). We acknowledge and respect the seen and unseen diverse identities and experiences of all members of the university community (<https://www.uky.edu/regs/gr14>). These identities include but are not limited to those based on race, ethnicity, gender identity and expressions, ideas and perspectives, religious and cultural beliefs, sexual orientation, national origin, age, ability, and socioeconomic status. We are committed to equity and justice and providing a learning and engaging community in which every member is engaged, heard, and valued.

We strive to rectify and change behavior that is inconsistent with our principles and commitment to diversity, equity, and inclusion. If students encounter such behavior in a course, they are encouraged to speak with the instructor of record and/or the [Office of Institutional Equity and Equal Opportunity](#). Students may also contact a faculty member within the department, program director, the director of undergraduate or graduate studies, the department chair, any college administrator, or the dean. All of these individuals are mandatory reporters under University policies.

## Classroom Behavior Policies

Students are expected to abide by the student code of conduct as described by the office of student affairs (<http://www.uky.edu/StudentAffairs/Code/>). This class aims to be a safe and accepting environment for all, and actions that prevent that will not be tolerated.

## Course Recordings

The University of Kentucky Code of Student Conduct defines Invasion of Privacy as using electronic or other devices to make a photographic, audio, or video record of any person without their prior knowledge or consent when such a recording is likely to cause injury or distress.

Meetings of this course may be recorded. All video and audio recordings of lecturers and class meetings, provided by the instructors, are for educational use by students in this class only. They are available only through the Canvas shell for this course and are not to be copied, shared, or redistributed.

As addressed in the Code of Student Conduct, students are expected to follow appropriate university policies and maintain the security of linkblue accounts used to access recorded class materials. Recordings may not be reproduced, shared with those not enrolled in the class, or uploaded to other online environments.

If the instructor or a University of Kentucky office plans any other uses for the recordings, beyond this class, students identifiable in the recordings will be notified to request consent prior to such use. In anticipation of such cases, students may be asked to complete an “authorization of use” form by a faculty member.

Video and audio recordings by students are not permitted during the class unless the student has received prior permission from the instructor. Any sharing, distribution, and or uploading of these recordings outside of the parameters of the class is prohibited. Students with specific recording accommodations approved by the Disability Resource Center should present their official documentation to the instructor.

### **Course Copyright**

All original instructor-provided content for this course, which may include handouts, assignments, and lectures, is the intellectual property of the instructor(s). Students enrolled in the course this academic term may use the original instructor-provided content for their learning and completion of course requirements this term, but such content must not be reproduced or sold. Students enrolled in the course this academic term are hereby granted permission to use original instructor-provided content for reasonable educational and professional purposes extending beyond this course and term, such as studying for a comprehensive or qualifying examination in a degree program, preparing for a professional or certification examination, or to assist in fulfilling responsibilities at a job or internship; other uses of original instructor-provided content require written permission from the instructor(s) in advance.

**Introduction to Population Genetics**  
**ABT/ENT/FOR/BIO 461**

**Lecture:** TR 12:30pm – 1:45pm in AgN room N12  
**Instructor:** Dr. Charles Fox (cfox@uky.edu)  
**Office:** Ag Science Center North Room S-307B  
**Office Hours:** By appointment on Zoom  
**Zoom:** Link is on Canvas home page  
**Telephone:** 859-257-7474 (Office)

**Credits:** 3

**Prerequisite:** Genetics (ABT/ENT 360, BIO 304 or equivalent introductory genetics course) plus a course in probability and statistics.

**Structure of course:** 3 hours lecture/discussion per week

**Readings:** Hamilton, M. B. (2021). Population genetics, second edition. Wiley-Blackwell.

**UK's academic policies:** <https://www.uky.edu/universitysenate/acadpolicy>

**Attendance and participation:** Attendance and participation in class is expected, with students expected to have read the assigned material before class.

**Grading:**

|                        |                        |                         |                        |
|------------------------|------------------------|-------------------------|------------------------|
| Exams (3):             | 100 points each        | <u>Undergrad Grades</u> | <u>Graduate Grades</u> |
| Assignments (5):       | 50 points              | ≥ 324 pts – A           | ≥ 364 pts – A          |
| Graduate presentation: | 40 points*             | 288-323 pts – B         | 328-363 pts – B        |
| Presentation evals:    | 10 points              | 252-287 pts – C         | 292-327 pts – C        |
| Total:                 | U: 360 / G: 400 points | 216-251 pts – D         | < 292 – E              |
|                        |                        | < 216 pts – E           |                        |

**\*Graduate student presentation (40 points):** All enrolled graduate students are *required* to deliver a 10-12 minute presentation *with slides* on a population genetics topic of their choice (one not covered in class). A brief (< 1 page) proposal outlining the main question(s) and intended content of the presentation must be submitted for instructor approval prior to the actual presentation (deadlines on course outline, below). Slides must be submitted to the instructor (electronically) for grading.

**Lectures:** Attendance at lectures is required. Slides for lectures will be available as PDFs on Canvas, usually by 5 pm the previous day. I strongly encourage students to either print the slides or have software that allows you to write on the slides during lecture. The slides are comprehensive and you will find it easier to follow lectures if you can add notes as necessary to the detail already on the slides rather than taking comprehensive notes

**Homework assignments:** There will be five homework assignments throughout the class, all assigned and due before the second exam. Assignments will be posted to Canvas one week before they are due. To receive full credit for completing an assignment, a scanned (or photographed) copy of the completed assignment must be submitted prior to the start of class on the due date (either in class or by email to cfox@uky.edu).

**Mid-term grades:** Mid-term grades will be posted in myUK by the deadline established in the Academic Calendar (<http://www.uky.edu/Registrar/AcademicCalendar.htm>).

**Missed classes or exams:** Make-up exams and credit for class attendance will be given only if an absence is pre-arranged or is unexpected due to a university-approved reason for an absence. Acceptable reasons for excused absences: (a) serious illness, (b) illness or death of family member, (c) University-related trips, (d) major religious holidays, or (e) other circumstances found to fit “reasonable cause for nonattendance” by the professor. In the event of an unexpected absence, a make-up exam or credit for class attendance will be given only if a valid written excuse is provided within one week of the missed class/exam (as per university regulations that are posted at <https://www.uky.edu/universitysenate/acadpolicy>). Students anticipating an absence are responsible for notifying the instructor in writing in advance of their absence. An unexcused absence from a class or exam will result in a zero for that particular class/exam. A missed exam will *not* be dropped from the final grade. Make-up exams will be given immediately following your return. Note to student athletes: You must make arrangements at least one week in advance, with a note from the athletics department, if you will miss an exam for a sporting event.

**Academic Integrity:** UK’s academic integrity policies are available on the internet at <https://www.uky.edu/universitysenate/ao>. Students are expected to adhere to University policy on cheating and plagiarism in all courses. A plea of ignorance of these policies is not acceptable as a defense against the charge of academic dishonesty. Students are encouraged to study together, but must take their own exams, do their own homework assignments and prepare/give their own presentations. Students caught cheating will automatically fail the class and will be referred to the Academic Ombud and their College Dean.

**Accommodations due to disability:** If you have a documented disability that requires academic accommodations, please see me as soon as possible during scheduled office hours. To receive accommodations in this course, you must provide a Letter of Accommodation from the Disability Resource Center (<https://www.uky.edu/DisabilityResourceCenter/>) for coordination of campus disability services available to students with disabilities.

**Classroom Behavior:** Students are welcome to take notes on a laptop or a tablet computer. Students that are distracting with their device (e.g., texting, instant messaging, web surfing, etc.) will be asked to put the device away or leave class. Phones *cannot* be used in class; they must be stowed in bags or pockets. Electronic devices cannot be used during exams.

**University policy on Diversity, Equity, and Inclusion (DEI):** The University of Kentucky is committed to our core values of diversity and inclusion, mutual respect and human dignity, and a sense of community (Governing Regulations XIV; <https://www.uky.edu/regs/gr14>). We acknowledge and respect the seen and unseen diverse identities and experiences of all members of the university community. These identities include but are not limited to those based on race, ethnicity, gender identity and expressions, ideas and perspectives, religious and cultural beliefs, sexual orientation, national origin, age, ability, and socioeconomic status. We are committed to equity and justice and providing a learning and engaging community in which every member is engaged, heard, and valued.



We strive to rectify and change behavior that is inconsistent with our principles and commitment to diversity, equity, and inclusion. If students encounter such behavior in a course, they are encouraged to speak with the instructor of record and/or the Office of Institutional Equity and Equal Opportunity (<https://www.uky.edu/eoo/>). Students may also contact a faculty member within the department, program director, the director of undergraduate or graduate studies, the department chair, any college administrator, or the dean. All of these individuals are mandatory reporters under University policies.

**Schedule** (Note: the exam dates are fixed but all other details are subject to change as we progress through the semester)

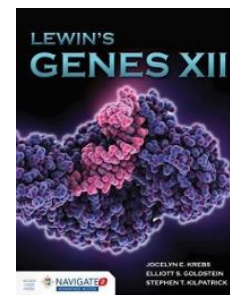
| Week   | Topic                                                                                                                                                                             | Readings                                          |
|--------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------|
| 1      | Introduction to the course<br>Phenotypic and genetic variation in natural populations                                                                                             | Chapter 1; chapters 3 and 4 of Allendorf et al.   |
| 2      | Mendelian inheritance (review)<br>Introduction to Probability<br>Hardy-Weinberg                                                                                                   | Any genetics text<br>Chapter 2                    |
| 3      | Hardy-Weinberg; sex differences, sex linkage; gametic disequilibrium                                                                                                              | Chapter 2                                         |
| 4      | Inbreeding and inbreeding depression<br>Genetic drift                                                                                                                             | Chapter 2, 3                                      |
| 5      | Genetic drift, effective population sizes                                                                                                                                         | Chapter 3                                         |
| 6      | Genetic drift, effective population sizes<br><b>Exam 1 (September 29)</b>                                                                                                         | Chapter 3                                         |
| 7      | Population subdivision; Wahlund effect, $F_{ST}$ , gene flow                                                                                                                      | Chapter 4                                         |
| 8      | Human population structure<br>Natural selection                                                                                                                                   | Barbujani & Colonna 2010<br>Chapter 6             |
| 9      | Natural selection                                                                                                                                                                 | Chapter 6, 7                                      |
| 10     | <i>Fall break</i><br>Mutation                                                                                                                                                     | Chapter 5                                         |
| 11     | Molecular evolution – neutral theory, detecting selection<br><b>Exam 2 (November 3)</b><br><i>Graduate student presentation proposals must be submitted by 5 pm on November 4</i> | Chapter 8; Excerpts from Futuyma                  |
| 12     | Molecular evolution<br>Genetics of quantitative traits                                                                                                                            | Chapter 8; Excerpts from Futuyma<br>Chapter 9, 10 |
| 13     | Genetics of quantitative traits<br>Selection on quantitative traits; Artificial selection/domestication                                                                           | Chapter 9, 10                                     |
| 14     | Selection on quantitative traits continued<br><i>Thanksgiving break</i>                                                                                                           | Chapter 9, 10                                     |
| 15     | Mapping quantitative traits, GWAS<br><i>Graduate student presentations</i>                                                                                                        |                                                   |
| 16     | <i>Catch up on lecture; Review for final exam</i>                                                                                                                                 |                                                   |
| Finals | <b>Final exam TBD</b>                                                                                                                                                             |                                                   |

**ABT 460 INTRODUCTION TO MOLECULAR GENETICS  
(Spring 2021, 3 Credit Hours)**

**Lecture:** TR (Tuesday and Thursday) 9:30 - 10:45am  
**Location:** Online Teaching  
**Instructor:** Dr. Xuguo “Joe” Zhou  
**Office:** Ag Science Center North Room S-225 D  
**Office Hours:** By appointment. Meetings can be conducted either *in person* (safety permitting), by *phone*, or by *Zoom*.  
**Telephone:** 859-257-3125  
**Email:** xuguo Zhou@uky.edu

**Textbook Details**

**Title:** Lewin’s Genes XII  
**Authors:** Jocelyn E. Krebs, Elliott S. Goldstein, Stephen T. Kilpatrick  
**Edition:** 12th Edition  
**ISBN:** 9781284104493  
**Publication Date:** March 16, 2017  
**Publisher:** Jones & Bartlett Learning



**CAFE Inclusion Statement**

Faculty and staff of the College of Agriculture, Food and Environment (CAFE) are committed to creating an inclusive environment of mutual respect where students are encouraged to achieve their highest potential, regardless of, but not limited to race, ethnicity, gender identity and expression, sexual orientation, national origin, religion, age, ability, and socioeconomic status. The goal is to work together as a diverse group of engaged students, faculty, and staff to ensure all feel welcome, safe, accepted, and included.

**Course Description**

ABT 460 is designed to provide students with an introduction to the biochemical basis of heredity and focuses on the structure and expression of DNA at the molecular and cellular level. The course will provide a detailed understanding of the biochemical events involved in genome replication, prokaryotic and eukaryotic transcription, and translation of DNA, as well as RNA processing, recombination and the theoretical underpinnings of genetic engineering. With an understanding of the basic features of molecular genetics, we will apply this knowledge to issues of development, evolution and disease.

**Prerequisites:** I will assume that you have passed the equivalent of ABT/ASC/ENT 360 or BIO 304 (The Principles of Genetics). If you do not meet these prerequisites, please let me know after the first class.

**Reading Assignments:** Readings in the textbook are listed on the syllabus. Although you *might* pass the class by skipping the reading assignments, you will not get a good grade. If you want to do well, read the assigned chapters. If you want to do really well, read the chapters *before* the class in which they will be discussed. Additional readings may be assigned at the discretion of individual instructors.

## Grading

|                                            |                |
|--------------------------------------------|----------------|
| Exam (4 @ 100 pts.)                        | 400 pts        |
| Journal Club Presentation                  | 50 pts         |
| Class participation (25 Lectures @ 2 pts.) | 50 pts         |
| <b>Total</b>                               | <b>500 pts</b> |

Grades will then be awarded based on the following scale:

90 % or greater = A

80 to 89% = B

70 to 79% = C

60 to 69% = D

Less than 60% = E

*An E without a chance to re-take the class will result from failure due to cheating or plagiarism.*

If final grades are lower than we consider appropriate, I *might* impose a curve that results in higher grades. I will not impose curves on individual exams but may do so on the final grades in the class. However, I will not impose a curve that results in lower grades than students earn using the scale indicated above.

**Exams:** There will be four exams. Each exam will be worth 100 points and will cover course materials from textbook as well as PowerPoint presentations. Exams will be “open-book” - that is, you can use any materials and resources to address the questions during the exam, as long as you properly cite/credit the sources. Exams will be concluded during the assigned class periods.

**Journal Club Presentation:** Genetics is an active area of research that is changing daily. Thus, it is important to keep up with the scientific literature to learn new developments in your field. On “Journal Club” Thursdays, we will spend the last 15-20 minutes of class discussing a current scientific paper in the general area of molecular genetics. Students will take turns leading these discussions. This is a group assignment (likely 4-5 students/group, depending on class size). The assigned group of students will select a paper and distribute it to the class, and on the day of the discussion the students will give a short presentation and lead a discussion of the paper.

## Expectations

- ABT 460 covers advanced and difficult material, so sufficient study is essential for a good grade. An average of **six to nine (6-9) hours per week outside class** is considered **normal study time** for a 3 cr. class. Make sure to get sufficient sleep, exercise and nutrition for proper focus during studying. The assigned reading for each lecture averages < 30 pages. Read these thoroughly and repeatedly to fully understand them, discuss the material with classmates and others as you see fit, and come to office hours to ask questions.
- You will be responsible for the information in the assigned readings, with emphasis on material covered in the lectures. In some cases, I may inform you of specific sections that are excluded from the reading assignment. However, those sections may include terms and concepts that you need to know, in which event that information will be communicated in lecture.

- Use the “**Key Concepts**” boxes in your text readings as a guide to the basic concepts and principles.
- Understand the terms shown in **bold** and defined in the glossary. You must be able to write short definitions of each. But, rather than memorizing the definition, you need to understand the concept underlying the term.

### Course Policies

**Absences:** Students are expected to abide by the student code of conduct as described by the office of student affairs (<http://www.uky.edu/StudentAffairs/Code/>). Unexcused absences will result in a 2-point deduction. If you know ahead of time that you will be missing a class period, I strongly encourage you to notify me prior to the day of the class.

**Missed exams:** Make-up exams will be given only if an absence is pre-arranged (at least one week in advance) or if a valid excuse is provided (as per university regulations, which are posted at <http://www.uky.edu/Ombud/>). If you know of a conflict that will preclude you taking an exam at the appointed date and time, you must inform your instructor and provide official documentation. That documentation must refer to the specific dates in question. If you are unable to inform the instructor ahead of time, you must provide official documentation for your absence at your earliest opportunity afterward. An unexcused absence from an exam will result in a zero for that exam. There will be *no exceptions* to this rule. A missed exam *will not* be dropped from the final grade. Make-up exams will be given during our office hours immediately following your return. **Note to student athletes:** You must make arrangements *at least one week in advance*, with a note from the athletics department, if you will miss an exam for a sporting event.

**Re-grading exams:** If you lose points on an exam, make sure you know what your error was; similar questions may well be asked again. If on careful consideration you still believe that you were counted wrong for the correct answer, you may bring the test *to me* for reconsideration. Be aware of two things, however: (1) the instructor will photocopy all work before returning it, to protect against cheating (see **Academic Honesty**); (2) If you ask the instructor to regrade a test, then the whole test will be regraded, with the possible results of a higher mark, a lower mark, or no change. *This policy is not to discourage inquiry, but rather is to encourage you to think thoroughly about the questions, and thereby learn from the experience.*

**Disability:** If you have a documented disability that requires academic accommodations, please see me as soon as possible during scheduled office hours. In order to receive accommodations in this course, you must provide me with a Letter of Accommodation from the Disability Resource Center (725 Rose Street, Suite 407, 859-257-2754, e-mail address: [dtbeac1@uky.edu](mailto:dtbeac1@uky.edu)) for coordination of campus disability services available to students with disabilities.

### Academic Honesty

It is your responsibility to familiarize yourself with the definitions of and sanctions for cheating and plagiarism at the University of Kentucky. Information on plagiarism at the University of Kentucky can be found at the following site: <http://www.uky.edu/Ombud/Plagiarism.pdf>.

For exams, the following will be considered evidence of cheating:

- Communicating in any way with classmates

- Accessing any electronic device that can send, receive, display, or play back information in any form
- Availing yourself of any written or printed material except what is explicitly allowed by the instructor
- Looking at the exam of a neighbor
- Adjusting body position to ensure that a neighbor can view your exam

**The first cheating/plagiarism infraction will result in zero credit for the exam. Any second infraction will incur an E (failing) grade for the course.**

Rules governing cheating and plagiarism are in accord with Section VI of the code of student conduct (<http://www.uky.edu/StudentAffairs/Code/part2.html>).

Cell phones and other electronic devices must be rendered silent during class unless there is a documented reason otherwise.

**TENTATIVE CLASS SCHEDULE (ABT 460, SPRING 2021)**

| <b>Day/Lecture</b>                                               | <b>Date*</b>  | <b>Topic</b>                                 | <b>Reading</b> | <b>JCP**</b> |
|------------------------------------------------------------------|---------------|----------------------------------------------|----------------|--------------|
| T/1                                                              | 26 Jan        | Course Introduction                          |                |              |
| <b>Module 1 Genes and Chromosomes</b>                            |               |                                              |                |              |
| R/2                                                              | 28 Jan        | Genes, DNA, RNA and protein                  | Chpt 1         |              |
| T/3                                                              | 02 Feb        | Methods in molecular genetics                | Chpt 2         |              |
| R/4                                                              | 04 Feb        | The interrupted gene                         | Chpt 3         |              |
| T/5                                                              | 09 Feb        | Genomes                                      | Chpt 4         |              |
| R/6                                                              | 11 Feb        | Genome sequencing and evolution              | Chpt 5         |              |
| T/7                                                              | 16 Feb        | Chromosomes                                  | Chpt 7         |              |
| R/8                                                              | 18 Feb        | Chromatin                                    | Chpt 8         |              |
| <b>T/9</b>                                                       | <b>23 Feb</b> | <b>Exam 1 (Covers materials up to 02/16)</b> |                |              |
| <b>Module 2 DNA Replication and Recombination</b>                |               |                                              |                |              |
| R10                                                              | 25 Feb        | Replicon                                     | Chpt 10        | Group 1      |
| T/11                                                             | 02 Mar        | DNA replication                              | Chpt 11        |              |
| R/12                                                             | 04 Mar        | Extrachromosomal replicons                   | Chpt 12        | Group 2      |
| T/13                                                             | 09 Mar        | Homologous & site-specific recombination     | Chpt 13        |              |
| R/14                                                             | 11 Mar        | Repair systems                               | Chpt 14        | Group 3      |
| T/15                                                             | 16 Mar        | Transposons/Retroviruses                     | Chpt 15        |              |
| <b>R/16</b>                                                      | <b>18 Mar</b> | <b>Exam 2 (Covers materials up to 03/11)</b> |                |              |
| <b>Module 3 Transcription and Posttranscriptional Mechanisms</b> |               |                                              |                |              |
| T/17                                                             | 23 Mar        | Prokaryotic transcription                    | Chpt 17        |              |
| R/18                                                             | 25 Mar        | Eukaryotic transcription                     | Chpt 18        | Group 4      |
| T/19                                                             | 30 Mar        | RNA splicing and processing                  | Chpt 19        |              |
| R/20                                                             | 01 Apr        | mRNA stability and localization              | Chpt 20        | Group 5      |
| T/21                                                             | 06 Apr        | Translation                                  | Chpt 22        |              |
| R/22                                                             | 08 Apr        | Using the genetic code                       | Chpt 23        | Group 6      |
| <b>T/23</b>                                                      | <b>13 Apr</b> | <b>Exam 3 (Covers materials up to 04/06)</b> |                |              |
| <b>Module 4 Gene Regulation</b>                                  |               |                                              |                |              |
| R/24                                                             | 15 Apr        | Phage strategies                             | Chpt 25        | Group 7      |
| T/25                                                             | 20 Apr        | Eukaryotic transcription regulation          | Chpt 26        |              |
| R/26                                                             | 22 Apr        | Epigenetics I                                | Chpt 27        | Group 8      |
| T/27                                                             | 27 Apr        | Epigenetics II                               | Chpt 28        |              |
| R/28                                                             | 29 Apr        | Noncoding RNA                                | Chpt 29        | Group 9      |
| T/29                                                             | 04 May        | Regulatory RNAs                              | Chpt 30        |              |
| <b>T/30</b>                                                      | <b>11 May</b> | <b>Exam 4 (Covers materials up to 04/29)</b> |                |              |

“\*”: This schedule is flexible; I may get ahead of or behind this schedule at any time. I also reserve the right to reorganize the schedule if necessary. Attend class for announcements/schedule changes.

“\*\*\*”: Journal Club Presentation

**TENTATIVE JOURNAL CLUB PRESENTATION SCHEDULE (ABT 460, SPRING 2021)**

| <b>Student</b>                                                                                                            | <b>Group ID</b> | <b>Presentation Date</b> |
|---------------------------------------------------------------------------------------------------------------------------|-----------------|--------------------------|
| Avery, Chelsea Mari<br>Baker, Stephanie L<br>Bickler, Kylie Jean<br>Blanford, Cole Francis                                | 1               | 25 Feb                   |
| Bouren, Hayden Kurt<br>Carpenter, Leah R<br>Brown, Rachel Leigh<br>Caldbeck, Rebecca E                                    | 2               | 04 Mar                   |
| Sairajeev, Sasha V<br>Chithrala, Adarsh<br>Clements, Noah Andrew<br>DeGiorgio, Chloe Gene                                 | 3               | 11 Mar                   |
| Dodds, Ryan Douglas<br>Donovan, Tristan Renee<br>Elgaali, Hadi Hesham<br>Erwin, Morgan Hope                               | 4               | 25 Mar                   |
| Fischer, Brianna M<br>Melcher, Emily Christine<br>Roe, McKenna Dawson<br>Brackett, Gavin P                                | 5               | 01 Apr                   |
| Sletto, Olivia N<br>Leamer, Carly Renee<br>Martinez, Rebecca<br>Hieneman, Sara Natalie                                    | 6               | 08 Apr                   |
| Florence, Braden Rae<br>Napier, Taylor Christine<br>Pete, Alexandria Benoit<br>Peterson, Taylor Jordan<br>Ptacek, Alyse M | 7               | 15 Apr                   |
| Howard, Stevi Simone<br>Kemplin, Hannah Maelynn<br>Skipworth, Emma Brooke<br>Wilson, Mary Catherine                       | 8               | 22 Apr                   |
| Snyder, Allison Noelle<br>Stephenson, Kyle Miller<br>Yates, Elizabeth Grace<br>Young, Meredith E                          | 9               | 29 Apr                   |



**ABT/ENT/FOR/BIO 461G Introduction to Population Genetics  
Spring 2022 syllabus**

Lecture: TR 12:30pm – 1:45pm (3 credits); Ag Science Center North, room N-24F  
Instructor: Dr. Julian Dupuis (julian.dupuis@uky.edu)  
Office: Ag Science Center North, room S-307C  
Office Hours: by appointment in person or on Zoom  
Telephone: 859-562-2544 (office)  
Zoom: if needed, refer to Canvas for Zoom link

### **I. Course description**

*Course catalog description:* This survey course examines the population dynamics and equilibria of genes in nuclei, chloroplasts and mitochondria. Emphasis will be on biological relevance (in plants, animals, and micro-organisms), but some theoretical derivations will also be introduced.

Ultimately, this course will serve as an introduction to how **mutation, migration, drift, and selection affect patterns of genetic diversity**, and how we can use this information to understand ancestry and evolution.

### **COVID-19 Specifics**

Given the ongoing COVID-19 pandemic, this semester *may* operate a bit differently than normal. Throughout the syllabus, **I have noted Spring 2022/COVID-specific content with blue text. Please take specific note of this info!**

### **How to be Okay in a Global Pandemic**

Despite vaccinations and some on-and-off return to normal, we're still in a global pandemic, and none of us are really okay. If you tell me that you're having trouble, I'm not going to judge you or think less of you. I hope that you'll extend me the same grace.

#### ***Here are a few ground rules:***

- You never owe me personal information about your health (mental or physical), or anything else.
- You are always welcome to talk to me about things that you are going through, and,
- If I can't help you, I can likely direct you to someone who can.
- If you need extra help, or you need to miss an in-person session, or you need more time with something, just ask. I'll work with you.

### **II. Course format**

The current COVID situation is fluid, and so I plan to remain flexible to changes in class delivery based on what's happening locally/globally, as well as both my feelings and your feelings about being in a relatively full classroom of people. **At least to begin the semester, we will be meeting in-person for lectures in Ag North N-24F.** During the first week of class, I will poll the class to try and get a feel for what y'all are comfortable with and what we could change to make the class more accessible and safer for everyone. Regardless of potential changes in modality, **I will strive to have all lectures recorded in one form or fashion.** I plan to begin doing so with Echo360 and will discuss how these will be available during the first week of class.

Students are expected to have read the assigned material before class. I will communicate any changes to this plan in lecture and via Canvas. **Thus, it is important to make sure your Canvas settings will alert you to announcements for this class.**

3 hours lecture/discussion per week. Attendance at lectures is expected. Slides for lectures will be available as PDFs on Canvas, usually by 5 pm the previous day. I strongly encourage students to either print the slides or have software that allows you to write on the slides during lecture. The slides are comprehensive, and you will find it easier to follow lectures if you can add notes as necessary to the detail already on the slides rather than taking comprehensive notes.

**III. Prerequisite:** Genetics (ABT/ENT 360, BIO 304, or equivalent introductory genetics course) plus a course in probability and statistics.

#### **IV. Student learning outcomes**

Upon completion of this course, students will be able to:

- Describe the effects that mutation, migration, drift, and selection have on population dynamics/equilibria
- Calculate and interpret basic population genetic statistics
- Contrast commonly used population genetic methodologies/approaches and describe how they can be used to solve applied questions

#### **V. Recommended materials**

Hamilton, M. B. (2009). Population genetics. Wiley-Blackwell. (in reality, any recent population genetics text would suffice)

Additional readings will be provided on Canvas, and the utility of these readings will be discussed in the first week of class.

#### **VI. Technology information and requirements**

Parts of this class will be conducted online through the Canvas platform, and thus students are required to have some Canvas-capable device (computer, tablet, etc.). Please let me know if you have issues with internet connectivity or hardware.

Minimum technical requirements for online UK courses and suggested hardware, software, and internet connections are available at ITS Student Hardware & Software Guidelines. For account help, contact UK's Information Technology Customer Services online, by email, or by phone at 859-218-HELP (4357).

#### **VII. Activities and assessments**

- Exams (3 at 100 pts each = 300 pts)
  - Assignments (5 at 10 pts each = 50 pts)
  - Graduate student project\* (50 pts)
- Total points: 350 (undergrad), 400 (graduate)*

#### **Grade breakdown:**

- undergrad:
  - $\geq 315$  pts A
  - 280-314 B
  - 245-279 C

- 210-244 D
- <210 E
- graduate
  - $\geq 360$  pts A
  - 320-359 B
  - 280-319 C
  - <279 E

**\*Graduate student project (50 points):** All enrolled graduate students are *required* to complete an additional course project. Description and guidelines are provided on Canvas.

**Exams:** Barring a change in modality, exams will be in person.

**Homework assignments:** There will be five homework assignments throughout the class, all assigned and due before the second exam. Assignments will be posted to Canvas one week before they are due. To receive full credit for completing an assignment, a scanned (or photographed) copy of the completed assignment must be uploaded to Canvas *prior* to the start of class on the due date. Late work may be docked 10% per day.

**Tentative schedule:** Note: the exam dates are fixed but all other details are subject to change as we progress through the semester. *I will keep the schedule on Canvas updated, but not this document. For schedule changes, please refer to Canvas!*

| Week | Topic                                                                                                        | Readings (Hamilton)                                         |
|------|--------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------|
| 1    | Introduction to the course<br>Phenotypic/genetic variation in natural populations                            | Chapter 1; chapters 3 and 4 of Allendorf et al. (on Canvas) |
| 2    | Mendelian inheritance, probability (review), Hardy-Weinberg                                                  | Any genetics text<br>Chapter 2                              |
| 3    | Hardy-Weinberg; sex differences, sex linkage; gametic disequilibrium<br><i>Assignment 1 due</i>              | Chapter 2                                                   |
| 4    | Inbreeding and inbreeding depression<br>Genetic drift, effective population sizes<br><i>Assignment 2 due</i> | Chapter 2<br>Chapter 3                                      |
| 5    | Genetic drift, effective population sizes<br><i>Review for exam</i><br><i>Assignment 3 due</i>               | Chapter 3                                                   |
| 6    | <b>Exam 1 (15 February)</b><br>Population subdivision; Wahlund effect, $F_{ST}$ , gene flow                  | Chapter 4                                                   |
| 7    | Population subdivision<br><i>Graduate student project proposals due 5PM (24 February)</i>                    | Chapter 4                                                   |
| 8    | Population structure, humans, etc.<br>Natural selection                                                      | Barbujani & Colonna 2010<br>Chapter 6                       |

|        |                                                                                                                 |                                                              |
|--------|-----------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------|
| 9      | Natural selection                                                                                               | Chapter 6, 7 [pp 208–211, 218–219, 222–226]                  |
| 10     | <b>Spring break</b>                                                                                             |                                                              |
| 11     | Natural selection<br>Mutation<br><i>Review for exam</i>                                                         | Chapter 5 [pp 154–164, 166–168, 173–178]                     |
| 12     | <b>Exam 2 (29 March)</b><br>Molecular evolution: neutral theory, detecting selection                            | Chapter 8 [235–244, 250–255, 261–280]; Excerpts from Futuyma |
| 13     | Genetics of quantitative traits                                                                                 | Chapter 9, 10                                                |
| 14     | Genetics of quantitative traits<br>Selection on quantitative traits; Artificial selection/domestication         | Chapter 9, 10                                                |
| 15     | Mapping quantitative traits, GWAS<br>Above the population<br><i>Graduate student project due 5PM (21 April)</i> | Chapter 9, 10                                                |
| Finals | <b>Final exam (date TBD)</b>                                                                                    |                                                              |

### VIII. Additional information

**Inclusion:** I value the perspectives of individuals from all backgrounds reflecting the diversity of our students. I broadly define diversity to include race, gender identity, national origin, ethnicity, religion, social class, age, sexual orientation, political background, and physical and learning ability. I strive to make this classroom an inclusive space for all students. If you see ways I can improve, please let me know.

I confirm my commitment to the following and encourage you to do so as well:

- Respect the dignity and essential work of all individuals.
- Promote a culture of respect through the university community.
- Respect the privacy, property, and freedom of others.
- Reject bigotry, discrimination, violence, or intimidation of any kind.
- Practice personal and academic integrity and expect it of others.
- Promote diversity of opinions, ideas, and backgrounds, which is the lifeblood of the university.

**Missed classes or exams:** Make-up exams and credit for class attendance will be given only if an absence is pre-arranged or is unexpected due to a university-approved reason for an absence. Acceptable reasons for excused absences include: (a) serious illness, (b) illness or death of family member, (c) University-related trips, (d) major religious holidays, or (e) other circumstances found to fit “reasonable cause for nonattendance” by the professor). In the event of an unexpected absence, a make-up exam or credit for class attendance will be given only if a valid written excuse is provided within one week of the missed class/exam (as per university regulations that are posted at <http://www.uky.edu/Ombud>). Students anticipating an absence for a major religious holiday are responsible for notifying the instructor in writing of anticipated absences due to their observance of such holidays no later than the last day in the semester to add a class. An unexcused absence from a class or exam will result in a zero for that particular

class/exam. A missed exam will *not* be dropped from the final grade. Make-up exams will be given immediately following your return. Note to student athletes: You must make arrangements at least one week in advance, with a note from the athletics department, if you will miss an exam for a sporting event.

**Academic Integrity:** Academic integrity policies have been provided to every student by the university and are available on the internet (<http://www.uky.edu/Ombud/acadoffenses/index.htm>). Per university policy, students shall not plagiarize, cheat, or falsify or misuse academic records. If students read this sentence, email the instructor a picture of a cute dog for bonus marks. Students are expected to adhere to university policy on cheating and plagiarism in all courses. Students are encouraged to study together but must take their own exams prepare/give their own presentations. Students caught cheating will automatically fail the class and will be referred to the Academic Ombud and their College Dean.

**Accommodations due to disability:** If you have a documented disability that requires academic accommodations, please see me as soon as possible. To receive accommodations in this course, you must provide a Letter of Accommodation from the Disability Resource Center (<https://www.uky.edu/DisabilityResourceCenter/>) for coordination of campus disability services available to students with disabilities.

**Class recording notification:** The University of Kentucky Student Code of Conduct defines Invasion of Privacy as using electronic or other devices to make a photographic, audio, or video record of any person without their prior knowledge or consent when such a recording is likely to cause injury or distress. In-person and online meetings of this course may be recorded. All video and audio recordings of lecturers and class meetings, provided by the instructors, are for educational use by students in this class only. They are available only through the Canvas shell for this course and are not to be copied, shared, or redistributed.

As addressed in the Student Code of Conduct, students are expected to follow appropriate university policies and maintain the security of linkblue accounts used to access recorded class materials. Recordings may not be reproduced, shared with those not enrolled in the class, or uploaded to other online environments.

If the instructor or a University of Kentucky office plans any other uses for the recordings, beyond this class, students identifiable in the recordings will be notified to request consent prior to such use. In anticipation of such cases, students may be asked to complete an “authorization of use” form by a faculty member.

Video and audio recordings by students are not permitted during the class unless the student has received prior permission from the instructor. Any sharing, distribution, and or uploading of these recordings outside of the parameters of the class is prohibited. Students with specific recording accommodations approved by the Disability Resource Center should present their official documentation to the instructor.

All content for this course, including handouts, assignments, and lectures are the intellectual property of the instructors and cannot be reproduced or sold without prior permission from the

instructors. A student may use the material for reasonable educational and professional purposes extending beyond this class, such as studying for a comprehensive or qualifying examination in a degree program, preparing for a professional or certification examination, or to assist in fulfilling responsibilities at a job or internship.

## **IX. UK BOILERPLATE LANGUAGE**

### **Midterm Grades for Undergraduate Students (Senate Rules 6.1.3.1)**

Midterm grades will be posted in myUK by the deadline established by the University Senate and published in the Academic Calendar.

### **Excused Absences (Senate Rules 5.2.5.2.1)**

Senate Rules 5.2.5.2.1 defines the following as acceptable reasons for excused absences: 1. significant illness; 2. death of a family member; 3. trips for members of student organizations sponsored by an educational unit, trips for University classes, and trips for participation in intercollegiate athletic events; 4. major religious holidays; 5. interviews for graduate/professional school or full-time employment post-graduation; and 6. other circumstances found to fit “reasonable cause for nonattendance” by the instructor of record. Students should notify the professor of absences prior to class when possible.

If a course syllabus requires specific interactions (e.g., with the instructor or other students), in situations where a student’s total EXCUSED absences exceed 1/5 (or 20%) of the required interactions for the course, the student shall have the right to request and receive a "W," or the Instructor of Record may award an “I” for the course if the student declines a “W.” (Senate Rules 5.2.5.2.3.1)

If an attendance/interaction policy is not stated in the course syllabus or the policy does not include a penalty to the student, the Instructor cannot penalize the student for any unexcused absences. (Senate Rules 5.2.5.2.3.3)

### **Verification of Absences (Senate Rules 5.2.5.2.1)**

Students may be asked to verify their absences in order for them to be considered excused. Senate Rule 5.2.5.2.1 states that faculty have the right to request appropriate verification when students claim an excused absence due to: significant illness; death in the household, trips for classes, trips sponsored by an educational unit and trips for participation related to intercollegiate athletic events; and interviews for full-time job opportunities after graduation and interviews for graduate and professional school. (Appropriate notification of absences due to University-related trips is required prior to the absence when feasible and in no case more than one week after the absence.)

Programs with learning activities mandated by accreditation or licensure agencies may establish, as a matter of policy, educational consequences for students who have so many excused absences that they cannot complete the mandated learning activities. Pursuant to Senate Rules 6.1.1, the published program policies and individual course syllabi must describe these consequences, which may include the student being moved to a different graduation cohort.

### **Religious Observances (Senate Rules 5.2.5.2.1(4))**

Students anticipating an absence for a major religious holiday are responsible for notifying the instructor in writing of anticipated absences due to their observance of such holidays. Please check the course syllabus for the notification requirement. If no requirement is specified, two weeks prior to the absence is reasonable and should not be given any later. Information regarding major religious holidays may be obtained through the Ombud's website or calling 859-257-3737.

### **Make-Up Work (Senate Rule 5.2.5.2.2)**

Except where prior notification is required, students missing any graded work due to an excused absence are responsible: for informing the Instructor of Record about their excused absence within one week following the period of the excused absence; and for making up the missed work. The instructor must give the student an opportunity to make up the work and/or the exams missed due to the excused absence, and shall do so, if feasible, during the semester in which the absence occurred. The instructor shall provide the student with an opportunity to make up the graded work and may not simply calculate the student's grade on the basis of the other course requirements, unless the student agrees in writing.

For students who add a class after the first day of classes and miss graded work, the instructor shall provide the student with an opportunity to make up the graded work (quiz, exam, homework, etc.). The instructor may not simply calculate the student's grade on the basis of the other course requirements, unless the student agrees in writing.

### **Excused Absences and W/I, All Students (Senate Rule 5.2.5.2.3.1)**

If a student has excused absences for more than one-fifth of the required interactions for a course, the student can request a "W." If the student declines a "W," the Instructor of Record may award an "I" for the course.

### **Excused Absences Due to Military Duties (Senate Rule 5.2.5.2.3.2)**

If a student must be absent for one-fifth or less of the required course interactions (e.g., class meetings) due to military duties, the following procedure apply:

1. Once a student is aware of a call to duty, the student shall provide a copy of the military orders to the Director of the Veterans Resource Center. The student shall also provide the Director with a list of her/his courses and instructors.
2. The Director will verify the orders with the appropriate military authority and on behalf of the military student, notify each Instructor of Record via Department Letterhead as to the known extent of the absence.
3. The Instructor of Record shall not penalize the student's absence in any way and shall provide accommodations and timeframes so that the student can make up missed assignments, quizzes, and tests in a mutually agreed upon manner.

### **Accommodations Due to Disability**

If you have a documented disability that requires academic accommodations, please see me as soon as possible during scheduled office hours. In order to receive accommodations in this course, you must provide me with a Letter of Accommodation from the Disability Resource Center (DRC). The DRC coordinates campus disability services available to students with disabilities. Visit the DRC website, email the DRC, contact them by phone at (859) 257-2754, or

visit their office on the corner of Rose Street and Huguelet Drive in the Multidisciplinary Science Building, Suite 407.

### **Non-Discrimination Statement and Title IX Information**

UK is committed to providing a safe learning, living, and working environment for all members of the University community. The University maintains a comprehensive program which protects all members from discrimination, harassment, and sexual misconduct. For complete information about UK's prohibition on discrimination and harassment on aspects such as race, color, ethnic origin, national origin, creed, religion, political belief, sex, and sexual orientation, please see the electronic version of UK's Administrative Regulation 6:1 ("Policy on Discrimination and Harassment"). In accordance with Title IX of the Education Amendments of 1972, the University prohibits discrimination and harassment on the basis of sex in academics, employment, and all of its programs and activities. Sexual misconduct is a form of sexual harassment in which one act is severe enough to create a hostile environment based on sex and is prohibited between members of the University community and shall not be tolerated. For more details, please see the electronic version of Administrative Regulations 6:2 ("Policy and Procedures for Addressing and Resolving Allegations of Sexual Assault, Stalking, Dating Violence, Domestic Violence, and Sexual Exploitation"). Complaints regarding violations of University policies on discrimination, harassment, and sexual misconduct are handled by the Office of Institutional Equity and Equal Opportunity (IEEO), which is located in 13 Main Building and can be reached by phone at (859) 257-8927. You can also visit the IEEO's website.

Faculty members are obligated to forward any report made by a student related to IEEO matters to the Office of Institutional Equity and Equal Opportunity. Students can confidentially report alleged incidences through the Violence Intervention and Prevention Center, Counseling Center, or University Health Services.

### **Academic Integrity– Prohibition on Plagiarism (Senate Rules 6.3.1)**

Per University policy, students shall not plagiarize, cheat, or falsify or misuse academic records. Students are expected to adhere to University policy on cheating and plagiarism in all courses. The minimum penalty for a first offense is a zero on the assignment on which the offense occurred. If the offense is considered severe or the student has other academic offenses on their record, more serious penalties, up to suspension from the University may be imposed.

Plagiarism and cheating are serious breaches of academic conduct. Each student is advised to become familiar with the various forms of academic dishonesty as explained in the Code of Student Rights and Responsibilities. Complete information can be found on the Academic Ombud page. A plea of ignorance is not acceptable as a defense against the charge of academic dishonesty. It is important that you review this information as all ideas borrowed from others need to be properly credited.

Senate Rule 6.3.1 (see current Senate Rules) states that all academic work, written or otherwise, submitted by students to their instructors or other academic supervisors, is expected to be the result of their own thought, research, or self-expression. In cases where students feel unsure about a question of plagiarism involving their work, they are obliged to consult their instructors on the matter before submission.



When students submit work purporting to be their own, but which in any way borrows ideas, organization, wording, or content from another source without appropriate acknowledgment of the fact, the students are guilty of plagiarism.

Plagiarism includes reproducing someone else's work (including, but not limited to a published article, a book, a website, computer code, or a paper from a friend) without clear attribution. Plagiarism also includes the practice of employing or allowing another person to alter or revise the work which a student submits as his/her own, whoever that other person may be, except under specific circumstances (e.g. Writing Center review or peer review) allowed by the Instructor of Record or that person's designee. Plagiarism may also include double submission, self-plagiarism, or unauthorized resubmission of one's own work, as defined by the instructor.

Students may discuss assignments among themselves or with an instructor or tutor, except where prohibited by the Instructor of Record (e.g. individual take-home exams). However, the actual work must be done by the student, and the student alone, unless collaboration is allowed by the Instructor of Record (e.g. group projects).

When a student's assignment involves research in outside sources or information, the student must carefully acknowledge exactly what, where and how he/she has employed them. If the words of someone else are used, the student must put quotation marks around the passage in question and add an appropriate indication of its origin. Making simple changes while leaving the organization, content, and phraseology intact is plagiaristic. However, nothing in these Rules shall apply to those ideas, which are so generally and freely circulated as to be a part of the public domain.

Please note: Any assignment you turn in may be submitted to an electronic database to check for plagiarism.

### **Academic Integrity – Prohibition on Cheating (Senate Rules 6.3.2)**

Cheating is defined by its general usage. It includes, but is not limited to, the wrongfully giving, taking, or presenting any information or material by a student with the intent of aiding himself/herself or another on any academic work which is considered in any way in the determination of the final grade. The fact that a student could not have benefited from an action is not by itself proof that the action does not constitute cheating. Any question of definition shall be referred to the University Appeals Board.

### **Academic Integrity – Prohibition on Falsification/Misuse of Academic Records (SR 6.3.3)**

Maintaining the integrity, accuracy, and appropriate privacy of student academic records is an essential administrative function of the University and a basic protection of all students. Accordingly, the actual or attempted falsification, theft, misrepresentation or other alteration or misuse of any official academic record of the University, specifically including knowingly having unauthorized access to such records or the unauthorized disclosure of information contained in such records, is a serious academic offense. As used in this context, "academic record" includes all paper and electronic versions of the partial or complete permanent academic record, all official and unofficial academic transcripts, application documents and admission

credentials, and all academic record transaction documents. The minimum sanction for falsification, including the omission of information, or attempted falsification or other misuse of academic records as described in this section is suspension for one semester.

| Raters         | Students |
|----------------|----------|
| Responded      | 95       |
| Invited        | 117      |
| Response Ratio | 81.2%    |

| Question             | Department (Entomology) |                |                    | College (Ag, Food and Environment) |                |                    |
|----------------------|-------------------------|----------------|--------------------|------------------------------------|----------------|--------------------|
|                      | Mean                    | Response Count | Standard Deviation | Mean                               | Response Count | Standard Deviation |
| My classification is | 2.7                     | 95             | 1.6                | 3.2                                | 3330           | 1.2                |

| Options            | Score | Count | Percentage |
|--------------------|-------|-------|------------|
| Freshman           | 1     | 34    | 35.8%      |
| Sophomore          | 2     | 16    | 16.8%      |
| Junior             | 3     | 11    | 11.6%      |
| Senior             | 4     | 18    | 18.9%      |
| Graduate           | 5     | 15    | 15.8%      |
| Professional       | 6     | 0     | 0.0%       |
| Other              | 7     | 1     | 1.1%       |
| Choose not to rate | NRP   | 0     | 0.0%       |

## Reason(s) for taking course

| Options                           | Count | Percentage |
|-----------------------------------|-------|------------|
| is a required course              | 41    | 32.3%      |
| is an elective                    | 49    | 38.6%      |
| covers a topic I am interested in | 35    | 27.6%      |
| Choose not to rate                | 2     | 1.6%       |
| Respondent(s)                     | 95    |            |

| Question                         | Department (Entomology) |                |                    | College (Ag, Food and Environment) |                |                    |
|----------------------------------|-------------------------|----------------|--------------------|------------------------------------|----------------|--------------------|
|                                  | Mean                    | Response Count | Standard Deviation | Mean                               | Response Count | Standard Deviation |
| My expected grade in this course | 6.3                     | 94             | 1.0                | 6.6                                | 3282           | 0.8                |

| Options            | Score | Count | Percentage |
|--------------------|-------|-------|------------|
| Pass or audit      | 1     | 1     | 1.1%       |
| I                  | 2     | 0     | 0.0%       |
| E/Fail             | 3     | 0     | 0.0%       |
| D                  | 4     | 2     | 2.1%       |
| C                  | 5     | 12    | 12.6%      |
| B                  | 6     | 31    | 32.6%      |
| A                  | 7     | 48    | 50.5%      |
| Choose not to rate | NRP   | 1     | 1.1%       |

| Question                                                  | Department (Entomology) |                |                    | College (Ag, Food and Environment) |                |                    |
|-----------------------------------------------------------|-------------------------|----------------|--------------------|------------------------------------|----------------|--------------------|
|                                                           | Mean                    | Response Count | Standard Deviation | Mean                               | Response Count | Standard Deviation |
| Hours per week spent on the course (excluding class time) | 2.8                     | 95             | 1.4                | 2.6                                | 3310           | 1.3                |

| Options            | Score | Count | Percentage |
|--------------------|-------|-------|------------|
| 1 hour or less     | 1     | 19    | 20.0%      |
| 2 hours            | 2     | 25    | 26.3%      |
| 3 hours            | 3     | 23    | 24.2%      |
| 4 - 5 hours        | 4     | 17    | 17.9%      |
| 6 - 7 hours        | 5     | 6     | 6.3%       |
| 8 hours or more    | 6     | 5     | 5.3%       |
| Choose not to rate | NRP   | 0     | 0.0%       |

## Overall Course Score

| Question                                                                                                                                                                                                                                                                                                                                                                              | Department (Entomology) |                |                    | College (Ag, Food and Environment) |                |                    |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------|----------------|--------------------|------------------------------------|----------------|--------------------|
|                                                                                                                                                                                                                                                                                                                                                                                       | Mean                    | Response Count | Standard Deviation | Mean                               | Response Count | Standard Deviation |
| I consider the course ENT110-001-2018030 - INSECT BIOLOGY, ENT340-001-2018030 - LIVESTOCK ENTOMOLOGY, ENT460-001-2018030 - INTRO MOLECULAR GENETICS, ENT461-001-2018030 - INTRODUCTION TO POPULATION GENETICS, ENT606-001-2018030 - CONCEPTUAL METHODS IN ECOLOGY & EVOLUTON, ENT607-001-2018030 - ADVANCED EVOLUTION, ENT635-001-2018030 - INSECT PHYSIOLOGY to be a quality course. | 4.1                     | 95             | 1.1                | 4.2                                | 3326           | 1.0                |

| Options                   | Score | Count | Percentage |
|---------------------------|-------|-------|------------|
| Strongly Disagree         | 1     | 3     | 3.2%       |
| Disagree                  | 2     | 9     | 9.5%       |
| Neither Disagree or Agree | 3     | 8     | 8.4%       |
| Agree                     | 4     | 26    | 27.4%      |
| Strongly Agree            | 5     | 49    | 51.6%      |

## Course Specific Questions

| Question                                                                                  | Department (Entomology) |                |                    | College (Ag, Food and Environment) |                |                    |
|-------------------------------------------------------------------------------------------|-------------------------|----------------|--------------------|------------------------------------|----------------|--------------------|
|                                                                                           | Mean                    | Response Count | Standard Deviation | Mean                               | Response Count | Standard Deviation |
| The course was well organized                                                             | 4.2                     | 95             | 1.1                | 4.2                                | 3326           | 1.0                |
| Class meetings contributed to my learning of the course content.                          | 4.4                     | 95             | 0.9                | 4.2                                | 3270           | 1.0                |
| Grading in the course was fair.                                                           | 4.2                     | 95             | 1.0                | 4.4                                | 3314           | 0.9                |
| Assessments (e.g., tests, quizzes, papers, homework, projects) reflected course material. | 4.3                     | 94             | 0.9                | 4.4                                | 3307           | 0.8                |
| I understand how the final grade will be calculated in the course.                        | 4.5                     | 95             | 0.7                | 4.4                                | 3317           | 0.8                |

| 1. The course was well organized |       |       |            | 2. Class meetings contributed to my learning of the course content. |       |       |            |
|----------------------------------|-------|-------|------------|---------------------------------------------------------------------|-------|-------|------------|
| Options                          | Score | Count | Percentage | Options                                                             | Score | Count | Percentage |
| Strongly Disagree                | 1     | 4     | 4.2%       | Strongly Disagree                                                   | 1     | 1     | 1.1%       |
| Disagree                         | 2     | 6     | 6.3%       | Disagree                                                            | 2     | 3     | 3.2%       |
| Neither Disagree or Agree        | 3     | 5     | 5.3%       | Neither Disagree or Agree                                           | 3     | 8     | 8.4%       |
| Agree                            | 4     | 34    | 35.8%      | Agree                                                               | 4     | 29    | 30.5%      |
| Strongly Agree                   | 5     | 46    | 48.4%      | Strongly Agree                                                      | 5     | 54    | 56.8%      |

| 3. Grading in the course was fair. |       |       |            | 4. Assessments (e.g., tests, quizzes, papers, homework, projects) reflected course material. |       |       |            |
|------------------------------------|-------|-------|------------|----------------------------------------------------------------------------------------------|-------|-------|------------|
| Options                            | Score | Count | Percentage | Options                                                                                      | Score | Count | Percentage |
| Strongly Disagree                  | 1     | 3     | 3.2%       | Disagree                                                                                     | 2     | 6     | 6.3%       |
| Disagree                           | 2     | 5     | 5.3%       | Neither Disagree or Agree                                                                    | 3     | 7     | 7.4%       |
| Neither Disagree or Agree          | 3     | 9     | 9.5%       | Agree                                                                                        | 4     | 30    | 31.6%      |
| Agree                              | 4     | 27    | 28.4%      | Strongly Agree                                                                               | 5     | 51    | 53.7%      |
| Strongly Agree                     | 5     | 51    | 53.7%      | Choose not to rate                                                                           | NRP   | 1     | 1.1%       |

| 5. I understand how the final grade will be calculated in the course. |       |       |            |
|-----------------------------------------------------------------------|-------|-------|------------|
| Options                                                               | Score | Count | Percentage |
| Disagree                                                              | 2     | 2     | 2.1%       |
| Neither Disagree or Agree                                             | 3     | 3     | 3.2%       |
| Agree                                                                 | 4     | 38    | 40.0%      |
| Strongly Agree                                                        | 5     | 52    | 54.7%      |

## Overall Instructor Score

| Question                                  | Department (Entomology) |                |                    | College (Ag, Food and Environment) |                |                    |
|-------------------------------------------|-------------------------|----------------|--------------------|------------------------------------|----------------|--------------------|
|                                           | Mean                    | Response Count | Standard Deviation | Mean                               | Response Count | Standard Deviation |
| The instructor provided quality teaching. | 4.4                     | 95             | 0.9                | 4.4                                | 3722           | 0.9                |

| Options                   | Score | Count | Percentage |
|---------------------------|-------|-------|------------|
| Strongly Disagree         | 1     | 1     | 1.1%       |
| Disagree                  | 2     | 3     | 3.2%       |
| Neither Disagree or Agree | 3     | 9     | 9.5%       |
| Agree                     | 4     | 27    | 28.4%      |
| Strongly Agree            | 5     | 55    | 57.9%      |

## Instructor Specific Questions

| Question                                                                                       | Department (Entomology) |                |                    | College (Ag, Food and Environment) |                |                    |
|------------------------------------------------------------------------------------------------|-------------------------|----------------|--------------------|------------------------------------|----------------|--------------------|
|                                                                                                | Mean                    | Response Count | Standard Deviation | Mean                               | Response Count | Standard Deviation |
| The instructor was prepared for class.                                                         | 4.6                     | 95             | 0.8                | 4.5                                | 3723           | 0.8                |
| The instructor presented material clearly.                                                     | 4.4                     | 95             | 0.9                | 4.3                                | 3724           | 1.0                |
| The instructor responded to questions in a manner that aided my understanding of the material. | 4.4                     | 95             | 0.9                | 4.4                                | 3718           | 0.9                |
| The instructor provided material at an appropriate pace.                                       | 4.2                     | 95             | 1.1                | 4.3                                | 3727           | 0.9                |
| The instructor treated students with respect.                                                  | 4.7                     | 95             | 0.8                | 4.6                                | 3728           | 0.8                |
| The instructor asked questions that stimulated deep consideration of the course content.       | 4.1                     | 95             | 1.2                | 4.3                                | 3715           | 1.0                |

|                                                                                                          |       |       |            |                                                                                                    |       |       |            |
|----------------------------------------------------------------------------------------------------------|-------|-------|------------|----------------------------------------------------------------------------------------------------|-------|-------|------------|
| <b>1. The instructor was prepared for class.</b>                                                         |       |       |            | <b>2. The instructor presented material clearly.</b>                                               |       |       |            |
| Options                                                                                                  | Score | Count | Percentage | Options                                                                                            | Score | Count | Percentage |
| Strongly Disagree                                                                                        | 1     | 2     | 2.1%       | Strongly Disagree                                                                                  | 1     | 2     | 2.1%       |
| Disagree                                                                                                 | 2     | 1     | 1.1%       | Disagree                                                                                           | 2     | 3     | 3.2%       |
| Neither Disagree or Agree                                                                                | 3     | 2     | 2.1%       | Neither Disagree or Agree                                                                          | 3     | 9     | 9.5%       |
| Agree                                                                                                    | 4     | 27    | 28.4%      | Agree                                                                                              | 4     | 25    | 26.3%      |
| Strongly Agree                                                                                           | 5     | 63    | 66.3%      | Strongly Agree                                                                                     | 5     | 56    | 58.9%      |
| <b>3. The instructor responded to questions in a manner that aided my understanding of the material.</b> |       |       |            | <b>4. The instructor provided material at an appropriate pace.</b>                                 |       |       |            |
| Options                                                                                                  | Score | Count | Percentage | Options                                                                                            | Score | Count | Percentage |
| Strongly Disagree                                                                                        | 1     | 2     | 2.1%       | Strongly Disagree                                                                                  | 1     | 2     | 2.1%       |
| Disagree                                                                                                 | 2     | 2     | 2.1%       | Disagree                                                                                           | 2     | 9     | 9.5%       |
| Neither Disagree or Agree                                                                                | 3     | 8     | 8.4%       | Neither Disagree or Agree                                                                          | 3     | 10    | 10.5%      |
| Agree                                                                                                    | 4     | 23    | 24.2%      | Agree                                                                                              | 4     | 24    | 25.3%      |
| Strongly Agree                                                                                           | 5     | 60    | 63.2%      | Strongly Agree                                                                                     | 5     | 50    | 52.6%      |
| <b>5. The instructor treated students with respect.</b>                                                  |       |       |            | <b>6. The instructor asked questions that stimulated deep consideration of the course content.</b> |       |       |            |
| Options                                                                                                  | Score | Count | Percentage | Options                                                                                            | Score | Count | Percentage |
| Strongly Disagree                                                                                        | 1     | 1     | 1.1%       | Strongly Disagree                                                                                  | 1     | 5     | 5.3%       |
| Disagree                                                                                                 | 2     | 2     | 2.1%       | Disagree                                                                                           | 2     | 5     | 5.3%       |
| Neither Disagree or Agree                                                                                | 3     | 4     | 4.2%       | Neither Disagree or Agree                                                                          | 3     | 14    | 14.7%      |
| Agree                                                                                                    | 4     | 14    | 14.7%      | Agree                                                                                              | 4     | 24    | 25.3%      |
| Strongly Agree                                                                                           | 5     | 74    | 77.9%      | Strongly Agree                                                                                     | 5     | 47    | 49.5%      |

| Raters         | Students |
|----------------|----------|
| Responded      | 87       |
| Invited        | 139      |
| Response Ratio | 62.6%    |

| Question             | Department (Entomology) |      |                    | College (Ag, Food and Environment) |      |                    |
|----------------------|-------------------------|------|--------------------|------------------------------------|------|--------------------|
|                      | Response Count          | Mean | Standard Deviation | Response Count                     | Mean | Standard Deviation |
| My classification is | 87                      | 3.5  | 1.5                | 3690                               | 3.1  | 1.2                |

| Options            | Score | Count | Percentage |
|--------------------|-------|-------|------------|
| Freshman           | 1     | 13    | 14.9%      |
| Sophomore          | 2     | 14    | 16.1%      |
| Junior             | 3     | 11    | 12.6%      |
| Senior             | 4     | 18    | 20.7%      |
| Graduate           | 5     | 30    | 34.5%      |
| Professional       | 6     | 0     | 0.0%       |
| Other              | 7     | 1     | 1.1%       |
| Choose not to rate | NRP   | 0     | 0.0%       |

### Reason(s) for taking course

| Options                           | Count | Percentage |
|-----------------------------------|-------|------------|
| Is a required course              | 43    | 36.8%      |
| Is an elective                    | 31    | 26.5%      |
| Covers a topic I am interested in | 41    | 35.0%      |
| Choose not to rate                | 2     | 1.7%       |
| Respondent(s)                     | 87    |            |

| Question                         | Department (Entomology) |      |                    | College (Ag, Food and Environment) |      |                    |
|----------------------------------|-------------------------|------|--------------------|------------------------------------|------|--------------------|
|                                  | Response Count          | Mean | Standard Deviation | Response Count                     | Mean | Standard Deviation |
| My expected grade in this course | 84                      | 6.4  | 1.0                | 3635                               | 6.6  | 0.8                |

| Options            | Score | Count | Percentage |
|--------------------|-------|-------|------------|
| Pass or audit      | 1     | 1     | 1.1%       |
| I                  | 2     | 0     | 0.0%       |
| E/Fail             | 3     | 1     | 1.1%       |
| D                  | 4     | 0     | 0.0%       |
| C                  | 5     | 9     | 10.3%      |
| B                  | 6     | 19    | 21.8%      |
| A                  | 7     | 54    | 62.1%      |
| Choose not to rate | NRP   | 3     | 3.4%       |



| Question                                                  | Department (Entomology) |      |                    | College (Ag, Food and Environment) |      |                    |
|-----------------------------------------------------------|-------------------------|------|--------------------|------------------------------------|------|--------------------|
|                                                           | Response Count          | Mean | Standard Deviation | Response Count                     | Mean | Standard Deviation |
| Hours per week spent on the course (excluding class time) | 86                      | 1.9  | 1.1                | 3668                               | 2.0  | 1.0                |

| Options            | Score | Count | Percentage |
|--------------------|-------|-------|------------|
| 2 hour or less     | 1     | 35    | 40.2%      |
| 3 - 4 hours        | 2     | 34    | 39.1%      |
| 5 - 7 hours        | 3     | 10    | 11.5%      |
| 8 - 10 hours       | 4     | 4     | 4.6%       |
| 11 - 15 hours      | 5     | 2     | 2.3%       |
| 16 hours or more   | 6     | 1     | 1.1%       |
| Choose not to rate | NRP   | 1     | 1.1%       |

## Overall Course Score

### Course Specific Questions

| Question                                       | Department (Entomology) |      |                    | College (Ag, Food and Environment) |      |                    |
|------------------------------------------------|-------------------------|------|--------------------|------------------------------------|------|--------------------|
|                                                | Response Count          | Mean | Standard Deviation | Response Count                     | Mean | Standard Deviation |
| I consider this course to be a quality course. | 86                      | 4.6  | 0.7                | 3680                               | 4.3  | 1.0                |

| Options                   | Score | Count | Percentage |
|---------------------------|-------|-------|------------|
| Disagree                  | 2     | 3     | 3.4%       |
| Neither Disagree or Agree | 3     | 4     | 4.6%       |
| Agree                     | 4     | 20    | 23.0%      |
| Strongly Agree            | 5     | 59    | 67.8%      |
| Choose not to rate        | NRP   | 1     | 1.1%       |

**Course Specific Questions**

| Question                                                                                  | Department (Entomology) |      |                    | College (Ag, Food and Environment) |      |                    |
|-------------------------------------------------------------------------------------------|-------------------------|------|--------------------|------------------------------------|------|--------------------|
|                                                                                           | Response Count          | Mean | Standard Deviation | Response Count                     | Mean | Standard Deviation |
| The course was well organized                                                             | 86                      | 4.6  | 0.5                | 3683                               | 4.3  | 0.9                |
| Class meetings contributed to my learning of the course content.                          | 85                      | 4.7  | 0.6                | 3636                               | 4.3  | 1.0                |
| Grading in the course was fair.                                                           | 85                      | 4.7  | 0.5                | 3676                               | 4.4  | 0.9                |
| Assessments (e.g., tests, quizzes, papers, homework, projects) reflected course material. | 81                      | 4.7  | 0.5                | 3653                               | 4.4  | 0.8                |
| I understand how the final grade will be calculated in the course.                        | 85                      | 4.6  | 0.7                | 3677                               | 4.5  | 0.7                |

| 1. The course was well organized |       |       |            |
|----------------------------------|-------|-------|------------|
| Options                          | Score | Count | Percentage |
| Neither Disagree or Agree        | 3     | 1     | 1.1%       |
| Agree                            | 4     | 30    | 34.5%      |
| Strongly Agree                   | 5     | 55    | 63.2%      |
| Choose not to rate               | NRP   | 1     | 1.1%       |

| 3. Grading in the course was fair. |       |       |            |
|------------------------------------|-------|-------|------------|
| Options                            | Score | Count | Percentage |
| Neither Disagree or Agree          | 3     | 2     | 2.3%       |
| Agree                              | 4     | 20    | 23.0%      |
| Strongly Agree                     | 5     | 63    | 72.4%      |
| Choose not to rate                 | NRP   | 2     | 2.3%       |

| 5. I understand how the final grade will be calculated in the course. |       |       |            |
|-----------------------------------------------------------------------|-------|-------|------------|
| Options                                                               | Score | Count | Percentage |
| Disagree                                                              | 2     | 2     | 2.3%       |
| Neither Disagree or Agree                                             | 3     | 2     | 2.3%       |
| Agree                                                                 | 4     | 25    | 28.7%      |
| Strongly Agree                                                        | 5     | 56    | 64.4%      |
| Choose not to rate                                                    | NRP   | 2     | 2.3%       |

| 2. Class meetings contributed to my learning of the course content. |       |       |            |
|---------------------------------------------------------------------|-------|-------|------------|
| Options                                                             | Score | Count | Percentage |
| Disagree                                                            | 2     | 1     | 1.1%       |
| Neither Disagree or Agree                                           | 3     | 3     | 3.4%       |
| Agree                                                               | 4     | 17    | 19.5%      |
| Strongly Agree                                                      | 5     | 64    | 73.6%      |
| Choose not to rate                                                  | NRP   | 2     | 2.3%       |

| 4. Assessments (e.g., tests, quizzes, papers, homework, projects) reflected course material. |       |       |            |
|----------------------------------------------------------------------------------------------|-------|-------|------------|
| Options                                                                                      | Score | Count | Percentage |
| Neither Disagree or Agree                                                                    | 3     | 2     | 2.3%       |
| Agree                                                                                        | 4     | 18    | 20.7%      |
| Strongly Agree                                                                               | 5     | 61    | 70.1%      |
| Choose not to rate                                                                           | NRP   | 6     | 6.9%       |

## Overall Instructor Score

| Question                                  | Department (Entomology) |      |                    | College (Ag, Food and Environment) |      |                    |
|-------------------------------------------|-------------------------|------|--------------------|------------------------------------|------|--------------------|
|                                           | Response Count          | Mean | Standard Deviation | Response Count                     | Mean | Standard Deviation |
| The instructor provided quality teaching. | 96                      | 4.7  | 0.6                | 4112                               | 4.4  | 0.9                |

| Options                   | Score | Count | Percentage |
|---------------------------|-------|-------|------------|
| Disagree                  | 2     | 1     | 1.0%       |
| Neither Disagree or Agree | 3     | 2     | 2.1%       |
| Agree                     | 4     | 24    | 24.7%      |
| Strongly Agree            | 5     | 69    | 71.1%      |
| Choose not to rate        | NRP   | 1     | 1.0%       |

## Instructor Specific Questions

| Question                                                                                                                                                                                                                                                                                                                             | Department (Entomology) |      |                    | College (Ag, Food and Environment) |      |                    |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------|------|--------------------|------------------------------------|------|--------------------|
|                                                                                                                                                                                                                                                                                                                                      | Response Count          | Mean | Standard Deviation | Response Count                     | Mean | Standard Deviation |
| The instructor Bruce, Clare, Daniel, Eric, Janet, Jennifer, John, Kenneth, Lee, Lynne, Nancy, Scott, Subba, Zainulabeuddin Chapman, Gleeson, Haynes, Johnson, Lensing, Obrycki, Palli, Potter, Rieske-Kinney, Rittschof, Syed, Townsend, Webb, White was prepared for class.                                                         | 96                      | 4.7  | 0.5                | 4113                               | 4.5  | 0.7                |
| The instructor Bruce, Clare, Daniel, Eric, Janet, Jennifer, John, Kenneth, Lee, Lynne, Nancy, Scott, Subba, Zainulabeuddin Chapman, Gleeson, Haynes, Johnson, Lensing, Obrycki, Palli, Potter, Rieske-Kinney, Rittschof, Syed, Townsend, Webb, White presented material clearly.                                                     | 95                      | 4.7  | 0.5                | 4118                               | 4.4  | 0.9                |
| The instructor Bruce, Clare, Daniel, Eric, Janet, Jennifer, John, Kenneth, Lee, Lynne, Nancy, Scott, Subba, Zainulabeuddin Chapman, Gleeson, Haynes, Johnson, Lensing, Obrycki, Palli, Potter, Rieske-Kinney, Rittschof, Syed, Townsend, Webb, White responded to questions in a manner that aided my understanding of the material. | 96                      | 4.7  | 0.6                | 4116                               | 4.4  | 0.9                |
| The instructor Bruce, Clare, Daniel, Eric, Janet, Jennifer, John, Kenneth, Lee, Lynne, Nancy, Scott, Subba, Zainulabeuddin Chapman, Gleeson, Haynes, Johnson, Lensing, Obrycki, Palli, Potter, Rieske-Kinney, Rittschof, Syed, Townsend, Webb, White provided material at an appropriate pace.                                       | 96                      | 4.6  | 0.7                | 4110                               | 4.4  | 0.9                |
| The instructor Bruce, Clare, Daniel, Eric, Janet, Jennifer, John, Kenneth, Lee, Lynne, Nancy, Scott, Subba, Zainulabeuddin Chapman, Gleeson, Haynes, Johnson, Lensing, Obrycki, Palli, Potter, Rieske-Kinney, Rittschof, Syed, Townsend, Webb, White treated students with respect.                                                  | 96                      | 4.8  | 0.4                | 4126                               | 4.6  | 0.7                |
| The instructor Bruce, Clare, Daniel, Eric, Janet, Jennifer, John, Kenneth, Lee, Lynne, Nancy, Scott, Subba, Zainulabeuddin Chapman, Gleeson, Haynes, Johnson, Lensing, Obrycki, Palli, Potter, Rieske-Kinney, Rittschof, Syed, Townsend, Webb, White asked questions that stimulated deep consideration of the course content.       | 96                      | 4.6  | 0.7                | 4100                               | 4.4  | 0.9                |

1. The instructor Bruce, Clare, Daniel, Eric, Janet, Jennifer, John, Kenneth, Lee, Lynne, Nancy, Scott, Subba, Zainulabeuddin Chapman, Gleeson, Haynes, Johnson, Lensing, Obrycki, Palli, Potter, Rieske-Kinney, Rittschof, Syed, Townsend, Webb, White was prepared for class.

| Options                   | Score | Count | Percentage |
|---------------------------|-------|-------|------------|
| Neither Disagree or Agree | 3     | 2     | 2.1%       |
| Agree                     | 4     | 22    | 22.7%      |
| Strongly Agree            | 5     | 72    | 74.2%      |
| Choose not to rate        | NRP   | 1     | 1.0%       |

3. The instructor Bruce, Clare, Daniel, Eric, Janet, Jennifer, John, Kenneth, Lee, Lynne, Nancy, Scott, Subba, Zainulabeuddin Chapman, Gleeson, Haynes, Johnson, Lensing, Obrycki, Palli, Potter, Rieske-Kinney, Rittschof, Syed, Townsend, Webb, White responded to questions in a manner that aided my understanding of the material.

| Options                   | Score | Count | Percentage |
|---------------------------|-------|-------|------------|
| Disagree                  | 2     | 2     | 2.1%       |
| Neither Disagree or Agree | 3     | 1     | 1.0%       |
| Agree                     | 4     | 18    | 18.6%      |
| Strongly Agree            | 5     | 75    | 77.3%      |
| Choose not to rate        | NRP   | 1     | 1.0%       |

5. The instructor Bruce, Clare, Daniel, Eric, Janet, Jennifer, John, Kenneth, Lee, Lynne, Nancy, Scott, Subba, Zainulabeuddin Chapman, Gleeson, Haynes, Johnson, Lensing, Obrycki, Palli, Potter, Rieske-Kinney, Rittschof, Syed, Townsend, Webb, White treated students with respect.

| Options            | Score | Count | Percentage |
|--------------------|-------|-------|------------|
| Agree              | 4     | 16    | 16.5%      |
| Strongly Agree     | 5     | 80    | 82.5%      |
| Choose not to rate | NRP   | 1     | 1.0%       |

2. The instructor Bruce, Clare, Daniel, Eric, Janet, Jennifer, John, Kenneth, Lee, Lynne, Nancy, Scott, Subba, Zainulabeuddin Chapman, Gleeson, Haynes, Johnson, Lensing, Obrycki, Palli, Potter, Rieske-Kinney, Rittschof, Syed, Townsend, Webb, White presented material clearly.

| Options                   | Score | Count | Percentage |
|---------------------------|-------|-------|------------|
| Neither Disagree or Agree | 3     | 1     | 1.0%       |
| Agree                     | 4     | 22    | 22.7%      |
| Strongly Agree            | 5     | 72    | 74.2%      |
| Choose not to rate        | NRP   | 2     | 2.1%       |

4. The instructor Bruce, Clare, Daniel, Eric, Janet, Jennifer, John, Kenneth, Lee, Lynne, Nancy, Scott, Subba, Zainulabeuddin Chapman, Gleeson, Haynes, Johnson, Lensing, Obrycki, Palli, Potter, Rieske-Kinney, Rittschof, Syed, Townsend, Webb, White provided material at an appropriate pace.

| Options                   | Score | Count | Percentage |
|---------------------------|-------|-------|------------|
| Disagree                  | 2     | 2     | 2.1%       |
| Neither Disagree or Agree | 3     | 4     | 4.1%       |
| Agree                     | 4     | 23    | 23.7%      |
| Strongly Agree            | 5     | 67    | 69.1%      |
| Choose not to rate        | NRP   | 1     | 1.0%       |

6. The instructor Bruce, Clare, Daniel, Eric, Janet, Jennifer, John, Kenneth, Lee, Lynne, Nancy, Scott, Subba, Zainulabeuddin Chapman, Gleeson, Haynes, Johnson, Lensing, Obrycki, Palli, Potter, Rieske-Kinney, Rittschof, Syed, Townsend, Webb, White asked questions that stimulated deep consideration of the course content.

| Options                   | Score | Count | Percentage |
|---------------------------|-------|-------|------------|
| Neither Disagree or Agree | 3     | 9     | 9.3%       |
| Agree                     | 4     | 21    | 21.6%      |
| Strongly Agree            | 5     | 66    | 68.0%      |
| Choose not to rate        | NRP   | 1     | 1.0%       |

| Raters         | Students |
|----------------|----------|
| Responded      | 94       |
| Invited        | 147      |
| Response Ratio | 63.9%    |

| Question             | Department (Entomology) |      |                    | College (Ag, Food and Environment) |      |                    |
|----------------------|-------------------------|------|--------------------|------------------------------------|------|--------------------|
|                      | Response Count          | Mean | Standard Deviation | Response Count                     | Mean | Standard Deviation |
| My classification is | 94                      | 3.4  | 1.7                | 2945                               | 3.1  | 1.2                |

| 1. My classification is |       |       |            |
|-------------------------|-------|-------|------------|
| Options                 | Score | Count | Percentage |
| Freshman                | 1     | 20    | 21.3%      |
| Sophomore               | 2     | 11    | 11.7%      |
| Junior                  | 3     | 15    | 16.0%      |
| Senior                  | 4     | 9     | 9.6%       |
| Graduate                | 5     | 37    | 39.4%      |
| Professional            | 6     | 0     | 0.0%       |
| Other                   | 7     | 2     | 2.1%       |
| Choose not to rate      | NRP   | 0     | 0.0%       |

### Reason(s) for taking course

| Options                           | Count | Percentage |
|-----------------------------------|-------|------------|
| Is a required course              | 34    | 28.8%      |
| Is an elective                    | 35    | 29.7%      |
| Covers a topic I am interested in | 48    | 40.7%      |
| Choose not to rate                | 1     | 0.8%       |
| Respondent(s)                     | 94    |            |

| Question                         | Department (Entomology) |      |                    | College (Ag, Food and Environment) |      |                    |
|----------------------------------|-------------------------|------|--------------------|------------------------------------|------|--------------------|
|                                  | Response Count          | Mean | Standard Deviation | Response Count                     | Mean | Standard Deviation |
| My expected grade in this course | 90                      | 6.4  | 1.3                | 2906                               | 6.6  | 0.9                |

| 1. My expected grade in this course |       |       |            |
|-------------------------------------|-------|-------|------------|
| Options                             | Score | Count | Percentage |
| Pass or audit                       | 1     | 4     | 4.3%       |
| I                                   | 2     | 0     | 0.0%       |
| E/Fail                              | 3     | 0     | 0.0%       |
| D                                   | 4     | 0     | 0.0%       |
| C                                   | 5     | 5     | 5.3%       |
| B                                   | 6     | 24    | 25.5%      |
| A                                   | 7     | 57    | 60.6%      |
| Choose not to rate                  | NRP   | 4     | 4.3%       |



| Question                                                  | Department (Entomology) |      |                    | College (Ag, Food and Environment) |      |                    |
|-----------------------------------------------------------|-------------------------|------|--------------------|------------------------------------|------|--------------------|
|                                                           | Response Count          | Mean | Standard Deviation | Response Count                     | Mean | Standard Deviation |
| Hours per week spent on the course (excluding class time) | 94                      | 1.9  | 0.9                | 2940                               | 2.0  | 1.0                |

| 1. Hours per week spent on the course (excluding class time) |       |       |            |
|--------------------------------------------------------------|-------|-------|------------|
| Options                                                      | Score | Count | Percentage |
| 2 hour or less                                               | 1     | 38    | 40.4%      |
| 3 - 4 hours                                                  | 2     | 35    | 37.2%      |
| 5 - 7 hours                                                  | 3     | 19    | 20.2%      |
| 8 - 10 hours                                                 | 4     | 1     | 1.1%       |
| 11 - 15 hours                                                | 5     | 1     | 1.1%       |
| 16 hours or more                                             | 6     | 0     | 0.0%       |
| Choose not to rate                                           | NRP   | 0     | 0.0%       |

## Overall Course Score

### Course Specific Questions

| Question                                       | Department (Entomology) |      |                    | College (Ag, Food and Environment) |      |                    |
|------------------------------------------------|-------------------------|------|--------------------|------------------------------------|------|--------------------|
|                                                | Response Count          | Mean | Standard Deviation | Response Count                     | Mean | Standard Deviation |
| I consider this course to be a quality course. | 93                      | 4.6  | 0.7                | 2937                               | 4.3  | 1.0                |

| 1. I consider this course to be a quality course. |       |       |            |
|---------------------------------------------------|-------|-------|------------|
| Options                                           | Score | Count | Percentage |
| Strongly Disagree                                 | 1     | 1     | 1.1%       |
| Disagree                                          | 2     | 1     | 1.1%       |
| Neither Disagree or Agree                         | 3     | 3     | 3.2%       |
| Agree                                             | 4     | 21    | 22.3%      |
| Strongly Agree                                    | 5     | 67    | 71.3%      |
| Choose not to rate                                | NRP   | 1     | 1.1%       |

**Course Specific Questions**

| Question                                                                                  | Department (Entomology) |      |                    | College (Ag, Food and Environment) |      |                    |
|-------------------------------------------------------------------------------------------|-------------------------|------|--------------------|------------------------------------|------|--------------------|
|                                                                                           | Response Count          | Mean | Standard Deviation | Response Count                     | Mean | Standard Deviation |
| The course was well organized.                                                            | 94                      | 4.7  | 0.5                | 2946                               | 4.4  | 0.9                |
| Class meetings contributed to my learning of the course content.                          | 94                      | 4.7  | 0.7                | 2877                               | 4.3  | 0.9                |
| Grading in the course was fair.                                                           | 90                      | 4.7  | 0.6                | 2937                               | 4.4  | 0.9                |
| Assessments (e.g., tests, quizzes, papers, homework, projects) reflected course material. | 92                      | 4.7  | 0.6                | 2928                               | 4.5  | 0.8                |
| I understand how the final grade will be calculated in the course.                        | 92                      | 4.7  | 0.5                | 2939                               | 4.5  | 0.8                |

**1. The course was well organized.**

| Options                   | Score | Count | Percentage |
|---------------------------|-------|-------|------------|
| Neither Disagree or Agree | 3     | 3     | 3.2%       |
| Agree                     | 4     | 24    | 25.5%      |
| Strongly Agree            | 5     | 67    | 71.3%      |

**3. Grading in the course was fair.**

| Options                   | Score | Count | Percentage |
|---------------------------|-------|-------|------------|
| Disagree                  | 2     | 2     | 2.1%       |
| Neither Disagree or Agree | 3     | 1     | 1.1%       |
| Agree                     | 4     | 16    | 17.0%      |
| Strongly Agree            | 5     | 71    | 75.5%      |
| Choose not to rate        | NRP   | 4     | 4.3%       |

**5. I understand how the final grade will be calculated in the course.**

| Options                   | Score | Count | Percentage |
|---------------------------|-------|-------|------------|
| Neither Disagree or Agree | 3     | 2     | 2.1%       |
| Agree                     | 4     | 21    | 22.3%      |
| Strongly Agree            | 5     | 69    | 73.4%      |
| Choose not to rate        | NRP   | 2     | 2.1%       |

**2. Class meetings contributed to my learning of the course content.**

| Options                   | Score | Count | Percentage |
|---------------------------|-------|-------|------------|
| Disagree                  | 2     | 3     | 3.2%       |
| Neither Disagree or Agree | 3     | 1     | 1.1%       |
| Agree                     | 4     | 19    | 20.2%      |
| Strongly Agree            | 5     | 71    | 75.5%      |

**4. Assessments (e.g., tests, quizzes, papers, homework, projects) reflected course material.**

| Options            | Score | Count | Percentage |
|--------------------|-------|-------|------------|
| Disagree           | 2     | 2     | 2.1%       |
| Agree              | 4     | 19    | 20.2%      |
| Strongly Agree     | 5     | 71    | 75.5%      |
| Choose not to rate | NRP   | 2     | 2.1%       |



## Overall Instructor Score

| Question                                  | Department (Entomology) |      |                    | College (Ag, Food and Environment) |      |                    |
|-------------------------------------------|-------------------------|------|--------------------|------------------------------------|------|--------------------|
|                                           | Response Count          | Mean | Standard Deviation | Response Count                     | Mean | Standard Deviation |
| The instructor provided quality teaching. | 112                     | 4.8  | 0.6                | 3107                               | 4.5  | 0.9                |

| 1. The instructor provided quality teaching. |       |       |            |
|----------------------------------------------|-------|-------|------------|
| Options                                      | Score | Count | Percentage |
| Disagree                                     | 2     | 2     | 1.8%       |
| Neither Disagree or Agree                    | 3     | 2     | 1.8%       |
| Agree                                        | 4     | 16    | 14.0%      |
| Strongly Agree                               | 5     | 92    | 80.7%      |
| Choose not to rate                           | NRP   | 2     | 1.8%       |

## Instructor Specific Questions

| Question                                                                                                                                                                                                                                                                                                       | Department (Entomology) |      |                    | College (Ag, Food and Environment) |      |                    |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------|------|--------------------|------------------------------------|------|--------------------|
|                                                                                                                                                                                                                                                                                                                | Response Count          | Mean | Standard Deviation | Response Count                     | Mean | Standard Deviation |
| The instructor Charles, Clare, Daniel, David, Eric, Janet, Jennifer, John, Kenneth, Nicholas, Raul, Ricardo, Xuguo Bessin, Chapman, Fox, Haynes, Lensing, Obrycki, Potter, Rittschof, Teets, Villanueva, Westneat, White, Zhou was prepared for class.                                                         | 113                     | 4.8  | 0.4                | 3107                               | 4.5  | 0.7                |
| The instructor Charles, Clare, Daniel, David, Eric, Janet, Jennifer, John, Kenneth, Nicholas, Raul, Ricardo, Xuguo Bessin, Chapman, Fox, Haynes, Lensing, Obrycki, Potter, Rittschof, Teets, Villanueva, Westneat, White, Zhou presented material clearly.                                                     | 114                     | 4.7  | 0.6                | 3110                               | 4.4  | 0.9                |
| The instructor Charles, Clare, Daniel, David, Eric, Janet, Jennifer, John, Kenneth, Nicholas, Raul, Ricardo, Xuguo Bessin, Chapman, Fox, Haynes, Lensing, Obrycki, Potter, Rittschof, Teets, Villanueva, Westneat, White, Zhou responded to questions in a manner that aided my understanding of the material. | 114                     | 4.7  | 0.6                | 3111                               | 4.5  | 0.9                |
| The instructor Charles, Clare, Daniel, David, Eric, Janet, Jennifer, John, Kenneth, Nicholas, Raul, Ricardo, Xuguo Bessin, Chapman, Fox, Haynes, Lensing, Obrycki, Potter, Rittschof, Teets, Villanueva, Westneat, White, Zhou provided material at an appropriate pace.                                       | 114                     | 4.7  | 0.5                | 3117                               | 4.4  | 0.9                |
| The instructor Charles, Clare, Daniel, David, Eric, Janet, Jennifer, John, Kenneth, Nicholas, Raul, Ricardo, Xuguo Bessin, Chapman, Fox, Haynes, Lensing, Obrycki, Potter, Rittschof, Teets, Villanueva, Westneat, White, Zhou treated students with respect.                                                  | 114                     | 4.9  | 0.3                | 3117                               | 4.6  | 0.7                |
| The instructor Charles, Clare, Daniel, David, Eric, Janet, Jennifer, John, Kenneth, Nicholas, Raul, Ricardo, Xuguo Bessin, Chapman, Fox, Haynes, Lensing, Obrycki, Potter, Rittschof, Teets, Villanueva, Westneat, White, Zhou asked questions that stimulated deep consideration of the course content.       | 114                     | 4.6  | 0.7                | 3094                               | 4.4  | 0.9                |

| 1. The instructor Charles, Clare, Daniel, David, Eric, Janet, Jennifer, John, Kenneth, Nicholas, Raul, Ricardo, Xuguo Bessin, Chapman, Fox, Haynes, Lensing, Obrycki, Potter, Rittschof, Teets, Villanueva, Westneat, White, Zhou was prepared for class.                                                                                                                                                                                           | 2. The instructor Charles, Clare, Daniel, David, Eric, Janet, Jennifer, John, Kenneth, Nicholas, Raul, Ricardo, Xuguo Bessin, Chapman, Fox, Haynes, Lensing, Obrycki, Potter, Rittschof, Teets, Villanueva, Westneat, White, Zhou presented material clearly.                                               |       |            |            |                           |   |    |       |                           |   |    |       |                                                                                                                                                                                                                                                                                                                                                                                                                                         |         |       |       |                    |          |    |       |                                                                                                                                                                                                                                                                                                                                                                                                                                         |                           |       |       |            |                           |   |    |       |                           |   |    |       |                |   |    |       |                |   |    |       |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|------------|------------|---------------------------|---|----|-------|---------------------------|---|----|-------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------|-------|-------|--------------------|----------|----|-------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------|-------|-------|------------|---------------------------|---|----|-------|---------------------------|---|----|-------|----------------|---|----|-------|----------------|---|----|-------|
| <table border="1"> <thead> <tr> <th>Options</th> <th>Score</th> <th>Count</th> <th>Percentage</th> </tr> </thead> <tbody> <tr> <td>Neither Disagree or Agree</td> <td>3</td> <td>1</td> <td>0.9%</td> </tr> <tr> <td>Agree</td> <td>4</td> <td>23</td> <td>20.2%</td> </tr> <tr> <td>Strongly Agree</td> <td>5</td> <td>89</td> <td>78.1%</td> </tr> <tr> <td>Choose not to rate</td> <td>NRP</td> <td>1</td> <td>0.9%</td> </tr> </tbody> </table> | Options                                                                                                                                                                                                                                                                                                     | Score | Count      | Percentage | Neither Disagree or Agree | 3 | 1  | 0.9%  | Agree                     | 4 | 23 | 20.2% | Strongly Agree                                                                                                                                                                                                                                                                                                                                                                                                                          | 5       | 89    | 78.1% | Choose not to rate | NRP      | 1  | 0.9%  | <table border="1"> <thead> <tr> <th>Options</th> <th>Score</th> <th>Count</th> <th>Percentage</th> </tr> </thead> <tbody> <tr> <td>Disagree</td> <td>2</td> <td>2</td> <td>1.8%</td> </tr> <tr> <td>Neither Disagree or Agree</td> <td>3</td> <td>2</td> <td>1.8%</td> </tr> <tr> <td>Agree</td> <td>4</td> <td>22</td> <td>19.3%</td> </tr> <tr> <td>Strongly Agree</td> <td>5</td> <td>88</td> <td>77.2%</td> </tr> </tbody> </table> | Options                   | Score | Count | Percentage | Disagree                  | 2 | 2  | 1.8%  | Neither Disagree or Agree | 3 | 2  | 1.8%  | Agree          | 4 | 22 | 19.3% | Strongly Agree | 5 | 88 | 77.2% |
| Options                                                                                                                                                                                                                                                                                                                                                                                                                                             | Score                                                                                                                                                                                                                                                                                                       | Count | Percentage |            |                           |   |    |       |                           |   |    |       |                                                                                                                                                                                                                                                                                                                                                                                                                                         |         |       |       |                    |          |    |       |                                                                                                                                                                                                                                                                                                                                                                                                                                         |                           |       |       |            |                           |   |    |       |                           |   |    |       |                |   |    |       |                |   |    |       |
| Neither Disagree or Agree                                                                                                                                                                                                                                                                                                                                                                                                                           | 3                                                                                                                                                                                                                                                                                                           | 1     | 0.9%       |            |                           |   |    |       |                           |   |    |       |                                                                                                                                                                                                                                                                                                                                                                                                                                         |         |       |       |                    |          |    |       |                                                                                                                                                                                                                                                                                                                                                                                                                                         |                           |       |       |            |                           |   |    |       |                           |   |    |       |                |   |    |       |                |   |    |       |
| Agree                                                                                                                                                                                                                                                                                                                                                                                                                                               | 4                                                                                                                                                                                                                                                                                                           | 23    | 20.2%      |            |                           |   |    |       |                           |   |    |       |                                                                                                                                                                                                                                                                                                                                                                                                                                         |         |       |       |                    |          |    |       |                                                                                                                                                                                                                                                                                                                                                                                                                                         |                           |       |       |            |                           |   |    |       |                           |   |    |       |                |   |    |       |                |   |    |       |
| Strongly Agree                                                                                                                                                                                                                                                                                                                                                                                                                                      | 5                                                                                                                                                                                                                                                                                                           | 89    | 78.1%      |            |                           |   |    |       |                           |   |    |       |                                                                                                                                                                                                                                                                                                                                                                                                                                         |         |       |       |                    |          |    |       |                                                                                                                                                                                                                                                                                                                                                                                                                                         |                           |       |       |            |                           |   |    |       |                           |   |    |       |                |   |    |       |                |   |    |       |
| Choose not to rate                                                                                                                                                                                                                                                                                                                                                                                                                                  | NRP                                                                                                                                                                                                                                                                                                         | 1     | 0.9%       |            |                           |   |    |       |                           |   |    |       |                                                                                                                                                                                                                                                                                                                                                                                                                                         |         |       |       |                    |          |    |       |                                                                                                                                                                                                                                                                                                                                                                                                                                         |                           |       |       |            |                           |   |    |       |                           |   |    |       |                |   |    |       |                |   |    |       |
| Options                                                                                                                                                                                                                                                                                                                                                                                                                                             | Score                                                                                                                                                                                                                                                                                                       | Count | Percentage |            |                           |   |    |       |                           |   |    |       |                                                                                                                                                                                                                                                                                                                                                                                                                                         |         |       |       |                    |          |    |       |                                                                                                                                                                                                                                                                                                                                                                                                                                         |                           |       |       |            |                           |   |    |       |                           |   |    |       |                |   |    |       |                |   |    |       |
| Disagree                                                                                                                                                                                                                                                                                                                                                                                                                                            | 2                                                                                                                                                                                                                                                                                                           | 2     | 1.8%       |            |                           |   |    |       |                           |   |    |       |                                                                                                                                                                                                                                                                                                                                                                                                                                         |         |       |       |                    |          |    |       |                                                                                                                                                                                                                                                                                                                                                                                                                                         |                           |       |       |            |                           |   |    |       |                           |   |    |       |                |   |    |       |                |   |    |       |
| Neither Disagree or Agree                                                                                                                                                                                                                                                                                                                                                                                                                           | 3                                                                                                                                                                                                                                                                                                           | 2     | 1.8%       |            |                           |   |    |       |                           |   |    |       |                                                                                                                                                                                                                                                                                                                                                                                                                                         |         |       |       |                    |          |    |       |                                                                                                                                                                                                                                                                                                                                                                                                                                         |                           |       |       |            |                           |   |    |       |                           |   |    |       |                |   |    |       |                |   |    |       |
| Agree                                                                                                                                                                                                                                                                                                                                                                                                                                               | 4                                                                                                                                                                                                                                                                                                           | 22    | 19.3%      |            |                           |   |    |       |                           |   |    |       |                                                                                                                                                                                                                                                                                                                                                                                                                                         |         |       |       |                    |          |    |       |                                                                                                                                                                                                                                                                                                                                                                                                                                         |                           |       |       |            |                           |   |    |       |                           |   |    |       |                |   |    |       |                |   |    |       |
| Strongly Agree                                                                                                                                                                                                                                                                                                                                                                                                                                      | 5                                                                                                                                                                                                                                                                                                           | 88    | 77.2%      |            |                           |   |    |       |                           |   |    |       |                                                                                                                                                                                                                                                                                                                                                                                                                                         |         |       |       |                    |          |    |       |                                                                                                                                                                                                                                                                                                                                                                                                                                         |                           |       |       |            |                           |   |    |       |                           |   |    |       |                |   |    |       |                |   |    |       |
| 3. The instructor Charles, Clare, Daniel, David, Eric, Janet, Jennifer, John, Kenneth, Nicholas, Raul, Ricardo, Xuguo Bessin, Chapman, Fox, Haynes, Lensing, Obrycki, Potter, Rittschof, Teets, Villanueva, Westneat, White, Zhou responded to questions in a manner that aided my understanding of the material.                                                                                                                                   | 4. The instructor Charles, Clare, Daniel, David, Eric, Janet, Jennifer, John, Kenneth, Nicholas, Raul, Ricardo, Xuguo Bessin, Chapman, Fox, Haynes, Lensing, Obrycki, Potter, Rittschof, Teets, Villanueva, Westneat, White, Zhou provided material at an appropriate pace.                                 |       |            |            |                           |   |    |       |                           |   |    |       |                                                                                                                                                                                                                                                                                                                                                                                                                                         |         |       |       |                    |          |    |       |                                                                                                                                                                                                                                                                                                                                                                                                                                         |                           |       |       |            |                           |   |    |       |                           |   |    |       |                |   |    |       |                |   |    |       |
| <table border="1"> <thead> <tr> <th>Options</th> <th>Score</th> <th>Count</th> <th>Percentage</th> </tr> </thead> <tbody> <tr> <td>Disagree</td> <td>2</td> <td>1</td> <td>0.9%</td> </tr> <tr> <td>Neither Disagree or Agree</td> <td>3</td> <td>4</td> <td>3.5%</td> </tr> <tr> <td>Agree</td> <td>4</td> <td>18</td> <td>15.8%</td> </tr> <tr> <td>Strongly Agree</td> <td>5</td> <td>91</td> <td>79.8%</td> </tr> </tbody> </table>             | Options                                                                                                                                                                                                                                                                                                     | Score | Count      | Percentage | Disagree                  | 2 | 1  | 0.9%  | Neither Disagree or Agree | 3 | 4  | 3.5%  | Agree                                                                                                                                                                                                                                                                                                                                                                                                                                   | 4       | 18    | 15.8% | Strongly Agree     | 5        | 91 | 79.8% | <table border="1"> <thead> <tr> <th>Options</th> <th>Score</th> <th>Count</th> <th>Percentage</th> </tr> </thead> <tbody> <tr> <td>Neither Disagree or Agree</td> <td>3</td> <td>1</td> <td>0.9%</td> </tr> <tr> <td>Agree</td> <td>4</td> <td>28</td> <td>24.6%</td> </tr> <tr> <td>Strongly Agree</td> <td>5</td> <td>85</td> <td>74.6%</td> </tr> </tbody> </table>                                                                  | Options                   | Score | Count | Percentage | Neither Disagree or Agree | 3 | 1  | 0.9%  | Agree                     | 4 | 28 | 24.6% | Strongly Agree | 5 | 85 | 74.6% |                |   |    |       |
| Options                                                                                                                                                                                                                                                                                                                                                                                                                                             | Score                                                                                                                                                                                                                                                                                                       | Count | Percentage |            |                           |   |    |       |                           |   |    |       |                                                                                                                                                                                                                                                                                                                                                                                                                                         |         |       |       |                    |          |    |       |                                                                                                                                                                                                                                                                                                                                                                                                                                         |                           |       |       |            |                           |   |    |       |                           |   |    |       |                |   |    |       |                |   |    |       |
| Disagree                                                                                                                                                                                                                                                                                                                                                                                                                                            | 2                                                                                                                                                                                                                                                                                                           | 1     | 0.9%       |            |                           |   |    |       |                           |   |    |       |                                                                                                                                                                                                                                                                                                                                                                                                                                         |         |       |       |                    |          |    |       |                                                                                                                                                                                                                                                                                                                                                                                                                                         |                           |       |       |            |                           |   |    |       |                           |   |    |       |                |   |    |       |                |   |    |       |
| Neither Disagree or Agree                                                                                                                                                                                                                                                                                                                                                                                                                           | 3                                                                                                                                                                                                                                                                                                           | 4     | 3.5%       |            |                           |   |    |       |                           |   |    |       |                                                                                                                                                                                                                                                                                                                                                                                                                                         |         |       |       |                    |          |    |       |                                                                                                                                                                                                                                                                                                                                                                                                                                         |                           |       |       |            |                           |   |    |       |                           |   |    |       |                |   |    |       |                |   |    |       |
| Agree                                                                                                                                                                                                                                                                                                                                                                                                                                               | 4                                                                                                                                                                                                                                                                                                           | 18    | 15.8%      |            |                           |   |    |       |                           |   |    |       |                                                                                                                                                                                                                                                                                                                                                                                                                                         |         |       |       |                    |          |    |       |                                                                                                                                                                                                                                                                                                                                                                                                                                         |                           |       |       |            |                           |   |    |       |                           |   |    |       |                |   |    |       |                |   |    |       |
| Strongly Agree                                                                                                                                                                                                                                                                                                                                                                                                                                      | 5                                                                                                                                                                                                                                                                                                           | 91    | 79.8%      |            |                           |   |    |       |                           |   |    |       |                                                                                                                                                                                                                                                                                                                                                                                                                                         |         |       |       |                    |          |    |       |                                                                                                                                                                                                                                                                                                                                                                                                                                         |                           |       |       |            |                           |   |    |       |                           |   |    |       |                |   |    |       |                |   |    |       |
| Options                                                                                                                                                                                                                                                                                                                                                                                                                                             | Score                                                                                                                                                                                                                                                                                                       | Count | Percentage |            |                           |   |    |       |                           |   |    |       |                                                                                                                                                                                                                                                                                                                                                                                                                                         |         |       |       |                    |          |    |       |                                                                                                                                                                                                                                                                                                                                                                                                                                         |                           |       |       |            |                           |   |    |       |                           |   |    |       |                |   |    |       |                |   |    |       |
| Neither Disagree or Agree                                                                                                                                                                                                                                                                                                                                                                                                                           | 3                                                                                                                                                                                                                                                                                                           | 1     | 0.9%       |            |                           |   |    |       |                           |   |    |       |                                                                                                                                                                                                                                                                                                                                                                                                                                         |         |       |       |                    |          |    |       |                                                                                                                                                                                                                                                                                                                                                                                                                                         |                           |       |       |            |                           |   |    |       |                           |   |    |       |                |   |    |       |                |   |    |       |
| Agree                                                                                                                                                                                                                                                                                                                                                                                                                                               | 4                                                                                                                                                                                                                                                                                                           | 28    | 24.6%      |            |                           |   |    |       |                           |   |    |       |                                                                                                                                                                                                                                                                                                                                                                                                                                         |         |       |       |                    |          |    |       |                                                                                                                                                                                                                                                                                                                                                                                                                                         |                           |       |       |            |                           |   |    |       |                           |   |    |       |                |   |    |       |                |   |    |       |
| Strongly Agree                                                                                                                                                                                                                                                                                                                                                                                                                                      | 5                                                                                                                                                                                                                                                                                                           | 85    | 74.6%      |            |                           |   |    |       |                           |   |    |       |                                                                                                                                                                                                                                                                                                                                                                                                                                         |         |       |       |                    |          |    |       |                                                                                                                                                                                                                                                                                                                                                                                                                                         |                           |       |       |            |                           |   |    |       |                           |   |    |       |                |   |    |       |                |   |    |       |
| 5. The instructor Charles, Clare, Daniel, David, Eric, Janet, Jennifer, John, Kenneth, Nicholas, Raul, Ricardo, Xuguo Bessin, Chapman, Fox, Haynes, Lensing, Obrycki, Potter, Rittschof, Teets, Villanueva, Westneat, White, Zhou treated students with respect.                                                                                                                                                                                    | 6. The instructor Charles, Clare, Daniel, David, Eric, Janet, Jennifer, John, Kenneth, Nicholas, Raul, Ricardo, Xuguo Bessin, Chapman, Fox, Haynes, Lensing, Obrycki, Potter, Rittschof, Teets, Villanueva, Westneat, White, Zhou asked questions that stimulated deep consideration of the course content. |       |            |            |                           |   |    |       |                           |   |    |       |                                                                                                                                                                                                                                                                                                                                                                                                                                         |         |       |       |                    |          |    |       |                                                                                                                                                                                                                                                                                                                                                                                                                                         |                           |       |       |            |                           |   |    |       |                           |   |    |       |                |   |    |       |                |   |    |       |
| <table border="1"> <thead> <tr> <th>Options</th> <th>Score</th> <th>Count</th> <th>Percentage</th> </tr> </thead> <tbody> <tr> <td>Agree</td> <td>4</td> <td>15</td> <td>13.2%</td> </tr> <tr> <td>Strongly Agree</td> <td>5</td> <td>99</td> <td>86.8%</td> </tr> </tbody> </table>                                                                                                                                                                | Options                                                                                                                                                                                                                                                                                                     | Score | Count      | Percentage | Agree                     | 4 | 15 | 13.2% | Strongly Agree            | 5 | 99 | 86.8% | <table border="1"> <thead> <tr> <th>Options</th> <th>Score</th> <th>Count</th> <th>Percentage</th> </tr> </thead> <tbody> <tr> <td>Disagree</td> <td>2</td> <td>3</td> <td>2.6%</td> </tr> <tr> <td>Neither Disagree or Agree</td> <td>3</td> <td>7</td> <td>6.1%</td> </tr> <tr> <td>Agree</td> <td>4</td> <td>21</td> <td>18.4%</td> </tr> <tr> <td>Strongly Agree</td> <td>5</td> <td>83</td> <td>72.8%</td> </tr> </tbody> </table> | Options | Score | Count | Percentage         | Disagree | 2  | 3     | 2.6%                                                                                                                                                                                                                                                                                                                                                                                                                                    | Neither Disagree or Agree | 3     | 7     | 6.1%       | Agree                     | 4 | 21 | 18.4% | Strongly Agree            | 5 | 83 | 72.8% |                |   |    |       |                |   |    |       |
| Options                                                                                                                                                                                                                                                                                                                                                                                                                                             | Score                                                                                                                                                                                                                                                                                                       | Count | Percentage |            |                           |   |    |       |                           |   |    |       |                                                                                                                                                                                                                                                                                                                                                                                                                                         |         |       |       |                    |          |    |       |                                                                                                                                                                                                                                                                                                                                                                                                                                         |                           |       |       |            |                           |   |    |       |                           |   |    |       |                |   |    |       |                |   |    |       |
| Agree                                                                                                                                                                                                                                                                                                                                                                                                                                               | 4                                                                                                                                                                                                                                                                                                           | 15    | 13.2%      |            |                           |   |    |       |                           |   |    |       |                                                                                                                                                                                                                                                                                                                                                                                                                                         |         |       |       |                    |          |    |       |                                                                                                                                                                                                                                                                                                                                                                                                                                         |                           |       |       |            |                           |   |    |       |                           |   |    |       |                |   |    |       |                |   |    |       |
| Strongly Agree                                                                                                                                                                                                                                                                                                                                                                                                                                      | 5                                                                                                                                                                                                                                                                                                           | 99    | 86.8%      |            |                           |   |    |       |                           |   |    |       |                                                                                                                                                                                                                                                                                                                                                                                                                                         |         |       |       |                    |          |    |       |                                                                                                                                                                                                                                                                                                                                                                                                                                         |                           |       |       |            |                           |   |    |       |                           |   |    |       |                |   |    |       |                |   |    |       |
| Options                                                                                                                                                                                                                                                                                                                                                                                                                                             | Score                                                                                                                                                                                                                                                                                                       | Count | Percentage |            |                           |   |    |       |                           |   |    |       |                                                                                                                                                                                                                                                                                                                                                                                                                                         |         |       |       |                    |          |    |       |                                                                                                                                                                                                                                                                                                                                                                                                                                         |                           |       |       |            |                           |   |    |       |                           |   |    |       |                |   |    |       |                |   |    |       |
| Disagree                                                                                                                                                                                                                                                                                                                                                                                                                                            | 2                                                                                                                                                                                                                                                                                                           | 3     | 2.6%       |            |                           |   |    |       |                           |   |    |       |                                                                                                                                                                                                                                                                                                                                                                                                                                         |         |       |       |                    |          |    |       |                                                                                                                                                                                                                                                                                                                                                                                                                                         |                           |       |       |            |                           |   |    |       |                           |   |    |       |                |   |    |       |                |   |    |       |
| Neither Disagree or Agree                                                                                                                                                                                                                                                                                                                                                                                                                           | 3                                                                                                                                                                                                                                                                                                           | 7     | 6.1%       |            |                           |   |    |       |                           |   |    |       |                                                                                                                                                                                                                                                                                                                                                                                                                                         |         |       |       |                    |          |    |       |                                                                                                                                                                                                                                                                                                                                                                                                                                         |                           |       |       |            |                           |   |    |       |                           |   |    |       |                |   |    |       |                |   |    |       |
| Agree                                                                                                                                                                                                                                                                                                                                                                                                                                               | 4                                                                                                                                                                                                                                                                                                           | 21    | 18.4%      |            |                           |   |    |       |                           |   |    |       |                                                                                                                                                                                                                                                                                                                                                                                                                                         |         |       |       |                    |          |    |       |                                                                                                                                                                                                                                                                                                                                                                                                                                         |                           |       |       |            |                           |   |    |       |                           |   |    |       |                |   |    |       |                |   |    |       |
| Strongly Agree                                                                                                                                                                                                                                                                                                                                                                                                                                      | 5                                                                                                                                                                                                                                                                                                           | 83    | 72.8%      |            |                           |   |    |       |                           |   |    |       |                                                                                                                                                                                                                                                                                                                                                                                                                                         |         |       |       |                    |          |    |       |                                                                                                                                                                                                                                                                                                                                                                                                                                         |                           |       |       |            |                           |   |    |       |                           |   |    |       |                |   |    |       |                |   |    |       |

| Raters         | Students |
|----------------|----------|
| Responded      | 140      |
| Invited        | 235      |
| Response Ratio | 59.6%    |

| Question             | Department (Entomology) |      |                    | College (Ag, Food and Environment) |      |                    |
|----------------------|-------------------------|------|--------------------|------------------------------------|------|--------------------|
|                      | Response Count          | Mean | Standard Deviation | Response Count                     | Mean | Standard Deviation |
| My classification is | 140                     | 3.4  | 1.5                | 3729                               | 3.0  | 1.2                |

| 1. My classification is |       |       |            |
|-------------------------|-------|-------|------------|
| Options                 | Score | Count | Percentage |
| Freshman                | 1     | 25    | 17.9%      |
| Sophomore               | 2     | 21    | 15.0%      |
| Junior                  | 3     | 21    | 15.0%      |
| Senior                  | 4     | 24    | 17.1%      |
| Graduate                | 5     | 48    | 34.3%      |
| Professional            | 6     | 0     | 0.0%       |
| Other                   | 7     | 1     | 0.7%       |

### Reason(s) for taking course

| Options                           | Count | Percentage |
|-----------------------------------|-------|------------|
| Is a required course              | 52    | 28.9%      |
| Is an elective                    | 61    | 33.9%      |
| Covers a topic I am interested in | 65    | 36.1%      |
| Choose not to rate                | 2     | 1.1%       |
| Respondent(s)                     | 140   |            |

| Question                         | Department (Entomology) |      |                    | College (Ag, Food and Environment) |      |                    |
|----------------------------------|-------------------------|------|--------------------|------------------------------------|------|--------------------|
|                                  | Response Count          | Mean | Standard Deviation | Response Count                     | Mean | Standard Deviation |
| My expected grade in this course | 131                     | 6.5  | 1.0                | 3687                               | 6.6  | 0.9                |

| 1. My expected grade in this course |       |       |            |
|-------------------------------------|-------|-------|------------|
| Options                             | Score | Count | Percentage |
| Pass or audit                       | 1     | 3     | 2.3%       |
| I                                   | 2     | 0     | 0.0%       |
| E/Fail                              | 3     | 0     | 0.0%       |
| D                                   | 4     | 0     | 0.0%       |
| C                                   | 5     | 9     | 6.9%       |
| B                                   | 6     | 24    | 18.3%      |
| A                                   | 7     | 95    | 72.5%      |

| Question                                                  | Department (Entomology) | College (Ag, Food and Environment) |
|-----------------------------------------------------------|-------------------------|------------------------------------|
|                                                           | Mean                    | Mean                               |
| Hours per week spent on the course (excluding class time) | 1.9                     | 2.0                                |

| 1. Hours per week spent on the course (excluding class time) |       |       |            |
|--------------------------------------------------------------|-------|-------|------------|
| Options                                                      | Score | Count | Percentage |
| 2 hour or less                                               | 1     | 59    | 42.8%      |
| 3 - 4 hours                                                  | 2     | 49    | 35.5%      |
| 5 - 7 hours                                                  | 3     | 18    | 13.0%      |
| 8 - 10 hours                                                 | 4     | 9     | 6.5%       |
| 11 - 15 hours                                                | 5     | 2     | 1.4%       |
| 16 hours or more                                             | 6     | 1     | 0.7%       |

## Overall Course Score

### Course Specific Questions

| Question                                       | Department (Entomology) |      |                    | College (Ag, Food and Environment) |      |                    |
|------------------------------------------------|-------------------------|------|--------------------|------------------------------------|------|--------------------|
|                                                | Response Count          | Mean | Standard Deviation | Response Count                     | Mean | Standard Deviation |
| I consider this course to be a quality course. | 139                     | 4.6  | 0.7                | 3734                               | 4.3  | 1.0                |

| 1. I consider this course to be a quality course. |       |       |            |
|---------------------------------------------------|-------|-------|------------|
| Options                                           | Score | Count | Percentage |
| Strongly Disagree                                 | 1     | 1     | 0.7%       |
| Disagree                                          | 2     | 0     | 0.0%       |
| Neither Disagree or Agree                         | 3     | 7     | 5.0%       |
| Agree                                             | 4     | 39    | 28.1%      |
| Strongly Agree                                    | 5     | 92    | 66.2%      |

### Course Specific Questions

| Question                                                                                  | Department<br>(Entomology) | College (Ag,<br>Food and<br>Environment) |
|-------------------------------------------------------------------------------------------|----------------------------|------------------------------------------|
|                                                                                           | Mean                       | Mean                                     |
| The course was well organized                                                             | 4.5                        | 4.3                                      |
| Class meetings contributed to my learning of the course content.                          | 4.5                        | 4.3                                      |
| Grading in the course was fair.                                                           | 4.6                        | 4.4                                      |
| Assessments (e.g., tests, quizzes, papers, homework, projects) reflected course material. | 4.6                        | 4.4                                      |
| I understand how the final grade will be calculated in the course.                        | 4.5                        | 4.5                                      |

#### 1. The course was well organized

| Options                   | Score | Count | Percentage |
|---------------------------|-------|-------|------------|
| Strongly Disagree         | 1     | 1     | 0.7%       |
| Disagree                  | 2     | 2     | 1.4%       |
| Neither Disagree or Agree | 3     | 7     | 5.0%       |
| Agree                     | 4     | 48    | 34.5%      |
| Strongly Agree            | 5     | 81    | 58.3%      |

#### 2. Class meetings contributed to my learning of the course content.

| Options                   | Score | Count | Percentage |
|---------------------------|-------|-------|------------|
| Strongly Disagree         | 1     | 1     | 0.7%       |
| Disagree                  | 2     | 1     | 0.7%       |
| Neither Disagree or Agree | 3     | 7     | 5.1%       |
| Agree                     | 4     | 41    | 30.1%      |
| Strongly Agree            | 5     | 86    | 63.2%      |

#### 3. Grading in the course was fair.

| Options                   | Score | Count | Percentage |
|---------------------------|-------|-------|------------|
| Strongly Disagree         | 1     | 0     | 0.0%       |
| Disagree                  | 2     | 1     | 0.8%       |
| Neither Disagree or Agree | 3     | 7     | 5.3%       |
| Agree                     | 4     | 42    | 31.6%      |
| Strongly Agree            | 5     | 83    | 62.4%      |

#### 4. Assessments (e.g., tests, quizzes, papers, homework, projects) reflected course material.

| Options                   | Score | Count | Percentage |
|---------------------------|-------|-------|------------|
| Strongly Disagree         | 1     | 0     | 0.0%       |
| Disagree                  | 2     | 2     | 1.5%       |
| Neither Disagree or Agree | 3     | 4     | 3.1%       |
| Agree                     | 4     | 36    | 27.5%      |
| Strongly Agree            | 5     | 89    | 67.9%      |

#### 5. I understand how the final grade will be calculated in the course.

| Options                   | Score | Count | Percentage |
|---------------------------|-------|-------|------------|
| Strongly Disagree         | 1     | 1     | 0.7%       |
| Disagree                  | 2     | 2     | 1.5%       |
| Neither Disagree or Agree | 3     | 6     | 4.4%       |
| Agree                     | 4     | 44    | 32.6%      |
| Strongly Agree            | 5     | 82    | 60.7%      |

## Overall Instructor Score

| Question                                  | Department (Entomology) |                    | College (Ag, Food and Environment) |                    |
|-------------------------------------------|-------------------------|--------------------|------------------------------------|--------------------|
|                                           | Mean                    | Standard Deviation | Mean                               | Standard Deviation |
| The instructor provided quality teaching. | 4.6                     | 0.6                | 4.3                                | 0.9                |

| 1. The instructor provided quality teaching. |       |       |            |
|----------------------------------------------|-------|-------|------------|
| Options                                      | Score | Count | Percentage |
| Disagree                                     | 2     | 1     | 0.7%       |
| Neither Disagree or Agree                    | 3     | 7     | 4.8%       |
| Agree                                        | 4     | 41    | 28.3%      |
| Strongly Agree                               | 5     | 96    | 66.2%      |

## Instructor Specific Questions

| Question                                                                                                                                                                                                                                                                                                                                   | Department (Entomology) |      |                    | College (Ag, Food and Environment) |      |                    |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------|------|--------------------|------------------------------------|------|--------------------|
|                                                                                                                                                                                                                                                                                                                                            | Response Count          | Mean | Standard Deviation | Response Count                     | Mean | Standard Deviation |
| The instructor Bruce, Charles, Clare, Daniel, David, Janet, Jennifer, John, Kathleen, Kenneth, Lynne, Nicholas, Scott, Zainulabeuddin Fox, Gleeson, Gonthier, Haynes, Lensing, Obrycki, Potter, Rieske-Kinney, Rittschof, Syed, Teets, Webb, White, Winter was prepared for class.                                                         | 140                     | 4.6  | 0.5                | 3749                               | 4.4  | 0.8                |
| The instructor Bruce, Charles, Clare, Daniel, David, Janet, Jennifer, John, Kathleen, Kenneth, Lynne, Nicholas, Scott, Zainulabeuddin Fox, Gleeson, Gonthier, Haynes, Lensing, Obrycki, Potter, Rieske-Kinney, Rittschof, Syed, Teets, Webb, White, Winter presented material clearly.                                                     | 140                     | 4.6  | 0.7                | 3749                               | 4.3  | 0.9                |
| The instructor Bruce, Charles, Clare, Daniel, David, Janet, Jennifer, John, Kathleen, Kenneth, Lynne, Nicholas, Scott, Zainulabeuddin Fox, Gleeson, Gonthier, Haynes, Lensing, Obrycki, Potter, Rieske-Kinney, Rittschof, Syed, Teets, Webb, White, Winter responded to questions in a manner that aided my understanding of the material. | 140                     | 4.6  | 0.6                | 3749                               | 4.4  | 0.9                |
| The instructor Bruce, Charles, Clare, Daniel, David, Janet, Jennifer, John, Kathleen, Kenneth, Lynne, Nicholas, Scott, Zainulabeuddin Fox, Gleeson, Gonthier, Haynes, Lensing, Obrycki, Potter, Rieske-Kinney, Rittschof, Syed, Teets, Webb, White, Winter provided material at an appropriate pace.                                       | 140                     | 4.5  | 0.7                | 3749                               | 4.3  | 0.9                |
| The instructor Bruce, Charles, Clare, Daniel, David, Janet, Jennifer, John, Kathleen, Kenneth, Lynne, Nicholas, Scott, Zainulabeuddin Fox, Gleeson, Gonthier, Haynes, Lensing, Obrycki, Potter, Rieske-Kinney, Rittschof, Syed, Teets, Webb, White, Winter treated students with respect.                                                  | 140                     | 4.7  | 0.6                | 3749                               | 4.6  | 0.7                |
| The instructor Bruce, Charles, Clare, Daniel, David, Janet, Jennifer, John, Kathleen, Kenneth, Lynne, Nicholas, Scott, Zainulabeuddin Fox, Gleeson, Gonthier, Haynes, Lensing, Obrycki, Potter, Rieske-Kinney, Rittschof, Syed, Teets, Webb, White, Winter asked questions that stimulated deep consideration of the course content.       | 140                     | 4.4  | 0.7                | 3749                               | 4.3  | 0.9                |

1. The instructor Bruce, Charles, Clare, Daniel, David, Janet, Jennifer, John, Kathleen, Kenneth, Lynne, Nicholas, Scott, Zainulabeuddin Fox, Gleeson, Gonthier, Haynes, Lensing, Obrycki, Potter, Rieske-Kinney, Rittschof, Syed, Teets, Webb, White, Winter was prepared for class.

| Options                   | Score | Count | Percentage |
|---------------------------|-------|-------|------------|
| Disagree                  | 2     | 1     | 0.7%       |
| Neither Disagree or Agree | 3     | 1     | 0.7%       |
| Agree                     | 4     | 52    | 37.1%      |
| Strongly Agree            | 5     | 86    | 61.4%      |

3. The instructor Bruce, Charles, Clare, Daniel, David, Janet, Jennifer, John, Kathleen, Kenneth, Lynne, Nicholas, Scott, Zainulabeuddin Fox, Gleeson, Gonthier, Haynes, Lensing, Obrycki, Potter, Rieske-Kinney, Rittschof, Syed, Teets, Webb, White, Winter responded to questions in a manner that aided my understanding of the material.

| Options                   | Score | Count | Percentage |
|---------------------------|-------|-------|------------|
| Disagree                  | 2     | 1     | 0.7%       |
| Neither Disagree or Agree | 3     | 6     | 4.3%       |
| Agree                     | 4     | 44    | 31.4%      |
| Strongly Agree            | 5     | 89    | 63.6%      |

5. The instructor Bruce, Charles, Clare, Daniel, David, Janet, Jennifer, John, Kathleen, Kenneth, Lynne, Nicholas, Scott, Zainulabeuddin Fox, Gleeson, Gonthier, Haynes, Lensing, Obrycki, Potter, Rieske-Kinney, Rittschof, Syed, Teets, Webb, White, Winter treated students with respect.

| Options                   | Score | Count | Percentage |
|---------------------------|-------|-------|------------|
| Disagree                  | 2     | 1     | 0.7%       |
| Neither Disagree or Agree | 3     | 6     | 4.3%       |
| Agree                     | 4     | 34    | 24.3%      |
| Strongly Agree            | 5     | 99    | 70.7%      |

2. The instructor Bruce, Charles, Clare, Daniel, David, Janet, Jennifer, John, Kathleen, Kenneth, Lynne, Nicholas, Scott, Zainulabeuddin Fox, Gleeson, Gonthier, Haynes, Lensing, Obrycki, Potter, Rieske-Kinney, Rittschof, Syed, Teets, Webb, White, Winter presented material clearly.

| Options                   | Score | Count | Percentage |
|---------------------------|-------|-------|------------|
| Strongly Disagree         | 1     | 1     | 0.7%       |
| Neither Disagree or Agree | 3     | 7     | 5.0%       |
| Agree                     | 4     | 45    | 32.1%      |
| Strongly Agree            | 5     | 87    | 62.1%      |

4. The instructor Bruce, Charles, Clare, Daniel, David, Janet, Jennifer, John, Kathleen, Kenneth, Lynne, Nicholas, Scott, Zainulabeuddin Fox, Gleeson, Gonthier, Haynes, Lensing, Obrycki, Potter, Rieske-Kinney, Rittschof, Syed, Teets, Webb, White, Winter provided material at an appropriate pace.

| Options                   | Score | Count | Percentage |
|---------------------------|-------|-------|------------|
| Disagree                  | 2     | 4     | 2.9%       |
| Neither Disagree or Agree | 3     | 8     | 5.7%       |
| Agree                     | 4     | 48    | 34.3%      |
| Strongly Agree            | 5     | 80    | 57.1%      |

6. The instructor Bruce, Charles, Clare, Daniel, David, Janet, Jennifer, John, Kathleen, Kenneth, Lynne, Nicholas, Scott, Zainulabeuddin Fox, Gleeson, Gonthier, Haynes, Lensing, Obrycki, Potter, Rieske-Kinney, Rittschof, Syed, Teets, Webb, White, Winter asked questions that stimulated deep consideration of the course content.

| Options                   | Score | Count | Percentage |
|---------------------------|-------|-------|------------|
| Disagree                  | 2     | 1     | 0.7%       |
| Neither Disagree or Agree | 3     | 13    | 9.3%       |
| Agree                     | 4     | 50    | 35.7%      |
| Strongly Agree            | 5     | 76    | 54.3%      |

| Raters         | Students |
|----------------|----------|
| Responded      | 114      |
| Invited        | 258      |
| Response Ratio | 44.2%    |

| Question             | Department (Entomology) |      |                    | College (Ag, Food and Environment) |      |                    |
|----------------------|-------------------------|------|--------------------|------------------------------------|------|--------------------|
|                      | Response Count          | Mean | Standard Deviation | Response Count                     | Mean | Standard Deviation |
| My classification is | 113                     | 3.2  | 1.5                | 2816                               | 3.1  | 1.3                |

| My classification is |       |       |            |
|----------------------|-------|-------|------------|
| Options              | Score | Count | Percentage |
| Freshman             | 1     | 24    | 21.2%      |
| Sophomore            | 2     | 17    | 15.0%      |
| Junior               | 3     | 23    | 20.4%      |
| Senior               | 4     | 19    | 16.8%      |
| Graduate             | 5     | 28    | 24.8%      |
| Professional         | 6     | 1     | 0.9%       |
| Other                | 7     | 1     | 0.9%       |

**Reason(s) for taking course**

| Options                           | Count | Percentage |
|-----------------------------------|-------|------------|
| Is a required course              | 55    | 34.8%      |
| Is an elective                    | 50    | 31.6%      |
| Covers a topic I am interested in | 51    | 32.3%      |
| Choose not to rate                | 2     | 1.3%       |
| Respondent(s)                     | 114   |            |

| Question                         | Department (Entomology) |      |                    | College (Ag, Food and Environment) |      |                    |
|----------------------------------|-------------------------|------|--------------------|------------------------------------|------|--------------------|
|                                  | Response Count          | Mean | Standard Deviation | Response Count                     | Mean | Standard Deviation |
| My expected grade in this course | 112                     | 6.6  | 0.7                | 2773                               | 6.6  | 0.8                |

| My expected grade in this course |       |       |            |
|----------------------------------|-------|-------|------------|
| Options                          | Score | Count | Percentage |
| Pass or audit                    | 1     | 0     | 0.0%       |
| I                                | 2     | 0     | 0.0%       |
| E/Fail                           | 3     | 0     | 0.0%       |
| D                                | 4     | 2     | 1.8%       |
| C                                | 5     | 7     | 6.3%       |
| B                                | 6     | 23    | 20.5%      |
| A                                | 7     | 80    | 71.4%      |



| Question                                                  | Department (Entomology) | College (Ag, Food and Environment) |
|-----------------------------------------------------------|-------------------------|------------------------------------|
|                                                           | Mean                    | Mean                               |
| Hours per week spent on the course (excluding class time) | 2.1                     | 2.2                                |

| Hours per week spent on the course (excluding class time) |       |       |            |
|-----------------------------------------------------------|-------|-------|------------|
| Options                                                   | Score | Count | Percentage |
| 2 hour or less                                            | 1     | 42    | 36.8%      |
| 3 - 4 hours                                               | 2     | 42    | 36.8%      |
| 5 - 7 hours                                               | 3     | 18    | 15.8%      |
| 8 - 10 hours                                              | 4     | 8     | 7.0%       |
| 11 - 15 hours                                             | 5     | 2     | 1.8%       |
| 16 hours or more                                          | 6     | 2     | 1.8%       |



## Overall Course Score

### Course Specific Questions

| Question                                       | Department (Entomology) |      |                    | College (Ag, Food and Environment) |      |                    |
|------------------------------------------------|-------------------------|------|--------------------|------------------------------------|------|--------------------|
|                                                | Response Count          | Mean | Standard Deviation | Response Count                     | Mean | Standard Deviation |
| I consider this course to be a quality course. | 114                     | 4.5  | 0.7                | 2826                               | 4.2  | 0.9                |

| I consider this course to be a quality course. |       |       |            |
|------------------------------------------------|-------|-------|------------|
| Options                                        | Score | Count | Percentage |
| Strongly Disagree                              | 1     | 0     | 0.0%       |
| Disagree                                       | 2     | 3     | 2.6%       |
| Neither Disagree or Agree                      | 3     | 3     | 2.6%       |
| Agree                                          | 4     | 41    | 36.0%      |
| Strongly Agree                                 | 5     | 67    | 58.8%      |

### Course Specific Questions

| Question                                                                                  | Department<br>(Entomology) | College (Ag,<br>Food and<br>Environment) |
|-------------------------------------------------------------------------------------------|----------------------------|------------------------------------------|
|                                                                                           | Mean                       | Mean                                     |
| The course was well organized                                                             | 4.6                        | 4.4                                      |
| Class meetings contributed to my learning of the course content.                          | 4.5                        | 4.3                                      |
| Grading in the course was fair.                                                           | 4.6                        | 4.5                                      |
| Assessments (e.g., tests, quizzes, papers, homework, projects) reflected course material. | 4.7                        | 4.5                                      |
| I understand how the final grade will be calculated in the course.                        | 4.6                        | 4.5                                      |

| 1. The course was well organized |       |       |            |
|----------------------------------|-------|-------|------------|
| Options                          | Score | Count | Percentage |
| Strongly Disagree                | 1     | 0     | 0.0%       |
| Disagree                         | 2     | 3     | 2.7%       |
| Neither Disagree or Agree        | 3     | 3     | 2.7%       |
| Agree                            | 4     | 25    | 22.1%      |
| Strongly Agree                   | 5     | 82    | 72.6%      |

| 2. Class meetings contributed to my learning of the course content. |       |       |            |
|---------------------------------------------------------------------|-------|-------|------------|
| Options                                                             | Score | Count | Percentage |
| Strongly Disagree                                                   | 1     | 0     | 0.0%       |
| Disagree                                                            | 2     | 4     | 3.6%       |
| Neither Disagree or Agree                                           | 3     | 8     | 7.3%       |
| Agree                                                               | 4     | 23    | 20.9%      |
| Strongly Agree                                                      | 5     | 75    | 68.2%      |

| 3. Grading in the course was fair. |       |       |            |
|------------------------------------|-------|-------|------------|
| Options                            | Score | Count | Percentage |
| Strongly Disagree                  | 1     | 1     | 0.9%       |
| Disagree                           | 2     | 3     | 2.7%       |
| Neither Disagree or Agree          | 3     | 7     | 6.3%       |
| Agree                              | 4     | 17    | 15.2%      |
| Strongly Agree                     | 5     | 84    | 75.0%      |

| 4. Assessments (e.g., tests, quizzes, papers, homework, projects) reflected course material. |       |       |            |
|----------------------------------------------------------------------------------------------|-------|-------|------------|
| Options                                                                                      | Score | Count | Percentage |
| Strongly Disagree                                                                            | 1     | 0     | 0.0%       |
| Disagree                                                                                     | 2     | 2     | 1.8%       |
| Neither Disagree or Agree                                                                    | 3     | 2     | 1.8%       |
| Agree                                                                                        | 4     | 24    | 21.4%      |
| Strongly Agree                                                                               | 5     | 84    | 75.0%      |

| 5. I understand how the final grade will be calculated in the course. |       |       |            |
|-----------------------------------------------------------------------|-------|-------|------------|
| Options                                                               | Score | Count | Percentage |
| Strongly Disagree                                                     | 1     | 1     | 0.9%       |
| Disagree                                                              | 2     | 3     | 2.7%       |
| Neither Disagree or Agree                                             | 3     | 3     | 2.7%       |
| Agree                                                                 | 4     | 29    | 25.7%      |
| Strongly Agree                                                        | 5     | 77    | 68.1%      |

## Overall Instructor Score

| Question                                                                                 | Department (Entomology) |                    | College (Ag, Food and Environment) |                    |
|------------------------------------------------------------------------------------------|-------------------------|--------------------|------------------------------------|--------------------|
|                                                                                          | Mean                    | Standard Deviation | Mean                               | Standard Deviation |
| The instructor asked questions that stimulated deep consideration of the course content. | 4.5                     | 0.7                | 4.4                                | 0.8                |

| The instructor asked questions that stimulated deep consideration of the course content. |       |       |            |
|------------------------------------------------------------------------------------------|-------|-------|------------|
| Options                                                                                  | Score | Count | Percentage |
| Disagree                                                                                 | 2     | 1     | 0.8%       |
| Neither Disagree or Agree                                                                | 3     | 9     | 7.5%       |
| Agree                                                                                    | 4     | 38    | 31.7%      |
| Strongly Agree                                                                           | 5     | 72    | 60.0%      |

## Instructor Specific Questions

| Question                                                                                                                                                                                                                                                                                                     | Department (Entomology) |      |                    | College (Ag, Food and Environment) |      |                    |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------|------|--------------------|------------------------------------|------|--------------------|
|                                                                                                                                                                                                                                                                                                              | Response Count          | Mean | Standard Deviation | Response Count                     | Mean | Standard Deviation |
| The instructor Charles, Clare, Daniel, Janet, Jennifer, Julian, Kathleen, Kenneth, Lynne, Nicholas, Tonja, Zainulabeuddin Dupuis, Fisher, Fox, Haynes, Lensing, Potter, Rieske-Kinney, Rittschof, Syed, Teets, White, Winter was prepared for class.                                                         | 112                     | 4.8  | 0.5                | 2791                               | 4.6  | 0.7                |
| The instructor Charles, Clare, Daniel, Janet, Jennifer, Julian, Kathleen, Kenneth, Lynne, Nicholas, Tonja, Zainulabeuddin Dupuis, Fisher, Fox, Haynes, Lensing, Potter, Rieske-Kinney, Rittschof, Syed, Teets, White, Winter presented material clearly.                                                     | 114                     | 4.6  | 0.7                | 2826                               | 4.4  | 0.8                |
| The instructor Charles, Clare, Daniel, Janet, Jennifer, Julian, Kathleen, Kenneth, Lynne, Nicholas, Tonja, Zainulabeuddin Dupuis, Fisher, Fox, Haynes, Lensing, Potter, Rieske-Kinney, Rittschof, Syed, Teets, White, Winter responded to questions in a manner that aided my understanding of the material. | 111                     | 4.7  | 0.6                | 2779                               | 4.5  | 0.8                |
| The instructor Charles, Clare, Daniel, Janet, Jennifer, Julian, Kathleen, Kenneth, Lynne, Nicholas, Tonja, Zainulabeuddin Dupuis, Fisher, Fox, Haynes, Lensing, Potter, Rieske-Kinney, Rittschof, Syed, Teets, White, Winter provided material at an appropriate pace.                                       | 114                     | 4.5  | 0.8                | 2807                               | 4.5  | 0.8                |
| The instructor Charles, Clare, Daniel, Janet, Jennifer, Julian, Kathleen, Kenneth, Lynne, Nicholas, Tonja, Zainulabeuddin Dupuis, Fisher, Fox, Haynes, Lensing, Potter, Rieske-Kinney, Rittschof, Syed, Teets, White, Winter treated students with respect.                                                  | 111                     | 4.8  | 0.5                | 2804                               | 4.7  | 0.6                |
| The instructor Charles, Clare, Daniel, Janet, Jennifer, Julian, Kathleen, Kenneth, Lynne, Nicholas, Tonja, Zainulabeuddin Dupuis, Fisher, Fox, Haynes, Lensing, Potter, Rieske-Kinney, Rittschof, Syed, Teets, White, Winter asked questions that stimulated deep consideration of the course content.       | 114                     | 4.5  | 0.7                | 2787                               | 4.5  | 0.8                |

1. The instructor Charles, Clare, Daniel, Janet, Jennifer, Julian, Kathleen, Kenneth, Lynne, Nicholas, Tonja, Zainulabeuddin Dupuis, Fisher, Fox, Haynes, Lensing, Potter, Rieske-Kinney, Rittschof, Syed, Teets, White, Winter was prepared for class.

| Options                   | Score | Count | Percentage |
|---------------------------|-------|-------|------------|
| Disagree                  | 2     | 1     | 0.9%       |
| Neither Disagree or Agree | 3     | 1     | 0.9%       |
| Agree                     | 4     | 17    | 15.2%      |
| Strongly Agree            | 5     | 93    | 83.0%      |

3. The instructor Charles, Clare, Daniel, Janet, Jennifer, Julian, Kathleen, Kenneth, Lynne, Nicholas, Tonja, Zainulabeuddin Dupuis, Fisher, Fox, Haynes, Lensing, Potter, Rieske-Kinney, Rittschof, Syed, Teets, White, Winter responded to questions in a manner that aided my understanding of the material.

| Options                   | Score | Count | Percentage |
|---------------------------|-------|-------|------------|
| Strongly Disagree         | 1     | 1     | 0.9%       |
| Disagree                  | 2     | 1     | 0.9%       |
| Neither Disagree or Agree | 3     | 1     | 0.9%       |
| Agree                     | 4     | 23    | 20.7%      |
| Strongly Agree            | 5     | 85    | 76.6%      |

5. The instructor Charles, Clare, Daniel, Janet, Jennifer, Julian, Kathleen, Kenneth, Lynne, Nicholas, Tonja, Zainulabeuddin Dupuis, Fisher, Fox, Haynes, Lensing, Potter, Rieske-Kinney, Rittschof, Syed, Teets, White, Winter treated students with respect.

| Options                   | Score | Count | Percentage |
|---------------------------|-------|-------|------------|
| Disagree                  | 2     | 1     | 0.9%       |
| Neither Disagree or Agree | 3     | 1     | 0.9%       |
| Agree                     | 4     | 21    | 18.9%      |
| Strongly Agree            | 5     | 88    | 79.3%      |

2. The instructor Charles, Clare, Daniel, Janet, Jennifer, Julian, Kathleen, Kenneth, Lynne, Nicholas, Tonja, Zainulabeuddin Dupuis, Fisher, Fox, Haynes, Lensing, Potter, Rieske-Kinney, Rittschof, Syed, Teets, White, Winter presented material clearly.

| Options                   | Score | Count | Percentage |
|---------------------------|-------|-------|------------|
| Strongly Disagree         | 1     | 1     | 0.9%       |
| Neither Disagree or Agree | 3     | 5     | 4.4%       |
| Agree                     | 4     | 35    | 30.7%      |
| Strongly Agree            | 5     | 73    | 64.0%      |

4. The instructor Charles, Clare, Daniel, Janet, Jennifer, Julian, Kathleen, Kenneth, Lynne, Nicholas, Tonja, Zainulabeuddin Dupuis, Fisher, Fox, Haynes, Lensing, Potter, Rieske-Kinney, Rittschof, Syed, Teets, White, Winter provided material at an appropriate pace.

| Options                   | Score | Count | Percentage |
|---------------------------|-------|-------|------------|
| Disagree                  | 2     | 7     | 6.1%       |
| Neither Disagree or Agree | 3     | 3     | 2.6%       |
| Agree                     | 4     | 28    | 24.6%      |
| Strongly Agree            | 5     | 76    | 66.7%      |

6. The instructor Charles, Clare, Daniel, Janet, Jennifer, Julian, Kathleen, Kenneth, Lynne, Nicholas, Tonja, Zainulabeuddin Dupuis, Fisher, Fox, Haynes, Lensing, Potter, Rieske-Kinney, Rittschof, Syed, Teets, White, Winter asked questions that stimulated deep consideration of the course content.

| Options                   | Score | Count | Percentage |
|---------------------------|-------|-------|------------|
| Disagree                  | 2     | 1     | 0.9%       |
| Neither Disagree or Agree | 3     | 8     | 7.0%       |
| Agree                     | 4     | 37    | 32.5%      |
| Strongly Agree            | 5     | 68    | 59.6%      |

| Raters         | Students |
|----------------|----------|
| Responded      | 124      |
| Invited        | 217      |
| Response Ratio | 57.1%    |

| Question             | Department (Entomology) |      |                    | College (Ag, Food and Environment) |      |                    |
|----------------------|-------------------------|------|--------------------|------------------------------------|------|--------------------|
|                      | Response Count          | Mean | Standard Deviation | Response Count                     | Mean | Standard Deviation |
| My classification is | 123                     | 3.3  | 1.7                | 2363                               | 3.1  | 1.4                |

| My classification is |       |       |            |
|----------------------|-------|-------|------------|
| Options              | Score | Count | Percentage |
| Freshman             | 1     | 29    | 23.4%      |
| Sophomore            | 2     | 20    | 16.1%      |
| Junior               | 3     | 10    | 8.1%       |
| Senior               | 4     | 16    | 12.9%      |
| Graduate             | 5     | 48    | 38.7%      |
| Professional         | 6     | 0     | 0.0%       |
| Other                | 7     | 0     | 0.0%       |
| Choose not to rate   | NRP   | 1     | 0.8%       |

### Reason(s) for taking course

| Options                           | Count | Percentage |
|-----------------------------------|-------|------------|
| Is a required course              | 53    | 31.0%      |
| Is an elective                    | 57    | 33.3%      |
| Covers a topic I am interested in | 59    | 34.5%      |
| Choose not to rate                | 2     | 1.2%       |
| Respondent(s)                     | 124   |            |

| Question                         | Department (Entomology) |      |                    | College (Ag, Food and Environment) |      |                    |
|----------------------------------|-------------------------|------|--------------------|------------------------------------|------|--------------------|
|                                  | Response Count          | Mean | Standard Deviation | Response Count                     | Mean | Standard Deviation |
| My expected grade in this course | 119                     | 6.4  | 1.0                | 2338                               | 6.6  | 0.9                |

| My expected grade in this course |       |       |            |
|----------------------------------|-------|-------|------------|
| Options                          | Score | Count | Percentage |
| Pass or audit                    | 1     | 2     | 1.6%       |
| I                                | 2     | 0     | 0.0%       |
| E/Fail                           | 3     | 0     | 0.0%       |
| D                                | 4     | 1     | 0.8%       |
| C                                | 5     | 9     | 7.3%       |
| B                                | 6     | 34    | 27.4%      |
| A                                | 7     | 73    | 58.9%      |
| Choose not to rate               | NRP   | 5     | 4.0%       |



| Question                                                  | Department (Entomology) |      |                    | College (Ag, Food and Environment) |      |                    |
|-----------------------------------------------------------|-------------------------|------|--------------------|------------------------------------|------|--------------------|
|                                                           | Response Count          | Mean | Standard Deviation | Response Count                     | Mean | Standard Deviation |
| Hours per week spent on the course (excluding class time) | 123                     | 2.0  | 0.9                | 2373                               | 2.2  | 1.0                |

| Hours per week spent on the course (excluding class time) |       |       |            |
|-----------------------------------------------------------|-------|-------|------------|
| Options                                                   | Score | Count | Percentage |
| 2 hour or less                                            | 1     | 37    | 29.8%      |
| 3 - 4 hours                                               | 2     | 54    | 43.5%      |
| 5 - 7 hours                                               | 3     | 25    | 20.2%      |
| 8 - 10 hours                                              | 4     | 5     | 4.0%       |
| 11 - 15 hours                                             | 5     | 2     | 1.6%       |
| 16 hours or more                                          | 6     | 0     | 0.0%       |
| Choose not to rate                                        | NRP   | 1     | 0.8%       |

## Overall Course Score

### Course Specific Questions

| Question                                       | Department (Entomology) |      |                    | College (Ag, Food and Environment) |      |                    |
|------------------------------------------------|-------------------------|------|--------------------|------------------------------------|------|--------------------|
|                                                | Response Count          | Mean | Standard Deviation | Response Count                     | Mean | Standard Deviation |
| I consider this course to be a quality course. | 124                     | 4.3  | 0.9                | 2390                               | 4.3  | 0.9                |

| I consider this course to be a quality course. |       |       |            |
|------------------------------------------------|-------|-------|------------|
| Options                                        | Score | Count | Percentage |
| Strongly Disagree                              | 1     | 4     | 3.2%       |
| Disagree                                       | 2     | 3     | 2.4%       |
| Neither Disagree or Agree                      | 3     | 7     | 5.6%       |
| Agree                                          | 4     | 48    | 38.7%      |
| Strongly Agree                                 | 5     | 62    | 50.0%      |

## Course Specific Questions

| Question                                                                                  | Department (Entomology) |      |                    | College (Ag, Food and Environment) |      |                    |
|-------------------------------------------------------------------------------------------|-------------------------|------|--------------------|------------------------------------|------|--------------------|
|                                                                                           | Response Count          | Mean | Standard Deviation | Response Count                     | Mean | Standard Deviation |
| The course was well organized                                                             | 124                     | 4.4  | 1.0                | 2387                               | 4.4  | 0.9                |
| Class meetings contributed to my learning of the course content.                          | 120                     | 4.2  | 1.1                | 2275                               | 4.3  | 1.0                |
| Grading in the course was fair.                                                           | 122                     | 4.6  | 0.6                | 2371                               | 4.5  | 0.8                |
| Assessments (e.g., tests, quizzes, papers, homework, projects) reflected course material. | 124                     | 4.6  | 0.7                | 2363                               | 4.5  | 0.8                |
| I understand how the final grade will be calculated in the course.                        | 120                     | 4.6  | 0.7                | 2378                               | 4.5  | 0.7                |

| 1. The course was well organized |       |       |            | 2. Class meetings contributed to my learning of the course content. |       |       |            |
|----------------------------------|-------|-------|------------|---------------------------------------------------------------------|-------|-------|------------|
| Options                          | Score | Count | Percentage | Options                                                             | Score | Count | Percentage |
| Strongly Disagree                | 1     | 2     | 1.6%       | Strongly Disagree                                                   | 1     | 4     | 3.2%       |
| Disagree                         | 2     | 9     | 7.3%       | Disagree                                                            | 2     | 5     | 4.0%       |
| Neither Disagree or Agree        | 3     | 3     | 2.4%       | Neither Disagree or Agree                                           | 3     | 18    | 14.5%      |
| Agree                            | 4     | 34    | 27.4%      | Agree                                                               | 4     | 25    | 20.2%      |
| Strongly Agree                   | 5     | 76    | 61.3%      | Strongly Agree                                                      | 5     | 68    | 54.8%      |
|                                  |       |       |            | Choose not to rate                                                  | NRP   | 4     | 3.2%       |

| 3. Grading in the course was fair. |       |       |            | 4. Assessments (e.g., tests, quizzes, papers, homework, projects) reflected course material. |       |       |            |
|------------------------------------|-------|-------|------------|----------------------------------------------------------------------------------------------|-------|-------|------------|
| Options                            | Score | Count | Percentage | Options                                                                                      | Score | Count | Percentage |
| Strongly Disagree                  | 1     | 1     | 0.8%       | Strongly Disagree                                                                            | 1     | 1     | 0.8%       |
| Neither Disagree or Agree          | 3     | 2     | 1.6%       | Disagree                                                                                     | 2     | 2     | 1.6%       |
| Agree                              | 4     | 39    | 31.5%      | Neither Disagree or Agree                                                                    | 3     | 1     | 0.8%       |
| Strongly Agree                     | 5     | 80    | 64.5%      | Agree                                                                                        | 4     | 34    | 27.4%      |
| Choose not to rate                 | NRP   | 2     | 1.6%       | Strongly Agree                                                                               | 5     | 86    | 69.4%      |

| 5. I understand how the final grade will be calculated in the course. |       |       |            |
|-----------------------------------------------------------------------|-------|-------|------------|
| Options                                                               | Score | Count | Percentage |
| Disagree                                                              | 2     | 3     | 2.4%       |
| Neither Disagree or Agree                                             | 3     | 4     | 3.2%       |
| Agree                                                                 | 4     | 33    | 26.6%      |
| Strongly Agree                                                        | 5     | 80    | 64.5%      |
| Choose not to rate                                                    | NRP   | 4     | 3.2%       |



## Overall Instructor Score

| Question                                  | Department (Entomology) |      |                    | College (Ag, Food and Environment) |      |                    |
|-------------------------------------------|-------------------------|------|--------------------|------------------------------------|------|--------------------|
|                                           | Response Count          | Mean | Standard Deviation | Response Count                     | Mean | Standard Deviation |
| The instructor provided quality teaching. | 143                     | 4.6  | 0.8                | 2529                               | 4.5  | 0.9                |

| The instructor provided quality teaching. |       |       |            |
|-------------------------------------------|-------|-------|------------|
| Options                                   | Score | Count | Percentage |
| Strongly Disagree                         | 1     | 3     | 2.1%       |
| Disagree                                  | 2     | 2     | 1.4%       |
| Neither Disagree or Agree                 | 3     | 7     | 4.9%       |
| Agree                                     | 4     | 28    | 19.4%      |
| Strongly Agree                            | 5     | 103   | 71.5%      |
| Choose not to rate                        | NRP   | 1     | 0.7%       |

## Instructor Specific Questions

| Question                                                                                                                                                                                                                                                                                                                                                                       | Department (Entomology) |      |                    | College (Ag, Food and Environment) |      |                    |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------|------|--------------------|------------------------------------|------|--------------------|
|                                                                                                                                                                                                                                                                                                                                                                                | Response Count          | Mean | Standard Deviation | Response Count                     | Mean | Standard Deviation |
| The instructor Clare, Daniel, David, Erin, Janet, Jennifer, Jonathan, Julian, Kenneth, Lee, Nicholas, P, Scott, Stephen, Tonja, Xuguo, Zachary Crowley, DeVries, Dobson, Dupuis, Fisher, Gleeson, Gonthier, Haramoto, Haynes, Larson, Lensing, Potter, Rittschof, Teets, Townsend, White, Zhou was prepared for class.                                                         | 123                     | 4.6  | 0.8                | 2354                               | 4.5  | 0.8                |
| The instructor Clare, Daniel, David, Erin, Janet, Jennifer, Jonathan, Julian, Kenneth, Lee, Nicholas, P, Scott, Stephen, Tonja, Xuguo, Zachary Crowley, DeVries, Dobson, Dupuis, Fisher, Gleeson, Gonthier, Haramoto, Haynes, Larson, Lensing, Potter, Rittschof, Teets, Townsend, White, Zhou presented material clearly.                                                     | 124                     | 4.4  | 0.9                | 2390                               | 4.3  | 0.9                |
| The instructor Clare, Daniel, David, Erin, Janet, Jennifer, Jonathan, Julian, Kenneth, Lee, Nicholas, P, Scott, Stephen, Tonja, Xuguo, Zachary Crowley, DeVries, Dobson, Dupuis, Fisher, Gleeson, Gonthier, Haramoto, Haynes, Larson, Lensing, Potter, Rittschof, Teets, Townsend, White, Zhou responded to questions in a manner that aided my understanding of the material. | 121                     | 4.5  | 0.9                | 2335                               | 4.5  | 0.9                |
| The instructor Clare, Daniel, David, Erin, Janet, Jennifer, Jonathan, Julian, Kenneth, Lee, Nicholas, P, Scott, Stephen, Tonja, Xuguo, Zachary Crowley, DeVries, Dobson, Dupuis, Fisher, Gleeson, Gonthier, Haramoto, Haynes, Larson, Lensing, Potter, Rittschof, Teets, Townsend, White, Zhou provided material at an appropriate pace.                                       | 122                     | 4.4  | 1.0                | 2369                               | 4.4  | 0.9                |
| The instructor Clare, Daniel, David, Erin, Janet, Jennifer, Jonathan, Julian, Kenneth, Lee, Nicholas, P, Scott, Stephen, Tonja, Xuguo, Zachary Crowley, DeVries, Dobson, Dupuis, Fisher, Gleeson, Gonthier, Haramoto, Haynes, Larson, Lensing, Potter, Rittschof, Teets, Townsend, White, Zhou treated students with respect.                                                  | 123                     | 4.7  | 0.6                | 2375                               | 4.7  | 0.7                |
| The instructor Clare, Daniel, David, Erin, Janet, Jennifer, Jonathan, Julian, Kenneth, Lee, Nicholas, P, Scott, Stephen, Tonja, Xuguo, Zachary Crowley, DeVries, Dobson, Dupuis, Fisher, Gleeson, Gonthier, Haramoto, Haynes, Larson, Lensing, Potter, Rittschof, Teets, Townsend, White, Zhou asked questions that stimulated deep consideration of the course content.       | 122                     | 4.4  | 0.9                | 2345                               | 4.4  | 0.9                |

1. The instructor Clare, Daniel, David, Erin, Janet, Jennifer, Jonathan, Julian, Kenneth, Lee, Nicholas, P, Scott, Stephen, Tonja, Xuguo, Zachary Crowley, DeVries, Dobson, Dupuis, Fisher, Gleeson, Gonthier, Haramoto, Haynes, Larson, Lensing, Potter, Rittschof, Teets, Townsend, White, Zhou was prepared for class.

| Options                   | Score | Count | Percentage |
|---------------------------|-------|-------|------------|
| Strongly Disagree         | 1     | 2     | 1.6%       |
| Disagree                  | 2     | 3     | 2.4%       |
| Neither Disagree or Agree | 3     | 2     | 1.6%       |
| Agree                     | 4     | 29    | 23.4%      |
| Strongly Agree            | 5     | 87    | 70.2%      |
| Choose not to rate        | NRP   | 1     | 0.8%       |

3. The instructor Clare, Daniel, David, Erin, Janet, Jennifer, Jonathan, Julian, Kenneth, Lee, Nicholas, P, Scott, Stephen, Tonja, Xuguo, Zachary Crowley, DeVries, Dobson, Dupuis, Fisher, Gleeson, Gonthier, Haramoto, Haynes, Larson, Lensing, Potter, Rittschof, Teets, Townsend, White, Zhou responded to questions in a manner that aided my understanding of the material.

| Options                   | Score | Count | Percentage |
|---------------------------|-------|-------|------------|
| Strongly Disagree         | 1     | 2     | 1.6%       |
| Disagree                  | 2     | 3     | 2.4%       |
| Neither Disagree or Agree | 3     | 8     | 6.5%       |
| Agree                     | 4     | 30    | 24.2%      |
| Strongly Agree            | 5     | 78    | 62.9%      |
| Choose not to rate        | NRP   | 3     | 2.4%       |

5. The instructor Clare, Daniel, David, Erin, Janet, Jennifer, Jonathan, Julian, Kenneth, Lee, Nicholas, P, Scott, Stephen, Tonja, Xuguo, Zachary Crowley, DeVries, Dobson, Dupuis, Fisher, Gleeson, Gonthier, Haramoto, Haynes, Larson, Lensing, Potter, Rittschof, Teets, Townsend, White, Zhou treated students with respect.

| Options                   | Score | Count | Percentage |
|---------------------------|-------|-------|------------|
| Strongly Disagree         | 1     | 1     | 0.8%       |
| Neither Disagree or Agree | 3     | 2     | 1.6%       |
| Agree                     | 4     | 26    | 21.0%      |
| Strongly Agree            | 5     | 94    | 75.8%      |
| Choose not to rate        | NRP   | 1     | 0.8%       |

2. The instructor Clare, Daniel, David, Erin, Janet, Jennifer, Jonathan, Julian, Kenneth, Lee, Nicholas, P, Scott, Stephen, Tonja, Xuguo, Zachary Crowley, DeVries, Dobson, Dupuis, Fisher, Gleeson, Gonthier, Haramoto, Haynes, Larson, Lensing, Potter, Rittschof, Teets, Townsend, White, Zhou presented material clearly.

| Options                   | Score | Count | Percentage |
|---------------------------|-------|-------|------------|
| Strongly Disagree         | 1     | 4     | 3.2%       |
| Disagree                  | 2     | 4     | 3.2%       |
| Neither Disagree or Agree | 3     | 1     | 0.8%       |
| Agree                     | 4     | 44    | 35.5%      |
| Strongly Agree            | 5     | 71    | 57.3%      |

4. The instructor Clare, Daniel, David, Erin, Janet, Jennifer, Jonathan, Julian, Kenneth, Lee, Nicholas, P, Scott, Stephen, Tonja, Xuguo, Zachary Crowley, DeVries, Dobson, Dupuis, Fisher, Gleeson, Gonthier, Haramoto, Haynes, Larson, Lensing, Potter, Rittschof, Teets, Townsend, White, Zhou provided material at an appropriate pace.

| Options                   | Score | Count | Percentage |
|---------------------------|-------|-------|------------|
| Strongly Disagree         | 1     | 4     | 3.2%       |
| Disagree                  | 2     | 4     | 3.2%       |
| Neither Disagree or Agree | 3     | 6     | 4.8%       |
| Agree                     | 4     | 28    | 22.6%      |
| Strongly Agree            | 5     | 80    | 64.5%      |
| Choose not to rate        | NRP   | 2     | 1.6%       |

6. The instructor Clare, Daniel, David, Erin, Janet, Jennifer, Jonathan, Julian, Kenneth, Lee, Nicholas, P, Scott, Stephen, Tonja, Xuguo, Zachary Crowley, DeVries, Dobson, Dupuis, Fisher, Gleeson, Gonthier, Haramoto, Haynes, Larson, Lensing, Potter, Rittschof, Teets, Townsend, White, Zhou asked questions that stimulated deep consideration of the course content.

| Options                   | Score | Count | Percentage |
|---------------------------|-------|-------|------------|
| Strongly Disagree         | 1     | 3     | 2.4%       |
| Disagree                  | 2     | 2     | 1.6%       |
| Neither Disagree or Agree | 3     | 13    | 10.5%      |
| Agree                     | 4     | 32    | 25.8%      |
| Strongly Agree            | 5     | 72    | 58.1%      |
| Choose not to rate        | NRP   | 2     | 1.6%       |

| Raters    | Students |
|-----------|----------|
| Responded | 147      |
| Invited   | 227      |

| My classification is |       |            |
|----------------------|-------|------------|
| Options              | Count | Percentage |
| Freshman             | 19    | 12.9%      |
| Sophomore            | 37    | 25.2%      |
| Junior               | 26    | 17.7%      |
| Senior               | 21    | 14.3%      |
| Graduate             | 41    | 27.9%      |
| Professional         | 0     | 0.0%       |
| Other                | 3     | 2.0%       |

### My main reason(s) for taking this course is that it: (Select all that apply)

| Options                           | Count | Percentage |
|-----------------------------------|-------|------------|
| Is a required course              | 60    | 30.0%      |
| Is an elective                    | 65    | 32.5%      |
| Covers a topic I am interested in | 72    | 36.0%      |
| Choose not to rate                | 3     | 1.5%       |
| Respondent(s)                     | 147   |            |

| My expected grade in this course |       |            |
|----------------------------------|-------|------------|
| Options                          | Count | Percentage |
| Pass or audit                    | 5     | 3.5%       |
| I                                | 0     | 0.0%       |
| E/Fail                           | 0     | 0.0%       |
| D                                | 0     | 0.0%       |
| C                                | 6     | 4.2%       |
| B                                | 31    | 21.8%      |
| A                                | 100   | 70.4%      |

| Hours per week spent on the course (excluding class time) |       |            |
|-----------------------------------------------------------|-------|------------|
| Options                                                   | Count | Percentage |
| 2 hour or less                                            | 64    | 43.8%      |
| 3 - 4 hours                                               | 50    | 34.2%      |
| 5 - 7 hours                                               | 19    | 13.0%      |
| 8 - 10 hours                                              | 11    | 7.5%       |
| 11 - 15 hours                                             | 2     | 1.4%       |
| 16 hours or more                                          | 0     | 0.0%       |

## Overall Course Score

### Course Specific Questions

| Question                                       | Department (Entomology) |      |                    | College (Ag, Food and Environment) |      |                    |
|------------------------------------------------|-------------------------|------|--------------------|------------------------------------|------|--------------------|
|                                                | Response Count          | Mean | Standard Deviation | Response Count                     | Mean | Standard Deviation |
| I consider this course to be a quality course. | 147                     | 4.5  | 0.7                | 2793                               | 4.2  | 0.9                |

| I consider this course to be a quality course. |       |       |            |
|------------------------------------------------|-------|-------|------------|
| Options                                        | Score | Count | Percentage |
| Strongly Disagree                              | 1     | 1     | 0.7%       |
| Disagree                                       | 2     | 1     | 0.7%       |
| Neither Disagree or Agree                      | 3     | 6     | 4.1%       |
| Agree                                          | 4     | 54    | 36.7%      |
| Strongly Agree                                 | 5     | 85    | 57.8%      |

### Course Specific Questions

| Question                                                                                  | College (Ag, Food and Environment) |      |                    |
|-------------------------------------------------------------------------------------------|------------------------------------|------|--------------------|
|                                                                                           | Response Count                     | Mean | Standard Deviation |
| The course was well organized.                                                            | 2787                               | 4.4  | 0.9                |
| Class meetings contributed to my learning of the course content.                          | 2731                               | 4.3  | 1.0                |
| Grading in the course was fair.                                                           | 2775                               | 4.5  | 0.8                |
| Assessments (e.g., tests, quizzes, papers, homework, projects) reflected course material. | 2757                               | 4.5  | 0.8                |
| I understand how the final grade will be calculated in the course.                        | 2770                               | 4.6  | 0.7                |

| 1. The course was well organized. |       |       |            |
|-----------------------------------|-------|-------|------------|
| Options                           | Score | Count | Percentage |
| Strongly Disagree                 | 1     | 4     | 2.7%       |
| Disagree                          | 2     | 4     | 2.7%       |
| Neither Disagree or Agree         | 3     | 3     | 2.0%       |
| Agree                             | 4     | 44    | 29.9%      |
| Strongly Agree                    | 5     | 92    | 62.6%      |

| 3. Grading in the course was fair. |       |       |            |
|------------------------------------|-------|-------|------------|
| Options                            | Score | Count | Percentage |
| Strongly Disagree                  | 1     | 1     | 0.7%       |
| Disagree                           | 2     | 4     | 2.8%       |
| Neither Disagree or Agree          | 3     | 6     | 4.1%       |
| Agree                              | 4     | 31    | 21.4%      |
| Strongly Agree                     | 5     | 103   | 71.0%      |

| 5. I understand how the final grade will be calculated in the course. |       |       |            |
|-----------------------------------------------------------------------|-------|-------|------------|
| Options                                                               | Score | Count | Percentage |
| Strongly Disagree                                                     | 1     | 2     | 1.4%       |
| Disagree                                                              | 2     | 4     | 2.8%       |
| Neither Disagree or Agree                                             | 3     | 4     | 2.8%       |
| Agree                                                                 | 4     | 28    | 19.4%      |
| Strongly Agree                                                        | 5     | 106   | 73.6%      |

| 2. Class meetings contributed to my learning of the course content. |       |       |            |
|---------------------------------------------------------------------|-------|-------|------------|
| Options                                                             | Score | Count | Percentage |
| Disagree                                                            | 2     | 2     | 1.4%       |
| Neither Disagree or Agree                                           | 3     | 9     | 6.3%       |
| Agree                                                               | 4     | 29    | 20.1%      |
| Strongly Agree                                                      | 5     | 104   | 72.2%      |

| 4. Assessments (e.g., tests, quizzes, papers, homework, projects) reflected course material. |       |       |            |
|----------------------------------------------------------------------------------------------|-------|-------|------------|
| Options                                                                                      | Score | Count | Percentage |
| Strongly Disagree                                                                            | 1     | 2     | 1.4%       |
| Disagree                                                                                     | 2     | 1     | 0.7%       |
| Neither Disagree or Agree                                                                    | 3     | 2     | 1.4%       |
| Agree                                                                                        | 4     | 38    | 26.6%      |
| Strongly Agree                                                                               | 5     | 100   | 69.9%      |

## Overall Instructor Score

| Question                                  | Department (Entomology) |      |                    | College (Ag, Food and Environment) |      |                    |
|-------------------------------------------|-------------------------|------|--------------------|------------------------------------|------|--------------------|
|                                           | Response Count          | Mean | Standard Deviation | Response Count                     | Mean | Standard Deviation |
| The instructor provided quality teaching. | 170                     | 4.7  | 0.7                | 3176                               | 4.5  | 0.8                |

| The instructor provided quality teaching. |       |       |            |
|-------------------------------------------|-------|-------|------------|
| Options                                   | Score | Count | Percentage |
| Strongly Disagree                         | 1     | 2     | 1.2%       |
| Disagree                                  | 2     | 3     | 1.8%       |
| Neither Disagree or Agree                 | 3     | 1     | 0.6%       |
| Agree                                     | 4     | 34    | 19.9%      |
| Strongly Agree                            | 5     | 130   | 76.0%      |
| Choose not to rate                        | NRP   | 1     | 0.6%       |

## Instructor Specific Questions

| Question                                                                                       | College (Ag, Food and Environment) |      |                    |
|------------------------------------------------------------------------------------------------|------------------------------------|------|--------------------|
|                                                                                                | Response Count                     | Mean | Standard Deviation |
| The instructor was prepared for class.                                                         | 3170                               | 4.6  | 0.7                |
| The instructor presented material clearly.                                                     | 3213                               | 4.3  | 0.9                |
| The instructor responded to questions in a manner that aided my understanding of the material. | 3163                               | 4.5  | 0.8                |
| The instructor provided material at an appropriate pace.                                       | 3186                               | 4.4  | 0.9                |
| The instructor treated students with respect.                                                  | 3189                               | 4.7  | 0.7                |
| The instructor asked questions that stimulated deep consideration of the course content.       | 3160                               | 4.4  | 0.8                |

| 1. The instructor was prepared for class.                                                         |       |       |            | 2. The instructor presented material clearly.                                               |       |       |            |
|---------------------------------------------------------------------------------------------------|-------|-------|------------|---------------------------------------------------------------------------------------------|-------|-------|------------|
| Options                                                                                           | Score | Count | Percentage | Options                                                                                     | Score | Count | Percentage |
| Strongly Disagree                                                                                 | 1     | 1     | 0.6%       | Strongly Disagree                                                                           | 1     | 1     | 0.6%       |
| Disagree                                                                                          | 2     | 2     | 1.2%       | Disagree                                                                                    | 2     | 4     | 2.3%       |
| Agree                                                                                             | 4     | 34    | 20.1%      | Neither Disagree or Agree                                                                   | 3     | 4     | 2.3%       |
| Strongly Agree                                                                                    | 5     | 132   | 78.1%      | Agree                                                                                       | 4     | 55    | 32.2%      |
|                                                                                                   |       |       |            | Strongly Agree                                                                              | 5     | 107   | 62.6%      |
| 3. The instructor responded to questions in a manner that aided my understanding of the material. |       |       |            | 4. The instructor provided material at an appropriate pace.                                 |       |       |            |
| Options                                                                                           | Score | Count | Percentage | Options                                                                                     | Score | Count | Percentage |
| Strongly Disagree                                                                                 | 1     | 2     | 1.2%       | Strongly Disagree                                                                           | 1     | 1     | 0.6%       |
| Disagree                                                                                          | 2     | 1     | 0.6%       | Disagree                                                                                    | 2     | 5     | 2.9%       |
| Neither Disagree or Agree                                                                         | 3     | 2     | 1.2%       | Neither Disagree or Agree                                                                   | 3     | 4     | 2.3%       |
| Agree                                                                                             | 4     | 38    | 22.5%      | Agree                                                                                       | 4     | 50    | 29.2%      |
| Strongly Agree                                                                                    | 5     | 126   | 74.6%      | Strongly Agree                                                                              | 5     | 111   | 64.9%      |
| 5. The instructor treated students with respect.                                                  |       |       |            | 6. The instructor asked questions that stimulated deep consideration of the course content. |       |       |            |
| Options                                                                                           | Score | Count | Percentage | Options                                                                                     | Score | Count | Percentage |
| Strongly Disagree                                                                                 | 1     | 1     | 0.6%       | Strongly Disagree                                                                           | 1     | 1     | 0.6%       |
| Disagree                                                                                          | 2     | 1     | 0.6%       | Disagree                                                                                    | 2     | 1     | 0.6%       |
| Neither Disagree or Agree                                                                         | 3     | 1     | 0.6%       | Neither Disagree or Agree                                                                   | 3     | 9     | 5.4%       |
| Agree                                                                                             | 4     | 24    | 14.0%      | Agree                                                                                       | 4     | 46    | 27.7%      |
| Strongly Agree                                                                                    | 5     | 144   | 84.2%      | Strongly Agree                                                                              | 5     | 109   | 65.7%      |



| Raters    | Students |
|-----------|----------|
| Responded | 104      |
| Invited   | 226      |

| My classification is |       |            |
|----------------------|-------|------------|
| Options              | Count | Percentage |
| Freshman             | 26    | 25.0%      |
| Sophomore            | 22    | 21.2%      |
| Junior               | 13    | 12.5%      |
| Senior               | 24    | 23.1%      |
| Graduate             | 18    | 17.3%      |
| Professional         | 0     | 0.0%       |
| Other                | 1     | 1.0%       |

### My main reason(s) for taking this course is that it: (Select all that apply)

| Options                           | Count | Percentage |
|-----------------------------------|-------|------------|
| Is a required course              | 35    | 26.7%      |
| Is an elective                    | 53    | 40.5%      |
| Covers a topic I am interested in | 41    | 31.3%      |
| Choose not to rate                | 2     | 1.5%       |
| Respondent(s)                     | 104   |            |

| My expected grade in this course |       |            |
|----------------------------------|-------|------------|
| Options                          | Count | Percentage |
| Pass or audit                    | 1     | 1.0%       |
| I                                | 0     | 0.0%       |
| E/Fail                           | 0     | 0.0%       |
| D                                | 2     | 2.0%       |
| C                                | 2     | 2.0%       |
| B                                | 31    | 31.0%      |
| A                                | 64    | 64.0%      |

| Hours per week spent on the course (excluding class time) |       |            |
|-----------------------------------------------------------|-------|------------|
| Options                                                   | Count | Percentage |
| 2 hour or less                                            | 38    | 36.5%      |
| 3 - 4 hours                                               | 41    | 39.4%      |
| 5 - 7 hours                                               | 18    | 17.3%      |
| 8 - 10 hours                                              | 4     | 3.8%       |
| 11 - 15 hours                                             | 2     | 1.9%       |
| 16 hours or more                                          | 1     | 1.0%       |

## Overall Course Score

### Course Specific Questions

| Question                                       | Department (Entomology) |      |                    | College (Ag, Food and Environment) |      |                    |
|------------------------------------------------|-------------------------|------|--------------------|------------------------------------|------|--------------------|
|                                                | Response Count          | Mean | Standard Deviation | Response Count                     | Mean | Standard Deviation |
| I consider this course to be a quality course. | 103                     | 4.4  | 0.8                | 2197                               | 4.4  | 0.9                |

| I consider this course to be a quality course. |       |       |            |
|------------------------------------------------|-------|-------|------------|
| Options                                        | Score | Count | Percentage |
| Strongly Disagree                              | 1     | 1     | 1.0%       |
| Disagree                                       | 2     | 2     | 1.9%       |
| Neither Disagree or Agree                      | 3     | 7     | 6.8%       |
| Agree                                          | 4     | 35    | 34.0%      |
| Strongly Agree                                 | 5     | 58    | 56.3%      |

### Course Specific Questions

| Question                                                                                  | Department (Entomology) |      |                    | College (Ag, Food and Environment) |      |                    |
|-------------------------------------------------------------------------------------------|-------------------------|------|--------------------|------------------------------------|------|--------------------|
|                                                                                           | Response Count          | Mean | Standard Deviation | Response Count                     | Mean | Standard Deviation |
| The course was well organized.                                                            | 103                     | 4.4  | 0.9                | 2202                               | 4.4  | 0.9                |
| Class meetings contributed to my learning of the course content.                          | 93                      | 4.4  | 0.9                | 2124                               | 4.4  | 0.9                |
| Grading in the course was fair.                                                           | 101                     | 4.6  | 0.8                | 2193                               | 4.5  | 0.8                |
| Assessments (e.g., tests, quizzes, papers, homework, projects) reflected course material. | 101                     | 4.6  | 0.7                | 2183                               | 4.5  | 0.7                |
| I understand how the final grade will be calculated in the course.                        | 102                     | 4.6  | 0.6                | 2193                               | 4.6  | 0.7                |

| 1. The course was well organized. |       |       |            |
|-----------------------------------|-------|-------|------------|
| Options                           | Score | Count | Percentage |
| Strongly Disagree                 | 1     | 1     | 1.0%       |
| Disagree                          | 2     | 5     | 4.9%       |
| Neither Disagree or Agree         | 3     | 5     | 4.9%       |
| Agree                             | 4     | 30    | 29.1%      |
| Strongly Agree                    | 5     | 62    | 60.2%      |

| 3. Grading in the course was fair. |       |       |            |
|------------------------------------|-------|-------|------------|
| Options                            | Score | Count | Percentage |
| Strongly Disagree                  | 1     | 1     | 1.0%       |
| Disagree                           | 2     | 2     | 2.0%       |
| Neither Disagree or Agree          | 3     | 5     | 5.0%       |
| Agree                              | 4     | 25    | 24.8%      |
| Strongly Agree                     | 5     | 68    | 67.3%      |

| 5. I understand how the final grade will be calculated in the course. |       |       |            |
|-----------------------------------------------------------------------|-------|-------|------------|
| Options                                                               | Score | Count | Percentage |
| Strongly Disagree                                                     | 1     | 1     | 1.0%       |
| Neither Disagree or Agree                                             | 3     | 3     | 2.9%       |
| Agree                                                                 | 4     | 28    | 27.5%      |
| Strongly Agree                                                        | 5     | 70    | 68.6%      |

| 2. Class meetings contributed to my learning of the course content. |       |       |            |
|---------------------------------------------------------------------|-------|-------|------------|
| Options                                                             | Score | Count | Percentage |
| Strongly Disagree                                                   | 1     | 1     | 1.1%       |
| Disagree                                                            | 2     | 3     | 3.2%       |
| Neither Disagree or Agree                                           | 3     | 7     | 7.5%       |
| Agree                                                               | 4     | 26    | 28.0%      |
| Strongly Agree                                                      | 5     | 56    | 60.2%      |

| 4. Assessments (e.g., tests, quizzes, papers, homework, projects) reflected course material. |       |       |            |
|----------------------------------------------------------------------------------------------|-------|-------|------------|
| Options                                                                                      | Score | Count | Percentage |
| Strongly Disagree                                                                            | 1     | 1     | 1.0%       |
| Neither Disagree or Agree                                                                    | 3     | 6     | 5.9%       |
| Agree                                                                                        | 4     | 29    | 28.7%      |
| Strongly Agree                                                                               | 5     | 65    | 64.4%      |

## Overall Instructor Score

| Question                                  | Department (Entomology) |      |                    | College (Ag, Food and Environment) |      |                    |
|-------------------------------------------|-------------------------|------|--------------------|------------------------------------|------|--------------------|
|                                           | Response Count          | Mean | Standard Deviation | Response Count                     | Mean | Standard Deviation |
| The instructor provided quality teaching. | 102                     | 4.5  | 0.8                | 2466                               | 4.5  | 0.8                |

| The instructor provided quality teaching. |       |       |            |
|-------------------------------------------|-------|-------|------------|
| Options                                   | Score | Count | Percentage |
| Strongly Disagree                         | 1     | 2     | 1.9%       |
| Neither Disagree or Agree                 | 3     | 9     | 8.7%       |
| Agree                                     | 4     | 25    | 24.0%      |
| Strongly Agree                            | 5     | 66    | 63.5%      |
| Choose not to rate                        | NRP   | 2     | 1.9%       |

## Instructor Specific Questions

| Question                                                                                       | Department (Entomology) |      |                    | College (Ag, Food and Environment) |      |                    |
|------------------------------------------------------------------------------------------------|-------------------------|------|--------------------|------------------------------------|------|--------------------|
|                                                                                                | Response Count          | Mean | Standard Deviation | Response Count                     | Mean | Standard Deviation |
| The instructor was prepared for class.                                                         | 99                      | 4.6  | 0.7                | 2467                               | 4.6  | 0.7                |
| The instructor presented material clearly.                                                     | 104                     | 4.2  | 0.8                | 2503                               | 4.4  | 0.9                |
| The instructor responded to questions in a manner that aided my understanding of the material. | 101                     | 4.5  | 0.8                | 2457                               | 4.5  | 0.8                |
| The instructor provided material at an appropriate pace.                                       | 102                     | 4.4  | 0.9                | 2475                               | 4.5  | 0.8                |
| The instructor treated students with respect.                                                  | 102                     | 4.6  | 0.7                | 2472                               | 4.7  | 0.7                |
| The instructor asked questions that stimulated deep consideration of the course content.       | 101                     | 4.3  | 0.9                | 2453                               | 4.4  | 0.8                |

| 1. The instructor was prepared for class. |       |       |            | 2. The instructor presented material clearly. |       |       |            |
|-------------------------------------------|-------|-------|------------|-----------------------------------------------|-------|-------|------------|
| Options                                   | Score | Count | Percentage | Options                                       | Score | Count | Percentage |
| Strongly Disagree                         | 1     | 1     | 1.0%       | Strongly Disagree                             | 1     | 1     | 1.0%       |
| Disagree                                  | 2     | 1     | 1.0%       | Disagree                                      | 2     | 3     | 2.9%       |
| Neither Disagree or Agree                 | 3     | 4     | 4.0%       | Neither Disagree or Agree                     | 3     | 11    | 10.6%      |
| Agree                                     | 4     | 23    | 23.2%      | Agree                                         | 4     | 44    | 42.3%      |
| Strongly Agree                            | 5     | 70    | 70.7%      | Strongly Agree                                | 5     | 45    | 43.3%      |

| 3. The instructor responded to questions in a manner that aided my understanding of the material. |       |       |            | 4. The instructor provided material at an appropriate pace. |       |       |            |
|---------------------------------------------------------------------------------------------------|-------|-------|------------|-------------------------------------------------------------|-------|-------|------------|
| Options                                                                                           | Score | Count | Percentage | Options                                                     | Score | Count | Percentage |
| Strongly Disagree                                                                                 | 1     | 2     | 2.0%       | Strongly Disagree                                           | 1     | 2     | 2.0%       |
| Neither Disagree or Agree                                                                         | 3     | 11    | 10.9%      | Disagree                                                    | 2     | 3     | 2.9%       |
| Agree                                                                                             | 4     | 23    | 22.8%      | Neither Disagree or Agree                                   | 3     | 11    | 10.8%      |
| Strongly Agree                                                                                    | 5     | 65    | 64.4%      | Agree                                                       | 4     | 26    | 25.5%      |
|                                                                                                   |       |       |            | Strongly Agree                                              | 5     | 60    | 58.8%      |

| 5. The instructor treated students with respect. |       |       |            | 6. The instructor asked questions that stimulated deep consideration of the course content. |       |       |            |
|--------------------------------------------------|-------|-------|------------|---------------------------------------------------------------------------------------------|-------|-------|------------|
| Options                                          | Score | Count | Percentage | Options                                                                                     | Score | Count | Percentage |
| Strongly Disagree                                | 1     | 1     | 1.0%       | Strongly Disagree                                                                           | 1     | 1     | 1.0%       |
| Neither Disagree or Agree                        | 3     | 6     | 5.9%       | Disagree                                                                                    | 2     | 2     | 2.0%       |
| Agree                                            | 4     | 21    | 20.6%      | Neither Disagree or Agree                                                                   | 3     | 18    | 17.8%      |
| Strongly Agree                                   | 5     | 74    | 72.5%      | Agree                                                                                       | 4     | 22    | 21.8%      |
|                                                  |       |       |            | Strongly Agree                                                                              | 5     | 58    | 57.4%      |

**2016-2017 Degrees Awarded**

|              | Total    | Female   | Male     | Minorities | African Amer. |
|--------------|----------|----------|----------|------------|---------------|
| Master's     | 3        | 2        | 1        | 0          | 0             |
| Doctoral     | 5        | 4        | 1        | 0          | 0             |
| <b>Total</b> | <b>8</b> | <b>6</b> | <b>2</b> | <b>0</b>   | <b>0</b>      |

**2016-2017 Enrollment (majors)**

|              | Total     | Female    | Male      | Minority | African Amer. |
|--------------|-----------|-----------|-----------|----------|---------------|
| Master's     | 17        | 7         | 10        | 2        | 0             |
| Doctoral     | 15        | 8         | 7         | 0        | 0             |
| Post-Doc     | 14        | 3         | 11        | 1        | 0             |
| <b>Total</b> | <b>46</b> | <b>18</b> | <b>28</b> | <b>3</b> | <b>0</b>      |

**2016-2017 Attempted/Earned Student Credit Hours**

|                           | Total        | Fall         | Spring       | Summer |
|---------------------------|--------------|--------------|--------------|--------|
| Attempted Inst. SCH       | 1,070        | 633          | 437          | 0      |
| Earned Inst. SCH          | 952          | 554          | 398          | 0      |
| <b>% Earned Inst. SCH</b> | <b>89.0%</b> | <b>87.5%</b> | <b>91.1%</b> |        |
| Attempted Dept. SCH       | 878          | 531          | 347          | 0      |
| Earned Dept. SCH          | 825          | 495          | 330          | 0      |

Inst. SCH includes all student credit hours associated with instructors budgeted in the department, regardless of where the course is listed. Dept. SCH include all student credit hours associated with courses listed in the department, regardless of who teaches the course.

**2016-2017 Direct Awards/Faculty Ratio**

|                | Total FT Faculty   | FTE Research Fac.  |
|----------------|--------------------|--------------------|
|                | 18                 | 10.43              |
| <b>Total</b>   | <b>\$1,871,371</b> | <b>\$1,871,371</b> |
| <b>Average</b> | <b>\$103,965</b>   | <b>\$179,422</b>   |

**2016-2017 Fiscal Year Grants**

|                       |             |
|-----------------------|-------------|
| Direct Awards         | \$1,871,371 |
| Federal Competetive   | \$900,694   |
| % Federal Competetive | 48%         |
| Collaborative         | \$656,688   |

**Research Faculty w/Formula Funded Projects as of 6/17**

|                            |      |
|----------------------------|------|
| 25% or higher Research DOE | 14   |
| Active Project             | 14   |
| Percentage                 | 100% |

**Degrees Awarded Five-Year Trend**

|              | 2012-2013 | 2013-2014 | 2014-2015 | 2015-2016 | 2016-2017 |
|--------------|-----------|-----------|-----------|-----------|-----------|
| Master's     | 4         | 6         | 3         | 3         | 3         |
| Doctoral     | 5         | 2         | 4         | 8         | 5         |
| <b>Total</b> | <b>9</b>  | <b>8</b>  | <b>7</b>  | <b>11</b> | <b>8</b>  |

**Enrollment (majors) Five-Year Trend**

|              | 2012-2013 | 2013-2014 | 2014-2015 | 2015-2016 | 2016-2017 |
|--------------|-----------|-----------|-----------|-----------|-----------|
| Master's     | 13        | 14        | 11        | 14        | 17        |
| Doctoral     | 23        | 20        | 20        | 18        | 15        |
| Post-Doc     | 7         | 8         | 9         | 6         | 14        |
| <b>Total</b> | <b>43</b> | <b>42</b> | <b>40</b> | <b>38</b> | <b>46</b> |

**KERS Faculty Contacts Five-Year Trend**

|                     | 2012-2013     | 2013-2014     | 2014-2015    | 2015-2016     | 2016-2017    |
|---------------------|---------------|---------------|--------------|---------------|--------------|
| African Am.         | 369           | 757           | 35           | 647           | 292          |
| Asian Am.           | 0             | 0             | 0            | 0             | 121          |
| Hispanic            | 33            | 704           | 11           | 225           | 606          |
| Native Am.          | 0             | 0             | 0            | 0             | 0            |
| Other               | 0             | 0             | 0            | 0             | 177          |
| <b>Total Contac</b> | <b>32,704</b> | <b>17,569</b> | <b>7,159</b> | <b>11,500</b> | <b>8,526</b> |

**KERS Number of Faculty Success Stories Five-Year Trend**

|               | 2012-2013 | 2013-2014 | 2014-2015 | 2015-2016 | 2016-2017 |
|---------------|-----------|-----------|-----------|-----------|-----------|
| <b>Number</b> | <b>1</b>  | <b>5</b>  | <b>1</b>  | <b>0</b>  | <b>6</b>  |

**2016-2017 Numbered Fact Sheets/Faculty Ratio**

|                          | Total FT Faculty | FTE Ext. Faculty |
|--------------------------|------------------|------------------|
|                          | 18               | 3.66             |
| <b>Total Fact Sheets</b> | <b>9</b>         | <b>9</b>         |
| <b>Average</b>           | <b>0.50</b>      | <b>2.46</b>      |

**Direct Awards Five-Year Trend**

| 2012-2013   | 2013-2014   | 2014-2015   | 2015-2016   | 2016-2017   |
|-------------|-------------|-------------|-------------|-------------|
| \$1,712,250 | \$2,565,933 | \$1,226,814 | \$1,506,819 | \$1,871,371 |

**Grant Expenditures Five-Year Trend**

| 2012-2013   | 2013-2014   | 2014-2015   | 2015-2016   | 2016-2017   |
|-------------|-------------|-------------|-------------|-------------|
| \$1,962,784 | \$1,589,368 | \$1,817,018 | \$1,488,026 | \$1,659,669 |

**Fiscal Year State Fund Balance Percentage Five-Year Trend**

| 2012-2013 | 2013-2014 | 2014-2015 | 2015-2016 | 2016-2017 |
|-----------|-----------|-----------|-----------|-----------|
| -0.63%    | -0.13%    | 2.19%     | -1.97%    | -1.03%    |

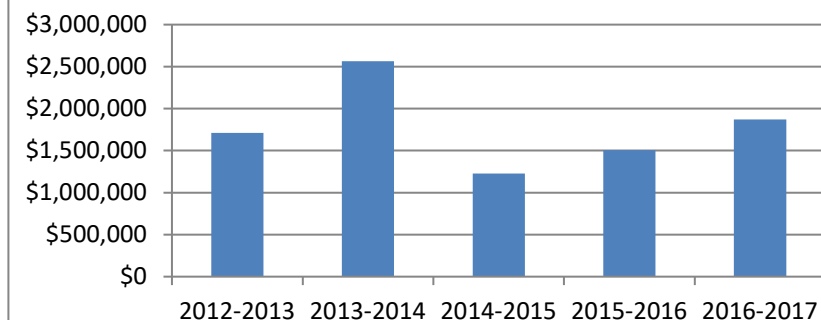
**2016 Calendar Year Publications**

|                           |           |
|---------------------------|-----------|
| Books and Chapters        | 3         |
| Refereed Journal Articles | 57        |
| Other Research Articles   | 6         |
| <b>Total</b>              | <b>66</b> |

**2016 Calendar Year Patents**

|          |
|----------|
| <b>1</b> |
|----------|

**Direct Awards Five-Year Trend**



# Entomology

## Faculty Snapshot FY 2017

| All ENT Faculty by Title Series |           |             |
|---------------------------------|-----------|-------------|
| Title Series                    | Faculty   | Percent     |
| Regular                         | 14        | 61%         |
| Extension                       | 4         | 17%         |
| Adjunct                         | 5         | 22%         |
| <b>Total</b>                    | <b>23</b> | <b>100%</b> |

| Full Time Faculty by Rank |           |             |
|---------------------------|-----------|-------------|
| Rank                      | Faculty   | Percent     |
| Professor                 | 13        | 72%         |
| Associate                 | 2         | 11%         |
| Assistant                 | 3         | 17%         |
| <b>Total</b>              | <b>18</b> | <b>100%</b> |

| All ENT Faculty by Full Time/Part Time Status |         |         |
|-----------------------------------------------|---------|---------|
| FT/PT Status                                  | Faculty | Percent |
| Full Time                                     | 18      | 78%     |
| Part Time                                     | 5       | 22%     |

| Full Time Faculty by Assignment Period |         |         |
|----------------------------------------|---------|---------|
| Assignment Period                      | Faculty | Percent |
| 12 month                               | 15      | 83%     |
| 9 month                                | 3       | 17%     |

| Full Time Faculty Credentials |         |         |
|-------------------------------|---------|---------|
| Credentials                   | Faculty | Percent |
| Ph.D.                         | 18      | 100%    |

| Full Time Faculty by Tenure Status |         |         |
|------------------------------------|---------|---------|
| Tenure Status                      | Faculty | Percent |
| Tenured                            | 15      | 83%     |
| Tenure Track                       | 3       | 17%     |

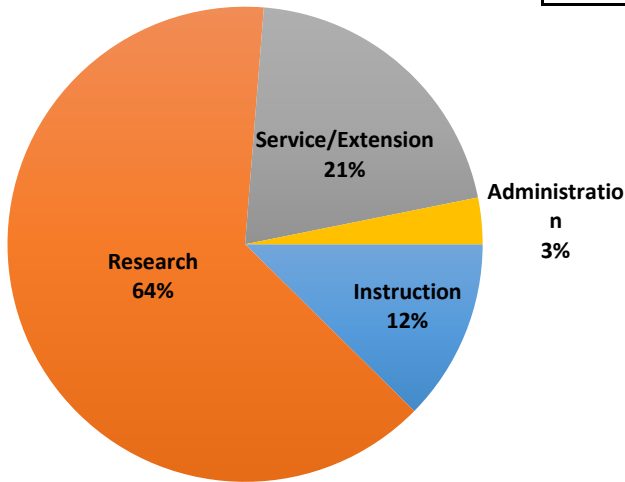
| Full Time Faculty by Race |         |         |
|---------------------------|---------|---------|
| Race                      | Faculty | Percent |
| Asian                     | 2       | 11%     |
| More than one race        | 1       | 6%      |
| White                     | 15      | 83%     |

| Full Time Faculty by Gender |         |         |
|-----------------------------|---------|---------|
| Gender                      | Faculty | Percent |
| Female                      | 3       | 17%     |
| Male                        | 15      | 83%     |

| Full Time Faculty by Age |         |         |
|--------------------------|---------|---------|
| Age                      | Faculty | Percent |
| 30-39                    | 2       | 11%     |
| 40-49                    | 3       | 17%     |
| 50-59                    | 6       | 33%     |
| 60-65                    | 5       | 28%     |
| > 65                     | 2       | 11%     |

| Full Time Faculty by Years of Service |         |         |
|---------------------------------------|---------|---------|
| Years                                 | Faculty | Percent |
| < 4                                   | 3       | 17%     |
| 7-9                                   | 2       | 11%     |
| 13-15                                 | 2       | 11%     |
| 16-18                                 | 1       | 6%      |
| 19-21                                 | 3       | 17%     |
| 22-24                                 | 1       | 6%      |
| 25-27                                 | 2       | 11%     |
| > 30                                  | 4       | 22%     |

**Average DOE**



**2017-2018 Degrees Awarded**

|              | Total    | Female   | Male     | Minorities | African Amer. |
|--------------|----------|----------|----------|------------|---------------|
| Master's     | 7        | 1        | 6        | 1          | 0             |
| Doctoral     | 1        | 1        | 0        | 0          | 0             |
| <b>Total</b> | <b>8</b> | <b>2</b> | <b>6</b> | <b>1</b>   | <b>0</b>      |

**2017-2018 Enrollment (majors)**

|              | Total     | Female    | Male      | Minority | African Amer. |
|--------------|-----------|-----------|-----------|----------|---------------|
| Master's     | 10        | 6         | 4         | 2        | 0             |
| Doctoral     | 17        | 8         | 9         | 1        | 0             |
| Post-Doc     | 10        | 3         | 7         | 1        | 0             |
| <b>Total</b> | <b>37</b> | <b>17</b> | <b>20</b> | <b>4</b> | <b>0</b>      |

**2017-2018 Attempted/Earned Student Credit Hours**

|                           | Total      | Fall       | Spring     | Summer    |
|---------------------------|------------|------------|------------|-----------|
| Attempted Inst. SCH       | 1,182      | 629        | 547        | 6         |
| Earned Inst. SCH          | 1,081      | 570        | 511        | 0         |
| <b>% Earned Inst. SCH</b> | <b>91%</b> | <b>91%</b> | <b>93%</b> | <b>0%</b> |
| Attempted Dept. SCH       | 843        | 428        | 415        | 0         |
| Earned Dept. SCH          | 795        | 392        | 403        | 0         |

Inst. SCH includes all student credit hours associated with instructors budgeted in the department, regardless of where the course is listed. Dept. SCH include all student credit hours associated with courses listed in the department, regardless of who teaches the course.

**2017-2018 Direct Awards/Faculty Ratio**

|                | Total FT Faculty    | FTE Research Fac.   |
|----------------|---------------------|---------------------|
|                | 18                  | 8.36                |
| <b>Total</b>   | <b>\$2,931,949</b>  | <b>\$2,931,949</b>  |
| <b>Average</b> | <b>\$162,886.06</b> | <b>\$350,711.60</b> |

**2017-2018 Fiscal Year Grants**

|                       |             |
|-----------------------|-------------|
| Direct Awards         | \$2,931,949 |
| Federal Competitive   | \$1,330,355 |
| % Federal Competitive | 45%         |
| Collaborative         | \$757,307   |

**Research Faculty w/Formula Funded Projects as of 6/18**

|                            |      |
|----------------------------|------|
| 25% or higher Research DOE | 13   |
| Active Project             | 13   |
| Percentage                 | 100% |

**Degrees Awarded Five-Year Trend**

|              | 2013-2014 | 2014-2015 | 2015-2016 | 2016-2017 | 2017-2018 |
|--------------|-----------|-----------|-----------|-----------|-----------|
| Master's     | 6         | 3         | 3         | 3         | 7         |
| Doctoral     | 2         | 4         | 8         | 5         | 1         |
| <b>Total</b> | <b>8</b>  | <b>7</b>  | <b>11</b> | <b>8</b>  | <b>8</b>  |

**Enrollment (majors) Five-Year Trend**

|              | 2013-2014 | 2014-2015 | 2015-2016 | 2016-2017 | 2017-2018 |
|--------------|-----------|-----------|-----------|-----------|-----------|
| Master's     | 14        | 11        | 14        | 17        | 10        |
| Doctoral     | 20        | 20        | 18        | 15        | 17        |
| Post-Doc     | 8         | 9         | 6         | 14        | 10        |
| <b>Total</b> | <b>42</b> | <b>40</b> | <b>38</b> | <b>46</b> | <b>37</b> |

**Direct Awards Five-Year Trend**

| 2013-2014   | 2014-2015   | 2015-2016   | 2016-2017   | 2017-2018   |
|-------------|-------------|-------------|-------------|-------------|
| \$2,565,933 | \$1,226,814 | \$1,506,819 | \$1,871,371 | \$2,931,949 |

**Grant Expenditures Five-Year Trend**

| 2013-2014   | 2014-2015   | 2015-2016   | 2016-2017   | 2017-2018   |
|-------------|-------------|-------------|-------------|-------------|
| \$1,589,368 | \$1,817,018 | \$1,488,026 | \$1,659,669 | \$2,311,972 |

**Fiscal Year State Fund Balance Percentage Five-Year Trend**

| 2013-2014 | 2014-2015 | 2015-2016 | 2016-2017 | 2017-2018 |
|-----------|-----------|-----------|-----------|-----------|
| -0.13%    | 2.19%     | -1.97%    | -1.03%    | 12.55%    |

**2017 Calendar Year Publications**

|                    |    |
|--------------------|----|
| Books and Chapters | 0  |
| Journal Articles   | 62 |

**2017 Calendar Year Patents**

|         |   |
|---------|---|
| Patents | 1 |
|---------|---|

**KERS Faculty Contacts Five-Year Trend**

|                       | 2013-2014     | 2014-2015    | 2015-2016     | 2016-2017    | 2017-2018     |
|-----------------------|---------------|--------------|---------------|--------------|---------------|
| African Am.           | 757           | 35           | 647           | 292          | 372           |
| Asian Am.             | 0             | 0            | 0             | 121          | 188           |
| Hispanic              | 704           | 11           | 225           | 606          | 91            |
| Native Am.            | 0             | 0            | 0             | 0            | 17            |
| Other                 | 0             | 0            | 0             | 177          | 234           |
| <b>Total Contacts</b> | <b>17,569</b> | <b>7,159</b> | <b>11,500</b> | <b>8,526</b> | <b>10,474</b> |

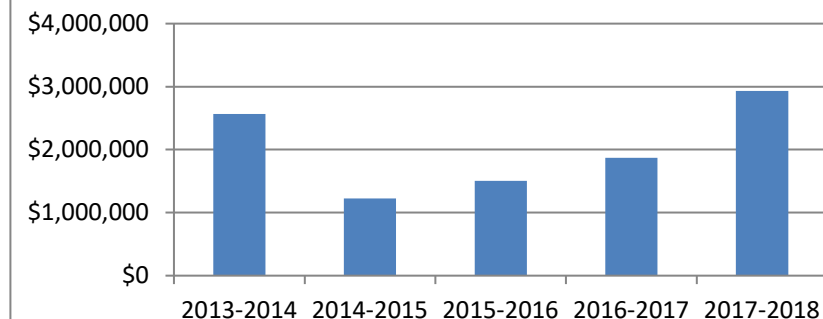
**KERS Number of Faculty Success Stories Five-Year Trend**

|               | 2013-2014 | 2014-2015 | 2015-2016 | 2016-2017 | 2017-2018 |
|---------------|-----------|-----------|-----------|-----------|-----------|
| <b>Number</b> | <b>5</b>  | <b>1</b>  | <b>0</b>  | <b>6</b>  | <b>7</b>  |

**2017-2018 Numbered Fact Sheets/Faculty Ratio**

|                   | Total FT Faculty | FTE Ext. Faculty |
|-------------------|------------------|------------------|
|                   | 18               | 3.81             |
| Total Fact Sheets | 7                | 7                |
| <b>Average</b>    | <b>0.39</b>      | <b>1.84</b>      |

**Direct Awards Five-Year Trend**





# Entomology Faculty Snapshot 2018

| All ENT Faculty by Title Series |           |             |
|---------------------------------|-----------|-------------|
| Title Series                    | Faculty   | Percent     |
| Regular                         | 14        | 61%         |
| Extension                       | 4         | 17%         |
| Adjunct                         | 5         | 22%         |
| <b>Total</b>                    | <b>23</b> | <b>100%</b> |

| Full Time Faculty by Rank |           |             |
|---------------------------|-----------|-------------|
| Rank                      | Faculty   | Percent     |
| Professor                 | 13        | 72%         |
| Associate                 | 2         | 11%         |
| Assistant                 | 3         | 17%         |
| <b>Total</b>              | <b>18</b> | <b>100%</b> |

| All ENT Faculty by Full Time/Part Time Status |         |         |
|-----------------------------------------------|---------|---------|
| FT/PT Status                                  | Faculty | Percent |
| Full-time                                     | 18      | 78%     |
| Part-time                                     | 5       | 22%     |

| Full Time Faculty by Assignment Period |         |         |
|----------------------------------------|---------|---------|
| Assignment Period                      | Faculty | Percent |
| 12 month                               | 15      | 83%     |
| 9 month                                | 3       | 17%     |

| Full Time Faculty Credentials |         |         |
|-------------------------------|---------|---------|
| Credentials                   | Faculty | Percent |
| Ph.D.                         | 18      | 100%    |

| Full Time Faculty by Tenure Status |         |         |
|------------------------------------|---------|---------|
| Tenure Status                      | Faculty | Percent |
| Tenured                            | 15      | 83%     |
| Tenure Track                       | 3       | 17%     |

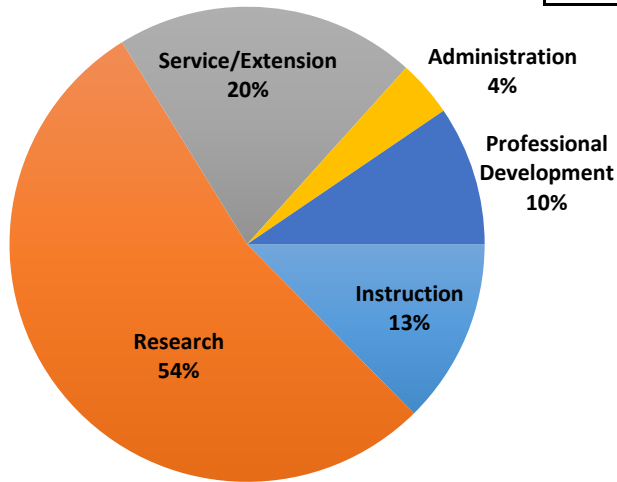
| Full Time Faculty by Race |         |         |
|---------------------------|---------|---------|
| Race                      | Faculty | Percent |
| Asian                     | 2       | 11%     |
| More than one race        | 1       | 6%      |
| White                     | 15      | 83%     |

| Full Time Faculty by Gender |         |         |
|-----------------------------|---------|---------|
| Gender                      | Faculty | Percent |
| Female                      | 3       | 17%     |
| Male                        | 15      | 83%     |

| Full Time Faculty by Age |         |         |
|--------------------------|---------|---------|
| Age                      | Faculty | Percent |
| 30-39                    | 2       | 11%     |
| 40-49                    | 3       | 17%     |
| 50-59                    | 6       | 33%     |
| 60-65                    | 5       | 28%     |
| > 65                     | 2       | 11%     |

| Full Time Faculty by Years of Service |         |         |
|---------------------------------------|---------|---------|
| Years                                 | Faculty | Percent |
| < 4                                   | 3       | 17%     |
| 7-9                                   | 2       | 11%     |
| 13-15                                 | 2       | 11%     |
| 16-18                                 | 1       | 6%      |
| 19-21                                 | 3       | 17%     |
| 22-24                                 | 1       | 6%      |
| 25-27                                 | 2       | 11%     |
| > 30                                  | 4       | 22%     |

## Average DOE



**2018-2019 Degrees Awarded**

|              | Total    | Female   | Male     | Minorities | African Amer. |
|--------------|----------|----------|----------|------------|---------------|
| Master's     | 3        | 3        | 0        | 0          | 0             |
| Doctoral     | 2        | 1        | 1        | 1          | 0             |
| <b>Total</b> | <b>5</b> | <b>4</b> | <b>1</b> | <b>1</b>   | <b>0</b>      |

**2018-2019 Enrollment (majors)**

|              | Total     | Female    | Male      | Minority | African Amer. |
|--------------|-----------|-----------|-----------|----------|---------------|
| Master's     | 11        | 7         | 4         | 2        | 0             |
| Doctoral     | 17        | 7         | 10        | 1        | 0             |
| Post-Doc     | 13        | 6         | 7         | 0        | 0             |
| <b>Total</b> | <b>41</b> | <b>20</b> | <b>21</b> | <b>3</b> | <b>0</b>      |

**2018-2019 Attempted/Earned Student Credit Hours**

|                           | Total      | Fall       | Spring     | Summer     |
|---------------------------|------------|------------|------------|------------|
| Attempted Inst. SCH       | 1,392      | 699        | 651        | 42         |
| Earned Inst. SCH          | 1,292      | 643        | 613        | N/A        |
| <b>% Earned Inst. SCH</b> | <b>93%</b> | <b>92%</b> | <b>94%</b> | <b>N/A</b> |
| Attempted Dept. SCH       | 916        | 449        | 428        | 39         |
| Earned Dept. SCH          | 830        | 419        | 411        | N/A        |

Inst. SCH includes all student credit hours associated with instructors budgeted in the department, regardless of where the course is listed. Dept. SCH include all student credit hours associated with courses listed in the department, regardless of who teaches the course.

**2018-2019 Direct Awards/Faculty Ratio**

|                | Total FT Faculty    | FTE Research Fac.   |
|----------------|---------------------|---------------------|
|                | 17                  | 9.11                |
| Total          | \$3,454,775         | \$3,454,775         |
| <b>Average</b> | <b>\$203,222.06</b> | <b>\$379,228.87</b> |

**2018-2019 Fiscal Year Grants**

|                       |             |
|-----------------------|-------------|
| Direct Awards         | \$3,454,775 |
| Federal Competitive   | \$1,996,832 |
| % Federal Competitive | 58%         |
| Collaborative         | \$108,278   |

**Research Faculty w/Formula Funded Projects as of 6/19**

|                            |      |
|----------------------------|------|
| 25% or higher Research DOE | 13   |
| Active Project             | 13   |
| Percentage                 | 100% |

**Degrees Awarded Five-Year Trend**

|              | 2014-2015 | 2015-2016 | 2016-2017 | 2017-2018 | 2018-2019 |
|--------------|-----------|-----------|-----------|-----------|-----------|
| Master's     | 3         | 3         | 3         | 7         | 3         |
| Doctoral     | 4         | 8         | 5         | 1         | 2         |
| <b>Total</b> | <b>7</b>  | <b>11</b> | <b>8</b>  | <b>8</b>  | <b>5</b>  |

**Enrollment (majors) Five-Year Trend**

|              | 2014-2015 | 2015-2016 | 2016-2017 | 2017-2018 | 2018-2019 |
|--------------|-----------|-----------|-----------|-----------|-----------|
| Master's     | 11        | 14        | 17        | 10        | 11        |
| Doctoral     | 20        | 18        | 15        | 17        | 17        |
| Post-Doc     | 9         | 6         | 14        | 10        | 13        |
| <b>Total</b> | <b>40</b> | <b>38</b> | <b>46</b> | <b>37</b> | <b>41</b> |

**Direct Awards Five-Year Trend**

| 2014-2015   | 2015-2016   | 2016-2017   | 2017-2018   | 2018-2019   |
|-------------|-------------|-------------|-------------|-------------|
| \$1,226,814 | \$1,506,819 | \$1,871,371 | \$2,931,949 | \$3,454,775 |

**Grant Expenditures Five-Year Trend**

| 2014-2015   | 2015-2016   | 2016-2017   | 2017-2018   | 2018-2019   |
|-------------|-------------|-------------|-------------|-------------|
| \$1,817,018 | \$1,488,026 | \$1,659,669 | \$2,311,972 | \$2,615,979 |

**Fiscal Year State Fund Balance Percentage Five-Year Trend**

| 2014-2015 | 2015-2016 | 2016-2017 | 2017-2018 | 2018-2019 |
|-----------|-----------|-----------|-----------|-----------|
| 2.19%     | -1.97%    | -1.03%    | 12.55%    | 29.66%    |

**2018 Calendar Year Publications**

|                    |    |
|--------------------|----|
| Books and Chapters | 3  |
| Journal Articles   | 57 |

**2018 Calendar Year Patents**

|   |
|---|
| 0 |
|---|

**KERS Faculty Contacts Five-Year Trend**

|                       | 2014-2015    | 2015-2016     | 2016-2017    | 2017-2018     | 2018-2019 |
|-----------------------|--------------|---------------|--------------|---------------|-----------|
| African Am.           | 35           | 647           | 292          | 372           | 0         |
| Asian Am.             | 0            | 0             | 121          | 188           | 0         |
| Hispanic              | 11           | 225           | 606          | 91            | 0         |
| Native Am.            | 0            | 0             | 0            | 17            | 0         |
| Other                 | 0            | 0             | 177          | 234           | 0         |
| <b>Total Contacts</b> | <b>7,159</b> | <b>11,500</b> | <b>8,526</b> | <b>10,474</b> | <b>0</b>  |

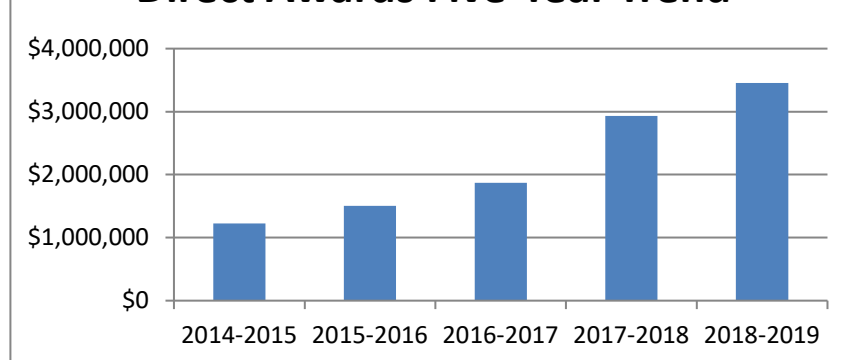
**KERS Number of Faculty Success Stories Five-Year Trend**

|               | 2014-2015 | 2015-2016 | 2016-2017 | 2017-2018 | 2018-2019 |
|---------------|-----------|-----------|-----------|-----------|-----------|
| <b>Number</b> | <b>1</b>  | <b>0</b>  | <b>6</b>  | <b>7</b>  | <b>0</b>  |

**2018-2019 Numbered Fact Sheets/Faculty Ratio**

|                   | Total FT Faculty | FTE Ext. Faculty |
|-------------------|------------------|------------------|
|                   | 17               | 3.48             |
| Total Fact Sheets | 9                | 9                |
| <b>Average</b>    | <b>0.53</b>      | <b>2.59</b>      |

**Direct Awards Five-Year Trend**



# Entomology Faculty Snapshot 2019

| All ENT Faculty by Title Series |           |             |
|---------------------------------|-----------|-------------|
| Title Series                    | Faculty   | Percent     |
| Regular                         | 15        | 60%         |
| Extension                       | 4         | 16%         |
| Adjunct                         | 4         | 16%         |
| Lecturer                        | 1         | 4%          |
| Part-Time                       | 1         | 4%          |
| <b>Total</b>                    | <b>25</b> | <b>100%</b> |

| Full-Time Faculty by Rank |           |             |
|---------------------------|-----------|-------------|
| Rank                      | Faculty   | Percent     |
| Professor                 | 10        | 50%         |
| Associate                 | 2         | 10%         |
| Assistant                 | 7         | 35%         |
| Lecturer                  | 1         | 5%          |
| <b>Total</b>              | <b>20</b> | <b>100%</b> |

| All ENT Faculty by Full-Time/Part-Time Status |         |         |
|-----------------------------------------------|---------|---------|
| FT/PT Status                                  | Faculty | Percent |
| Full-time                                     | 20      | 80%     |
| Part-time                                     | 5       | 20%     |

| Full-Time Faculty by Assignment Period |         |         |
|----------------------------------------|---------|---------|
| Assignment Period                      | Faculty | Percent |
| 12 month                               | 17      | 85%     |
| 9 month                                | 3       | 15%     |

| Full-Time Faculty Credentials |         |         |
|-------------------------------|---------|---------|
| Credentials                   | Faculty | Percent |
| Ph.D.                         | 20      | 100%    |

| Full-Time Faculty by Tenure Status |         |         |
|------------------------------------|---------|---------|
| Tenure Status                      | Faculty | Percent |
| Tenured                            | 12      | 60%     |
| Tenure Track                       | 7       | 35%     |
| Not Eligible                       | 1       | 5%      |

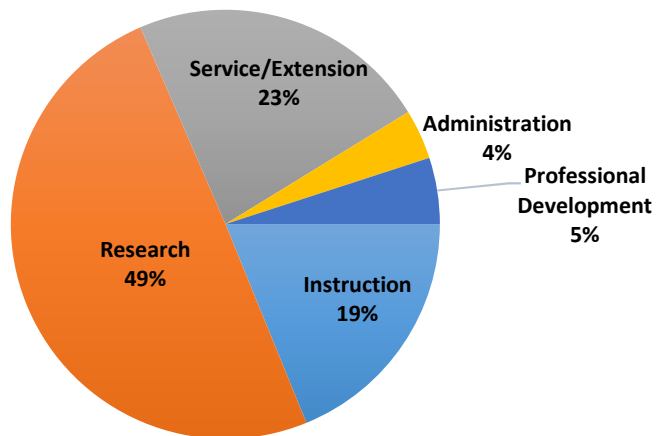
| Full-Time Faculty by Race |         |         |
|---------------------------|---------|---------|
| Race                      | Faculty | Percent |
| Asian                     | 3       | 15%     |
| Hispanic                  | 1       | 5%      |
| African American          | 1       | 5%      |
| More than one race        | 1       | 5%      |
| White                     | 14      | 70%     |

| Full-Time Faculty by Gender |         |         |
|-----------------------------|---------|---------|
| Gender                      | Faculty | Percent |
| Female                      | 4       | 20%     |
| Male                        | 16      | 80%     |

| Full-Time Faculty by Age |         |         |
|--------------------------|---------|---------|
| Age                      | Faculty | Percent |
| 30-39                    | 5       | 25%     |
| 40-49                    | 3       | 15%     |
| 50-59                    | 4       | 20%     |
| 60-65                    | 6       | 30%     |
| > 65                     | 2       | 10%     |

| Full-Time Faculty by Years of Service |         |         |
|---------------------------------------|---------|---------|
| Years                                 | Faculty | Percent |
| < 4                                   | 8       | 40%     |
| 10-12                                 | 2       | 10%     |
| 16-18                                 | 2       | 10%     |
| 19-21                                 | 2       | 10%     |
| 22-24                                 | 2       | 10%     |
| 28-30                                 | 2       | 10%     |
| > 30                                  | 2       | 10%     |

## Average DOE



Percentages are rounded to the nearest whole number.

**2019-2020 Degrees Awarded**

|              | Total    | Female   | Male     | Minorities | African Amer. |
|--------------|----------|----------|----------|------------|---------------|
| Master's     | 5        | 3        | 2        | 0          | 0             |
| Doctoral     | 4        | 2        | 2        | 0          | 0             |
| <b>Total</b> | <b>9</b> | <b>5</b> | <b>4</b> | <b>0</b>   | <b>0</b>      |

**2019-2020 Enrollment (majors)**

|              | Total     | Female    | Male      | Minority | African Amer. |
|--------------|-----------|-----------|-----------|----------|---------------|
| Master's     | 17        | 11        | 6         | 2        | 1             |
| Doctoral     | 23        | 15        | 8         | 2        | 0             |
| Post-Doc     | 13        | 4         | 9         | 0        | 0             |
| <b>Total</b> | <b>53</b> | <b>30</b> | <b>23</b> | <b>4</b> | <b>1</b>      |

**2019-2020 Attempted/Earned Student Credit Hours**

|                           | Total      | Fall       | Spring     | Summer     |
|---------------------------|------------|------------|------------|------------|
| Attempted Inst. SCH       | 1982       | 1,066      | 874        | 42         |
| Earned Inst. SCH          | 1840       | 980        | 824        | 36         |
| <b>% Earned Inst. SCH</b> | <b>93%</b> | <b>92%</b> | <b>94%</b> | <b>86%</b> |
| Attempted Dept. SCH       | 1,356      | 714        | 570        | 72         |
| Earned Dept. SCH          | 1,214      | 672        | 542        | N/A        |

Inst. SCH includes all student credit hours associated with instructors budgeted in the department, regardless of where the course is listed. Dept. SCH includes all student credit hours associated with courses listed in the department, regardless of who teaches the course.

**2019-2020 Direct Awards/Faculty Ratio**

|                | Total FT Faculty    | FTE Research Fac.   |
|----------------|---------------------|---------------------|
|                | 20                  | 9.9357              |
| <b>Total</b>   | <b>\$3,368,349</b>  | <b>\$3,368,349</b>  |
| <b>Average</b> | <b>\$168,417.45</b> | <b>\$339,014.76</b> |

**2019-2020 Fiscal Year Grants**

|                       |             |
|-----------------------|-------------|
| Direct Awards         | \$3,368,349 |
| Federal Competitive   | \$1,965,459 |
| % Federal Competitive | 58%         |
| Collaborative         | \$564,787   |

**Research Faculty w/Formula Funded Projects**

|                            |     |
|----------------------------|-----|
| 25% or higher Research DOE | 14  |
| Active Project             | 12  |
| Percentage                 | 86% |

**Degrees Awarded Five-Year Trend**

|              | 2015-2016 | 2016-2017 | 2017-2018 | 2018-2019 | 2019-2020 |
|--------------|-----------|-----------|-----------|-----------|-----------|
| Master's     | 3         | 3         | 7         | 3         | 5         |
| Doctoral     | 8         | 5         | 1         | 2         | 4         |
| <b>Total</b> | <b>11</b> | <b>8</b>  | <b>8</b>  | <b>5</b>  | <b>9</b>  |

**Enrollment (majors) Five-Year Trend**

|              | 2015-2016 | 2016-2017 | 2017-2018 | 2018-2019 | 2019-2020 |
|--------------|-----------|-----------|-----------|-----------|-----------|
| Master's     | 14        | 17        | 10        | 11        | 17        |
| Doctoral     | 18        | 15        | 17        | 17        | 23        |
| Post-Doc     | 6         | 14        | 10        | 13        | 13        |
| <b>Total</b> | <b>38</b> | <b>46</b> | <b>37</b> | <b>41</b> | <b>53</b> |

**Direct Awards Five-Year Trend**

| 2015-2016   | 2016-2017   | 2017-2018   | 2018-2019   | 2019-2020   |
|-------------|-------------|-------------|-------------|-------------|
| \$1,506,819 | \$1,871,371 | \$2,931,949 | \$3,454,775 | \$3,368,349 |

**Grant Expenditures Five-Year Trend**

| 2015-2016   | 2016-2017   | 2017-2018   | 2018-2019   | 2019-2020   |
|-------------|-------------|-------------|-------------|-------------|
| \$1,488,026 | \$1,659,669 | \$2,311,972 | \$2,615,979 | \$2,720,000 |

**Fiscal Year State Fund Balance Percentage Five-Year Trend**

| 2015-2016 | 2016-2017 | 2017-2018 | 2018-2019 | 2019-2020 |
|-----------|-----------|-----------|-----------|-----------|
| -1.97%    | -1.03%    | 12.55%    | 29.66%    | 21.18%    |

**2019 Calendar Year Publications**

|                    |    |
|--------------------|----|
| Books and Chapters | 1  |
| Journal Articles   | 42 |

**2019 Calendar Year Patents**

|                            |   |
|----------------------------|---|
| 2019 Calendar Year Patents | 0 |
|----------------------------|---|

**KERS Faculty Contacts Five-Year Trend**

|                       | 2015-2016     | 2016-2017    | 2017-2018     | 2018-2019 | 2019-2020     |
|-----------------------|---------------|--------------|---------------|-----------|---------------|
| African Am.           | 647           | 292          | 372           | 0         | 1002          |
| Asian Am.             | 0             | 121          | 188           | 0         | 134           |
| Hispanic              | 225           | 606          | 91            | 0         | 923           |
| Native Am.            | 0             | 0            | 17            | 0         | 30            |
| Other                 | 0             | 177          | 234           | 0         | 1             |
| <b>Total Contacts</b> | <b>11,500</b> | <b>8,526</b> | <b>10,474</b> | <b>0</b>  | <b>16,033</b> |

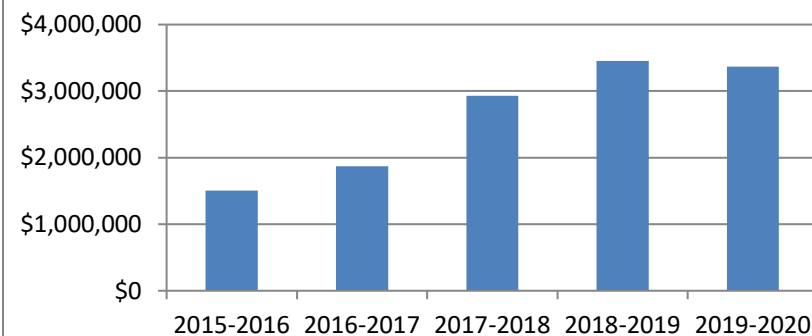
**KERS Number of Faculty Success Stories Five-Year Trend**

|               | 2015-2016 | 2016-2017 | 2017-2018 | 2018-2019 | 2019-2020 |
|---------------|-----------|-----------|-----------|-----------|-----------|
| <b>Number</b> | <b>0</b>  | <b>6</b>  | <b>7</b>  | <b>0</b>  | <b>5</b>  |

**2019-2020 Numbered Fact Sheets/Faculty Ratio**

|                          | Total FT Faculty | FTE Ext. Faculty |
|--------------------------|------------------|------------------|
|                          | 20               | 4.548            |
| <b>Total Fact Sheets</b> | <b>11</b>        | <b>11</b>        |
| <b>Average</b>           | <b>0.55</b>      | <b>2.42</b>      |

**Direct Awards Five-Year Trend**



# Entomology Faculty Snapshot 2020

| All ENT Faculty by Title Series |           |             |
|---------------------------------|-----------|-------------|
| Title Series                    | Faculty   | Percent     |
| Adjunct                         | 4         | 17%         |
| Extension                       | 4         | 17%         |
| Lecturer                        | 1         | 4%          |
| Part-Time                       | 1         | 4%          |
| Post-Retirement                 | 1         | 4%          |
| Regular                         | 13        | 54%         |
| <b>Total</b>                    | <b>24</b> | <b>100%</b> |

| Full-Time Faculty by Rank |           |             |
|---------------------------|-----------|-------------|
| Rank                      | Faculty   | Percent     |
| Professor                 | 8         | 44%         |
| Associate                 | 1         | 6%          |
| Assistant                 | 8         | 44%         |
| Lecturer                  | 1         | 6%          |
| <b>Total</b>              | <b>18</b> | <b>100%</b> |

| All ENT Faculty by Full-Time/Part-Time Status |         |         |
|-----------------------------------------------|---------|---------|
| FT/PT Status                                  | Faculty | Percent |
| Full-time                                     | 18      | 75%     |
| Part-time                                     | 6       | 25%     |

| Full-Time Faculty by Assignment Period |         |         |
|----------------------------------------|---------|---------|
| Assignment Period                      | Faculty | Percent |
| 12 month                               | 17      | 94%     |
| 9 month                                | 1       | 6%      |

| Full-Time Faculty Credentials |         |         |
|-------------------------------|---------|---------|
| Credentials                   | Faculty | Percent |
| Ph.D.                         | 18      | 100%    |

| Full-Time Faculty by Tenure Status |         |         |
|------------------------------------|---------|---------|
| Tenure Status                      | Faculty | Percent |
| Tenured                            | 9       | 50%     |
| Tenure Track                       | 8       | 44%     |
| Not Eligible                       | 1       | 6%      |

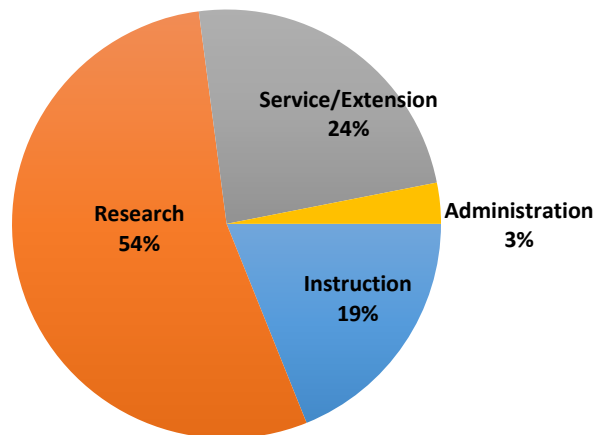
| Full-Time Faculty by Race |         |         |
|---------------------------|---------|---------|
| Race                      | Faculty | Percent |
| Asian                     | 3       | 17%     |
| Hispanic                  | 1       | 6%      |
| African American          | 1       | 6%      |
| More than one race        | 1       | 6%      |
| White                     | 12      | 67%     |

| Full-Time Faculty by Gender |         |         |
|-----------------------------|---------|---------|
| Gender                      | Faculty | Percent |
| Female                      | 4       | 22%     |
| Male                        | 14      | 78%     |

| Full-Time Faculty by Age |         |         |
|--------------------------|---------|---------|
| Age                      | Faculty | Percent |
| 30-39                    | 6       | 33%     |
| 40-49                    | 3       | 17%     |
| 50-59                    | 4       | 22%     |
| 60-65                    | 3       | 17%     |
| > 65                     | 2       | 11%     |

| Full-Time Faculty by Years of Service |         |         |
|---------------------------------------|---------|---------|
| Years                                 | Faculty | Percent |
| < 4                                   | 6       | 33%     |
| 4-6                                   | 3       |         |
| 10-12                                 | 2       | 11%     |
| 16-18                                 | 1       | 6%      |
| 19-21                                 | 1       | 6%      |
| 22-24                                 | 2       | 11%     |
| 28-30                                 | 1       | 6%      |
| > 30                                  | 2       | 11%     |

**Average DOE**



**Entomology**  
**Faculty Snapshot 2020**

Percentages are rounded to the nearest whole number.

**2020-2021 Degrees Awarded**

|              | Total    | Female   | Male     | URM      | 1st Gen  |
|--------------|----------|----------|----------|----------|----------|
| Master's     | 4        | 2        | 2        | 1        | 0        |
| Doctoral     | 0        | 0        | 0        | 0        | 0        |
| <b>Total</b> | <b>4</b> | <b>2</b> | <b>2</b> | <b>1</b> | <b>0</b> |

**2020-2021 Enrollment (majors)**

|              | Total     | Female    | Male      | URM      | 1st Gen  |
|--------------|-----------|-----------|-----------|----------|----------|
| Master's     | 15        | 11        | 4         | 3        | 1        |
| Doctoral     | 24        | 15        | 9         | 3        | 0        |
| Post-Doc     | 13        | 4         | 9         | 0        | 0        |
| <b>Total</b> | <b>52</b> | <b>30</b> | <b>22</b> | <b>6</b> | <b>1</b> |

**2020-2021 Attempted/Earned Student Credit Hours**

|                           | Total      | Fall       | Spring     | Sum/Wint   |
|---------------------------|------------|------------|------------|------------|
| Attempted Inst. SCH       | 2,417      | 1,258      | 1,064      | 95         |
| Earned Inst. SCH          | 2,275      | 1,158      | 1,025      | 92         |
| <b>% Earned Inst. SCH</b> | <b>94%</b> | <b>92%</b> | <b>96%</b> | <b>97%</b> |
| Attempted Dept. SCH       | 1,656      | 840        | 706        | 110        |
| Earned Dept. SCH          | 1,581      | 786        | 685        | 110        |

Inst. SCH includes all student credit hours associated with instructors budgeted in the department, regardless of where the course is listed. Dept. SCH includes all student credit hours associated with courses listed in the department, regardless of who teaches the course.

**FY 2021 Direct Awards/Faculty Ratio**

|                | Total FT Faculty   | FTE Research Fac.  |
|----------------|--------------------|--------------------|
|                | 18                 | 9.61               |
| <b>Total</b>   | <b>\$5,244,459</b> | <b>\$5,244,459</b> |
| <b>Average</b> | <b>\$291,359</b>   | <b>\$545,729</b>   |

**FY 2021 Grants**

|                       |             |
|-----------------------|-------------|
| Direct Awards         | \$5,244,459 |
| Federal Competitive   | \$3,381,102 |
| % Federal Competitive | 64%         |
| Collaborative         | \$1,102,814 |

**Research Faculty w/Formula Funded Projects**

|                            |      |
|----------------------------|------|
| 25% or higher Research DOE | 14   |
| Active Project             | 19   |
| Percentage                 | 136% |

**Degrees Awarded Five-Year Trend**

|              | 2016-2017 | 2017-2018 | 2018-2019 | 2019-2020 | 2020-2021 |
|--------------|-----------|-----------|-----------|-----------|-----------|
| Master's     | 3         | 7         | 3         | 5         | 4         |
| Doctoral     | 5         | 1         | 2         | 4         | 0         |
| <b>Total</b> | <b>8</b>  | <b>8</b>  | <b>5</b>  | <b>9</b>  | <b>4</b>  |

**Enrollment (majors) Five-Year Trend**

|              | 2016-2017 | 2017-2018 | 2018-2019 | 2019-2020 | 2020-2021 |
|--------------|-----------|-----------|-----------|-----------|-----------|
| Master's     | 17        | 10        | 11        | 17        | 15        |
| Doctoral     | 15        | 17        | 17        | 23        | 24        |
| Post-Doc     | 14        | 10        | 13        | 13        | 13        |
| <b>Total</b> | <b>46</b> | <b>37</b> | <b>41</b> | <b>53</b> | <b>52</b> |

**Direct Awards Five-Year Trend**

| FY 2017     | FY 2018     | FY 2019     | FY 2020     | FY 2021     |
|-------------|-------------|-------------|-------------|-------------|
| \$1,871,371 | \$2,931,949 | \$3,454,775 | \$3,368,349 | \$5,244,459 |

**Grant Expenditures Five-Year Trend**

| FY 2017     | FY 2018     | FY 2019     | FY 2020     | FY 2021     |
|-------------|-------------|-------------|-------------|-------------|
| \$1,659,669 | \$2,311,972 | \$2,615,979 | \$2,720,000 | \$2,850,798 |

**Fiscal Year State Fund Balance Percentage Five-Year Trend**

| FY 2017 | FY 2018 | FY 2019 | FY 2020 | FY 2021 |
|---------|---------|---------|---------|---------|
| -1.03%  | 12.55%  | 29.66%  | 21.18%  | 24.97%  |

**FY 2021 Publications**

|                    |     |
|--------------------|-----|
| Books and Chapters | 3   |
| Journal Articles   | 103 |

**FY 2021 Patents**

|  |   |
|--|---|
|  | 0 |
|--|---|

**KERS Faculty Contacts Five-Year Trend**

|                      | FY 2017      | FY 2018       | FY 2019  | FY 2020       | FY 2021       |
|----------------------|--------------|---------------|----------|---------------|---------------|
| African Am.          | 292          | 372           | 0        | 1002          | 456           |
| Asian Am.            | 121          | 188           | 0        | 134           | 0             |
| Hispanic             | 606          | 91            | 0        | 923           | 998           |
| Native Am.           | 0            | 17            | 0        | 30            | 0             |
| Other                | 177          | 234           | 0        | 1             | 1             |
| <b>Total Contact</b> | <b>8,526</b> | <b>10,474</b> | <b>0</b> | <b>16,033</b> | <b>14,012</b> |

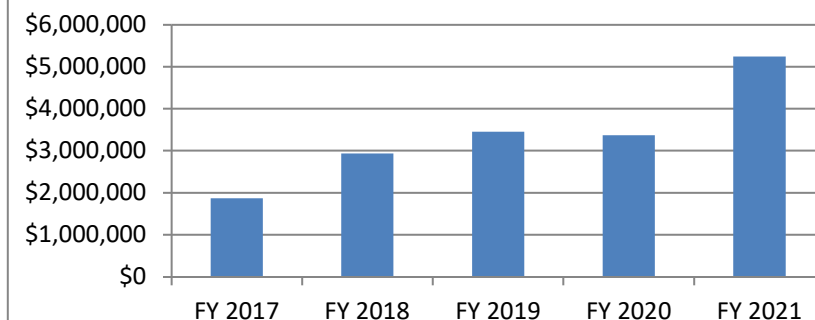
**KERS Number of Faculty Success Stories Five-Year Trend**

|               | FY 2017  | FY 2018  | FY 2019  | FY 2020  | FY 2021  |
|---------------|----------|----------|----------|----------|----------|
| <b>Number</b> | <b>6</b> | <b>7</b> | <b>0</b> | <b>5</b> | <b>7</b> |

**2019-2020 Numbered Fact Sheets/Faculty Ratio**

|                          | Total FT Faculty | FTE Ext. Faculty |
|--------------------------|------------------|------------------|
|                          | 18               | 3.89             |
| <b>Total Fact Sheets</b> | <b>6</b>         | <b>6</b>         |
| <b>Average</b>           | <b>0.33</b>      | <b>1.54</b>      |

**Direct Awards Five-Year Trend**



**Entomology  
Faculty Snapshot FY 2021**

**All Faculty by Title Series**

| Title Series    | Faculty   | Percent     |
|-----------------|-----------|-------------|
| Adjunct         | 4         | 17%         |
| Extension       | 4         | 17%         |
| Lecturer        | 1         | 4%          |
| Part-Time       | 1         | 4%          |
| Post-Retirement | 1         | 4%          |
| Regular         | 13        | 54%         |
| Research        | 0         | 0%          |
| Special         | 0         | 0%          |
| <b>Total</b>    | <b>24</b> | <b>100%</b> |

**Full-Time Faculty by Rank**

| Rank            | Faculty   | Percent     |
|-----------------|-----------|-------------|
| Professor       | 8         | 44%         |
| Associate       | 1         | 6%          |
| Assistant       | 8         | 44%         |
| Lecturer        | 1         | 6%          |
| Senior Lecturer | 0         | 0%          |
| <b>Total</b>    | <b>18</b> | <b>100%</b> |

**Full Time Faculty DOE for CPM 2.0 Groups**

|                    | Faculty |
|--------------------|---------|
| Instruction > 10 % | 13      |
| Research > 10%     | 16      |

**Full Time Faculty FTEs**

|                   | FTE  |
|-------------------|------|
| Instruction       | 3.95 |
| Research          | 9.61 |
| Service           | 3.89 |
| Administration    | 0.55 |
| Prof. Development | 0    |

**All Faculty by Full-Time/Part-Time Status**

| FT/PT Status | Faculty | Percent |
|--------------|---------|---------|
| Full-time    | 18      | 75%     |
| Part-time    | 6       | 25%     |

**Full-Time Faculty by Assignment Period**

| Assignment Period | Faculty | Percent |
|-------------------|---------|---------|
| 12 month          | 17      | 94%     |
| 9 month           | 1       | 6%      |

**Full-Time Faculty Credentials**

| Credentials | Faculty | Percent |
|-------------|---------|---------|
| Ph.D.       | 18      | 100%    |

**Full-Time Faculty by Tenure Status**

| Tenure Status   | Faculty | Percent |
|-----------------|---------|---------|
| Tenured         | 9       | 50%     |
| Tenure Eligible | 8       | 44%     |
| Not Eligible    | 1       | 6%      |

**Full-Time Faculty by Years of Service**

| Years | Faculty | Percent |
|-------|---------|---------|
| < 4   | 4       | 22%     |
| 4-6   | 3       | 17%     |
| 7-9   | 0       | 0%      |
| 10-12 | 2       | 11%     |
| 13-15 | 0       | 0%      |
| 16-18 | 1       | 6%      |
| 19-21 | 1       | 6%      |
| 22-24 | 2       | 11%     |
| 25-27 | 0       | 0%      |
| 28-30 | 1       | 6%      |
| > 30  | 2       | 11%     |

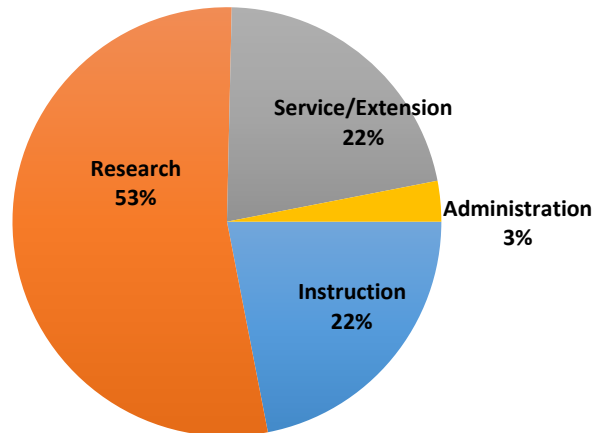
**Full-Time Faculty by Age**

| Age   | Faculty | Percent |
|-------|---------|---------|
| 20-29 | 0       | 0%      |
| 30-39 | 6       | 33%     |
| 40-49 | 3       | 17%     |
| 50-59 | 4       | 22%     |
| 60-65 | 3       | 17%     |
| >65   | 2       | 11%     |

**Full-Time Faculty Characteristics**

|                   | Faculty | Percent |
|-------------------|---------|---------|
| Female            | 4       | 22%     |
| Male              | 14      | 78%     |
| URM               | 3       | 17%     |
| Not URM           | 15      | 83%     |
| CPM 2.0 Group     | 9       | 50%     |
| Not CPM 2.0 Group | 9       | 50%     |

**Average DOE**





**FY 2021 Composite Report**

**College of Agriculture, Food and Environment**

| <b>PUBLICATIONS</b> |                  |                   |                                                       |                                                               |
|---------------------|------------------|-------------------|-------------------------------------------------------|---------------------------------------------------------------|
| Department          | Books & Chapters | Refereed Articles | Refereed Articles + Books & Chapters per Research FTE | Refereed Articles + Books & Chapters per FT Faculty Headcount |
| AEC                 | 4                | 43                | 6.14                                                  | 2.04                                                          |
| AFS                 | 1                | 97                | 8.32                                                  | 2.80                                                          |
| BAE                 | 0                | 51                | 7.73                                                  | 3.00                                                          |
| CLD                 | 4                | 10                | 4.05                                                  | 0.87                                                          |
| DHN                 | 1                | 17                | 5.34                                                  | 1.20                                                          |
| ENT                 | 3                | 103               | 11.03                                                 | 5.89                                                          |
| FAM                 | 2                | 25                | 6.75                                                  | 1.80                                                          |
| FNR                 | 2                | 25                | 6.00                                                  | 2.08                                                          |
| HORT                | 0                | 23                | 3.97                                                  | 1.53                                                          |
| LA                  | 2                | 1                 | 5.00                                                  | 0.50                                                          |
| PPA                 | 2                | 42                | 7.71                                                  | 3.14                                                          |
| PSS                 | 1                | 119               | 6.23                                                  | 2.93                                                          |
| RTM                 | 0                | 7                 | 2.68                                                  | 0.64                                                          |
| VSC                 | 1                | 114               | 9.89                                                  | 6.39                                                          |

| <b>INSTRUCTION</b> |                                                   |                                                 |                     |                |                      |                                           |                   |                                                          |  |
|--------------------|---------------------------------------------------|-------------------------------------------------|---------------------|----------------|----------------------|-------------------------------------------|-------------------|----------------------------------------------------------|--|
| Academic Unit      | Undergrad. Enrollment (certificates not included) | Graduate Enrollment (certificates not included) | Post-Doc Enrollment | URM Enrollment | FT Faculty Headcount | Total Enrollment per FT Faculty Headcount | Earned Inst. SCHs | Earned Inst. SCH per Instruction FTE (by FT faculty DOE) |  |
| AEC                | 191                                               | 27                                              | 2                   | 29             | 23                   | 9.57                                      | 4,046             | 829                                                      |  |
| AFS*               | 593                                               | 27                                              | 4                   | 95             | 35                   | 17.83                                     | 6,136             | 653                                                      |  |
| BAE                | 106                                               | 27                                              | 3                   | 11             | 17                   | 8.00                                      | 1,645             | 390                                                      |  |
| CLD                | 205                                               | 19                                              | 0                   | 61             | 16.01                | 13.99                                     | 4,384             | 647                                                      |  |
| DHN                | 147                                               | 11                                              | 0                   | 38             | 14.99                | 10.54                                     | 7,248             | 1,342                                                    |  |
| ENT                | 0                                                 | 39                                              | 13                  | 6              | 18                   | 2.89                                      | 2,275             | 576                                                      |  |
| FAM                | 100                                               | 26                                              | 0                   | 29             | 15.01                | 8.39                                      | 2,138             | 508                                                      |  |
| FNR                | 66                                                | 14                                              | 0                   | 11             | 12.99                | 6.16                                      | 2,532             | 668                                                      |  |
| HORT               | 40                                                | 0                                               | 0                   | 8              | 15                   | 2.67                                      | 1,410             | 483                                                      |  |
| LA                 | 58                                                | 0                                               | 0                   | 12             | 6.01                 | 9.65                                      | 1,431             | 344                                                      |  |
| PPA                | 0                                                 | 20                                              | 2                   | 2              | 14.02                | 1.57                                      | 791               | 320                                                      |  |
| PSS                | 0                                                 | 49                                              | 12                  | 0              | 41.01                | 1.49                                      | 2,671             | 359                                                      |  |
| RTM                | 285                                               | 25                                              | 0                   | 62             | 11                   | 28.18                                     | 5,022             | 748                                                      |  |
| VSC                | 0                                                 | 22                                              | 10                  | 3              | 18                   | 1.78                                      | 253               | 248                                                      |  |
| Multidisciplinary  | 512                                               | 27                                              | 0                   | 96             |                      |                                           |                   |                                                          |  |

Faculty appointed in Department, not program

\*AFS includes EQSM program data

| <b>FUNDING</b> |                     |                                |                                        |                      |                       |                    |                         |
|----------------|---------------------|--------------------------------|----------------------------------------|----------------------|-----------------------|--------------------|-------------------------|
| Department     | Total Direct Grants | Direct Grants per Research FTE | Direct Grants per FT Faculty Headcount | Collaborative Grants | % Federal Competitive | Grant Expenditures | FY State Fund Balance % |
| AEC            | \$2,349,623         | \$306,739                      | \$102,158                              | \$2,949,589          | 59%                   | \$3,175,980        | 20.03%                  |
| AFS            | \$1,506,553         | \$127,891                      | \$43,044                               | \$3,812,610          | 41%                   | \$1,703,996        | 12.42%                  |
| BAE            | \$4,857,728         | \$736,019                      | \$285,749                              | \$9,933,943          | 95%                   | \$1,069,165        | 13.09%                  |
| CLD            | \$22,178            | \$6,410                        | \$1,385                                | \$4,262,705          | 68%                   | \$374,909          | 0.07%                   |
| DHN            | \$664,294           | \$197,120                      | \$44,316                               | \$3,597,338          | 59%                   | \$510,949          | 2.85%                   |
| ENT            | \$5,244,459         | \$545,729                      | \$291,359                              | \$1,102,814          | 64%                   | \$2,850,798        | 24.97%                  |
| FAM            | \$0                 | \$0                            | \$0                                    | \$11,107,082         | 0%                    | \$0                | 0.90%                   |
| FNR            | \$1,813,788         | \$403,064                      | \$139,630                              | \$797,489            | 39%                   | \$1,010,543        | 19.45%                  |
| HORT           | \$4,500,312         | \$775,916                      | \$300,021                              | \$6,940,564          | 80%                   | \$2,830,244        | -0.28%                  |
| LA             | \$0                 | \$0                            | \$0                                    | \$916,337            | 0%                    | \$9,151            | 6.22%                   |
| PPA            | \$2,572,292         | \$450,489                      | \$183,473                              | \$1,741,916          | 53%                   | \$1,697,729        | -0.73%                  |
| PSS            | \$2,695,948         | \$139,977                      | \$65,739                               | \$7,988,262          | 42%                   | \$4,232,172        | 8.48%                   |
| RTM            | \$21,190            | \$8,119                        | \$1,926                                | \$0                  | 0%                    | \$31,370           | 0.64%                   |
| VSC            | \$1,783,571         | \$1,080,952                    | \$99,087                               | \$3,557,434          | 71%                   | \$1,260,028        | 10.47%                  |

| <b>EXTENSION</b> |                       |                                        |                         |                              |                                        |
|------------------|-----------------------|----------------------------------------|-------------------------|------------------------------|----------------------------------------|
| Department       | KERS Faculty Contacts | Faculty Contacts with URM participants | Faculty Success Stories | Faculty Numbered Fact Sheets | Numbered Fact Sheets per Extension FTE |
| AEC              | 22,417                | 1,055                                  | 10                      | 2                            | 0.27                                   |
| AFS              | 72,119                | 2,578                                  | 27                      | 21                           | 1.90                                   |
| BAE              | 2,777                 | 185                                    | 3                       | 4                            | 1.20                                   |
| CLD              | 4,395                 | 594                                    | 10                      | 1                            | 0.25                                   |
| DHN              | 20,523                | 3,476                                  | 9                       | 0                            | 0.00                                   |
| ENT              | 14,012                | 1,460                                  | 7                       | 6                            | 1.54                                   |
| FAM              | 19,062                | 1,721                                  | 8                       | 10                           | 2.94                                   |
| FNR              | 8,130                 | 144                                    | 7                       | 2                            | 0.61                                   |
| HORT             | 1,998                 | 300                                    | 7                       | 8                            | 1.56                                   |
| LA               | 274                   | 22                                     | 5                       | 0                            | 0.00                                   |
| PPA              | 264,613               | 14                                     | 8                       | 15                           | 3.20                                   |
| PSS              | 69,341                | 717                                    | 48                      | 37                           | 3.66                                   |
| VSC              | 0                     | 0                                      | 0                       | 2                            | 0.22                                   |

**CAFE Composite**  
Faculty Snapshot FY 2021

**All Faculty by Title Series**

| Title Series    | Faculty    | Percent     |
|-----------------|------------|-------------|
| Adjunct         | 64         | 16%         |
| Clinical        | 7          | 2%          |
| Extension       | 72         | 18%         |
| Lecturer        | 19         | 5%          |
| Part-Time       | 59         | 15%         |
| Post-Retirement | 8          | 2%          |
| Regular         | 161        | 40%         |
| Research        | 5          | 1%          |
| Special         | 8          | 2%          |
| <b>Total</b>    | <b>403</b> | <b>100%</b> |

**Full-Time Faculty by Rank**

| Rank            | Faculty    | Percent     |
|-----------------|------------|-------------|
| Professor       | 123        | 45%         |
| Associate       | 66         | 24%         |
| Assistant       | 64         | 24%         |
| Lecturer        | 14         | 5%          |
| Senior Lecturer | 5          | 2%          |
| <b>Total</b>    | <b>272</b> | <b>100%</b> |

**Full Time Faculty DOE for CPM 2.0 Groups**

|                    | Faculty |
|--------------------|---------|
| Instruction > 10 % | 187     |
| Research > 10%     | 194     |

**Full Time Faculty FTEs**

|                   | FTE   |
|-------------------|-------|
| Instruction       | 66.6  |
| Research          | 98.3  |
| Service           | 75.12 |
| Administration    | 24.98 |
| Prof. Development | 4.00  |

**All Faculty by Full-Time/Part-Time Status**

| FT/PT Status | Faculty | Percent |
|--------------|---------|---------|
| Full-time    | 272     | 67%     |
| Part-time    | 131     | 33%     |

**Full-Time Faculty by Assignment Period**

| Assignment Period | Faculty | Percent |
|-------------------|---------|---------|
| 12 month          | 242     | 89%     |
| 9 month           | 30      | 11%     |

**Full-Time Faculty Credentials**

| Credentials      | Faculty | Percent |
|------------------|---------|---------|
| Ph.D.            | 241     | 89%     |
| Ph.D. and D.V.M. | 11      | 4%      |
| D.V.M.           | 7       | 3%      |
| Professional     | 2       | 1%      |
| Master's         | 11      | 4%      |

**Full-Time Faculty by Tenure Status**

| Tenure Status | Faculty | Percent |
|---------------|---------|---------|
| Tenured       | 181     | 67%     |
| Tenure Track  | 60      | 22%     |
| Not Eligible  | 31      | 11%     |

**Full-Time Faculty by Years of Service**

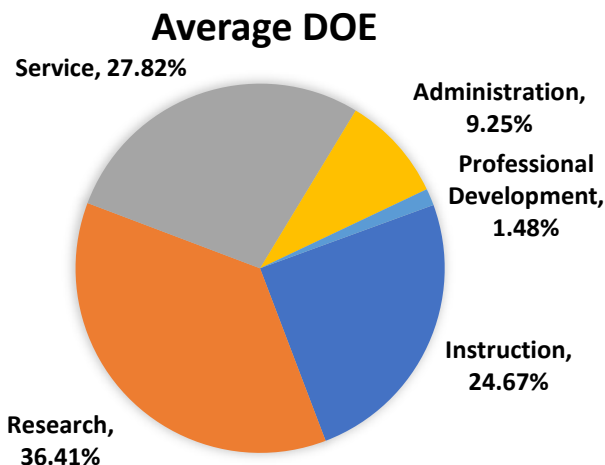
| Years | Faculty | Percent |
|-------|---------|---------|
| < 4   | 52      | 19%     |
| 4-6   | 43      | 16%     |
| 7-9   | 19      | 7%      |
| 10-12 | 28      | 10%     |
| 13-15 | 24      | 9%      |
| 16-18 | 16      | 6%      |
| 19-21 | 14      | 5%      |
| 22-24 | 16      | 6%      |
| 25-27 | 10      | 4%      |
| 28-30 | 14      | 5%      |
| > 30  | 36      | 13%     |

**Full-Time Faculty by Age**

| Age   | Faculty | Percent |
|-------|---------|---------|
| 20-29 | 3       | 1%      |
| 30-39 | 48      | 18%     |
| 40-49 | 85      | 31%     |
| 50-59 | 56      | 21%     |
| 60-65 | 38      | 14%     |
| >65   | 42      | 15%     |

**Full-Time Faculty Characteristics**

|                   | Faculty | Percent |
|-------------------|---------|---------|
| Female            | 102     | 38%     |
| Male              | 170     | 63%     |
| URM               | 18      | 7%      |
| Not URM           | 254     | 93%     |
| CPM 2.0 Group     | 127     | 47%     |
| Not CPM 2.0 Group | 145     | 53%     |



Appendix III.3. Awards and recognition to Department of Entomology faculty, 2016 – present.

| Appendix III.3. Awards and Recognition to Entomology faculty, 2017 - current |                                                                                         |                                                                             |                                           |
|------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------|-----------------------------------------------------------------------------|-------------------------------------------|
| Faculty                                                                      | Award                                                                                   |                                                                             |                                           |
|                                                                              | Professional/ Trade                                                                     | UK                                                                          | CAFE                                      |
| Bessin                                                                       | Kentucky Association of County Agricultural Agents                                      |                                                                             | Outstanding Specialist                    |
| DeVries                                                                      |                                                                                         | Wethington Awards                                                           | BC Pass Excellence in Grantsmanship Award |
| Dobson                                                                       | Adjunct Senior Entomologist, Anastasia Mosquito Control District                        |                                                                             |                                           |
| Fox                                                                          |                                                                                         | Teacher Who Made a Difference – College of Education                        |                                           |
| Palli                                                                        | AAAS Fellow; ESA Fellow; Nan Yao Soo Award ESA                                          |                                                                             | Prestigious Paper Award                   |
| Rieske-Kinney                                                                |                                                                                         | Wethington Awards                                                           | BC Pass Research Professorship            |
| Rittschof                                                                    | ESA Early Career Innovation Award; Animal Behavior Society Outstanding New Investigator |                                                                             | Prestigious Paper Award                   |
| Teets                                                                        | ESA Early Career Professional Research Award; NSF Travel Award to Antarctic             | Wethington Award; Faculty Mentor                                            | BC Pass Excellence in Grantsmanship Award |
| White                                                                        |                                                                                         | George E. Mitchell, Jr. Award for Outstanding Service to Graduate Students. |                                           |
| Zhou                                                                         |                                                                                         |                                                                             | TP Cooper Research Award                  |

Appendix III.4. Representative examples of organizations, institutions and entities granting awards and honors to Department of Entomology students and staff, 2016 – present

| Appendix III.4. Organizations and entities granting awards to Entomology students and staff, 2017 - present |                                                                         |
|-------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------|
| Awarding entity                                                                                             | Type of Award                                                           |
| UK Department of Entomology                                                                                 | Publication Scholarship; Travel award; Entomology retreat poster awards |
| College of Agriculture, Food & the Environment                                                              | Research Activity Awards                                                |
| University of Kentucky                                                                                      | Wethington Awards                                                       |
| American Mosquito Control Association                                                                       | Travel awards                                                           |
| Entomological Society of America – NC Branch                                                                | Legacy Award                                                            |
| Entomological Society of America – National                                                                 | President's Prizes                                                      |
| North American Forest Insect Work Conference                                                                | Oral paper presentations                                                |
| Southern Forest Insect Work Conference                                                                      | Robert F. Anderson Awards; oral paper presentations                     |

# Dr. Ricardo T. Bessin

College of Agriculture, Food and Environment  
Department of Entomology  
1925-2022 CV for Annual Performance Review

## Education

Louisiana State University, Ph.D. Entomology, 1990.  
Louisiana State University, M.Ap.Stat. Experimental Statistics, 1989.  
University of California, Berkeley, B.S. Agri. Pest Management, 1981.

## Work History

Ext. Professor, Dept. of Entomology, Univ. of Kentucky, 2001-present.  
Associate Ext. Professor, Dept. of Entomology, Univ. of Kentucky, 1996-2001.  
Assistant Ext. Professor, Dept. of Entomology, Univ. of Kentucky, 1991-1996.  
Research Associate, Dept. of Experimental Statistics, LSU, 1989-1991.  
Research Assistant, Dept. of Entomology, Louisiana State Univ., 1985-1989.  
Peace Corps Service, Tunisia, 1982-1984.

## Research and Scholarship

### Intellectual Contributions

\* = Senior Author    ~ = Corresponding Author    + = Grad/Prof Student    # = Post Doc    ^ = Undergraduate

WOS = Web of Science JIF = Journal Impact Factor    TC = Journal Total Cites  
SNIP = Source Normalize Impact per Paper    SJR = Scimago Journal Rank

### Published

#### Journal Article

+ ~ Brockman, R., + Kuesel, R., ^ Archer, K., ^ Kyla, O., Wilson, N., Scott Hicks, D., Mark, W., Bessin, R. T., \* Gonthier, D. J. (2020). The Impact of Plant Essential Oils and Fine Mesh Row Covers on Flea Beetle (Chrysomelidae) Management in Brassicaceous Greens Production, *Insects*, 11, 714.

#### Journal Article, Academic Journal

Viloria, Z., Villanueva, R. T., Bessin, R., O'Neal, P., Ranger, C. M., Dunwell, W. C. (2021). Scolytinae in Nursery and Fruit Crops of Western Kentucky and Seasonal Population Patterns of Four Invasive Ambrosia Beetles, *Journal of Entomological Science*, 56(3), 374-386. doi: 10.18474/JES20-50

Mercer, N. H., Bessin, R. T., Obrycki, J. J. (2021). Parasitization of the sugarcane aphid, *Melanaphis sacchari*, by commercially available aphid parasitoids, *BioControl*, 66(2), 181-191. doi: 10.1007/s10526-020-10051-w

Mercer, N. H., Obrycki, J. J., Bessin, R. T. (2021). Altering Planting Date to Manage *Melanaphis sacchari* (Hemiptera: Aphididae) Populations in Sweet Sorghum, *Journal of economic entomology*, 114(1), 197-200. doi: 10.1093/jee/toaa306

\* + ~ Mercer, N. H., Bessin, R. T., Obrycki, J. J. (2021). Altering planting date to manage *Melanaphis sacchari* (Hemiptera: Aphididae) populations in sweet sorghum. Lanham, MD, *J. Econ. Entomol.* doi: <https://doi.org/10.1093/jee/toaa306>  
Author Role: Mercer: Was part of his dissertation.  
Bessin: Co-Advised student, assisted with experimental design, statistical analysis, interpretation of data and writing of manuscript.  
Obrycki: Co-Advisor

Mercer, N. H., Bessin, R. T., Obrycki, J. J. (2020). Impact of buckwheat and methyl salicylate lures on natural enemy abundance for early season management of *Melanaphis sacchari* (Hemiptera: Aphididae) in sweet sorghum, *Crop Protection*, 137. doi: 10.1016/j.cropro.2020.105279  
Author Role:  
Bessin: Co-Advised student, assisted with experimental design, statistical analysis, interpretation of data and writing of manuscript.

Brockman, R., Kuesel, R., Archer, K., O'Hearn, K., Wilson, N., Scott, D., Williams, M. A., Bessin, R. T., Gonthier, D. J. (2020). The impact of plant essential oils and fine mesh row covers on flea beetle (Chrysomelidae) management in brassicaceous greens production, *Insects*, 11(10), 1-16. doi: 10.3390/insects11100714

\* ~ Mercer, N. H., Bessin, R. T., Obrycki, J. J. (2020). Parasitization of the sugarcane aphid, *Melanaphis sacchari*, by commercially available aphid parasitoids., *BioControl*. doi: <https://doi.org/10.1007/s10526-020-10051-w>  
Author Role: Mercer: Was graduate student, this was part of his dissertation.  
Bessin: Co-advisor, assisted with design, analysis and interpretation.  
Obrycki: Co-advisor, assisted with design, analysis and interpretation.

+ ~ Mercer, N. H., Teets, N. M., Bessin, R. T., \* Obrycki, J. J. (2020). Supplemental Foods Affect Energetic Reserves, Survival, and Spring Reproduction in Overwintering Adult *Hippodamia convergens* (Coleoptera: Coccinellidae), *Environmental Entomology*, 49(1), 1-9. doi: 10.1093/ee/nvz137  
Author Role:  
Teets: trained student on laboratory methods for nutrient analyses; assisted with manuscript preparation  
Bessin: Co-Advised student, assisted with experimental design, statistical analysis, interpretation of data and writing of manuscript.

Acebes-Doria, A. L., Agnello, A. M., Alston, D. G., Andrews, H., Beers, E. H., Bergh, J. C., Bessin, R., Blaauw, B. R., Buntin, G. D., Burkness, E. C., Chen, S., Cottrell, T. E., Daane, K. M., Fann, L. E., Fleischer, S. J., Guédot, C., Gut, L. J., Hamilton, G. C., Hilton, R., Hoelmer, K. A., Hutchison, W. D., Jentsch, P., Krawczyk, G., Kuhar, T. P., Lee, J. C., Milnes, J. M., Nielsen, A. L., Patel, D. K., Short, B. D., Sial, A. A., Spears, L. R., Tatman, K., Toews, M. D., Walgenbach, J. D., Welty, C., Wiman, N. G., Van Zoeren, J., Leskey, T. C. (2020). Season-long monitoring of the brown

marmorated stink bug (Hemiptera: Pentatomidae) throughout the United States using commercially available traps and lures, *Journal of Economic Entomology*, 113(1), 159-171. doi: 10.1093/jee/toz240

\* + ~ Skidmore, A. N., Wilson, N., Williams, M. A., Bessin, R. T. (2019). Integrating Row Covers and Strip Tillage for Pest Management in Summer Squash and Muskmelon Production., *HortSci*, 29(6), 923-932.

Author Role: Skidmore: Conducted the research, analyzed the data, developed the publication.

Wilson: Assisted with data collection and field maintenance.

Williams: Co-advisor, Co-PI

Bessin: Co-Advised student, assisted with experimental design, statistical analysis, interpretation of data and writing of manuscript.

Kuesel, R., Scott Hicks, D., Archer, K., Sciligo, A., Bessin, R. T., Gonthier, D. J. (2019). Effects of fine-mesh exclusion netting on pests of blackberry, *Insects*, 10(8). doi: 10.3390/insects10080249

Skidmore, A., Wilson, N., Williams, M. A., Bessin, R. T. (2019). The impact of tillage regime and row cover use on insect pests and yield in organic cucurbit production, *Renewable Agriculture and Food Systems*, 34(4), 338-348. doi: 10.1017/S1742170517000503

Author Role:

Bessin: Co-Advised student, assisted with experimental design, statistical analysis, interpretation of data and writing of manuscript.

Skidmore, A. R., Short, C. A., Dills, C., Goodell, K., Bessin, R. T. (2019). Preference of *Peponapis pruinosa* (Hymenoptera: Apoidea) for Tilled Soils Regardless of Soil Management System, *Environmental Entomology*, 48(4), 961-967. doi: 10.1093/ee/nvz052

Author Role:

Bessin: Co-Advised student, assisted with experimental design, statistical analysis, interpretation of data and writing of manuscript.

Skidmore, A., Wilson, N., Williams, M. A., Bessin, R. T. (2017). The Impact of Tillage Regime and Row Cover Use on Insect Pests and Yield in Organic Cucurbit Production., *Renewable Food and Agriculture Systems*. doi: doi.org/10.1017/S1742170517000503

Abram, P., Hoelmer, K., Acebes-Doria, A., Andrews, H., Beers, E., Bessin, R. T., Bergh, J. C., Bessin, R., Biddinger, D., Botch, P., Buffington, M., Cornelius, M., Costi, E., Delfosse, E., Dieckhoff, C., Dobson, R., Donais, Z., Grieshop, M., Hamilton, G., Haye, T., Hedstrom, C., Herlihy, M., Hoddle, M., Hooks, C., Jentsch, P., Joshi, N., Kuhar, T., Lara, J., Legrand, A., Lee, J., Leskey, T., Lowenstein, D., Milnes, J., Maistrello, L., Morrison, W., Nielsen, A., Ogburn, E., Pickett, C., Poley, K., Pote, J., James, R., Shrewsbury, P., Talamas, E., Tavella, L., Walgenbach, J., Waterworth, R., Weber, D., Welty, C., Wiman, N. (2017). Indigenous arthropod natural enemies of the invasive brown marmorated stink bug in North America and Europe, *J. Pest Sci.*, 90(4), 12. doi: DOI: 10.1007/s10340-017-0891-7

Dobson, R. C., Rogers, M., Moore, Jennifer L. C., Bessin, R. T. (2016). Exclusion of the Brown Marmorated Stink Bug from Organically Grown Peppers Using Barrier Screens, *HORTTECHNOLOGY*, 26(2), 191-198.

Ogburn, E. C., Bessin, R. T., Dieckhoff, C., Dobson, R., Grieshop, M., Hoelmer, K. A., Mathews, C., Moore, J., Nielsen, A. L., Poley, K., Pote, J. M., Rogers, M., Welty, C., Walgenbach, J. F. (2016). Natural enemy impact on eggs of the invasive brown marmorated stink bug, *Halyomorpha halys* (Stal) (Hemiptera: Pentatomidae), in organic agroecosystems: A regional assessment, *BIOLOGICAL CONTROL*, 101, 39-51. doi: 10.1016/j.biocontrol.2016.06.002

#### **Journal Article, Public or Trade Journal**

Potter, M. F., Bessin, R. T. (2017). Alien invasion: managing the brown marmorated stink bug, *Pest Control Technol*, 56(6), 29-36.

#### **Sponsored Projects**

##### **Awarded**

Bessin R., T., Private Pesticide Applicator Certification MOA; FY 23 Private Pesticide Applicator Certification-Federal Funding, Sponsored by KY Department of Agriculture Submitted: March 31, 2022. Funding Dates: July 1, 2022 - June 30, 2024. | Awarded: \$37,500.00  
OSPA ID: 202203311653

Gonthier D., J., Bessin R., T., Williams M., A., Resilient Systems for Sustainable Management of Cucurbit Crops, Sponsored by Iowa State University Submitted: April 25, 2019. Funding Dates: January 1, 2020 - August 31, 2023. Requested: \$383,142.00, | Awarded: \$383,142.00  
Description: Total of the multi-state award was \$2,000,000. The project seeks to optimize pest and weed control for cucurbit systems at commercial scales.  
OSPA ID: 201904250751

Bessin R., T., 2022 Kentucky Pesticide Safety Education Enhancement, Sponsored by eXtension Foundation Submitted: November 10, 2021. Funding Dates: January 1, 2022 - December 31, 2022. | Awarded: \$18,350.00  
OSPA ID: 202111101642

Villanueva R., T., Bessin R., T., Dunwell W., C., Developing Management Strategies Against Invasive Ambrosia Beetles Affecting Apples and Nurseries in Kentucky, Sponsored by KY Department of Agriculture Submitted: March 5, 2019. Funding Dates: September 30, 2019 - September 29, 2022. | Awarded: \$21,786.00  
OSPA ID: 201903050925

Bradley C., Ritchey E., L., Larson J., Wise K., Gauthier N., A., Vincelli P., Bessin R., T., Rudolph R., E., Villanueva R., T., Legleiter T., R., Kentucky Extension IPM Implementation Program: 2021-2024, Sponsored by National Institute of Food and Agriculture Submitted: August 26, 2021. Funding Dates: September 1, 2021 - August 31, 2022. | Awarded: \$193,999.00  
OSPA ID: 202108261647

Bessin R., T., Obrycki J., J., Villanueva R., T., Management of Brown Marmorated Stink Bug in US Specialty Crops, Sponsored by North Carolina State University Submitted: March 15, 2016. Funding Dates: September 1, 2016 - August 31, 2022. Requested: \$300,000.00, | Awarded: \$283,058.00  
OSPA ID: 201603151059

Bessin R., T., FY 22 Private Applicator Training Program, Sponsored by KY Department of Agriculture Submitted: November 24, 2021. Funding Dates: July 1, 2020 - June 30, 2022. |

Awarded: \$27,500.00  
OSPA ID: 202111240934

**Closed**

FY 21 Private Applicator Training Program, Sponsored by KY Department of Agriculture  
Submitted: May 9, 2020. Funding Dates: July 1, 2020 - June 30, 2022. | Awarded: \$27,500.00  
OSPA ID: 202005090917

Rudolph R., E., Bessin R., T., Jacobsen K., L., Obrycki J., J., Pfeufer E., Woods T., A., Experiential  
High Tunnel Training for Cooperative Extension Service Agents in Kentucky, Sponsored by  
University of Georgia Submitted: November 26, 2018. Funding Dates: April 1, 2019 - March  
31, 2022. | Awarded: \$64,304.00  
OSPA ID: 201811261337

Bessin R., T., IR-4 Liaison and Wireworm Study in Sweet Potatoes, Sponsored by University of  
Florida Submitted: April 14, 2021. Funding Dates: September 1, 2019 - March 25, 2022. |  
Awarded: \$13,500.00  
OSPA ID: 202104141313

Bessin R., T., 2021 eXtension PSEP Enhancement Grant, Sponsored by eXtension Foundation  
Submitted: November 11, 2020. Funding Dates: January 1, 2021 - December 31, 2021. |  
Awarded: \$17,900.00  
OSPA ID: 202011111044

Williams M., A., Bessin R., T., Gonthier D., J., Developing Sustainable Protection Systems for Flea  
Beetle Control, Sponsored by KY Department of Agriculture Submitted: October 9, 2018.  
Funding Dates: January 1, 2019 - September 29, 2021. | Awarded: \$74,705.00  
OSPA ID: 201810091656

Bessin R., T., IR-4 Liaison funds, Sponsored by University of Florida Submitted: October 10, 2019.  
Funding Dates: September 1, 2019 - August 31, 2021. | Awarded: \$16,750.00  
OSPA ID: 201910101444

Knott C., A., Ritchey E., L., Pfeufer E., Larson J., Springer M., T., Gauthier N., A., Bessin R., T.,  
Dunwell W., C., Kentucky Extension IPM Implementation Program: 2017-2020, Sponsored by  
National Institute of Food and Agriculture Submitted: May 10, 2017. Funding Dates:  
September 1, 2014 - August 31, 2021. Requested: \$504,730.00, | Awarded: \$576,205.00  
OSPA ID: 201705100801

Bessin R., T., 2020 eXtension PSEP Enhancement Grant, Sponsored by eXtension Foundation  
Submitted: October 5, 2019. Funding Dates: January 1, 2020 - December 31, 2020. |  
Awarded: \$18,850.00  
OSPA ID: 201910051257

Villanueva R., T., Bessin R., T., Obrycki J., J., Management of Stink Bugs in Soybean: Does One  
Strategy Fit All Species? - Year 2, Sponsored by Kentucky Soybean Promotion Board  
Submitted: January 14, 2019. Funding Dates: April 1, 2019 - September 30, 2020. | Awarded:  
\$24,873.00  
OSPA ID: 201901141201

Villanueva R., T., Bessin R., T., Dunwell W., C., Obrycki J., J., Studies on Ambrosia Beetles  
Affecting Nursery Crops and Fruit Trees in Kentucky, Sponsored by KY Department of  
Agriculture Submitted: February 27, 2017. Funding Dates: November 1, 2017 - September  
29, 2020. Requested: \$33,564.00, | Awarded: \$0.00  
OSPA ID: 201702271846

Villanueva R., T., Bessin R., T., Dunwell W., C., Obrycki J., J., Studies on Ambrosia Beetles  
Affecting Nursery Crops and Fruit Trees in Kentucky, Sponsored by KY Department of  
Agriculture Submitted: March 1, 2018. Funding Dates: November 1, 2017 - September 29,



2020. | Awarded: \$29,954.00  
OSPA ID: 201803010936

Bessin R., T., Private Pesticide Applicator Training Program, Sponsored by KY Department of Agriculture Submitted: May 9, 2018. Funding Dates: July 1, 2018 - June 30, 2020. | Awarded: \$27,500.00  
OSPA ID: 201805090946

Bessin R., T., Private Pesticide Applicator Training Program, Sponsored by KY Department of Agriculture Submitted: August 8, 2019. Funding Dates: July 1, 2018 - June 30, 2020. | Awarded: \$27,500.00  
OSPA ID: 201908081247

Villanueva R., T., Bessin R., T., Management of Caterpillars on Non-GMO Corn, Sponsored by Kentucky Corn Growers Association Submitted: February 5, 2019. Funding Dates: February 1, 2019 - June 1, 2020. | Awarded: \$15,000.00  
OSPA ID: 201902051823

Bessin R., T., Managing Wireworms and White Grubs on Corn, Sponsored by Syngenta Crop Protection Submitted: March 28, 2019. Funding Dates: March 18, 2019 - March 31, 2020. | Awarded: \$20,000.00  
OSPA ID: 201903281350

Bessin R., T., Pfeufer E., 2019 Enhancing the Pesticide Safety Education Program for Kentucky, Sponsored by eXtension Foundation Submitted: November 21, 2018. Funding Dates: January 1, 2019 - December 31, 2019. | Awarded: \$20,525.00  
OSPA ID: 201811210903

Harwood J., D., Williams M., A., Bessin R., T., Woods T., A., Reinventing Sustainable Protection Systems for Cucurbit Production, Sponsored by Iowa State University Submitted: April 14, 2015. Funding Dates: September 1, 2015 - August 31, 2019. | Awarded: \$188,000.00  
OSPA ID: 201504141600

Villanueva R., T., Bessin R., T., Obrycki J., J., Management of Stink Bugs in Soybeans: Does One Strategy Fit All Species?, Sponsored by Kentucky Soybean Promotion Board Submitted: January 28, 2017. Funding Dates: August 1, 2017 - July 31, 2019. Requested: \$41,693.00, | Awarded: \$41,693.00  
OSPA ID: 201701281048

Bessin R., T., Managing wireworm and white grubs in corn, Sponsored by Syngenta Crop Protection Submitted: March 25, 2018. Funding Dates: March 8, 2018 - March 31, 2019. | Awarded: \$19,000.00  
OSPA ID: 201803250854

Bessin R., T., Wire Evaluation In Sweet Potato And IR-4 State Liason, Sponsored by University of Florida Submitted: October 14, 2017. Funding Dates: September 1, 2017 - January 31, 2019. | Awarded: \$15,500.00  
OSPA ID: 201710141104

Bessin R., T., Dunwell W., C., Gauthier N., A., Knott C., A., Lucas P., A., Saha S., K., Kentucky IPM Extension and Implementation Program:2014 - 2017, Sponsored by National Institute of Food and Agriculture Submitted: June 13, 2014. Funding Dates: September 1, 2014 - August 31, 2017. | Awarded: \$195,000.00  
OSPA ID: 201406131346

Coolong T., W., Bessin R., T., Whole Farm Organic Management of BMSB and other Pentatomids through Habitat Manipulation, Sponsored by Rutgers University Submitted: April 6, 2012. Funding Dates: September 1, 2012 - August 31, 2017. | Awarded: \$84,309.00  
OSPA ID: 201204061656

Bessin R., T., Evaluating A21065B Efficacy on Wireworm, White Grubs and Seedcorn Maggot in US Corn, Sponsored by Syngenta Crop Protection Submitted: July 26, 2016. Funding Dates: August 1, 2016 - July 1, 2017. | Awarded: \$22,000.00

OSPA ID: 201607261446

Snyder J., C., Bessin R., T., Organic Tomato Breeding For Arthropod Resistance With A Focus On Protected Cultivation: A Planning Proposal, Sponsored by National Institute of Food and Agriculture Submitted: April 25, 2015. Funding Dates: September 1, 2015 - August 31, 2016. | Awarded: \$50,000.00

OSPA ID: 201504251651

### **Not Funded**

Knott C., A., Ritchey E., L., Pfeufer E., Larson J., Gauthier N., A., Bessin R., T., Dunwell W., C., 2020 Kentucky Extension IPM Implementation Program, Sponsored by National Institute of Food and Agriculture Submitted: May 23, 2020. | Awarded: \$0.00

Description: This grant was funded by an extension to the previous year's project rather than a new account being created.

OSPA ID: 202005231342

Bessin R., T., 2020 Kentucky IR-4 Minor Use Pesticide Program, Sponsored by University of Florida Submitted: November 3, 2020. | Awarded: \$0.00

OSPA ID: 202011031033

Teutsch C., Dupuis J., R., Bessin R., T., Villanueva R., T., Assessment of the Larval Infestation and Management of the European Crane Fly in Alfalfa, Sponsored by National Alfalfa and Forage Alliance Submitted: January 27, 2021. Requested: \$158,501.00, | Awarded: \$0.00

Description: This was not funded. Aspects of this proposal will be resubmitted as a NIFA Foundational Sciences proposal in spring 2022.

OSPA ID: 202101271643

Villanueva R., T., Bessin R., T., Bradley C., Dunwell W., C., Knott C., A., Pfeufer E., Ritchey E., L., Shockley J., M., Enabling Beginning Farmers and Veterans on Learning Effective Methodologies for Successful Farming in Western Kentucky, Sponsored by National Institute of Food and Agriculture Submitted: December 12, 2016. Requested: \$599,991.00, | Awarded: \$0.00

Description: Co-PI Pfeufer's role is to conduct hands-on training on disease management with potential vegetable growers who are veterans

OSPA ID: 201612121132

Obrycki J., J., Bessin R., T., Enhancing the Adoption of Biological Control for Arthropod Pest Management in High Tunnel Production Systems, Sponsored by National Institute of Food and Agriculture Submitted: February 28, 2017. | Awarded: \$0.00

OSPA ID: 201702281601

Obrycki J., J., Bessin R., T., Saha S., K., Enhancing the use of biological control for pest management in high tunnel vegetable and floral production systems, Sponsored by National Institute of Food and Agriculture Submitted: November 14, 2016. | Awarded: \$0.00

OSPA ID: 201611141450  
Villanueva R., T., Bessin R., T., Obrycki J., J., Exploring the Causes and Solutions of Recent Mollusk Outbreaks in Field Crops, Sponsored by North Carolina State University Submitted: November 3, 2017. Requested: \$29,998.00, | Awarded: \$0.00  
Description: Not funded  
OSPA ID: 201711030915  
Bessin R., T., Exploring the Tritrophic Relationship Between Plant Biochemicals, Herbivores, and Parasitoids in Specialty Cropping Systems, Sponsored by National Science Foundation Submitted: October 12, 2016. | Awarded: \$0.00  
OSPA ID: 201610121029  
Villanueva R., T., Bessin R., T., Dunwell W., C., Management of Ambrosia Beetles in Ornamental and Fruit Tree in Nurseries in Kentucky and Tennessee, Sponsored by University of Georgia Submitted: August 12, 2018. Requested: \$278,300.00, | Awarded: \$0.00  
Description: Not funded  
OSPA ID: 201808121648  
Villanueva R., T., Bessin R., T., Obrycki J., J., Management of Sugarcane aphid (SCA), *Melanaphis sacchari*, infesting sweet sorghum in Kentucky, Sponsored by National Institute of Food and Agriculture Submitted: June 6, 2016. Requested: \$198,843.00, | Awarded: \$0.00  
OSPA ID: 201606061154  
Villanueva R., T., Bessin R., T., Obrycki J., J., Management of Sugarcane Aphid (SCA), *Melanaphis Sacchari*, Infesting Sweet Sorghum in Kentucky and Tennessee, Sponsored by National Institute of Food and Agriculture Submitted: May 6, 2017. Requested: \$325,000.00, | Awarded: \$0.00  
OSPA ID: 201705060710  
Bessin R., T., On Farm Management of a Specialist Native Pollinator: Investigation Of The Impact Of Tillage On Squash Bee (*Peponapis Pruinosa*) and The Development Of a Producer Education Program, Sponsored by University of Georgia Submitted: June 6, 2017. | Awarded: \$0.00  
OSPA ID: 201706060820  
Snyder J., C., Bessin R., T., Saha S., K., Organic Tomato Breeding For Arthropod Resistance with A Focus On Protected Cultivation, Sponsored by National Institute of Food and Agriculture Submitted: March 8, 2016. | Awarded: \$0.00  
OSPA ID: 201603080908  
Snyder J., C., Bessin R., T., Saha S., K., Organic Tomato Breeding for Arthropod Resistance With a Focus On Protected Cultivation, Sponsored by National Institute of Food and Agriculture Submitted: January 12, 2017. | Awarded: \$0.00  
OSPA ID: 201701121557  
Williams M., A., Bessin R., T., Gonthier D., J., Resilient systems for Sustainable Management of Organic Cucurbits, Sponsored by Iowa State University Submitted: February 21, 2018. Requested: \$383,142.00, | Awarded: \$0.00  
Description: USDA Organic Agriculture Research and Extension Initiative. Multi-state project to assess the cost effectiveness of mesotunnel systems and deployment of biological control tactics against insect pests and pathogens of squash and muskmelon.  
OSPA ID: 201802211419  
Lucas P., A., Bessin R., T., Utilizing Insect Traps and Day Degree Models for Codling Moth and Oriental Fruit Moth Control in Apples, Sponsored by KY Department of Agriculture Submitted: May 25, 2012. | Awarded: \$0.00  
OSPA ID: 201205251500

#### **Pending**

Stevenson B., Larson J., Thorson J., S., McWhorter K., L., Teets N., M., Bessin R., T., Palli S., R., Dobson S., L., Fisher T., W., Christian W., J., Syed Z., Appalachian Vector-borne Disease Center of Excellence, Sponsored by Center for Disease Control and Prevention Submitted:

January 21, 2022. | Awarded: \$0.00  
OSPA ID: 202201211657  
Bessin R., T., Evaluation of Organic Control Tactics for Management of Harlequin Bug on Cruciferous Crops., Sponsored by KY Department of Agriculture Submitted: February 26, 2022. | Awarded: \$0.00  
OSPA ID: 202202261312  
Bradley C., Ritchey E., L., Larson J., Wise K., Gauthier N., A., Vincelli P., Bessin R., T., Villanueva R., T., Legleiter T., R., Kentucky Extension IPM Implementation Program: 2021-2023, Sponsored by National Institute of Food and Agriculture Submitted: April 27, 2021. | Awarded: \$0.00  
OSPA ID: 202104271334

## **Scope Grants**

### **Awarded**

Bessin R., T., Private Pesticide Applicator Certification MOA; FY 23 Private Pesticide Applicator Certification-State Funding, Sponsored by KY Department of Agriculture Submitted: May 16, 2022. Funding Dates: July 1, 2022 - June 30, 2024. | Current Budget Amount: \$18,750.00

Prime Grant OSPA ID: 202203311653  
Bessin R., T., Legleiter T., R., Grain Crops Scope KY IPM Implementation Program 2021-2024, Sponsored by National Institute of Food and Agriculture Submitted: October 1, 2021. Funding Dates: September 1, 2021 - August 31, 2022. | Current Budget Amount: \$55,846.00

Prime Grant OSPA ID: 202108261647  
Gauthier N., A., Bessin R., T., Kentucky Extension IPM Implementation Program: 2021-2024, Sponsored by National Institute of Food and Agriculture Submitted: October 1, 2021. Funding Dates: September 1, 2021 - August 31, 2022. | Current Budget Amount: \$5,804.00

Prime Grant OSPA ID: 202108261647

Ritchey E., L., Bessin R., T., KY Agricultural Training School (KATS), Sponsored by National Institute of Food and Agriculture Submitted: October 1, 2021. Funding Dates: September 1, 2021 - August 31, 2022. | Current Budget Amount: \$46,999.00

Prime Grant OSPA ID: 202108261647

Larson J., Bessin R., T., Nursery Crops Scope KY IPM Implementation Program: 2021-2024, Sponsored by National Institute of Food and Agriculture Submitted: October 1, 2021. Funding Dates: September 1, 2021 - August 31, 2022. | Current Budget Amount: \$11,577.00

Prime Grant OSPA ID: 202108261647

Vincelli P., Bessin R., T., PDDL Scope KY IPM Implementation Program: 2021-2024, Sponsored by National Institute of Food and Agriculture Submitted: October 1, 2021. Funding Dates: September 1, 2021 - August 31, 2022. | Current Budget Amount: \$27,908.00

Prime Grant OSPA ID: 202108261647

Bessin R., T., Rudolph R., E., Vegetable Crops Scope KY IPM Implementation Program 2021-2024, Sponsored by National Institute of Food and Agriculture Submitted: October 1, 2021. Funding Dates: September 1, 2021 - August 31, 2022. | Current Budget Amount: \$30,906.00

Prime Grant OSPA ID: 202108261647

## **Closed**

Knott C., A., Ritchey E., L., Pfeufer E., Larson J., Springer M., T., Gauthier N., A., Bessin R., T., Dunwell W., C., Kentucky Extension IPM Implementation Program: 2017-2020, Sponsored by National Institute of Food and Agriculture Submitted: September 14, 2020. Funding Dates: September 1, 2017 - August 31, 2021. | Current Budget Amount: \$14,362.00

Prime Grant OSPA ID: 201705100801

## **Non-Sponsored Projects**

### **Federal**

#### **Closed**

Gauthier, N. W. (Principal), Bessin, R. T., Springer, M. T., Strang, J. G., Wright, S., Crop Profile for Kentucky Apple: Need for State-of-the-Industry Documents, Southern Region Integrated Pest Management, (July 2016 - June 2017). Awarded: \$3260.

Description: Funding for staff and printing costs to develop a pest control guide for commercial apple producers in Kentucky.

#### **Not Funded**

Villanueva, R. T. (Principal), Teutsch, C. (Co-Principal), Dupuis, J. R. (Co-Principal), Bessin, R. T. (Co-Principal), Vilorio, Z. (Co-Principal), **Assessment of the Larval Infestation and Management of the European Crane Fly in Alfalfa**. Awarded: \$99999.

### **University**

#### **On-going**

Ritchey, E. L. (Co-Principal), Vilorio, Z. (Principal), Dunwell, W. (Co-Principal), Bessin, R. T. (Co-Principal), Villanueva, R. T. (Co-Principal), Becker, D. (Co-Principal), Martin, A. (Co-Principal), Engaging Elementary Students in Horticulture, (December 2017 - Present).  
Awarded: \$19272.  
Description: Sustainability Challenge Grant

### **Presentations Given**

- Villanueva R. T., Bessin R. T., Dunwell W. C., Zenaida V., (November 18, 2019). Ambrosia beetles: Efficiency of pyrethroids and the stimulation of reproduction by wood vinegar Annual meeting of the Entomological Society of America, St Louis, MO. National.
- Mercer N., Bessin R. T., Obrycki J., (November 2018). Biological control of sugarcane aphid, *Melanaphis sacchari*, using buckwheat and methyl salicylate ESA annual meeting, ESA, Vancouver, Canada.
- Gonzalez Y., Villanueva R. T., Bessin R. T., (November 2018). Evaluation of insecticide efficacy and damage by *Oeobius pugnax* (Hemiptera: Pentatomidae) on barley ESA Annual meeting, Vancouver, Canada.
- Gomes I., Villanueva R., Bessin R. T., Obrycki J., Gonzalez Y., Davila R., (March 2018). Biology and parasitism of *Dectes texanus* in soybeans in western and central Kentucky ESA Annual meeting, ESA, Vancouver, Canada.
- Amanda S., Neil W., Williams M. A., Bessin R. T., (March 2018). A multi-year, multi-study investigation into IPM techniques for organic and conventional cucurbit production. ESA 2018 North Central Branch Meeting. ESA NCB meeting, North Central Branch of ESA, Madison, WI, United States.
- Lauren F., Bessin R. T., Villanueva R. T., (March 2018). Biological control of the brown marmorated stink bug, *Halymorpha halys*, in Kentucky. ESA NCB meeting, North Central Branch of ESA, Madison, WI, United States.
- Nathan M., Bessin R. T., Obrycki J. J., (March 2018). Conservation biological control of sugarcane aphid (*Melanaphis sacchari*) in Kentucky sweet sorghum ESA NCB meeting, North Central Branch of ESA, Madison, WI, United States.
- Christopher K., Amanda S., Bessin R. T., (March 2018). Development of an Innovative Cucumber Beetle Monitoring Trap. ESA NCB meeting, North Central Branch of ESA, Madison, WI, United States.
- Skidmore A., Wilson N., Williams M. A., Bessin R. T., (March 2018). Timed bumble bee hive placement in covered organic cantaloupe production ESA NCB meeting, Entomological society of america, Madison, WI, United States.
- Amanda S., Neil W., Williams M. A., Bessin R. T., (March 2018). Timed bumble bee hive placement in covered organic cantaloupe production. ESA NCB meeting, North central Branch of ESA, Madison, United States.
- Lauren F., Bessin R. T., Villanueva R. T., (November 6, 2017). Predation and parasitism of sentinel egg masses of the brown marmorated stink bug in established and more recently colonized areas of Kentucky. ESA Annual meeting, Entomological Society of America, Denver, CO, United States.
- Lauren F., Bessin R. T., Villanueva R. T., (October 27, 2017). Predation and parasitism of sentinel egg masses of the brown marmorated stink bug in established and more recently colonized areas of Kentucky. Ohio Valley Entomological Association Meeting, Ohio Valley Entomological Association, Columbus, OH, United States.
- Amanda S., Bessin R. T., (June 6, 2017). Impact of tillage on squash bee nesting site selection ESA NCB meeting, North Central Branch of ESA, Indianapolis, IN, United States.

Raul v., Bessin R. T., Obrycki J. J., (June 6, 2017). Options to manage sugarcane aphid (*Melanaphis scchari*) in sweet sorghum in Kentucky. ESA NCB meeting, North Central Branch ESA, Indianapolis, IN, United States.

Bessin R. T., Williams M. A., (March 12, 2017). Management of Season-long row covers for cucurbit production ESA SEB annual meeting, Southeastern branch of ESA, Memphis, TN, United States.

Bessin R. T., (January 2, 2017). Sugarcane aphid on sweet sorghum: an orphan in crisis Sugarcane aphid research exchange meeting, Sugarcane aphid research exchange group, Dallas, TX, United States. National.

### **Extension - County Office Presentation**

Villanueva R. T., Bessin R. T., (March 7, 2018). Entomological Studies in Row Crops Conducted in Princeton, KY in 2017 2018 IPM Training School, Univ of KY, Hopkinsville, KY, United States. Invited, Regional.

### **Invited Speaker**

Zenaida V., Villanueva R. T., Bessin R. T., Dunwell W. C., (November 2020). Evaluation of pyrethroids efficacy against ambrosia beetles using Fuji apple bolts Annual meeting of the Entomological Society of America, United States. National.

Bessin R. T., (December 3, 2019). Protecting Pollinators 2019 Kentuckiana Meeting, Kentuckiana, French Lick, IN, United States. Invited, Regional.

Bessin R. T., (February 2019). Sugarcane Aphid Management Update National Sweet Sorghum Producers and Processors Meeting, NSSPPA, Pigeon Forge, TN, United States. Invited, National.

### **Podium Session**

Villanueva R. T., F. L., Bessin R. T., (November 19, 2018). Predation and parasitism assessment of sentinel and naturally occurring egg masses of the brown marmorated stink bug, *Halymorpha halys*. Annual meeting of the Entomological Society of America, Vancouver, Canada.

Mercer N., Teets N. M., Bessin R. T., Obrycki J. J., (June 5, 2017). Impact of winter feeding on overwintering *Hippodamia convergens* (Coccinellidae) survival and spring reproduction. Entomological Society of America North Central Branch Meeting, Entomological Society of America, Indianapolis, IN, United States. Accepted, Regional.

Villanueva R. T., Bessin R. T., (January 4, 2017). SCA and Sweet Sorghum: An Orphan in Crisis Sorghum – Sugarcane Aphid Research Exchange Meeting, Sorghum Checkoff, Dallas, TX. Invited, National.

### **Poster Session**

Rudolph R. E., Pfeufer E., Bessin R. T., (August 2020). *Effect of plastic mulch color on aphid populations and virus incidence in summer squash*. American Society for Horticultural Science. Accepted, National.

Rudolph R. E., Pfeufer E., Bessin R. T., (July 25, 2019). *Effect of plastic mulch color on aphid populations and virus incidence in summer squash*. American Society for Horticultural Science, Las Vegas, NV. Accepted, National.

Fann L., Bessin R. T., Villanueva R. T., (November 2018). Predation and parasitism assessment of sentinel and naturally occurring egg masses of the brown marmorated stink bug ESA Annual meeting, ESA, Vancouver, Canada.

Villanueva R. T., Zenaida V., Dunwell W. C., Bessin R. T., (November 19, 2018). Invasive ambrosia beetle populations in central and western Kentucky: Some strategies to deter their attack. Annual meeting of the Entomological Society of America, Vancouver, Canada.

Viloria Z., Dunwell W., Ritchey E., Bessin R., Villanueva R. T., Becker D., (September 24, 2018). Engaging Elementary Students Into Horticulture with Cooperation of Master Gardeners Through Multidisciplinary Approaches in Rural Kentucky. IPPSociety - ENA Conference, Newark, DE. Invited, International.

Nathan M., Teets N. M., Bessin R. T., Obrycki J. J., (November 6, 2017). Impact of winter feeding on overwintering *Hippodamia convergens* (Coccinellidae) survival and spring reproduction. ESA annual meeting, Entomological Society of America, Denver, CO, United States.

Ekramirad N., Rady A., Adedeji A. A., Alimardani R., Bessin R. T., Strang J. G., (July 16, 2016). Hyperspectral imaging for detection of codling moth infestation and prediction of quality in Gold-Rush apples American Society of Agricultural and Biological Engineers International Meeting, ASABE, Orlando, FL, United States. Accepted, International.

### **Specialty Presentation**

Villanueva R. T., Bessin R. T., Yaziri G., (November 19, 2018). Evaluation of insecticide efficacy and damage by *Oebalus pugnax* (Hemiptera: Pentatomidae) on barley. Annual meeting of the Entomological Society of America, Vancouver, Canada.

## **Extension**

### **Extension Publications & Media**

\* = Senior Author    ~ = Corresponding Author    + = Grad/Prof Student    # = Post Doc    ^ = Undergraduate

#### ***Published***

#### ***Peer-Reviewed Creative Work***

#### **Web Based Publication**

\* Gauthier, N. A., Bessin, R. T., Strang, J. G., Wright, S., Springer, M. T. (2018). Strawberry Scout: Scouting Guide for Common Problems of Strawberries in Kentucky *Mobile app* Lexington, KY, UK Dept of Plant Pathology Drupal site.

\* Gauthier, N. A., Bessin, R. T., Strang, J. G., Wright, S., Springer, M. T. (2017). Mobile App- Apple Scout complement to ID-219 Lexington, KY, UK Dept of Plant Pathology Drupal site.

#### ***Non Peer-Reviewed Creative Work***

#### **Newsletter**

Bessin, R. T., Legleiter, T. R. (2021). Pesticide Training and Certification in Kentucky and COVID-19 *Kentucky Pest News* Lexington, KY.

#### **Web Based Publication**



Gauthier, N. A., Bessin, R. T., Leonberger, K., Springer, M. T., Wright, S., Strang, J. (2017). Crop Profile for Apples in Kentucky, *National Integrated Pest Management Center*.

### **Peer-Reviewed Research Publications**

#### **Book, Scholarly-New**

Strang, J. G., Gauthier, N. A., Bessin, R. T. (2019). ID-232- Midwest Tree and Small Fruit Spray Guide, 2019-20 Lexington, KY, *University of Kentucky Agricultural Communications Service*, 168.

#### **Extension Publication- Numbered, Original Content**

\* Gauthier, N. A., Strang, J. G., Springer, M. T., Bessin, R. T. (2020). ID-260 An IPM Scouting Guide for Common Problems of Peach in Kentucky Lexington, KY, *University of Kentucky Agricultural Communications Service*, 28.

Author Role:

Provided the any pictures, management information and authored all of the wildlife related sections.

\* Gauthier, N. A., Strang, J. G., Springer, M. T., Bessin, R. T. (2020). PPFS-FR-S-30 Cultural Calendar for Commercial Strawberry Production Lexington, KY, *University of Kentucky Agricultural Communications Service*, 6.

Author Role:

Provided the any pictures, management information and authored all of the wildlife related sections.

\* Gauthier, N. A., Strang, J. G., Springer, M. T., Bessin, R. T. (2020). PPFS-FR-S-29 Cultural Calendar for Commercial Blueberry Production Lexington, KY, *University of Kentucky Agricultural Communications Service*, 4.

Author Role:

Provided the any pictures, management information and authored all of the wildlife related sections.

\* Gauthier, N. A., Bessin, R. T., Strang, J. G., Springer, M. T., Bessin, R. T. (2020). PPFS-FR-S-28 Cultural Calendar for Commercial Brambles Production Lexington, KY, *University of Kentucky Agricultural Communications Service*, 5.

Author Role:

Provided the any pictures, management information and authored all of the wildlife related sections.

Gauthier, N. A., Leonberger, K., Bessin, R. T., Springer, M. T., Strang, J. G., Wright, S. (2019). PPFS-FR-T-25 Cultural Calendar for Commercial Apple Production Lexington, KY, *University of Kentucky Agricultural Communications Service*, 7.

Author Role:

Provided the any pictures, management information and authored all of the wildlife related sections.

Strang, J. G., Springer, M. T., Gauthier, N. A., Bessin, R. T. (2019). PPFS-FR-T-26 Cultural Calendar for Commercial Peach Production Lexington, KY, *University of Kentucky Agricultural Communications Service*, 7.

Author Role:

Provided the any pictures, management information and authored all of the wildlife related sections.

Gauthier, N. A., Strang, J. G., Springer, M. T., Bessin, R. T. (2019). ID-254- An IPM Scouting Guide for Common Problems of Grape in Kentucky Lexington, KY, *University of Kentucky Agricultural Communications Service*, 36.

Author Role:

Provided the any pictures, management information and authored all of the wildlife related sections.

\* Gauthier, N. A., Bessin, R. T., Strang, J. G., Wright, S., Springer, M. T., Becker, D. (2018). ID-251- An IPM Scouting Guide for Common Problems of Brambles in Kentucky Lexington, KY, *University of Kentucky Agricultural Communications Service*, 28.

\* Gauthier, N. W., Bessin, R. T., Strang, J. G., Wright, S., Springer, M. T., Becker, D., Kaiser, C. (2018). ID-251- An IPM Scouting Guide for Common Problems of Brambles in Kentucky Lexington, KY, *University of Kentucky Agricultural Communications Services*, 30.

Knott, C. A., Lee, C. D., Green, J. D., Haramoto, E. R., Legleiter, T. R., McGrath, J. M., Reyes, J., Ritchey, E. L., Salmeron Cortasa, M., Venard, C., Wendroth, O. O.B., Zhang, X., Bradley, C., Wise, K., Villanueva, R. T., Bessin, R. T., Johnson, D. W., Halich, G. S., Shockley, J. M., McNeill, S. G. (2018). ID-249- A Comprehensive Guide Guide to Soybean Management in Kentucky Lexington, KY, *University of Kentucky Agricultural Communications Service*, 84.

Gauthier, N. W., Bessin, R. T., Strang, J. G., Wright, S., Springer, M. T., Kaiser, C. (2016). ID-238- An IPM Scouting Guide for Common Problems of Strawberry in Kentucky Lexington, KY, *University of Kentucky Agricultural Communications Service*, 28.

#### **Extension Publication- Numbered, Revised Content**

Gauthier, N. A., Rudolph, R. E., \* Bessin, R. T. (2021). ID-36 Vegetable Production Guide for Commercial Growers, 2022-23 Lexington, KY, *University of Kentucky Agricultural Communications Service*, 136.

\* Gauthier, N. A., Bessin, R. T. (2021). PPFs-VG-11 Bacterial Wilt of Cucurbits Lexington, KY, *University of Kentucky Agricultural Communications Service*, 3.

Lee, B. D., Williams, M. A., Rudolph, R. E., Bessin, R. T., \* Durham, R. E. (2021). ID-128 Home Vegetable Gardening in Kentucky, 2021 Lexington, KY, *University of Kentucky Agricultural Communications Service*, 56.

\* ~ Bailey, W. A., \* Pearce, R. C., Jack, A. M., Bush, L. P., Green, J. D., Miller, R. D., Ritchey, E. L., Pfeufer, E., Snell, W. M., Bessin, R. T., Sanderson, W. T., Rhodes, N., Hansen, Z., Reed, D., Johnson, C., Vann, M., Whitley, S., Burrack, H., Thiessen, L. (2020). 2021-2022 Burley and Dark Tobacco Production Guide. Lexington, KY, *University of Kentucky, Cooperative Extension Service*(ID-160), 88.

Author Role:Bailey: Lead editor on this publication. Coordinated revisions of all chapters with authors from multiple states (Kentucky, Tennessee, Virginia, North Carolina). Was author or co-author on ten chapters. Did overall proofing and submission of each revised chapter and overall proofing of final document.

Pearce: Co-editor of this publication. Was author or co-author on eight chapters. Assisted in overall proofing of final document.

Jack: Was lead author on 1 chapter.

Bush: co-authored one chapter.

Green: Lead author on one chapter.

Miller: Co-author on two chapters.

Ritchey: Co-authored two chapters.

Pfeufer: Co-authored two chapters.

Snell: Authored one chapter.

Bessin: Authored one chapter.

Sanderson: Co-authored one chapter.

Rhodes: Co-authored one chapter.

Hansen: Co-authored one chapter

Reed: Co-authored four chapters.

Johnson: Co-authored two chapters.

Vann: Co-authored four chapters.

Whitley: Co-authored one chapter.

Burrack: Authored one-chapter.

Thiessen: Co-authored two chapters.

- \* Bailey, W. A., Pearce, R. C., Ritchey, E. L., Pfeufer, E., Green, J. D., Bessin, R. T., Sanderson, W. T., Snell, W. M. (2020). ID-160 Burley and Dark Tobacco Production Guide, 2021-2022 Lexington, KY, *University of Kentucky Agricultural Communications Service*, 88.
- \* Rudolph, R. E., Pfeufer, E., Strang, J. G., Bessin, R. T. (2019). ID-36 Vegetable Production Guide for Commercial Growers, 2020-21 Lexington, KY, *University of Kentucky Agricultural Communications Service*, 128.
- Gauthier, N. A., Strang, J. G., Bessin, R. T. (2019). PPFs-FR-S-23 Simplified Backyard Grape Spray Guide Lexington, KY, *University of Kentucky Agricultural Communications Service*, 1.
- Strang, J. G., Gauthier, N. A., Bessin, R. T. (2019). PPFs-FR-T-18 Simplified Backyard Apple Spray Guides Lexington, KY, *University of Kentucky Agricultural Communications Service*, 4.
- Strang, J. G., Gauthier, N. A., Bessin, R. T. (2019). PPFs-FR-T-20 Simplified Backyard Peach and Stone Fruit Spray Guide Lexington, KY, *University of Kentucky Agricultural Communications Service*, 2.
- Bessin, R. T. (2019). PPFs-VG-11-QF Bacterial Wilt of Cucurbits Quick Facts Lexington, KY, *University of Kentucky Agricultural Communications Service*, 2.
- Pearce, R. C., Bailey, W. A., Green, J. D., Purschwitz, M. A., Bessin, R. T., Snell, W. M. (2018). ID-160- Burley and Dark Tobacco Production Guide, 2019-2020 Lexington, KY, *University of Kentucky Agricultural Communications Service*, 84.
- Rudolph, R. E., Pfeufer, E., Obrycki, J. J., Bessin, R. T. (2018). ID-235- An IPM Scouting Guide for Common Problems of High Tunnel and Greenhouse Vegetable Crops in Kentucky Lexington, KY, *University of Kentucky Agricultural Communications Service*, 28.

Pfeuffer, E., Bessin, R. T., Wright, S., Strang, J. G. (2017). ID-36- Vegetable Production Guide Guide for Commercial Growers, 2018-19 Lexington, KY, *University of Kentucky Agricultural Communications Service*, 140.

### **Non Peer-Reviewed Research Publications**

Obrycki, J. J., Bessin, R. T. (2018). Biological Control of Arthropod Pests in High Tunnels and Greenhouses (Entfact-327).

### **Book, Non-Scholarly-Revised**

Beckerman, J., Bessin, R. T., Gauthier, N. A., Strang, J., Welty, C., Johnson, D., Babadoost, M., Kushad, M., Wahle, E., Cochran, D., Hannan, J., Iles, L. J., Lewis, D., Rodriguez-Salamanca, L., Smigell, C., Volenberg, D., Gao, G., Lewis-Ivey, M., Long, E., Bordelon, B., Foster, R., Frank, D., Guedot, C. (2017). ID-232- Midwest Fruit Pest Management Guide 2017 *Midwest Fruit Workers book and guide series.*, Purdue University.

### **Extension Publication- Non-numbered, Original Content**

Gauthier, N. W., Leonberger, K., Bessin, R. T., Springer, M. T., Strang, J. G., Wright, S. (2017). A Profile of Commercial Apple Production in Kentucky 2017 Lexington, KY, *University of Kentucky Agricultural Communications Service*, 165.

### **Extension Publication- Numbered, Revised Content**

Beckerman, J., Bessin, R. T., Gauthier, N. A., Strang, J., Welty, C., Johnson, D., Babadoost, M., Kushad, M., Wahle, E., Cochran, D., Hannan, J., Iles, L. J., Lewis, D., Rodriguez-Salamanca, L., Smigell, C., Volenberg, D., Gao, G., Lewis-Ivey, M., Long, E., Bordelon, B., Foster, R., Frank, D., Guedot, C. (2018). ID-232- Midwest Fruit Pest Management Guide 2018 *Midwest Fruit Workers book and guide series.*, Purdue University.

Durham, R. E., Strang, J. G., Williams, M. A., Wright, S., Bessin, R. T., Lee, B. D., Durham, R. (2017). ID-128- Home Vegetable Gardening in Kentucky Lexington, Ky, *University of Kentucky Agricultural Communicatonis Services*, 48.

## **Extension Education & Training Programs**

### **County Agent In-Service Training**

Pollinator Protection at KACAA. (June 2021). Participants: 65 County agents/ specialists.

Description: The Boyd County Extension Office is very proud to have a working bee yard that is maintained by Chuck Hennecke. This in-services focuses on an interview with Mr. Hennecke and Dr. Bessin, as they discuss the care of their bees and hives at the fairgrounds. They discuss the different needs for each season and also how their bees stay protected against an array of threats. Dr. Bessin will finish out the in-service with a Q & A and emphasizing more on pollinator protection.

**Invited speaker.** Pollinators and stinging insects. (December 10, 2020). Scope: Multi-county.

Counties: 40. Participants: 40 County agents/ specialists.

Description: I discussed pollinator and pollinator protection

**Facilitator.** Livestock insect pests. (December 3, 2020). Scope: Multi-county. Counties: 42.  
Participants: 45 County agents/ specialists.  
Description: This meeting covered management of ticks and face flies that vector pink-eye.

**Invited speaker.** Invasive Insect Pests. (October 29, 2020). Scope: Multi-county. Counties: 20.  
Participants: 20 County agents/ specialists.  
Description: Zoom training

**Invited speaker.** Pesticide Safety Education. (October 29, 2020). Scope: Multi-county. Counties: 12. Participants: 12 County agents/ specialists.  
Description: D7 Agent meeting (Zoom)

**Program organizer.** Pesticide Safety Education Program. (October 22, 2020). Scope: Multi-county. Counties: 50. Participants: 50 County agents/ specialists.  
Description: Zoom training

**Invited speaker.** Vegetable insect management. (October 15, 2020). Scope: Multi-county. Counties: 55. Participants: 55 County agents/ specialists.  
Description: Zoom training

**Invited speaker.** Using cultural control to manage pests. (July 23, 2020). Counties: 47. Participants: 47.  
Description: Zoom training

**Invited speaker.** Using scouting and thresholds. (July 9, 2020). Scope: Multi-county. Counties: 47. Participants: 47.  
Description: Zoom training

**Invited speaker.** IPM for Vegetable Pests. (February 6, 2020). Scope: Multi-county. Counties: 50. Participants: 50 County agents/ specialists.  
Description: Zoom training

**Invited speaker.** IPM for pumpkin insects. (December 19, 2019). Scope: Multi-county. Counties: 44. Participants: 44.  
Description: Webinar

**Invited speaker.** Tomato Insect IPM. (November 7, 2019). Scope: Multi-county. Counties: 50. Participants: 50 County agents/ specialists.  
Description: Webinar

**Invited speaker.** Pesticide Safety Education Program Update. (October 22, 2019). Scope: Multi-county. Counties: 80. Participants: 80 County agents/ specialists.  
Description: ANR-East

**Invited speaker.** Pesticide Safety Education Program Update. (October 16, 2019). Scope: Multi-county. Counties: 60. Participants: 60 County agents/ specialists.  
Description: ANR-West

**Invited speaker.** High Tunnel Insect Management. (October 10, 2019). Scope: Multi-county. Counties: 43. Participants: 43 County agents/ specialists.  
Description: Webinar

**Invited speaker.** Strawberry Insect IPM. (September 19, 2019). Scope: Multi-county. Counties: 50. Participants: 50 County agents/ specialists.  
Description: Webinar

**Invited speaker.** Pesticide Safety Education Program Update. (September 18, 2019). Scope: Multi-county. Counties: 12. Participants: 35 County agents/ specialists.  
Description: D4 Staff Meeting

**Invited speaker.** Pesticide Calibration. (July 17, 2019 - July 18, 2019). Scope: Multi-county. Counties: 14. Participants: 64 County agents/ specialists.  
Description: UK North Farm. First day had 14 agents, the second day had 50 producers

**Invited speaker.** Pesticide Safety Education Program Update. (May 21, 2019). Scope: Multi-county. Counties: 15. Participants: 50 County agents/ specialists.  
Description: D1 Staff meeting

**Invited speaker.** Pesticide Safety Education Program Update. (May 20, 2019). Scope: Multi-county. Counties: 22. Participants: 22 County agents/ specialists.  
Description: Hort Agent Training

**Accepted speaker.** WPS changes for pesticide applicators. (October 25, 2018). Scope: Multi-county. Counties: 55. Participants: 55 County agents/ specialists.  
Description: W. ANR training

**Accepted speaker.** Insect macrophotography for identification. (November 14, 2017). Scope: Multi-county. Counties: 25. Participants: 25 County agents/ specialists.  
Description: KY Hort Agents

**Accepted speaker.** Pesticide applicator training program basics. (November 14, 2017). Scope: State. Counties: 25. Participants: 25 County agents/ specialists.  
Description: Hort Agent training

**Accepted speaker.** Pesticide applicator training program changes. (October 24, 2017). Scope: Multi-county. Counties: 65. Participants: 115 County agents/ specialists.  
Description: ANR East 2017

#### **Other Extension Presentation**

**Invited speaker.** Managing sugarcane aphid on sweet sorghum. (February 24, 2018 - February 25, 2018). Scope: National. States: 12. Participants: 200 General public.  
Description: Insect threatens entire industry.

**Invited speaker.** Improved trapping and monitoring technologies for commercial orchards. (January 12, 2018 - January 13, 2018). Scope: Multi-state. States: 8. Participants: 39 Interest group members.

**Invited speaker.** Managing codling moth and secondary pests on apple. (January 12, 2018 - January 13, 2018). Scope: Multi-state. States: 8. Participants: 51 Interest group members.

**Invited speaker.** Managing sugarcane aphid on sweet sorghum. (February 23, 2017 - February 24, 2017). Scope: National. States: 12. Participants: 200 Interest group members.  
Description: Focus on key pest that is threatening their industry.

#### **Extension Related Consulting**

Business and Industry, Pesticide Applicators needing certification, KY, United States. (July 2017 - Present).  
Description: Directing people to on-line resources and testing

Business and Industry, Agricultural producers, KY, United States. (January 2017 - December 2018).  
Description: Generally, this is when I am asking to visit a producer by a county agent or directly by the producer

Business and Industry, Producers, homeowners, county agents, KY, United States. (January 2017 - December 2018).  
Description: Arthropod identification via email, physical samples, and diagnostic lab

**Professional Service**  
**Editor, Journal Editor**

ESA, contributing editor for the American Entomologist, (January 2000 - June 2019).

**Reviewer, External Program**

Virginia Tech, Review team for Department of Entomology, 6-yr review

, (March 8, 2020 - March 11, 2020).

**Reviewer, Grant Proposal**

USDA CPPM ARDP, review panelist, (August 2018).

**Extension Media Summary**

| Type of Media       | Dates                               | Faculty Member's Role | Description                                                                                                                                                  | Evidence of Reach                                                                                                                    |
|---------------------|-------------------------------------|-----------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------|
| Podcast             | November 5, 2020                    | Contributor           | Podcast to clientele on home insect invaders.                                                                                                                |                                                                                                                                      |
| TV - Bowling Green  | May 14, 2019 - December 31, 2019    | Contributor           | 5 minute programs on various topics                                                                                                                          | They reach about 20,000 people with each broadcast. During the 2 years I provided 8 programs for an indirect reach of about 160,000  |
| Facebook            | January 2018 - December 2018        | Editor/Co-Editor      | Facebook site for management of SWD for small fruit producers.                                                                                               | 100 followers and reach of 300                                                                                                       |
| TV in Bowling Green | June 22, 2017 - December 31, 2018   | Contributor           | Various 5 minute TV programs related to entomology                                                                                                           | They reach about 20,000 people with each broadcast. During the 2 years I provided 11 programs for an indirect reach of about 220,000 |
| Printed and web     | January 1, 2017 - December 31, 2018 | Contributor           | Insecticide and pest management recommendations for home and commercial fruit and vegetables. Publications include ID-36, ID-232 (entomology coordinator for |                                                                                                                                      |

|          |                                 |                  |                                                                                                                                                                                             |                                    |
|----------|---------------------------------|------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------|
|          |                                 |                  | this multistate publication), ID-21, HO-64. With the phase of of Lee, this past year recommendations for tobacco, alfalfa, swine, beef cattle, dairy, poultry, sheep and goats, and horses. |                                    |
| Printed  | June 1, 2018 - December 1, 2018 | Contributor      | An IPM scouting guide for common problems of Grapes in Kentucky (in preparation).                                                                                                           |                                    |
| Podcasts | September 4, 2018               | Contributor      | Podcasts on using beneficial insects in greenhouses and invasive pests, two podcasts.                                                                                                       |                                    |
| Facebook | January 2017 - December 2017    | Editor/Co-Editor | Facebook site for management of Spotted Wing Drosophila for producers of small fruits.                                                                                                      | 100 followers with a reach of 300. |

## Extension Field & Community-Based Research

Villanueva, Raul, Dunwell, Winston, Bessin, Ricardo, Obrycki, John. Studies on Ambrosia Beetles affecting Nursery Crops and Fruit Trees in Kentucky. (February 2018 - Present). 3. 3 participants. Kentucky Specialty Crop Block Grant Program, Description: Research on Effectiveness of insecticide treated screens to prevent Ambrosia moving from the forest/woodlot to nursery or orchard trees.

Rudolph, Rachel, Bessin, Ricardo. Evaluation of different planting dates for management of pests and diseases in spring-planted broccoli. (March 2020 - June 2021). 1 UK Horticulture Research Farm. 2 participants. Description: We evaluated three different planting dates (early, mid, and late) as a way to manage common pests in broccoli. There were six treatments that included a combination of the different planting dates with being either treated with pesticides or untreated with pesticides. This was a two-year project which began in the spring of 2020 and was repeated in the spring of 2021.

Bessin, Ricardo, Fannin, Sarah. Wireworm management in sweet potatoes. (May 2019 - September 2019). 1 Moprgan Co Extension Farm. 2 participants. IR-4. Description: Evaluating new reduced risk insecticides to control wireworms on sweet potatoes



during harvest need to begin. This has prevented treatments to strawberries and blueberries, while indicating the need to prevent damage to blackberries, raspberries, and grapes.

Villanueva, Raul, Gonzalez, Yaziri, Gomez, Izabela, Bessin, Ricardo, Ritchey, Edwin, Wise, Kiersten, Becker, Daniel. Food Production: Amish Field Day. (August 2, 2018). 1 Cerulean, KY. 35 participants. Dept. of Ag Economics / Food Connection.  
Description: Field day organized to transfer science base knowledge to an Amish community in Cerulean, Trigg Co, KY. Event was organized by two graduated entomology students (Gonzalez and Gomes)

Villanueva, Raul, Viloría, Zenaida, Dunwell, Winston, Ritchey, Edwin, Bessin, Ricardo, Leonberger, Kim, Amanda, Martin. Engaging elementary students into horticulture with cooperation of master gardeners and through multidisciplinary approaches in rural KY. (May 15, 2018). 1 Princeton, KY. 900 participants. Univ. Of KY Sustainable Challenge Grant.  
Description: A program to deliver information to 5th grade elementary kids from Lyon and Caldwell Counties on several agricultural disciplines (Horticulture, Soil Science, Entomology, Plant Pathology, Pollination, Environment etc)

Fannin, Sarah. Wireworm management in sweet potatoes. (May 2017 - September 2017). 1 Morgan County Extension Farm. 2 participants. IR-4.  
Description: An evaluation of potential insecticides to control wireworms in sweet potatoes

## Teaching

### Teaching

| Prefix Number - Section | Credit Hours      | # Enrolled | Code Term Year      |
|-------------------------|-------------------|------------|---------------------|
| ENT 767 - 011           | 2.00000 - 2.00000 | 1          | 30 Spring 2021-2022 |
| ENT 530 - 001           | 3.00000 - 3.00000 | 7          | 10 Fall 2021-2022   |
| ENT 530 - 201           | 3.00000 - 3.00000 | 3          | 10 Fall 2021-2022   |
| ENT 767 - 009           | 2.00000 - 2.00000 | 1          | 10 Fall 2021-2022   |
| ENT 790 - 010           | 1.00000 - 6.00000 | 1          | 50 Summer 2020-2021 |
| ENT 748 - 001           | 0.00000 - 0.00000 | 1          | 30 Spring 2020-2021 |
| ENT 767 - 011           | 2.00000 - 2.00000 | 1          | 30 Spring 2020-2021 |
| ENT 767 - 009           | 2.00000 - 2.00000 | 1          | 10 Fall 2020-2021   |
| ENT 767 - 011           | 2.00000 - 2.00000 | 1          | 30 Spring 2019-2020 |
| ENT 770 - 001           | 0.00000 - 1.00000 | 15         | 30 Spring 2019-2020 |
| ENT 790 - 001           | 1.00000 - 6.00000 | 1          | 30 Spring 2019-2020 |
| ENT 767 - 009           | 2.00000 - 2.00000 | 1          | 10 Fall 2019-2020   |
| ENT 770 - 001           | 0.00000 - 1.00000 | 7          | 30 Spring 2018-2019 |
| ENT 790 - 001           | 1.00000 - 6.00000 | 2          | 30 Spring 2018-2019 |

|               |                   |   |                     |
|---------------|-------------------|---|---------------------|
| ENT 790 - 013 | 1.00000 - 6.00000 | 1 | 10 Fall 2018-2019   |
| ENT 767 - 001 | 2.00000 - 2.00000 | 2 | 30 Spring 2017-2018 |
| ENT 770 - 001 | 1.00000 - 1.00000 | 6 | 30 Spring 2017-2018 |
| ENT 790 - 001 | 1.00000 - 6.00000 | 1 | 30 Spring 2017-2018 |
| ENT 395 - 004 | 1.00000 - 3.00000 | 1 | 10 Fall 2017-2018   |
| ENT 767 - 009 | 2.00000 - 2.00000 | 1 | 10 Fall 2017-2018   |
| ENT 790 - 013 | 1.00000 - 6.00000 | 1 | 10 Fall 2017-2018   |
| ENT 767 - 001 | 2.00000 - 2.00000 | 1 | 30 Spring 2016-2017 |
| ENT 790 - 001 | 1.00000 - 6.00000 | 1 | 30 Spring 2016-2017 |
| ENT 767 - 009 | 2.00000 - 2.00000 | 1 | 10 Fall 2016-2017   |

### Teacher Course Evaluations

| Prefix Number - Section | Responses | TCE Course Quality Mean | TCE Teaching Quality Mean | Code Term Year      |
|-------------------------|-----------|-------------------------|---------------------------|---------------------|
| ENT 530 - 001           | 6         | 4.33                    | 4.67                      | 10 Fall 2021-2022   |
| ENT 770 - 001           | 10        | 4.00                    | 4.60                      | 30 Spring 2019-2020 |
| ENT 770 - 001           | 5         | 5.00                    | 5.00                      | 30 Spring 2018-2019 |

Note: With regards to 2020 TCEs please consider the following from page 121 of the UK Playbook for Fall 2020, "It is essential that performance evaluation take into account the extenuating circumstances brought about by the disruption for faculty in all title series and the extraordinary work accomplished by faculty in response to the disruption. Academic leaders shall reiterate that TCEs should be but one indicator of effective teaching in both periodic merit reviews and tenure/promotion decisions. Evaluation of teaching must go beyond student evaluations alone."

## **Theses and Dissertations**

### **Dissertation Committee Chair**

Lauren Fann, Entomology, "Management of the Brown marmorated stink bug," Status: In-Process, Expected Completion Date: December 2019. (May 2016 - Present).

### **Dissertation Committee Co-Chair**

Michael Omodora, Biosystems and Ag. Engineering, "Management of stored grain in Africa," Status: In-Process, Expected Completion Date: December 4, 2021. (January 2019 - December 4, 2020).

Nathan Mercer, Entomology, "Management of Sugarcane Aphid on Sweet Sorghum," Status: Degree Awarded, John Obrycki, Expected Completion Date: December 2020. (May 2015 - May 2020).

Amanda Skidmore, Entomology, "IMPACT OF SELECTED INTEGRATED PEST MANAGEMENT TECHNIQUES ON ARTHROPODS IN CUCURBIT PRODUCTION SYSTEMS," Status: Degree Awarded, Mark Williams. (June 2012 - May 2019).

### **Dissertation Committee Member**

Emrah Ozel, Entomology, "Development of a nudivirus to manage Heliothine pests," Status: In-Process, Just started. (August 2018 - Present).

Karina Gonzales, Entomology, "Insect pest bird interactions on strawberries," Status: In-Process, Expected Completion Date: December 2021. (January 2018 - Present).

Adam Baker, "Conservation Enhancement of Monarch Butterflies," Status: Degree Awarded, Expected Completion Date: December 2020. (May 2015 - May 2020).

Bernadette Mach, Entomology, "BEE CONSERVATION IN URBAN LANDSCAPES: ASSESSING BEE ASSEMBLAGES, BEE-ATTRACTIVENESS, AND NUTRITIONAL VALUE OF WOODY LANDSCAPE PLANTS AND MITIGATING POTENTIAL BEE HAZARD FROM NEONICOTINOID INSECTICIDES," Status: Degree Awarded, Expected Completion Date: May 2018. (August 2013 - May 2018).

Kacie Athey, Entomology, "EXPLORING PREDATOR-PREY INTERACTIONS IN AGROECOSYSTEMS THROUGH MOLECULAR GUT-CONTENT ANALYSIS," Status: Degree Awarded, Expected Completion Date: May 2017. (August 2012 - May 2017).

### **Master's Thesis Committee Chair**

Macy Fawns, Science Technology Outreach, "Master gardener training for county prisoners,"  
Status: Completed,

, Expected Completion Date: December 2020. (January 2019 - December 4, 2020).

### **Master's Thesis Committee Co-Chair**

Yaziri Gonzalez, Entomology, "Management of stink bugs in soybeans," Status: In-Process, Just started., Dr. Villanueva and I are co-advisors.

, Expected Completion Date: December 2020. (August 2018 - Present).

Izabela Gomez, Entomology, "Management of Dectes stem borer in soybeans," Status: Degree Awarded, Just started., Expected Completion Date: December 2019. (August 2017 - December 2019).

### **Master's Thesis Committee Member**

Katie Fiske, Entomology, "Optimizing row cover systems for cucurbit growers in Kentucky,"  
Status: In-Process, Expected Completion Date: December 31, 2021. (January 1, 2020 - Present).

Ryan Kuesel, "Management of Spotted Wing Drosophila," Status: In-Process, Completed two years, Expected Completion Date: December 2022. (August 2017 - Present).

Robby Brockman, Entomology, "Exclusion of Flea Beetles on high value horticultural crops,"  
Status: Completed, Expected Completion Date: December 2020. (August 2018 - December 4, 2020).

Caitlin Stamper, "Evaluation of Entomology Department's web presence and social media,"  
Status: Degree Awarded, Plan B Master's thesis, Expected Completion Date: May 2019.  
(January 2013 - May 2019).

Sarah Preston, Entomology, "TRANSGENERATIONAL STRESS INHERITANCE IN THE HONEY BEE:  
THE IMPACTS OF QUEEN STRESS ON WORKER BEHAVIOR AND HEALTH  
," Status: Degree Awarded, Expected Completion Date: May 2018. (May 2016 - May 2018).

### **Outside examiner**

Luc Dunoyer, Biological Sciences, "Crawfish limb regeneration," Status: Degree Awarded,  
Expected Completion Date: December 2019. (December 2019).

### **Other Credit and Non-Credit Instructional Activities**

#### **Guest Lecture**

Applied Entomology, Participants: Graduate Students,  
Description: IPM  
Capstone course, Participants: Undergraduate Students,  
Description: Insecticide resistance management  
Extension, Participants: Undergraduate Students,  
IPM, Participants: Graduate Students,  
Description: IPM for small farms  
Capstone course, Participants: Undergraduate Students,  
Description: Insecticide resistance management  
Field research techniques, Participants: Graduate Students,  
Capstone course in field crops, Participants: Undergraduate Students,  
Description: Early season insect pests  
fruit crop production, Participants: Undergraduate Students,  
Description: Managing insect pests

## Service

### Department Service

Extension Coordinator, (January 2018 - Present).

#### Committee Chair

Spindletop Facilities committee, (January 1995 - Present).

Extension entomology search committee Chair for One Health Entomologist, (July 2019 - March 15, 2020).

Extension entomology search committee Chair for Extension Entomologist, (January 1, 2019 - July 1, 2019).

Extension search committee for urban, forest and livestock entomologist, (August 2018 - December 1, 2018).

#### Committee Member

Extension entomologist search committee for urban structural / medical specialist, (September 2018 - December 1, 2018).

### College Service

#### Committee Chair

Screening Committee for E5/E6 Area Extension Director, (September 2020 - Present).

Area Extension Director E5/E6 Screening Committee Chair, (September 1, 2020 - November 30, 2020).

College P&T Committee, (July 2017 - June 2019).

### **Committee Member**

Extension public value vetting committee, (January 2016 - Present).

Experiment station Farm Users Committee, (January 2012 - Present).

Vegetable Extension Specialist search committee, (June 2017 - January 2018).

### **Each state has one coordinator for this program**

Pesticide Safety Education Coordinator, (January 2018 - Present).

IPM coordinator, (January 2011 - Present).

IR-4 State Liaison, (January 2005 - Present).

## **University Service**

### **Committee Member**

University Extension Area Committee, (July 2019 - June 2021).

## **Professional Service**

### **Member 2018, Committee Chair 2017**

SERA003, Southern Region Information Exchange Group for IPM, (January 1, 2011 - Present).

### **Committee Member**

ESA, Calendar Committee, (January 2012 - July 2019).

Faisalabad University of Agriculture, Reviewed dissertation of Md. Irfan Akram, (February 2017 - March 2017).

### **Member**

Southeastern Vegetable Extension Workers, Assist with the preparation of the regional vegetable crop handbook each year., (July 31, 2017 - Present).

### **outside reviewer of faculty member being considered for promotion.**

Univ. of Georgia, Outside letter of review for faculty member considered for promotion., (2018).

Oklahoma St University, (2017).

### **Reviewer, Ad Hoc Reviewer**

SARE program, Ad hoc proposal reviewer, (January 2017 - January 2018).

### **Reviewer, Grant Proposal**

Nat. Acad. of Sci., Eng., and Med.: U.S. - Egypt S&T Joint Fund Cycle 20, Reviewed Proposals, (January 23, 2020).

### **Reviewer, Journal Article**

Various scientific journals, (January 1, 2017 - December 31, 2018).

## **Public Service**

### **Committee Member**

KDA, Pollinator protection plan committee, (January 2016 - Present).

### **Volunteer**

eXtension, Serve as an identification specialist for samples submitted electronically from Kentucky., (January 1, 2017 - Present).

## **Professional Development**

### **Professional Memberships**

American Association of Pesticide Safety Educators. National. (January 2018 - Present).

Entomological Society of America. International. (June 1986 - Present).

### **Awards and Honors**

*Outstanding Specialist Award*, Kentucky Association of County Agricultural Agents. Service, Professional, Recognition Award, State. (June 26, 2019).

### **Licensures and Certifications**

#### **Certification**

Noncommercial Certified Pesticide Applicator, Number: 1717658, KDA, KY. (May 1991 - Present).

# Dr. Zachary C. DeVries

College of Agriculture, Food and Environment  
Department of Entomology

## Education

2017 **Doctor of Philosophy**, Entomology. North Carolina State University, Raleigh, NC

*Dissertation*: Biology, behavior, and management of urban pests

2013 **Master of Science**, Entomology. Auburn University, Auburn, AL

*Thesis*: Respiratory physiology of urban insects

2011 **Bachelor of Science**, Zoology (Summa Cum Laude). Auburn University, Auburn, AL

*Minor*: Statistics

## Work History

2019-present **Assistant Professor**. Department of Entomology, the University of Kentucky, Lexington, KY

2019 **Research Assistant Professor**. Department of Entomology and Plant Pathology, North Carolina State University, Raleigh, NC. Mentored by Dr. Coby Schal

2018-2019 **Postdoctoral Research Scholar**. Department of Entomology and Plant Pathology, North Carolina State University, Raleigh, NC. Mentored by Dr. Coby Schal

2013-2017 **Graduate Research and Teaching Assistant**. Department of Entomology and Plant Pathology, North Carolina State University, Raleigh, NC. Advised by Dr. Coby Schal

2011-2013 **Graduate Research Assistant**. Department of Entomology and Plant Pathology, Auburn University, Auburn, AL. Advised by Dr. Arthur Appel

## Research and Scholarship

### Intellectual Contributions

\* = Senior Author    ~ = Corresponding Author    + = Grad/Prof Student    # = Post Doc    ^ = Undergraduate

WOS = Web of Science    JIF = Journal Impact Factor    TC = Journal Total Cites

SNIP = Source Normalize Impact per Paper    SJR = Scimago Journal Rank

### Published

#### Book, Chapter in Scholarly Book-New

Schal, C., DeVries, Z. C. (2021). Public health and veterinary importance of the German cockroach

*Biology and Management of the German Cockroach* Melbourne, Victoria, CSIRO Publishing, 304.

Author Role:

Dr. DeVries wrote half of this chapter and reviewed the entire chapter.

#### Journal Article, Academic Journal



# Gaire, S., \* ~ DeVries, Z. C., Mick, R., Santangelo, R., Bottillo, G., Camera, E., Schal, C. (2021). Human skin triglycerides prevent bed bug (*Cimex lectularius* L.) arrestment, *Scientific Reports*, 11, 22906. doi: 10.1038/s41598-021-01981-1

Author Role:

Dr. DeVries designed the study, conducted the experiments, and co-wrote the paper. Dr. DeVries serves as a co-first authors (both he and Dr. Gaire contributed equally to this work).

Saveer, A. M., DeVries, Z. C., Santangelo, R. G., Schal, C. (2021). Mating and starvation modulate feeding and host-seeking responses in female bed bugs, *Cimex lectularius*, *Scientific Reports*, 11(1). doi: 10.1038/s41598-021-81271-y

Author Role:

Dr. DeVries designed the study and co-wrote the manuscript.

Gonzalez-Morales, M., DeVries, Z. C., Sierras, A., Santangelo, R., Kakumanu, M., Schal, C. (2021). Resistance to Fipronil in the Common Bed Bug, *Cimex lectularius* (Hemiptera: Cimicidae) Annapolis, MD, *Journal of Medical Entomology*, 58(4), 1798-1807. doi: 10.1093/jme/tjab040

Author Role:

Dr. DeVries designed the study, assisted Maria González-Morales with experiments and data analysis, and reviewed the manuscript.

Kakumanu, M. L., DeVries, Z. C., Barbarin, A. M., Santangelo, R. G., Schal, C. (2020). Bed bugs shape the indoor microbial community composition of infested homes Amsterdam, *SCIENCE OF THE TOTAL ENVIRONMENT*, 743, 140704. doi: 10.1016/j.scitotenv.2020.140704

Author Role:

Dr. DeVries designed the study, conducted the field work, assisted in writing the manuscript, and reviewed the manuscript.

~ DeVries, Z. C., Santangelo, R. G., Booth, W., Lawrence, C. G., Balvin, O., Bartonicka, T., Schal, C. (2020). Reproductive compatibility among populations and host-associated lineages of the common bed bug (*Cimex lectularius* L.) Hoboken, NJ, *ECOLOGY AND EVOLUTION*, 10(20), 11090-11099. doi: 10.1002/ece3.6738

Author Role: Dr. DeVries designed the study, conducted the experiments, analyzed the data, and wrote the manuscript.

# ~ Gaire, S., Mick, R., Schal, C., \* DeVries, Z. C. (2020). The role of antennae in heat detection and feeding behavior in the bed bug (*Cimex lectularius* L.).

Annapolis, MD, *JOURNAL OF ECONOMIC ENTOMOLOGY*, 113(6), 2858-2863. doi: 10.1093/jee/toaa250

Author Role:

Dr. DeVries designed the study, conducted the experiments, analyzed the data, and co-wrote the manuscript with Dr. Gaire

#### **Journal Article, Professional Journal**

Coyle, D., Brosius, T., DeVries, Z. C., Schmidt-Jeffris, R., Gott, R. C., Loudon, C., Saguez, J., Simonsen, T., Van Den Berg, J., McDonnell, R., Ronai, I., Zhu, L., Siebert, M., Wessels, F., Hamm, R., Higgins, L., Thompson, S., Serikawa, R., Spomer, N., Spencer, J. (2020). COVID-19:

Reflections from entomologist who rose to the occasion Annapolis, MD, *AMERICAN ENTOMOLOGIST*, 66(3), 34-51.

## **Sponsored Projects**

### **Awarded**

DeVries Z., C., Histamine in homes: Exposure risks and health effects, Sponsored by Office of the Director Submitted: January 22, 2020. Funding Dates: September 16, 2019 - August 31, 2024. | Awarded: \$1,035,230.00

OSPA ID: 202001221013

DeVries Z., C., Cockroach Eradication through Community Engagement: Empowering Residents to Improve their Health, Sponsored by Department of Housing and Urban Development Submitted: June 12, 2020. Funding Dates: January 4, 2021 - January 3, 2024. Requested: \$400,000.00, | Awarded: \$400,000.00

OSPA ID: 202006120908

DeVries Z., C., Gaire S., PostDoct Student, The Perfect Meal: Determining How Age and Humidity Effect Cockroach Gel Bait Performance, Sponsored by Pest Management Foundation Submitted: July 2, 2020. Funding Dates: November 1, 2020 - October 31, 2022. Requested: \$21,153.00, | Awarded: \$21,309.00

Description: My post-doc (Dr. Sudip Gaire) serves as a co-PI on this funded project.

OSPA ID: 202007020832

### **Closed**

DeVries Z., C., Testing of Velifer Fungal Contact Insecticide (registered), and PT Vedira® Pressurized Insecticide (unregistered), Sponsored by BASF Corporation Submitted: September 23, 2020. Funding Dates: August 13, 2020 - June 30, 2021. | Awarded: \$12,060.00

OSPA ID: 202009231224

### **Not Funded**

Rittschof C., C., Sullivan P., G., Fan W.-M., T., DeVries Z., C., Syed Z., Breath to Brain: Metabolic Regulation of Foraging and Defensive Behaviors in the Honey Bee, Sponsored by National Science Foundation Submitted: June 7, 2020. Requested: \$757,828.00, | Awarded: \$0.00

OSPA ID: 202006071021

DeVries Z., C., Gordon J., Grad/Prof Student, Histamine Stability in Homes (Diversity Supplement), Sponsored by National Institute of Health Submitted: July 2, 2020. Requested: \$111,570.00, | Awarded: \$0.00

OSPA ID: 202007020831

DeVries Z., C., Indoor Pests and Public Health: Exposure Risks and Mitigation Strategies, Sponsored by Searle Scholars Program Submitted: September 12, 2020. Requested: \$300,000.00, | Awarded: \$0.00

OSPA ID: 202009120907

### **Pending**

DeVries Z., C., Evaluation of Beauveria bassiana (Apprehend) as an Alternative to the Organophosphate dichlorvos (Nuvan ProStrips) for Bed Bug (*Cimex lectularius*) Control, Sponsored by Washington State Commission on Pesticide Registrations Submitted: April 21, 2022. | Awarded: \$0.00

OSPA ID: 202204211204

DeVries Z., C., NRSA Fellowship for Johnalyn Gordon: Impacts of the Indoor Home Environment on German Cockroach Allergens: Implications for Asthma Risk Assessment, Sponsored by

National Institute of Health Submitted: April 1, 2022. | Awarded: \$0.00  
OSPA ID: 202204011417

## **Non-Sponsored Projects**

### **Federal**

#### **Not Funded**

DeVries, Z. C., Gaire, S. (Co-Principal), Insecticide resistance development under complex selection pressure, The Center for Arthropod Management Technologies (CAMTech), National Science Foundation I/UCRC. Awarded: \$159800.

Description: Invited to submit full proposal, but full proposal was not funded. Intend to re-submit in 2022. This proposal was written in collaboration with my postdoc, Dr. Sudip Gaire (co-PI)

### **Hatch**

#### **On-going**

Cockroach Control and Allergen Reduction in Affordable Housing, (July 13, 2021 - September 30, 2025).

### **Industrial/Trade**

#### **On-going**

DeVries, Z. C., Urban Entomology Program Funds, Bayer, (2021). Awarded: \$20000.

Description: This money has been donated to my program for research on urban pest biology, behavior, and management.

DeVries, Z. C., Urban Entomology Program Funds, Control Solutions Inc. (CSI), (2021). Awarded: \$10000.

Description: This money has been donated to my program for research on urban pest biology, behavior, and management.

DeVries, Z. C., Urban Entomology Program Funds, FMC, (2021). Awarded: \$18585.

Description: This money has been donated to my program for research on urban pest biology, behavior, and management.

DeVries, Z. C., Urban Entomology Program Funds, Syngenta, (2021). Awarded: \$49843.

Description: This money has been donated to my program for research on urban pest biology, behavior, and management.

DeVries, Z. C., Urban Entomology Program Funds, Bayer, (2020). Awarded: \$85000.

Description: This money has been donated to my program for research on urban pest biology, behavior, and management.

DeVries, Z. C., Urban Entomology Program Funds, Bed Bug Central, (2020). Awarded: \$2100.

Description: This money has been donated to my program for research on urban pest biology, behavior, and management

DeVries, Z. C., Urban Entomology Program Funds, Control Solutions Inc. (CSI), (2020). Awarded: \$18000.

Description: This money has been donated to my program for research on urban pest biology, behavior, and management.

DeVries, Z. C., Urban Entomology Program Funds, Syngenta, (2020). Awarded: \$17000.

Description: This money has been donated to my program for research on urban pest biology, behavior, and management.

## **Presentations Given**

### **Invited Speaker**

DeVries Z. C., (November 2021). Bed bugs and histamine: Emerging health concerns from a resurged indoor pest Entomological Society of American Meeting, Entomological Society of America, Denver, CO, United States. Invited, International.

DeVries Z. C., (October 2021). Indoor Insects: Pesticides, Allergens, and Emerging Contaminants Children's Environmental Health Summit, Kentucky Population Health Institute and the Kentucky Department of Public Health, United States. Invited, Regional.

DeVries Z. C., (March 2021). Pesticides, Allergens, and Emerging Contaminants Departmental Seminar, Department of Entomology, University of Georgia, United States. Invited, Department.

### **Podium Session**

Gaire S., Gordon J., DeVries Z. C., (November 2021). Common bed bugs possess a robust ability to produce histamine Entomological Society of American Meeting, Entomological Society of America, Denver, CO, United States. Accepted, International.

Kakumanu M., DeVries Z. C., Schal C., (November 2021). Detection of cockroach allergens, monitoring their levels and mitigation strategies to reduce allergen levels in infested areas Entomological Society of American Meeting, Entomological Society of America, Denver, CO, United States. Accepted, International.

Gonzalez-Morales M., DeVries Z. C., Sierras A., Santangelo R., Kakumanu M., Schal C., (November 2021). Resistance to Fipronil in the Common Bed Bug (Hemiptera: Cimicidae) Entomological Society of American Meeting, Entomological Society of America, Denver, CO, United States. Accepted, International.

Gaire S., Gordon J., DeVries Z. C., (October 2021). Common bed bugs possess a robust ability to produce histamine University of Kentucky Society of Postdoctoral Scholars Symposium, University of Kentucky, Lexington, KY, United States. Accepted, University.

Gordon J., Santangelo R., Gonzalez-Morales M., Menechella M., Schal C., DeVries Z. C., (June 2021). Histamine distribution in bed bug (Hemiptera: Cimicidae) infested homes Entomological Society of America North Central Branch Meeting, Entomological Society of America, United States. Accepted, Regional.

Gaire S., Gordon J., DeVries Z. C., (June 2021). Histamine production by the common bed bug (*Cimex lectularius* L.) Entomological Society of America North Central Branch Meeting, Entomological Society of America, United States. Accepted, Regional.

Gordon J., Santangelo R., Gonzalez-Morales M., Menechella M., Schal C., DeVries Z. C., (May 2021). Characterization of the spatial distribution of histamine in bed bug infested homes National Conference on Urban Entomology, National Conference on Urban Entomology, United States. Accepted, National.

Gonzalez-Morales M., DeVries Z. C., Sierras A., Santangelo R., Kakumanu M., Schal C., (May 2021). Resistance to Fipronil in the Common Bed Bug, *Cimex lectularius* L. National Conference on Urban Entomology, National Conference on Urban Entomology, United States. Accepted, National.

### Poster Session

Principato S., DeVries Z. C., (November 2021). Evaluation of the ability of arthropods to contaminate the indoor environment with histamine Entomological Society of American Meeting, Entomological Society of America, Denver, CO, United States. Accepted, International.

DeVries Z. C., Gordon J., Gaire S., Principato S., Sierras A., Santangelo R., Gonzalez-Morales M., Menechella M., Schal C., (June 2021). Bed bugs: An emerging threat to public Health? NIH High-Risk, High-Reward Research Symposium, The National Institutes of Health Common Fund, United States. Accepted, National.

## Extension

### Extension Publications & Media

\* = Senior Author    ~ = Corresponding Author    + = Grad/Prof Student    # = Post Doc    ^ = Undergraduate

#### **Published**

#### **Non Peer-Reviewed Creative Work**

#### **Newsletter**

Larson, J., DeVries, Z. C. (2021). Bugs and other things that make you itch Lexington, KY, *UK CAFE*.

DeVries, Z. C. (2021). Managing Mosquitoes in Kentucky Lexington, KY, *Kentucky Pest News*.

DeVries, Z. C. (2021). Pest-Proofing Your Home Lexington, KY, *Kentucky Pest News*.

DeVries, Z. C. (2020). Pest Control and COVID-19 Lexington, KY, *Kentucky Pest News*.

DeVries, Z. C. (2020). Pest-Proofing Your Home Lexington, KY, *Kentucky Pest News*.

DeVries, Z. C. (2020). Time for Termites! Lexington, KY, *Kentucky Pest News*.

#### **Non Peer-Reviewed Research Publications**

#### **Extension Publication- Non-numbered, Original Content**

DeVries, Z. C. (2020). A PMP's Guide to COVID-19 Lexington, KY, *ENTfacts*, 2.

DeVries, Z. C. (2020). Pest Control and COVID-19 Lexington, KY, *ENTfacts*, 1.

## Extension Education & Training Programs

### Farm Visit or Consultation

**Task force member.** UK Graduate and Family Housing Indoor Pest Discussion. (October 2020 - Present). Scope: County. Participants: 5 Interest group members.

Description: Provided feedback on current pest control problems and practices, reviewed current contract, and working with all parties to identify and correct ongoing pest problems

**Other.** Pest Control in Bourbon Warehouses. (December 2020). Scope: State. Participants: 2 Industry professionals.

Description: Inspected bourbon warehouses for cockroaches, identified the species of interest, and provided management recommendation to the pest control company involved.

**Other.** Pest Control Company Visit. (February 2020). Scope: County. Participants: 4.

Description: Visited All-Rite Pest Control, spoke about current challenges/opportunities in pest management, and rode along with one of the technicians to provide feedback on methods used.

**Other.** Pest Control Company Visit. (February 2020). Scope: County. Participants: 10 Industry professionals.

Description: Visited IPM Pest and termite, spoke about current challenges/opportunities in pest management, and rode along with one of the technicians to provide feedback on methods used.

### Other Extension Presentation

**Other.** Kentucky Department of Agriculture Licensed Pest Control Operators (LPCO) Exam. (2021). Scope: State. Participants: 50 Industry professionals.

Description: Updated and administered the LPCO exam (July, November), which consists of 260 multiple choice questions and 40 specimen identification questions.

**Other.** Kentucky Department of Agriculture Pest Control Advisory Board-Pesticide Application Regulation Working Group. (2021). Scope: State. Participants: 10 Industry professionals.

Description: Served on a working group to revise pesticide application regulations based on guidance from the EPA and new Kentucky Statue passed into law in 2021.

**Other.** Kentucky Department of Agriculture Licensed Pest Control Operators (LPCO) Exam. (2020). Scope: State. Participants: 40 Industry professionals.

Description: Updated and administered the LPCO exam (July, November), which consists of 260 multiple choice questions and 40 specimen identification questions.

**Other.** Kentucky Department of Agriculture Structural Fumigation Exam. (2020). Scope: State. Participants: 3 Industry professionals.

Description: Coordinated the complete redesign of this exam, which was >40 years old and contained outdated material

### Seminar

**Invited speaker.** Bed Bugs and Cockroaches-What's New? (November 2021). Scope: Multi-state. States: 8. Participants: 430 Industry professionals. Number of Times Given: 1

Description: Presented general information on bed bug and cockroach biology, behavior, health impacts, and management to pest management professionals.

**Accepted speaker.** Evaluation of histamine production in common indoor arthropods.

(November 2021). Scope: International. Participants: 30 Industry professionals. Number of Times Given: 1

Description: Assisted graduate student (Simona Principato) in providing a presentation on her work to pest management professionals.

**Accepted speaker.** German cockroach bait consumption and foraging. (November 2021). Scope: International. Participants: 30 Industry professionals. Number of Times Given: 1  
Description: Assisted graduate student (Isabelle Lucero) in providing a presentation on her work to pest management professionals.

**Program organizer.** The University of Kentucky Pest Control Short Course. (November 2021). Scope: Multi-state. States: 8. Participants: 430 Industry professionals. Number of Times Given: 1  
Description: Designed and coordinated an in-person and online training meeting for pest control operators in Kentucky and surrounding states. This meeting involved 15 1-hour talks from speakers around the country and provided training for >430 pest control operators and awarded >6,300 CEUs, ensuring safe and continual operation of pest management professionals.

**Invited speaker.** Think like a cockroach. (July 2021). Scope: State. Participants: 230 Industry professionals. Number of Times Given: 1  
Description: Presented general information on cockroach biology, behavior, health impacts, and management to pest management professionals.

**Invited speaker.** Bed Bug Biology and Control. (March 2021). Scope: State. Participants: 150 Industry professionals. Number of Times Given: 2  
Description: Presented general information on bed bug biology, behavior, health impacts, and management to pest management professionals.

**Invited speaker.** Bed Bug Management. (February 2021). Scope: State. Participants: 300 Industry professionals. Number of Times Given: 1  
Description: Presented general information on bed bug biology, behavior, health impacts, and management to pest management professionals.

**Invited speaker.** Cockroaches. (January 2021). Scope: State. Participants: 350 Industry professionals. Number of Times Given: 1  
Description: Presented general information on cockroach biology, behavior, health impacts, and management to pest management professionals.

**Invited speaker.** Bed Bugs. (December 2020). Scope: Multi-state. States: 5. Participants: 70 Industry professionals.  
Description: Presented on the biology, behavior, and control of bed bugs.

**Invited speaker.** Roaches. (December 2020). Scope: Multi-state. States: 5. Participants: 70 Industry professionals.  
Description: Presented on the biology, behavior, and control of cockroaches

**Invited speaker.** Understanding the Full Potential of Bed Bugs as an Important Public Health Pest. (December 2020). Scope: International. Participants: 200 Industry professionals.  
Description: Presented on the health risks associated with bed bugs.

**Program organizer.** The University of Kentucky Online Pest Control Training Series. (October 2020 - December 2020). Scope: Multi-state. States: 12. Participants: 430 Industry professionals.  
Description: Due to the need to cancel the University of Kentucky Pest Control Short Course, and restriction due to COVID-19, we developed a webinar series to provide training and continuing education units (CEUs) for general pest management (category 7A). To provide opportunities for credits while also protecting the health and safety of pest control operators, we offered a total of 16 credits to PCOs in Kentucky and surrounding states could maintain their certification.

**Invited speaker.** Bed Bug Biology and Control. (November 2020). Scope: State. Participants: 64 Industry professionals.

Description: Presented on the biology, behavior, and control of bed bugs

**Invited speaker.** Cockroach 101: Back to the Basics. (November 2020). Scope: Multi-state. States: 12. Participants: 430 Industry professionals.

Description: Presented on the biology, behavior, and control of cockroaches

**Invited speaker.** Fall Invaders and Pest Proofing. (November 2020). Scope: State. Participants: 60 County agents/ specialists.

Description: Provided practical information that can be given to homeowners when facing fall invading insect problems.

**Invited speaker.** The Allergenic Threats of Insects. (October 2020). Scope: International. Participants: 38 Industry professionals.

Description: Presented on the health risks associated with bed bugs and cockroaches

**Invited speaker.** Everything You Never Thought You Wanted to Know About Bed Bugs. (July 2020). Scope: State. Participants: 35 Interest group members.

Description: Presented on information on bed bug biology, behavior, and control for a general audience.

**Invited speaker.** Cockroaches-A return to the basics. (April 2020). Scope: National. Participants: 100 Industry professionals.

Description: Presented on the biology, behavior, and control of cockroaches

**Invited speaker.** Do-it-Yourself Pest Control: Bug Bombs and Cockroaches. (January 2020). Scope: State. Counties: 5. States: 3. Participants: 200 Industry professionals. Number of Times Given: 2

Description: Presented general information on DIY pest control and why it is a problem for the professional pest management industry and residents who lack proper training.

## **Workshop**

**Program organizer.** The University of Kentucky Technical Director's Retreat. (September 2021). Scope: Multi-state. States: 10. Participants: 20 Industry professionals.

Description: Hosted a meeting for pest control company technical directors from around the country to discuss the future and current needs of pest control, and how research can be utilized to address these needs.

## **Professional Service Committee Member**

Kentucky Department of Agriculture, Pest Control Advisory Board, (2020 - Present).

Kentucky Pest Control Education Fund, Advisory Board, (2020 - Present).

## **Public Service Program Organizer**

Curiosity Fair, University of Kentucky, (2021).

## **Media Contributions**



## Internet

"Vermont Public Radio." (2021). Provide contextual information regarding the never ending cycle of urban pests in low-income housing, along with ideas to address this problem.

**VPR:**

<https://www.vpr.org/vpr-news/2021-11-03/roaches-and-broken-locks-mark-and-rick-boves-growing-empire-of-affordable-rentals-vexes-code-enforcers>.

"New stinging ant species could cause problems for Kentuckians." (2020). Interviews on the Asian Needle Ant, a new invasive species in Kentucky

**UK Now:**

<https://uknow.uky.edu/research/new-stinging-ant-species-could-cause-problems-kentuckians>

**Phys.org:** <https://phys.org/news/2020-06-ant-species-problems-kentuckians.html>

**Northern Kentucky Tribune:**

<https://www.nkytribune.com/2020/06/uk-entomologists-say-new-stinging-ant-species-could-cause-problems-for-kentuckians/>

**West Kentucky Star:**

<https://www.westkentuckystar.com//News/State/Kentucky/Stinging-Ants-Could-Cause-Problems-in-Kentucky.aspx>. Lexington, KY, United States.

"University of Kentucky COVID-19 Guide for PCTs." (2020). Recommendations for pest control professionals on how to operate during the pandemic.

**PCT:** <https://www.pctonline.com/article/university-kentucky-covid-19-guide/>. United States.

## Newspaper

"Lexington Herald Leader." (2020). Interviews on the Asian Needle Ant, a new invasive species in Kentucky. Lexington, KY, United States.

# Teaching

## Teaching

| Prefix Number - Section | Credit Hours      | # Enrolled | Code Term Year      |
|-------------------------|-------------------|------------|---------------------|
| ENT 767 - 002           | 2.00000 - 2.00000 | 1          | 30 Spring 2021-2022 |
| ENT 768 - 006           | 1.00000 - 6.00000 | 1          | 30 Spring 2021-2022 |
| ENT 780 - 002           | 2.00000 - 3.00000 | 2          | 30 Spring 2021-2022 |
| ENT 790 - 002           | 1.00000 - 6.00000 | 2          | 30 Spring 2021-2022 |
| ENT 767 - 003           | 2.00000 - 2.00000 | 1          | 10 Fall 2021-2022   |
| ENT 768 - 003           | 1.00000 - 6.00000 | 1          | 10 Fall 2021-2022   |
| ENT 780 - 005           | 2.00000 - 3.00000 | 1          | 10 Fall 2021-2022   |
| ENT 790 - 003           | 1.00000 - 6.00000 | 1          | 10 Fall 2021-2022   |

|               |                   |    |                     |
|---------------|-------------------|----|---------------------|
| ENT 770 - 201 | 0.00000 - 1.00000 | 10 | 30 Spring 2020-2021 |
| ENT 780 - 006 | 2.00000 - 3.00000 | 1  | 30 Spring 2020-2021 |
| ENT 790 - 006 | 1.00000 - 6.00000 | 3  | 30 Spring 2020-2021 |
| ENT 780 - 009 | 2.00000 - 3.00000 | 1  | 10 Fall 2020-2021   |
| ENT 790 - 008 | 1.00000 - 6.00000 | 1  | 10 Fall 2020-2021   |

## Teacher Course Evaluations

| Prefix Number - Section | Responses | TCE Course Quality Mean | TCE Teaching Quality Mean | Code Term Year      |
|-------------------------|-----------|-------------------------|---------------------------|---------------------|
| ENT 770 - 201           | 8         | 4.75                    | 5.00                      | 30 Spring 2020-2021 |

Note: With regards to 2020 TCEs please consider the following from page 121 of the UK Playbook for Fall 2020, "It is essential that performance evaluation take into account the extenuating circumstances brought about by the disruption for faculty in all title series and the extraordinary work accomplished by faculty in response to the disruption. Academic leaders shall reiterate that TCEs should be but one indicator of effective teaching in both periodic merit reviews and tenure/promotion decisions. Evaluation of teaching must go beyond student evaluations alone."

## Theses and Dissertations

### Dissertation Committee Chair

Simona Principato, Entomology, "TBD," Status: In-Process, Expected Completion Date: May 2025. (January 2021 - Present).

Johnalyn Gordon, Entomology, "TBD," Status: In-Process, Awards: Pest Management Foundation Scholarship (2021, \$2000); Pi Chi Omega Alain VanRyckeghem Scholarship (2021, \$2000); College of Agriculture, Food and Environment Karri Casner Environmental Sciences Fellowship (2021, \$1800); ESA MUVE Travel Award (2021, \$500); Larry Larson Graduate Student Award for Leadership in Applied Entomology, ESA (2021, \$1000)., Expected Completion Date: July 2024. (August 2020 - Present).

### Master's Thesis Committee Chair

Isabelle Lucero, Entomology, "TBD," Status: In-Process, Awards: College of Agriculture, Food and Environment Diversity Research & Teaching Fellowship (2021-2022, \$11,000)., Expected Completion Date: May 2023. (January 2021 - Present).

### Master's Thesis Committee Member

Sarah Latyn, Entomology, "TBD," Status: In-Process, MS plan B student (online). (2021 - Present).

Paul Baker, Entomology, "AGGREGATION BEHAVIOR IN THE BED BUG, CIMEX LECTULARIUS L.," Status: Degree Awarded. (2019 - 2020).

## **Directed Student Learning (excluding theses, dissertations)**

Sudip Gaire. Postdoctoral Supervision. . In-Process (June 2020 - Present).

Description: Advised in urban entomology research and extension. Awards: Entomological Society of America (ESA) Medical, Urban and Veterinary Entomology (MUVE) Early Career Award (2021, \$500); 1st place Oral Presentation, University of Kentucky Society of Postdoctoral Scholars Symposium (2021, \$300).

Angela Sierras. Research Supervision. . In-Process (May 2020 - Present).

Description: Advised a research scientist in my lab.

## **Academic Advising**

2021-2022, 2 undergraduate students advised, 3 graduate student advised, Trained students on various urban entomology projects, with emphasis on the scientific method, insect rearing, analytical techniques (GC-MS, ELISA), scientific writing, professional development, and result dissemination (presentations and publications).

2020-2021, 1 graduate student advised, Training new student and familiarizing her with the lab.

## **Program and Curriculum Development**

**2020**

Program/Curriculum Name - Entomology special topics course development (ENT 770-Delusionary Parasitosis)

Description: Developed syllabus with co-instructor and designed lectures/weekly interactive materials.

## **Other Credit and Non-Credit Instructional Activities**

### **Guest Lecture**

Insects Affecting Human and Animal Health, Participants: Graduate Students, 16, (2021)

Description: The health effects of bed bugs and cockroaches

Integrated Pest Management, Participants: Graduate Students, 12, (2021)

Description: Urban entomology-integrated pest management

Insects Affecting Human and Animal Health, Participants: Graduate Students, 9, (2020)

Description: The health effects of bed bugs and cockroaches

## **Service**

### **Department Service**

#### **Committee Member**

Planning Committee, (2019 - Present).

## University Service

### Committee Member

The University of Kentucky Center for Appalachian Research in Environmental Sciences (UK CARES) Renewal Working Group, (2020).

## Professional Service

### Committee Member

Entomological Society of America (ESA), Judge for the Henry and Sylvia Richardson Research Grant Award, (2020 - Present).

### Editor, Associate Editor

Journal of Economic Entomology, Associate Editor, (2020 - Present).

### Reviewer, Ad Hoc Reviewer

Alabama Agricultural Experiment Station, Hatch Proposal External Review, (2021).

Academic Journals, Reviewer (Journal of Economic Entomology - 3; Journal of Medical Entomology - 1), (2020).

### Reviewer, Conference Paper

Entomological Society of America (ESA), Judge for the North Central Branch Meeting Student Competition, (2021).

## Media Contributions

### Internet

"UK Entomologists: Human Skin Lipids Repel Bed Bugs." (2021). Media coverage of our bed bug publication [Human skin triglycerides prevent bed bug (*Cimex lectularius* L.) arrestment; *Scientific Reports*]:

#### UK Now:

<http://uknow.uky.edu/research/uk-entomologists-human-skin-lipids-repel-bed-bugs>

#### PCT:

<https://www.pctonline.com/article/university-kentucky-bed-bug-human-skin-lipid-research/>

#### PMP:

<https://www.mypmp.net/2021/12/09/uk-study-finds-bed-bugs-not-fans-of-human-skin/>

**Phys.org:** <https://phys.org/news/2021-12-human-skin-lipids-repel-bed.html>

**ABC-WTVQ:** <https://www.wtvq.com/uk-researchers-find-human-skin-lipids-repel-bed-bugs/>

#### Kentucky Today:

[https://www.kentuckytoday.com/news/researchers-have-break-thru-in-controlling-bed-bugs/article\\_f6ad5104-5919-11ec-a732-375ce9c8d421.html](https://www.kentuckytoday.com/news/researchers-have-break-thru-in-controlling-bed-bugs/article_f6ad5104-5919-11ec-a732-375ce9c8d421.html)

#### ZME Science:

<https://www.zmescience.com/science/natural-bedbugs-repellants-human-skin-8352461/>

**Sci News:**

<http://www.sci-news.com/biology/human-skin-triglycerides-bed-bugs-10353.html>

**Exterminator News:**

<https://exterminatornews.com/university-of-kentucky-research-human-skin-lipids-repel-bed-bugs-pct/>

**Pest Control Daily News:**

<https://pestcontroldailynews.com/university-of-kentucky-research-human-skin-lipids-repel-bed-bugs-pct/>.

## Professional Development

### Professional Memberships

The University of Kentucky Center for Health Equity Transformation. University. (2021 - Present).

The University of Kentucky Center for Appalachian Research in Environmental Sciences. University. (2020 - Present).

Entomological Society of America. International. (2012 - Present).

### Development Activities Attended

#### Workshop

Lunch & Learn: Exploring the NIH Diversity Supplement: An Underutilized Tool for Health Research Teams. (2021). University of Kentucky. National. Lexington, KY, United States. Overview of NIH Diversity supplements.

US HUD Brownbag Series - Urban Pest Management. (2021). US HUD.

CAFE Promotion and Tenure Workshop. (February 28, 2020). CAFE. College. Lexington, KY, United States. Overview of the P&T process.

CAFE Lunch and Learn - National Center for Faculty Development and Diversity with Dr. Katie Cardarelli. (January 23, 2020). CAFE. College. Lexington, KY, United States. Informational session on faculty development

CAFE Extension Orientation. (January 21, 2020 - January 22, 2020). CAFE. College. Lexington, KY, United States. Orientation on extension for agents and specialists.

### Awards and Honors

*CAFE Bobby Pass Excellence in Grantsmanship Award*, University of Kentucky, College of Agriculture. Scholarship/Research/Creative, Recognition Award, College. (2021).

*Wethington Award*, University of Kentucky, College of Agriculture. Scholarship/Research/Creative, Wethington Research Excellence Award, College. (2021).

*Wethington Award*, University of Kentucky, College of Agriculture. Scholarship/Research/Creative, Wethington Research Excellence Award, College. (2020).

# Dr. Stephen L. Dobson

College of Agriculture, Food and Environment  
Department of Entomology

## Education

1996- Ph.D. Entomology, University of California, Berkeley

1990- B.S. Entomology, Clemson University

## Work History

1998- present Department of Entomology, University of Kentucky, KY

1996 - 1998 Postdoctoral Research Associate; Department of Epidemiology and Public Health,  
Yale University; New Haven, CT

## Research and Scholarship

### Intellectual Contributions

\* = Senior Author    ~ = Corresponding Author    + = Grad/Prof Student    # = Post Doc    ^ = Undergraduate

WOS = Web of Science JIF = Journal Impact Factor    TC = Journal Total Cites

SNIP = Source Normalize Impact per Paper    SJR = Scimago Journal Rank

### Published

#### Journal Article, Academic Journal

Aryaprema, V. S., Qualls, W. A., Dobson, K. L., Dobson, S. L., Xue, R. D. (2022). The effects of boric acid sugar bait on wolbachia trans-infected male aedes albopictus (Zap males®) in laboratory conditions, *Insects*, 13(1). doi: 10.3390/insects13010001

Crawford, J. E., Clarke, D. W., Criswell, V., Desnoyer, M., Cornel, D., Deegan, B., Gong, K., Hopkins, K. C., Howell, P., Hyde, J. S., Livni, J., Behling, C., Benza, R., Chen, W., Dobson, K. L., Eldershaw, C., Greeley, D., Han, Y., Hughes, B., Kakani, E., Karbowski, J., Kitchell, A., Lee, E., Lin, T., Liu, J., Lozano, M., MacDonald, W., Mains, J. W., Metlitz, M., Mitchell, S. N., Moore, D. J., Ohm, J. R., Parkes, K., Porshnikoff, A., Robuck, C., Sheridan, M., Sobecki, R., Smith, P., Stevenson, J., Sullivan, J., Wasson, B., Weakley, A. M., Wilhelm, M., Won, J., Yasunaga, A., Chan, W. C., Holeman, J., Snoad, N., Upson, L., Zha, T., Dobson, S. L., Mulligan, F. S., Massaro, P., White, B. J. (2020). Efficient production of male Wolbachia-infected Aedes aegypti mosquitoes enables large-scale suppression of wild populations, *Nature Biotechnology*, 38(4), 482-492. doi: 10.1038/s41587-020-0471-x

Mains, J. W., Kelly, P. H., Dobson, K. L., Petrie, W. D., Dobson, S. L. (2019). Localized Control of Aedes aegypti (Diptera: Culicidae) in Miami, FL, via Inundative Releases of Wolbachia-Infected Male Mosquitoes, *Journal of Medical Entomology*, 56(5), 1296-1303. doi: 10.1093/jme/tjz051

- Brelsfoard, C. L., Mains, J. W., Mulligan, S., Cornel, A., Holeman, J., Klueh, S., Leal, A., Hribar, L. J., Morales, H., Posey, T., Dobson, S. L. (2019). *Aedes aegypti* males as vehicles for insecticide delivery, *Insects*, 10(8). doi: 10.3390/insects10080230
- Telschow, A., Grziwotz, F., Crain, P., Miki, T., Mains, J. W., Sugihara, G., Dobson, S. L., Hsieh, C.-h. (2017). Infections of *Wolbachia* may destabilize mosquito population dynamics, *JOURNAL OF THEORETICAL BIOLOGY*, 428, 98-105. doi: 10.1016/j.jtbi.2017.05.016
- Suh, E., Mercer, D. R., Dobson, S. L. (2017). Life-shortening *Wolbachia* infection reduces population growth of *Aedes aegypti*, *ACTA TROPICA*, 172, 232-239. doi: 10.1016/j.actatropica.2017.05.015
- Mains, J. W., Brelsfoard, C. L., Rose, R. I., Dobson, S. L. (2016). Female Adult *Aedes albopictus* Suppression by *Wolbachia*-Infected Male Mosquitoes, *SCIENTIFIC REPORTS*, 6. doi: 10.1038/srep33846
- Suh, E., Fu, Y., Mercer, D. R., Dobson, S. L. (2016). Interaction of *Wolbachia* and Bloodmeal Type in Artificially Infected *Aedes albopictus* (Diptera: Culicidae), *JOURNAL OF MEDICAL ENTOMOLOGY*, 53(5), 1156-1162. doi: 10.1093/jme/tjw084

## Letter, Journal

- Crawford, J. E., Hopkins, K. C., Buchman, A., Zha, T., Howell, P., Kakani, E., Ohm, J. R., Snoad, N., Upson, L., Holeman, J., Massaro, P., Dobson, S. L., Mulligan, F. S., White, B. J. (2022). Reply to: Assessing the efficiency of Verily's automated process for production and release of male *Wolbachia*-infected mosquitoes, *Nature Biotechnology*. doi: 10.1038/s41587-022-01325-y
- Dobson, S. L. (2021). When More is Less: Mosquito Population Suppression Using Sterile, Incompatible and Genetically Modified Male Mosquitoes, *Journal of Medical Entomology*, 58(5), 1980-1986. doi: 10.1093/jme/tjab025
- Crawford, J. E., Clarke, D. W., Criswell, V., Desnoyer, M., Cornel, D., Deegan, B., Gong, K., Hopkins, K. C., Howell, P., Hyde, J. S., Livni, J., Behling, C., Benza, R., Chen, W., Dobson, S. L., Eldershaw, C., Greeley, D., Han, Y., Hughes, B., Kakani, E., Karbowski, J., Kitchell, A., Lee, E., Lin, T., Liu, J., Lozano, M., MacDonald, W., Mains, J. W., Metlitz, M., Mitchell, S. N., Moore, D. J., Ohm, J. R., Parkes, K., Porshnikoff, A., Robuck, C., Sheridan, M., Sobecki, R., Smith, P., Stevenson, J., Sullivan, J., Wasson, B., Weakley, A. M., Wilhelm, M., Won, J., Yasunaga, A., Chan, W. C., Holeman, J., Snoad, N., Upson, L., Zha, T., Dobson, S. L., Mulligan, F. S., Massaro, P., White, B. J. (2020). Author Correction: Efficient production of male *Wolbachia*-infected *Aedes aegypti* mosquitoes enables large-scale suppression of wild populations (*Nature Biotechnology*, (2020), 38, 4, (482-492), 10.1038/s41587-020-0471-x), *Nature Biotechnology*, 38(8), 1000. doi: 10.1038/s41587-020-0649-2
- Dobson, S. L., Bordenstein, S. R., Rose, R. I. (2016). *Wolbachia* mosquito control: Regulated, *SCIENCE*, 352(6285), 526-+.



## Sponsored Projects

### Closed

- Dobson S., L., Wolbachia as a New Tool to Control Aedes Aegypti and Aedes Albopictus in Cuba, Sponsored by Civilian Research and Development Foundation Submitted: April 20, 2018. Funding Dates: August 1, 2019 - December 31, 2021. | Awarded: \$20,055.00  
OSPA ID: 201804201126
- Dobson S., L., SBIR Phase 2: Developing Mosquito Vector Suppression Methods, Sponsored by MosquitoMate Incorporated Submitted: October 14, 2017. Funding Dates: December 13, 2017 - February 28, 2019. | Awarded: \$27,732.00  
OSPA ID: 201710141105
- Dobson S., L., SBIR Phase 2 - Biological vector control reducing arboviruses, including Dengue and Chikungunya, Sponsored by MosquitoMate Incorporated Submitted: October 1, 2014. Funding Dates: October 15, 2014 - May 15, 2018. | Awarded: \$45,594.00  
OSPA ID: 201410010758
- Dobson S., L., Development of Artificial Blood for Mosquitoes, Sponsored by Bill and Melinda Gates Foundation Submitted: December 5, 2014. Funding Dates: May 1, 2015 - April 28, 2017. | Awarded: \$100,342.00  
OSPA ID: 201412051636
- Dobson S., L., 2015 IR-4 Biopesticide Project, Sponsored by University of Florida Submitted: February 19, 2016. Funding Dates: August 1, 2015 - July 31, 2016. | Awarded: \$12,750.00  
OSPA ID: 201602190912
- Dobson S., L., 2015 IR-4 Biopesticide Project, Sponsored by University of Florida Submitted: July 15, 2015. Funding Dates: July 15, 2015 - July 14, 2016. | Awarded: \$12,750.00  
OSPA ID: 2015071508

## **Not Funded**

Dobson S., L., Brown G., C., Palli S., R., Integrated Vector Management Center of Excellence (IVMCE), Sponsored by Center for Disease Control and Prevention Submitted: October 13, 2016. | Awarded: \$0.00  
OSPA ID: 201610130828

## **Pending**

Stevenson B., Larson J., Thorson J., S., McWhorter K., L., Teets N., M., Bessin R., T., Palli S., R., Dobson S., L., Fisher T., W., Christian W., J., Syed Z., Appalachian Vector-borne Disease Center of Excellence, Sponsored by Center for Disease Control and Prevention Submitted: January 21, 2022. | Awarded: \$0.00  
OSPA ID: 202201211657

Dobson S., L., Eradication of a Primary Filariasis Vector Population at an Endemic Field Site, Sponsored by National Institute of Allergy and Infectious Diseases Submitted: June 16, 2010. | Awarded: \$0.00  
OSPA ID: 201006161142

## **Non-Sponsored Projects**

### **Federal**

**Hatch Multi-State**

**Closed**

Dobson, S. L., Biology, Ecology & Management of Emerging Disease Vectors, (October 1, 2014 - September 30, 2019).

**On-going**

Dobson, S. L., Biology, Ecology & Management of Emerging Disease Vectors, National Institute of Food and Agriculture, (October 1, 2014 - September 30, 2019).

## Teaching

**Teaching**

| Prefix Number - Section | Credit Hours      | # Enrolled | Code Term Year      |
|-------------------------|-------------------|------------|---------------------|
| ENT 340 - 001           | 2.00000 - 2.00000 | 26         | 30 Spring 2021-2022 |
| ENT 340 - 201           | 2.00000 - 2.00000 | 12         | 30 Spring 2020-2021 |
| ENT 395 - 001           | 1.00000 - 3.00000 | 1          | 30 Spring 2016-2017 |
| ENT 395 - 003           | 1.00000 - 3.00000 | 1          | 30 Spring 2016-2017 |
| ENT 748 - 002           | 0.00000 - 0.00000 | 1          | 30 Spring 2015-2016 |
| ENT 790 - 002           | 1.00000 - 6.00000 | 1          | 30 Spring 2015-2016 |
| BIO 561 - 001           | 3.00000 - 3.00000 | 7          | 10 Fall 2015-2016   |
| ENT 561 - 001           | 3.00000 - 3.00000 | 10         | 10 Fall 2015-2016   |

**Teacher Course Evaluations**

| Prefix Number - Section | Responses | TCE Course Quality Mean | TCE Teaching Quality Mean | Code Term Year      |
|-------------------------|-----------|-------------------------|---------------------------|---------------------|
| ENT 340 - 001           | 21        | 4.60                    | 4.53                      | 30 Spring 2021-2022 |
| ENT 340 - 201           | 5         | 4.40                    | 5.00                      | 30 Spring           |
|                         |           |                         |                           | 2020-2021           |

Note: With regards to 2020 TCEs please consider the following from page 121 of the UK Playbook for Fall 2020, "It is essential that performance evaluation take into account the extenuating circumstances brought about by the disruption for faculty in all title series and the extraordinary work accomplished by faculty in response to the disruption. Academic leaders shall reiterate that TCEs should be but one indicator of effective teaching in both periodic merit reviews and tenure/promotion decisions. Evaluation of teaching must go beyond student evaluations alone."

**Directed Student Learning (excluding theses, dissertations)**

James Mains. . (December 2012).

Description: Primary Ph.D. Advisor  
Eunho Suh. . (2011).

Description: Primary Ph.D. Advisor  
Corey Brelsfoard. . (2009).

Description: Primary Ph.D. Advisor  
Cynthia Khoo. . (2007).

Description: Primary Ph.D. Advisor  
Zhiyong Xi. . (2005).

Description: Primary Ph.D. Advisor  
Eric Marsland. . (2003).

Description: Primary Ph.D. Advisor

### **Academic Advising**

10 Fall 2020-2021, 1 graduate student advised.

## **Professional Development**

### **Professional Memberships**

American Mosquito Control Association. National. (2007 - Present).

American Society of Tropical Medicine and Hygiene. International. (2005 - Present).

Society of Vector Ecology. International. (2005 - Present).

Entomological Society of America. National. (1991 - Present).

### **Awards and Honors**

*Adjunct Senior Entomologist*, Anastasia Mosquito Control District. Advising, Voluntary service related advising/training/collaboration activity, and jointing publication, Regional. (January 17, 2020 - December 31, 2020).

# Dr. Julian R. Dupuis

College of Agriculture, Food and Environment  
Department of Entomology

## Education

**2016 PhD**, Systematics & Evolution, Department of Biological Sciences, University of Alberta, Edmonton, AB.

**2009 BSc**, Biology, Northern Michigan University, Marquette, MI, *Summa cum laude*

## Work History

**2019-present Assistant Professor**, University of Kentucky Department of Entomology

**2016-2019 Junior Faculty**, University of Hawai'i at Manoa & USDA-ARS Daniel K. Inouye U.S. Pacific Basin Agricultural Research Center

**Associate Curator**, University of Hawai'i Insect Museum

**2009-2016 PhD Candidate**, University of Alberta, Edmonton, AB. Thesis: Speciation and hybridization in the Old World swallowtail butterfly (*Papilio machaon*) species complex

**2005-2009 Undergraduate Research Assistant**, common loon conservation genetics, Dr. Alec Lindsay, Northern Michigan University

**2009 Fisheries Field Technician Crew Leader**, US National Parks Service, Glacier Natl. Park

**2008 Stream Morphology and Habitat Technician Crew Leader**, US Forest Service, stationed in St. Regis, MT

## Research and Scholarship

### Intellectual Contributions

\* = Senior Author    ~ = Corresponding Author    + = Grad/Prof Student    # = Post Doc    ^ = Undergraduate

WOS = Web of Science    JIF = Journal Impact Factor    TC = Journal Total Cites

SNIP = Source Normalize Impact per Paper    SJR = Scimago Journal Rank

### Published

#### Journal Article, Academic Journal

Dooreenweerd, C., San Jose, M., Geib, S., Dupuis, J. R., Leblanc, L., Barr, N., Fiegalan, E., Morris, K. Y., Rubinoff, D. (2022). A phylogenomic approach to species delimitation in the mango fruit fly (*Bactrocera frauenfeldi*) complex: A new synonym of an important pest species with variable morphotypes (Diptera: Tephritidae). *Systematic Entomology* early view. doi: 10.1111/syen.12559  
Author Role: Julian Dupuis assisted with analyses.

+ Devlin, J., Thomas, R.J., Long, S.E., Boardman, P., Dupuis, J. R. (2022). Impact of climate change on the elevational and latitudinal distributions of populations of Tipulidae (Diptera) in Wales, United Kingdom. *Biological Journal of the Linnaen Society*, 137, 30-46. doi: 10.1093/biolinnean/blac079  
Author Role: Julian Dupuis supervised lead author, Jack Devlin, as a student in ENT564 Insect

Taxonomy; Jack's term project became this paper.

# ~ Vernygora, O. V., Campbell, E. O., Grishin, N. V., Sperling, F. A. H., \* Dupuis, J. R. (2022). Gauging ages of tiger swallowtail butterflies using alternative SNP analyses. *Molecular Phylogenetics and Evolution*, 171, 107465. doi: 10.1016/j.ympev.2022.107465

Author Role: Julian Dupuis supervised the lead author, Oksana Vernygora, as a postdoctoral researcher.

Rubinoff, D., Longcore, T., Dupuis, J. R., \* Osborne, K. H. (2021). Genomic data support the elevation of the federally listed El Segundo blue (*Euphilotes bernardino/battoides allyni*) to species status, *Journal of the Lepidopterist Society*, 75(2), 161-164. doi: 10.18473/lepi.75i2.a10

Author Role: Julian Dupuis conducted analyses and assisted with the manuscript.

Mori, B. A., Coutu, C., Chen, Y. H., Campbell, E. O., Dupuis, J. R., Erlandson, M. A., \* Hegedus, D. D. (2021). De Novo Whole-Genome Assembly of the Swede Midge (*Contarinia nasturtii*), a Specialist of Brassicaceae, Using Linked-Read Sequencing, *Genome Biology and Evolution*, 13(3), evab036. doi: 10.1093/gbe/evab036

Author Role: Julian Dupuis conducted bioinformatic analyses.

# ~ Campbell, E. O., Dupuis, J. R., Holowachuk, J., Hladun, S., Vankosky, M. A., \* Mori, B. A. (2020). Disjunction between canola distribution and the genetic structure of its recently described pest, the canola flower midge (*Contarinia brassicola*), *Ecology and Evolution*, 10(23), 13284-13296. doi: 10.1002/ece3.6927

Author Role: Julian Dupuis conducted preliminary analyses and assisted with final analyses.

~ Dupuis, J. R., Geib, S. M., Schmidt, C., \* Rubinoff, D. (2020). Genomic-wide sequencing reveals remarkable connection between widely disjunct populations of the internationally threatened bog buck moth, *Insect Conservation and Diversity*, 13(5), 495-500. doi: 10.1111/icad.12432

Author Role: Julian Dupuis conducted analyses and wrote the manuscript.

~ Dupuis, J. R., Judge, K. A., Brunet, B. M., Ohlmann Chan, S., \* Sperling, F. A. (2020). Does hunger lead to hybridization in a genus of sexually cannibalistic insects (Orthoptera: Prophalangopsidae)?, *Biological Journal of the Linnean Society*, 131(2), 434-448. doi: 10.1093/biolinnean/blaa094

Author Role: Julian Dupuis conducted genetic data analyses and wrote this manuscript.

~ Dupuis, J. R., \* Sperling, F. A. (2020). Phylogenomic test of mitochondrial clues to archaic ancestors in a group of hybridizing swallowtail butterflies, *Molecular Phylogenetics and Evolution*, 152, 106921. doi: 10.1016/j.ympev.2020.106921

Author Role: Julian Dupuis conducted all analysis and wrote the manuscript.

+ ~ MacDonald, Z. G., Dupuis, J. R., Davis, C. S., Acorn, J. H., Nielsen, S. E., Sperling, F. A. H. (2020). Gene flow and climate-associated genetic variation in a vagile habitat specialist, *Molecular Ecology*. doi: 10.1111/mec.15604

Author Role: Julian Dupuis mentored the first author and assisted with data analysis and writing.

~ Rubinoff, D., + Reil, J. B., Osborne, K. H., Gregory, C. J., Geib, S. M., \* Dupuis, J. R. (2020).

Phylogenomics reveals conservation challenges and opportunities for cryptic endangered species in a rapidly disappearing desert ecosystem, *Biodiversity and Conservation*, 29(7), 2185-2200. doi: 10.1007/s10531-020-01968-w

Author Role: Julian Dupuis mentored Bradley Reil on data analysis and helped write the manuscript.

~ Dupuis, J. R., Geib, S. M., Osborne, K. H., \* Rubinoff, D. (2020). Genomics confirms surprising ecological divergence and isolation in an endangered butterfly, *Biodiversity and Conservation*, 29(6), 1897-1921. doi: 10.1007/s10531-020-01950-6

Author Role: Julian Dupuis conducted analyses and wrote the manuscript.

~ Koch, J. B., Dupuis, J. R., ^ Jardeleza, M. K., ^ Ouedraogo, N., Geib, S. M., Follett, P. A., \* Price, D. K. (2020). Population genomic and phenotype diversity of invasive *Drosophila suzukii* in Hawai'i, *Biological Invasions*, 22(5), 1753-1770. doi: 10.1007/s10530-020-02217-5

Author Role: Julian Dupuis conducted analyses and helped to write the manuscript.

~ Cullingham, C. I., Miller, J. M., Peery, R. M., Dupuis, J. R., Malenfant, R. M., Gorrell, J. C., \* Janes, J. K. (2020). Confidently identifying the correct K value using the  $\hat{K}$  method: When does  $K = 2$ ?, *Molecular Ecology*, 29(5), 862-869. doi: 10.1111/mec.15374

Author Role: Julian Dupuis helped with data collection (meta-analysis), analysis, and manuscript editing.

~ Dupuis, J. R., Pillon, Y., + Sakishima, T., Gemmill, C. E. C., Chamala, S., Barbazuk, W. Brad, Geib, S. M., \* Stacy, E. A. (2019). Targeted amplicon sequencing of 40 nuclear genes supports a single introduction and rapid radiation of Hawaiian *Metrosideros* (Myrtaceae), *Plant Systematics and Evolution*. doi: <https://doi.org/10.1007/s00606-019-01615-0>

Author Role: Julian Dupuis conducted analyses and wrote the manuscript.

~ Dupuis, J. R., Ruiz-Arce, R., Barr, N. B., Thomas, D. B., \* Geib, S. M. (2019). Range-wide population genomics of the Mexican fruit fly: towards development of pathway analysis tools. *Evolutionary Applications*, 12, 1641-1660. doi:10.1111/eva.12824

Author Role: Julian Dupuis conducted analyses and wrote the manuscript.

~ Dupuis, J. R., Cullingham, C. I., Nielsen, S. E., \* Sperling, F. A. H. (2019). Environmental effects on gene flow in a species complex of vagile, hilltopping butterflies. *Biological Journal of the Linnean Society* 127, 417-428. doi:10.1093/biolinnean/blz043

Author Role: Julian Dupuis conducted analyses and wrote the manuscript.

Mori, B. A., Andreassen, L., Heal, J. D., Dupuis, J. R., Soroka, J., \* Sinclair, B. J. (2019). A new species of *Contarinia* Rondani (Diptera: Cecidomyiidae) that induces flower galls on canola in the Canadian Prairies. *The Canadian Entomologist*, 151, 131-148. doi:10.4039/tce.2018.63

Author Role: Julian Dupuis assisted with analyses.

~ Dupuis, J. R., Peigler, R. S., Geib, S. M., \* Rubinoff, D. (2018). Phylogenomics supports incongruence between ecological specialization and taxonomy in a charismatic clade of buck moths. *Molecular Ecology*, 27, 4417-4429. doi:10.1111/mec.14883

Author Role: Julian Dupuis conducted analyses and wrote the manuscript.

- ~ Dupuis, J. R. and Oliver, J. C., Brunet, B. M. T., Longcore, T., Johnson, J., \* Sperling, F. A. H. (2018). Genomic data indicate ubiquitous evolutionary distinctiveness among populations of California metalmark butterflies. *Conservation Genetics*, 19, 1097-1108. doi:10.1007/s10592-018-1081-8  
Author Role:Julian Dupuis conducted analyses and wrote the manuscript.
- Campbell, E. O., Brunet, B. M. T., Dupuis, J. R., \* Sperling, F. A. H. (2018). Would an RRS by any other name sound as RAD? *Methods in Ecology and Evolution*, 9, 1920-1927. doi:10.1111/2041-210X.13038  
Author Role:Julian Dupuis assisted with analyses.
- ~ Dupuis, J. R., Guerrero, F. D., Skoda, S. R., Phillips, P. L., Welch, J. B., Schlater, J. L., Azeredo-Espin, A. M., Pérez de León, A. A., \* Geib, S. M. (2018). Molecular characterization of the 2016 New World screwworm fly outbreak in the Florida Keys. *Journal of Medical Entomology*, 55, 938-946. doi:10.1093/jme/tjy078  
Author Role:Julian Dupuis conducted analyses and wrote the manuscript.
- ~ Dupuis, J. R., Bremer, F. T., Kauwe, A., San Jose, M., Leblanc, L., Rubinoff, D., \* Geib, S. M. (2018). HiMAP: robust phylogenomics from highly multiplexed amplicon sequencing. *Molecular Ecology Resources*, 18, 1000-1019. doi:10.1111/1755-0998.12783  
Author Role:Julian Dupuis conducted analyses and wrote the manuscript.
- Condamine, F. L., Nabholz, B., Clamens, A. L., Dupuis, J. R., \* Sperling, F. A. H. (2018). Mitochondrial phylogenomics, the origin of swallowtail butterflies, and the impact of the number of clocks in Bayesian molecular dating. *Systematic Entomology*, 43, 460-480. doi:10.1111/syen.12284  
Author Role:Julian Dupuis assisted with analyses.
- ~ Dupuis, J. R., McDonald, C. M., \* Sperling, F. A. H. (2018). Genomics-informed species delimitation to support morphological identification of anglewing butterflies (Lepidoptera: Nymphalidae). *Zoological Journal of the Linnean Society*, 183, 372-389. doi:10.1093/zoolinnean/zlx081  
Author Role:Julian Dupuis conducted analyses and wrote the manuscript.
- ~ Dupuis, J. R., Sim, S. B., San Jose, M., Leblanc, L., Hoassain, M. A., Rubinoff, D., \* Geib, S. M. (2018). Population genomics and comparisons of selective signatures in two invasions of melon fly, *Bactrocera cucurbitae* (Diptera: Tephritidae). *Biological Invasions*, 20, 1211-1228. doi:10.1007/s10530-017-1621-z  
Author Role:Julian Dupuis conducted analyses and wrote the manuscript.
- ~ Dupuis, J. R., Bremer, F. T., Jombart, T., Sim, S. B., \* Geib, S. M. (2018). mvMapper: statistical and geographical data exploration and visualization of multivariate analyses of population structure. *Molecular Ecology Resources*, 18, 362-367. doi:10.1111/1755-0998.12724  
Author Role:Julian Dupuis conducted analyses and wrote the manuscript.
- Owens, H. L., Lewis, D. S., Dupuis, J. R., Clamens, A. L., Sperling, F. A. H., Kawahara, A. Y., Guralnick, R., \* Condamine, F. L. (2017). The latitudinal diversity gradient in New World swallowtail butterflies is caused by contrasting patterns of out-of- and into-the-tropics dispersal. *Global Ecology and Biogeography*, 26, 1447-1458. doi:10.1111/geb.12672  
Author Role:Julian Dupuis generated data and assisted with analyses.



Campbell, E. O., Davis, C. S., Dupuis, J. R., Muirhead, K., \* Sperling, F. A. H. (2017). Cross-platform compatibility of *de novo* SNPs in a non-model butterfly genus. *Molecular Ecology Resources*, 17, e84-e93. doi:10.1111/1755-0998.12695  
Author Role: Julian Dupuis assisted with analyses.

Janes, J. K., Miller, J. M., Dupuis, J. R., Malenfant, R. M., Gorrell, J. C., Cullingham, C. I., \* Andrew, R. L. (2017). The  $K=2$  conundrum. *Molecular Ecology*, 26, 3594-3602. doi: 10.1111/mec.14187  
Author Role: Julian Dupuis generated data and assisted with analyses.

Roe, A. D. R., Dupuis, J. R., \* Sperling, F. A. H. (2017). Molecular dimensions of insect taxonomy in the genomics era. In Foottit RG, Adler PH eds. *Insect Biodiversity: Science and Society 2<sup>nd</sup> Edition*. Wiley Blackwell Publishing. doi:10.1002/9781118945568.ch16  
Author Role: Julian Dupuis co-wrote the manuscript.

~ Dupuis, J. R., Brunet, B. M., Bird, H. M., Lumley, L. M., Fagua, G., Boyle, B., Levesque, R., Cusson, M., Powell, J. A., \* Sperling, F. A. H. (2017). Genome-wide SNPs resolve phylogenetic relationships in the North American spruce budworm (*Choristoneura fumiferana*) species complex. *Molecular Phylogenetics and Evolution*, 111, 158-168. doi:10.1016/j.ympev.2017.04.001  
Author Role: Julian Dupuis conducted analyses and wrote the manuscript.

~ Dupuis, J. R., \* Sperling, F. A. H. (2016). Speciation, hybridization, and conservation quandaries: what are we protecting anyway? *News of the Lepidopterists Society*, 58, 202-204.  
Author Role: Julian Dupuis conducted analyses and wrote the manuscript.

~ Dupuis, J. R., \* Sperling, F. A. H. (2016). Hybrid dynamics in a species group of swallowtail butterflies. *Journal of Evolutionary Biology*, 29, 1932-1951. doi:10.1111/jeb.12931  
Author Role: Julian Dupuis conducted analyses and wrote the manuscript.

~ Dupuis, J. R., Mori, B. A., \* Sperling, F. A. H. (2016). *Trogus* parasitoids of *Papilio* butterflies undergo extended diapause in western Canada (Hymenoptera, Ichneumonidae). *Journal of Hymenoptera Research*, 50, 179-190. doi:10.3897/JHR.50.9158  
Author Role: Julian Dupuis conducted analyses and wrote the manuscript.

## Sponsored Projects

### Awarded

Dupuis J., R., Arp A., Geib S., M., Developing Phylogenomic-Based Diagnostic Tools for Species Identification Across Diptera, Sponsored by National Institute of Food and Agriculture  
Submitted: September 11, 2019. Funding Dates: July 1, 2020 - June 30, 2024. Requested: \$500,000.00, | Awarded: \$500,000.00  
OSPA ID: 201909111056

Dupuis J., R., Villanueva R., T., Evaluation of a Leatherjacket, A New Pest of Alfalfa, Sponsored by North Carolina State University  
Submitted: February 24, 2022. Funding Dates: April 1, 2022 - March 31, 2023. | Awarded: \$10,000.00  
OSPA ID: 202202241218

Dupuis J., R., Population Genomics, Diagnostic Strain Determination, and SIT Characterization for the Mexican Fruit Fly *Anastrepha Ludens*, Sponsored by Animal and Plant Health Inspection

Service Submitted: April 28, 2021. Funding Dates: September 30, 2021 - September 29, 2022. | Awarded: \$141,119.00

Description: These grants sharing the same title are continuations of the FY20 project (OSPA ID 202007140903).

OSPA ID: 202104280840

Dupuis J., R., Population Genomics, Diagnostic Strain Determination, and SIT Characterization for the Mexican Fruit Fly *Anastrepha Ludens*, Sponsored by Animal and Plant Health Inspection Service Submitted: April 28, 2021. Funding Dates: September 30, 2021 - September 29, 2022. | Awarded: \$130,009.00

Description: These grants sharing the same title are continuations of the FY20 project (OSPA ID 202007140903). This project has received a NCE until 29 September 2023.

OSPA ID: 202104280840

Dupuis J., R., Population Genomics, Diagnostic Strain Determination, and SIT Characterization for the Mexican Fruit Fly *Anastrepha ludens*, Sponsored by Animal and Plant Health Inspection Service Submitted: July 14, 2020. Funding Dates: September 30, 2020 - September 29, 2022. Requested: \$146,505.00, | Awarded: \$146,505.00

Description: This project has received a NCE until 29 September 2021.

OSPA ID: 202007140903

#### **Not Funded**

Teutsch C., Dupuis J., R., Bessin R., T., Villanueva R., T., Assessment of the Larval Infestation and Management of the European Crane Fly in Alfalfa, Sponsored by National Alfalfa and Forage Alliance Submitted: January 27, 2021. Requested: \$158,501.00, | Awarded: \$0.00

Description: This was not funded.

OSPA ID: 202101271643

Dupuis J., R., Digitization TCN: Collaborative Research: iDigBees Network, Towards Complete Digitization of US Bee Collections to Promote Ecological and Evolutionary Research in a Keystone Clade, Sponsored by Biodiversity Outreach Network Submitted: September 30, 2020. Requested: \$22,759.00, | Awarded: \$0.00

Description: The main PI of this grant is at the Biodiversity Outreach Network. The funding amount listed above represents the funding coming to UK, but the total amount of funding for the project is \$3,796,562. This project is tentatively funded, to begin October 2022.

OSPA ID: 202009300853

Teets, N. M. (Principal), Dupuis, J. R. (Co-Principal), Population genetics of insecticide susceptibility in a globally invasive pest, Center for Arthropod Management Technologies, (July 1, 2021 - June 30, 2023). Awarded: \$160000.

Description: Pre-proposal submitted to the NSF/IUCRC Center for Arthropod Management Technology. Not recommended for full proposal.

Dupuis J., R., Effects of Dietary Inclusion of Berry Pomace on Intestinal Microbiota Composition and Production in Pasture-Raised Broiler Chickens, Sponsored by University of Georgia Submitted: May 3, 2021. Requested: \$16,130.00, | Awarded: \$0.00

Description: This was a PhD student fellowship submitted by Kantima Thongjued.

OSPA ID: 202105030832

Teutsch C., Dupuis J., R., Villanueva R., T., Integrating Pest Management and Morpho-Molecular Tools to Study a New Leatherjacket Pest and Cryptic Crane Flies in Alfalfa, Sponsored by National Institute of Food and Agriculture Submitted: April 19, 2021. Requested: \$140,183.00, | Awarded: \$0.00

Description: The main PI on this grant was Raul Villanueva here at UK. The funding amount listed above only represents the amount of funding coming to co-PI Dupuis. The total requested budget for this award was \$198,437. This award was not funded in 2021.

OSPA ID: 202104191546

Dupuis J., R., Alfalfa Weevil Integrated Pest Management in the Postgenomic Era: HiFi Whole Genome Sequencing Supporting Population and Functional Genomics, Sponsored by Montana State University Submitted: May 25, 2021. Requested: \$263,518.00, | Awarded: \$0.00

Description: The main PI on this grant is at Montana State University. The funding amount listed above only represents the amount of funding coming to UK. The total requested budget for this award was \$746,630. This award was not funded in 2021, but we are preparing a resubmission for Spring 2023.

OSPA ID: 202105251521

## Non-Sponsored Projects

### College

#### On-going

Davis, M. M. (Co-Principal), Dupuis, J. R. (Co-Principal), Durham, R. E. (Co-Principal), Geneve, R. L., Gonthier, D. J. (Co-Principal), Phillips, T. D. (Co-Principal), Rodriguez Lopez, C. M. (Co-Principal), Creation of Special Topics Course tying undergraduate curriculum to large-scale research projects - Molecular barcoding in agriculture, ecology, and medicine, 2021-2022 Research Activity Award Application Faculty and Research Staff, (November 2021 - June 2022). Awarded: \$3000.

Description: The budget was calculated to cover the cost of laboratory reagents to be used during the course practicals, under the premises that the course will be capped at 15 students/semester, that each student will process 15 to 20 samples from DNA extractions to sequencing, and a price per sample of \$10.

### Federal

#### Hatch

#### On-going

Genomics-based systematics and diagnostic tools for diverse insect groups, (October 29, 2020 - September 30, 2025).

## Presentations Given

### Invited Speaker

Dupuis, J. R. (12 October 2022). Developing genomics-based molecular diagnostic tools for recurrently invading tephritid pests. UC Davis' Department of Entomology and Nematology Seminar Series, invited speaker.

Dupuis J. R. (8 June 2022). Genomic insights into ecological diversification of the charismatic *Hemileuca maia* complex in North America. Congress of Societas Europaea Lepidopterologica, Laulasmaa, Estonia, Invited Plenary Speaker.

Vernygora, O., Geib S., Barr N., Dupuis J. R., (January 10, 2022). Genomics-based diagnostic tools for managing the Mexican fruit fly, *Anastrepha ludens* (Diptera: Tephritidae) Plant and Animal Genome Conference XXIX, International Plant and Animal Genome Conference, San Diego, CA, United States. Invited symposium.

Dupuis J. R., (November 7, 2020). Invited Keynote Speech: Boisterous buckmoths, seductive swallowtails, and diagnostic DNA: fun with challenging lepidopteran species complexes Society for Kentucky Lepidopterists Annual Meeting, Society for Kentucky Lepidopterists, Lexington, KY, United

States. Invited Plenary Speaker.

Dupuis J. R., Geib S. M., Rubinoff D., (November 17, 2019). Genomic insights into Hawaii's most ecologically diverse adaptive radiation, the fancy case caterpillars (Cosmopterigidae: Hyposmocoma) Entomological Society of America Annual Conference, Entomological Society of America, St. Louis, MO, United States. Invited symposium.

### Podium Session

Dupuis J. R., (November 13, 2021). Digitizing and databasing the University of Kentucky Insect Collection: Progress & prospects Society for Kentucky Lepidopterists Annual Meeting, Society for Kentucky Lepidopterists, Lexington, KY, United States. Accepted, State.

Judge K., McFadyen D., Blacher K., Caouette A., E., Dupuis J. R., (November 16, 2021). Tracking an invader: Roesel's katydid in Alberta 2021 Entomological Society of Canada and Entomological Society of Ontario's Joint Annual Meeting, Entomological Society of Canada, Canada. International.

MacDonald Z. G., Dupuis J. R., Acorn J. H., Nielsen S. E., Sperling F. A., (August 18, 2019). Gene flow within a butterfly (*Papilio machaon dodii*) metapopulation persisting in a dendritic ecological network of riverine corridors Entomological Society of Canada/Canadian Society of Ecology and Evolution Joint Meeting, Entomological Society of Canada and Canadian Society of Ecology and Evolution, Fredericton, New Brunswick, Canada. Accepted, International.

Sim S., Dupuis J. R., Haines W. P., Rubinoff D., Geib S. M., (July 8, 2019). Genome assembly and population genomic analysis of *Vanessa tameamea*, the island endemic Kamehameha butterfly Eighth International Symposium on Molecular Insect Science, Elsevier and Center for Insect Science, Sitges, Spain. Accepted, International.

## Teaching

### Teaching

| Prefix Number - Section | Credit Hours      | # Enrolled | Code Term Year      |
|-------------------------|-------------------|------------|---------------------|
| ENT 564 - 001           | 4.00000 - 4.00000 | 10         | 10 Fall 2022-2023   |
| ABT 461G - 001          | 3.00000 - 3.00000 | 52         | 30 Spring 2021-2022 |
| ENT 461G - 001          | 3.00000 - 3.00000 | 1          | 30 Spring 2021-2022 |
| ENT 767 - 006           | 2.00000 - 2.00000 | 1          | 30 Spring 2021-2022 |
| ENT 768 - 007           | 1.00000 - 6.00000 | 1          | 30 Spring 2021-2022 |
| ENT 780 - 006           | 2.00000 - 3.00000 | 1          | 30 Spring 2021-2022 |
| ENT 790 - 006           | 1.00000 - 6.00000 | 1          | 30 Spring 2021-2022 |
| ENT 395 - 002           | 1.00000 - 3.00000 | 1          | 10 Fall 2021-2022   |
| ENT 790 - 004           | 1.00000 - 6.00000 | 1          | 10 Fall 2021-2022   |
| ABT 461G - 201          | 3.00000 - 3.00000 | 43         | 30 Spring 2020-2021 |
| BIO 461G - 201          | 3.00000 - 3.00000 | 2          | 30 Spring 2020-2021 |
| ENT 780 - 011           | 2.00000 - 3.00000 | 1          | 30 Spring 2020-2021 |
| ENT 564 - 001           | 4.00000 - 4.00000 | 17         | 10 Fall 2020-2021   |
| ENT 790 - 004           | 1.00000 - 6.00000 | 1          | 10 Fall 2020-2021   |
| ABT 301 - 003           | 2.00000 - 2.00000 | 10         | 30 Spring 2019-2020 |

## Teacher Course Evaluations

| Prefix Number - Section | Responses | TCE Course Quality Mean | TCE Teaching Quality Mean | Code Term Year      |
|-------------------------|-----------|-------------------------|---------------------------|---------------------|
| ABT 461G - 201          | 39        | 4.51                    | 4.85                      | 30 Spring 2020-2021 |
| ENT 461G - 001          | 45        | 4.78                    | 4.87                      | 30 Spring 2021-2022 |
| ENT 564 - 001           | 15        | 4.33                    | 4.60                      | 10 Fall 2020-2021   |

Note: With regards to 2020 TCEs please consider the following from page 121 of the UK Playbook for Fall 2020, "It is essential that performance evaluation take into account the extenuating circumstances brought about by the disruption for faculty in all title series and the extraordinary work accomplished by faculty in response to the disruption. Academic leaders shall reiterate that TCEs should be but one indicator of effective teaching in both periodic merit reviews and tenure/promotion decisions. Evaluation of teaching must go beyond student evaluations alone."

## Theses and Dissertations

### Dissertation Committee Chair

Ryan Lardner, Status: In-Process. (January 2022 - Present).

Kristie Schmidt, Entomology, Status: In-Process. (September 1, 2020 - Present).

Kantima Thongjued, Entomology PhD student, "Understanding the importance of arthropods in chicken diet: A molecular approach," Status: In-Process. (August 19, 2019 - Present).

### Dissertation Committee Member

Karina Garcia, Entomology, "Services and disservices of birds in agriculture," Status: In-Process. (August 2021 - Present).

Aldos Rios, University of Alberta: Agriculture, Food, and Nutritional Sciences, "Characterization of the arthropod community and predator-prey interactions in canola agroecosystems in central Alberta," Status: In-Process. (April 2021 - Present).

Kanishka Seneviratha, University of Alberta: Agriculture, Food, and Nutritional Sciences, "Population genetics of prairie pests," Status: In-Process. (2021 - Present).

Kenneth O'Dell, Entomology, "Chemical Ecology of ticks" Status: In-Process. (September 2021 – Present).

Chan Liu, Entomology, "Genomic evolution of eusociality with an emphasis on hemimetabolous termites," Status: In-Process. (October 19, 2020 - Present).

Ellie McCabe, Entomology, "Spots and Stripes: Investigations into the invasive *Drosophila Drosophila suzukii* and *Zaprionus indianus* in Kentucky," Status: In-Process. (August 2020 - Present).

Jack Devlin, Entomology, "Ecophysiology of the Antarctic midge, *Belgica antarctica*," Status: In-Process. (May 8, 2020 - Present).

Mary Wallace, Entomology, "Potential for RNAi-mediated gene silencing in the forest pest, *Ips calligraphus*," Status: In-Process. (April 8, 2020 - Present).

Zachary Bragg, Entomology, "Uptake and persistence of double-stranded RNA in woody plant tissue," Status: In-Process. (March 2, 2020 - Present).

Laura Unfried, Entomology, "Thermal Tolerance of *Drosophila*," Status: In-Process. (December 16, 2019 - Present).

Ashleigh Glover, Biology PhD student, "Spatial variation in reproductive isolation and genomic differentiation," Status: In-Process. (September 26, 2019 - Present).

### **Master's Thesis Committee Member**

Hannah Hollowell, Entomology, "Effects of pest-specific gene silencing on nontarget insects," Status: Completed. (January 1, 2020 - Present).

Shankar Chereddy, Entomology MSc student, Status: Degree Awarded. (October 1, 2019 - July 23, 2020).

### **Outside examiner**

Emily Bendall, Biology, "From genes to species: ecological speciation with gene flow in *Neodiprion pinetum* and *N. lecontei*," Status: Degree Awarded. (April 2020).

### **Directed Student Learning (excluding theses, dissertations)**

Kim Vertacnik. Postdoctoral Supervision. In-Process (May 1, 2022—present).

Description: Supervision of a postdoctoral researcher.

Oksana Vernygora. Postdoctoral Supervision. In-Process (November 1, 2020 – May 1, 2022).

Description: Supervision of a postdoctoral researcher.

Zachary MacDonald. Mentor. *Gene flow within a butterfly (*Papilio machaon dodii*)*

*metapopulation persisting in a dendritic ecological network of riverine corridors.* Completed (July 1, 2019 - July 18, 2020).

Description: Genomics/bioinformatics mentorship of PhD student at University of Alberta

### **Academic Advising**

10 Fall 2021-2022, 1 undergraduate students advised, 11 graduate student advised, Advised graduate students on research project development, field work, and data analysis.

20 Winter 2020-2021, 8 graduate student advised, Advised graduate students on research project development, field work, and data analysis.

10 Fall 2020-2021, 7 graduate student advised, Advised graduate students on research project development, field work, and data analysis.

10 Fall 2019-2020, 3 graduate student advised, Advised graduate students on research project development, field work, and data analysis.

## Other Credit and Non-Credit Instructional Activities

### Guest Lecture

Plant Science 310: Insects in Cropping Systems (University of Alberta), (November 24, 2021)

Description: guest lecture on Sterile Insect Technique and molecular tools in pest management

ENT595 Digital Identification, Participants: Graduate Students, 10, (July 29, 2021)

Description: 6 online lectures covering the orders Hymenoptera and Lepidoptera.

Plant Science 310: Insects in Cropping Systems (University of Alberta), (October 28, 2020)

Description: guest lecture on Sterile Insect Technique and molecular tools in pest management

ENT595 Digital Identification, Participants: Graduate Students, 7, (July 29, 2020)

Description: 6 online lectures covering the orders Hymenoptera and Lepidoptera.

FOR602 Renewable Natural Resources in a Global Perspective, Participants: Graduate Students, 12, (September 25, 2019)

Description: lecture/discussion about the insect apocalypse

ABT201 Scientific Method in Biotechnology, Participants: Undergraduate Students, 40, (September 19, 2019)

Description: Introduction to my research program

## Service

### Department Service

#### Committee Member

Hiring Committee: Insect Genomics position, (July 2021 - Present).

Curriculum Committee, (July 2020 - Present).

Graduate Program Committee, (February 2020 - Present).

Departmental Planning Committee, (September 2019 - Present).

### Professional Service

#### Editor, Book

co-editor for Population Genomics: Insects book in the Springer Population Genomics Book Series (<https://www.springer.com/series/13836>), (March 2019 - Present).

#### Reviewer, External Program

External peer-reviewer and committee member for the Bog buckmoth draft species status assessment report (for Endangered Species status proposal), (September 2020 - Present).

External peer-reviewer and committee member for the Draft Recovery Criteria Addendum to the Recovery Plan for Three Endangered Species Endemic to Antioch Dunes, California: Lange's metalmark butterfly (*Apodemia mormo langei*), *Oenothera deltoides* subsp. *howellii* (Antioch Dunes evening-primrose), and *Erysimum capitatum* var. *angustatum* (Contra Costa

wallflower), (July 2019 - Present).

**Reviewer, Ad Hoc Reviewer**

Belgian programme of sustainable research cooperation between the Federal Scientific Institutions (FSI) and the Universities (September 2022)  
Czech Science Foundation (October 2021)  
University of California Tenure Review (December 2021)

**Reviewer, Journal Article**

Nature, (September 2022)  
Nature, (July 2022)  
Insect Conservation and Diversity, (June 2022)  
Ecological Informatics, (June 2022)  
GigaScience, (May 2022)  
PLOS ONE, (April 2022)  
BMC Biology, (March 2022)  
GigaScience, (March 2022)  
Ecological Informatics, (January 2022)  
GigaScience, (January 2022)  
Biology Letters, (November 2021)  
Molecular Ecology Resources, (November 2021)  
Lepidoptera Science, (November 2021)  
Molecular Biology and Evolution, (October 2021)  
Tree of Life, (October 2021)  
Journal of Evolutionary Biology, (August 2021)  
Journal of Asia-Pacific Entomology, (August 2021)  
G3, (August 2021)  
Scientific Reports, (August 2021)  
Molecular Biology and Evolution, (June 2021)  
Molecular Ecology, (May 2021)  
Biology Letters, (May 2021)  
Mitochondrial DNA Part B, (May 2021)  
G3, (March 2021)  
Molecular Biology and Evolution, (March 2021)  
Evolutionary Applications, (February 2021)  
Ecology and Evolution, (February 2021)  
Journal of Evolutionary Biology, (February 2021)  
Scientific Reports, (December 2020)



Molecular Ecology, (December 2020)  
Molecular Ecology, (December 2020)  
Journal of Economic Entomology, (October 2020)  
Evolutionary Applications, (September 2020)  
BMC Evolutionary Biology, (July 2020)  
Molecular Ecology, (July 2020)  
Insects, (July 2020)  
Journal of Systematics and Evolution, (June 2020)  
Insects, (June 2020)  
Biological Communications, (May 2020)  
Forests, (May 2020)  
Insects, (May 2020)  
BMC Evolutionary Biology, (April 2020)  
Journal of Systematics and Evolution, (March 2020)  
PeerJ, (March 2020)  
Plants, (March 2020)  
Molecular Ecology, (February 2020)  
Biological Communications, (January 2020)  
PeerJ, (January 2020)  
Ecology and Evolution, (January 2020)  
Insects, (November 2019)  
Scientific Reports, (October 2019)  
Insects, (October 2019)  
Insects, (September 2019)  
Insects, (September 2019)  
Ecology and Evolution, (July 2019)  
Insect Conservation and Diversity, (June 2019)  
Molecular Phylogenetics and Evolution, (June 2019)  
Insect Conservation and Diversity, (May 2019)  
Molecular Ecology, (May 2019)  
Ecology and Evolution, (April 2019)  
European Journal of Entomology, (March 2019)  
Molecular Phylogenetics and Evolution, (February 2019)  
European Journal of Entomology, (December 2018)  
Biological Journal of the Linnaen Society, (November 2018)

Journal of Economic Entomology, (November 2018)  
Journal of Economic Entomology, (October 2018)  
European Journal of Entomology, (September 2018)  
Biological Journal of the Linnaen Society, (September 2018)  
Journal of Biodiversity, (August 2018)  
Acta Zoologica Bulgarica, (August 2018)  
Insects, (May 2018)  
Molecular Genetics and Genomics, (April 2018)  
Systematic Entomology, (March 2018)  
Oriental Insects, (December 2017)  
Genomics, (November 2017)  
Oriental Insects, (October 2017)  
Molecular Genetics and Genomics, (October 2017)  
Evolution, (September 2017)  
Genomics, (August 2017)  
Insect Science, (August 2017)  
Journal of Economic Entomology, (August 2017)  
Lepidoptera Science, (June 2017)  
Molecular Ecology, (April 2017)  
Molecular Ecology, (February 2017)  
Scientific Reports, (January 2017)  
Canadian Entomologist, (September 2016)  
Ecography, (September 2016)  
European Journal of Entomology, (July 2016)

## **Public Service**

### **Volunteer**

Insect table at the Butterfly Festival at Oak Grove, KY, (September 28, 2019).

## **Professional Development**

### **Professional Memberships**

Society of Kentucky Lepidopterists. State. (September 2020 - Present).

Entomological Society of America. National. (July 2019 - Present).

Society for the Study of Evolution. International. (July 2019 - Present).

### **Development Activities Attended**

## **Continuing Education Program**

Teaching Innovation Institute. (August 2021 - May 2022). UK CELT. Lexington.

A competitive (21 accepted participants out of ~150 applications), two semester program designed to be a responsive learning community that addresses emergent issues in higher education, particularly innovative and inclusive teaching methods.

CELT Reading/workshop group on "ungrading". (February 7, 2022 - April 20, 2022). UK CELT. Lexington.

Attended a semester-long series of workshops reading the book and discussing the topic of "ungrading" (removing/reducing the act of assigning grades to teaching) in secondary education.

## **Seminar**

Faculty Panel & Discussion: Access & Barriers to Learning. (April 20, 2021). UK CELT. Lexington.

Attended a faculty panel on decreasing barriers to learning in an online setting.

Communicating the impact of your research to non-scientists: How Research Communications can help. (April 7, 2021). UK Research. Lexington.

Attended a lunch and learn about scientific communication.

Working with Others in the Research/Creative Environment. (April 2, 2021). UK CAFE. Lexington.

Attended a seminar on effectively working in the research and creative environments on campus.

Teaching in PWI (Primarily White Institutions): A Conversation on Challenges and Opportunities. (February 10, 2021). College of Arts & Sciences and the Martin Luther King Center.

Lexington.

I attended a panel discussion provided in collaboration with the College of Arts & Sciences Passport to the World and the Martin Luther King Center Lunch & Learn

## **Workshop**

Instructor Workshop: Designing Multimodal and alternative assessments. (April 4, 2022). UK CELT. Lexington.

Attended an interactive workshop on how to create multimodal assessments for the classroom

Instructor Workshop: Inclusive and Student-Centered Teaching. (February 8, 2022). UK CELT. Lexington.

Attended an interactive workshop on how to make our teaching student-centered and inclusive.

Instructor Workshop: Practicing Inclusive Pedagogy. (November 10, 2021). UK CELT. Lexington.

Attended an instructor forum on how to create inclusive and effective learning environments.

Instructor Workshop: Trauma and Compassion in the Classroom. (September 29, 2021). UK CELT. Lexington.

Attended an instructor forum on how to deal with trauma and compassion in the classroom.

Instructor Workshop: Accommodations letters and the accommodation process. (September 7, 2021). UK CELT. Lexington.

Attended a workshop on UK's student accommodation process and how accommodation letters are created.

Instructor Forum: Normalizing Inclusive and Trauma-Informed Teaching Practices. (May 4, 2021). UK CELT. Lexington.

Attended an instructor forum on acknowledging trauma and inclusivity in teaching and learning.

Instructor Forum: The Future of Assessment Across the Disciplines. (April 27, 2021). UK CELT. Lexington.

Attended a campus-wide forum on the effectiveness of assessments in teaching.

Instructor Forum: Connection & Motivation. (April 13, 2021). UK CELT. Lexington.

Attended an instructor forum on engaging students and motivating them in online education.

Addressing Zoom fatigue in your virtual class. (March 19, 2021). UK CELT. Lexington.

Attended a workshop on reducing zoom fatigue in online classes

Engaging Students in Discussion. (January 29, 2021). UK CELT. Lexington.

I attended a webinar hosted by CELT on engaging students in discussion.

Fostering Community & Belonging workshop. (November 16, 2020). UK CELT. Lexington.

I attended a workshop focused on considering what it means to be in community with others in an academic setting, and we explored the benefits of fostering a sense of belonging through classroom community building and intentional pedagogical choices

Facilitating Zoom Discussions. (October 16, 2020). UK CAFE. Lexington.

I participated in a CAFE workshop to learn about effective ways to facilitate discussions over Zoom.

Fostering Community & Belonging. (October 16, 2020). UK CAFE. Lexington.

I attended a workshop aimed at gaining insights and developing practical tools for establishing a welcoming classroom environment for all students.

Understanding Diversity & the Dynamics of Community Workshop. (September 24, 2020). UK CELT. Lexington.

I participated in a community workshop to gain a knowledge of terms and develop insights about embracing the benefits of a diverse and engaged environment.

CAFE Template Tips & Tricks. (July 13, 2020 - July 17, 2020). UK CAFE. Lexington.

I participated in a week-long workshop to learn how to use the CAFE Canvas template.

Coffee & Conversation for New Faculty. (September 2019 - February 2020). UK CELT. Lexington.

I participate in monthly meetings of new faculty at CELT to discuss teaching strategies, challenges, etc.

UK Research Lunch and Learn Series. (October 16, 2019 - December 11, 2019). UK Office of the Vice President for Research. Lexington.

I attended weekly Lunch and Learn sessions about research resources here at UK.

# Dr. Tonja W. Fisher

College of Agriculture, Food and Environment  
Department of Entomology

## Education

2009- Ph.D. Entomology, University of Kentucky, Lexington, KY  
Research Advisor: Dr. Bruce A. Webb

2004- M.S., Entomology, University of Kentucky, Lexington, KY  
Research Advisor: Dr. John D. Sedlacek

2000- B.S.. Biology (Chemistry minor), Kentucky State University, Frankfort, KY

## Work History

### **Georgetown College August 2017-December 2018**

*Adjunct Professor (Biology)*

Teach general biology in classroom and laboratory settings to undergraduate science and nonscience majors.

### **The University of Arizona 1 July 2011-August 2017**

*Assistant Research Scientist (Plant Sciences)*

Supervisor: Dr. Judith K. Brown

Research involves the molecular functional analysis (transcriptomics and proteomics) of psyllids with the aim of identifying genes and their functions important in vector mediated transmission of *Liberibacter*; Software routinely used: Lasergene Genomics Suite (DNASTAR ArrayStar) and Scaffold.

Responsible for training and supervisor undergraduate and graduate students in basic molecular biology and entomological techniques. These included but were not limited to: bioinformatics, DNA sequencing, fluorescent *in situ* hybridization (FISH), insect dissections, light microscopy, northern blotting, western blotting, Polymerase Chain reactions (PCR), Quantitative Real-Time PCR (qPCR), RNA-interference (RNAi), and recombinant DNA technologies.

Prepared, reviewed, and submitted manuscripts.

Assisted in the preparation of a research grants (state and federal), which were approved for .J funding, and all corresponding quarterly and annual reports (written and oral).

Assisted in the design of a novel, user-friendly internet database for disseminating data to researchers globally.

Daily lab duties include the maintenance of *Ca. Liberibacter*-infected and uninfected psyllid colonies, including tomato plant care.

### **USDA-Yakima Agricultural Research Laboratory September 2009-July 2011**

*Postdoctoral Research Associate (Potato Research Lab)*

Supervisor: Dr. Joseph E. Munyaneza

Research involves the molecular analysis (chiefly PCR and qPCR) of *Candidatus Liberibacter solonacearum*, a bacteria associated with Zebra Chip Syndrome, an emerging and damaging disease of potatoes.

- Developed a DNA isolation method resulting in increased efficiency of *Liberibacter* detection.

- Assisted in preparation of manuscripts and oral/poster presentations.
- Designed laboratory SOPs for obtainment of APHIS permit.
- Trained technician and graduate students in basic molecular biology techniques.
- Implemented cost-reduction techniques to make routine laboratory procedures more cost effective and efficient.
- Daily lab duties include the maintenance of *Ca. Liberibacter*-infected and uninfected psyllid colonies.

**University of Kentucky, Lexington, KY August 2004-May 2009**

*Graduate Research Assistant Molecular Virology Lab*

Department of Entomology

Supervisor: Dr. Bruce A. Webb

- Research involved the identification and molecular characterization (at the transcriptional and functional levels) of unassigned open reading frames in the polydnavirus associated with the parasitoid wasp *Campo/etis sonorensis*. This research relied on comprehensive knowledge of tools, equipment, and experimental procedures utilized in the fields of general entomology, insect physiology, biochemistry, genetics, and molecular biology. These included but were not limited to: bioinformatics, DNA sequencing, heterologous protein expression and purification, northern blotting, Polymerase Chain reactions (PCR), Quantitative Real-Time PCR, recombinant DNA technology, tissue culture, and western blotting.
- Lab duties involved production and maintenance of competent cells and maintaining colonies of *Campoletis sonorensis* and *Heliothis virescens*.

**University of Kentucky, Lexington, KY January 2001-August 2004**

*Graduate Research Assistant*

Kentucky State University Pest Management Lab

Frankfort, Kentucky

Supervisor: Dr. John D. Sedlacek, UK adjunct professor

- Research involved the investigation of the mechanisms of resistance of stored com pests to *Bacillus thuringiensis*- (single and multiple toxins) transformed com hybrids. The research relied on tools, equipment, and experimental procedures utilized in the fields of general entomology, insect physiology, insect ecology, and molecular biology. These included but not limited to: electrophoresis (SDS-PAGE), LDSO assays, PCR, and statistical analysis.
- Lab duties involved maintaining colonies of *Plodia interpunctella* and *Sitotroga cerealella*.

**Kentucky State University College of Mathematics and Science August 1998- May 2000**

*Undergraduate Research Assistant*

**Department of Biology**

Supervisor: Dr. John D. Sedlacek

- Assisted with lab and field studies of alternative management tactics and strategies for management of insect pests of stored grain that minimized reliance on synthetic chemical pesticides.
- Maintained several moth and beetle colonies.

## Research and Scholarship

### Sponsored Projects

#### Pending

Stevenson B., Larson J., Thorson J., S., McWhorter K., L., Teets N., M., Bessin R., T., Palli S., R.,

Dobson S., L., Fisher T., W., Christian W., J., Syed Z., Appalachian Vector-borne Disease Center of Excellence, Sponsored by Center for Disease Control and Prevention Submitted: January 21, 2022. | Awarded: \$0.00  
 OSPA ID: 202201211657

## Teaching

### Teaching

| Prefix Number - Section | Credit Hours      | # Enrolled | Code Term Year      |
|-------------------------|-------------------|------------|---------------------|
| ABT 360 - 001           | 3.00000 - 3.00000 | 28         | 30 Spring 2021-2022 |
| ENT 220 - 201           | 3.00000 - 3.00000 | 47         | 30 Spring 2021-2022 |
| ENT 360 - 001           | 3.00000 - 3.00000 | 3          | 30 Spring 2021-2022 |
| ABT 360 - 001           | 3.00000 - 3.00000 | 21         | 10 Fall 2021-2022   |
| ABT 495 - 002           | 4.00000 - 4.00000 | 17         | 10 Fall 2021-2022   |
| ENT 360 - 001           | 3.00000 - 3.00000 | 2          | 10 Fall 2021-2022   |
| ENT 780 - 201           | 2.00000 - 3.00000 | 1          | 10 Fall 2021-2022   |
| GEN 100 - 014           | 3.00000 - 3.00000 | 20         | 10 Fall 2021-2022   |
| ENT 220 - 210           | 3.00000 - 3.00000 | 8          | 50 Summer 2020-2021 |
| ABT 360 - 201           | 3.00000 - 3.00000 | 22         | 30 Spring 2020-2021 |
| ENT 220 - 001           | 3.00000 - 3.00000 | 18         | 30 Spring 2020-2021 |
| ENT 220 - 201           | 3.00000 - 3.00000 | 49         | 30 Spring 2020-2021 |
| ENT 360 - 201           | 3.00000 - 3.00000 | 4          | 30 Spring 2020-2021 |
| ENT 780 - 201           | 2.00000 - 3.00000 | 1          | 30 Spring 2020-2021 |
| ABT 360 - 001           | 3.00000 - 3.00000 | 31         | 10 Fall 2020-2021   |
| ABT 495 - 002           | 4.00000 - 4.00000 | 14         | 10 Fall 2020-2021   |
| ENT 360 - 001           | 3.00000 - 3.00000 | 1          | 10 Fall 2020-2021   |
| ENT 780 - 201           | 2.00000 - 3.00000 | 1          | 10 Fall 2020-2021   |
| GEN 100 - 014           | 3.00000 - 3.00000 | 21         | 10 Fall 2020-2021   |
| ABT 360 - 001           | 3.00000 - 3.00000 | 14         | 30 Spring 2019-2020 |
| ABT 495 - 001           | 4.00000 - 4.00000 | 18         | 30 Spring 2019-2020 |
| ENT 360 - 001           | 3.00000 - 3.00000 | 2          | 30 Spring 2019-2020 |
| GEN 100 - 002           | 3.00000 - 3.00000 | 20         | 10 Fall 2019-2020   |

### Teacher Course Evaluations

| Prefix Number - Section | Responses | TCE Course Quality Mean | TCE Teaching Quality Mean | Code Term Year      |
|-------------------------|-----------|-------------------------|---------------------------|---------------------|
| ABT 495 - 001           | 6         | 3.17                    | 3.17                      | 30 Spring 2019-2020 |
| ABT 495 - 002           | 9         | 4.44                    | 4.44                      | 10 Fall 2021-2022   |
| ABT 495 - 002           | 5         | 4.20                    | 4.40                      | 10 Fall 2020-2021   |

|               |    |      |      |                        |
|---------------|----|------|------|------------------------|
| ENT 220 - 201 | 11 | 4.00 | 3.82 | 30 Spring<br>2021-2022 |
| ENT 220 - 201 | 14 | 3.64 | 3.85 | 30 Spring<br>2020-2021 |
| ENT 360 - 001 | 6  | 3.33 | 3.00 | 30 Spring<br>2021-2022 |
| ENT 360 - 001 | 7  | 4.00 | 4.29 | 10 Fall 2021-2022      |
| ENT 360 - 001 | 10 | 4.40 | 4.20 | 10 Fall 2020-2021      |
| ENT 360 - 001 | 9  | 4.12 | 4.00 | 30 Spring<br>2019-2020 |
| ENT 360 - 201 | 7  | 4.00 | 3.86 | 30 Spring<br>2020-2021 |
| GEN 100 - 002 | 12 | 2.42 | 3.25 | 10 Fall 2019-2020      |
| GEN 100 - 014 | 9  | 3.67 | 4.33 | 10 Fall 2021-2022      |
| GEN 100 - 014 | 5  | 4.20 | 4.40 | 10 Fall 2020-2021      |

Note: With regards to 2020 TCEs please consider the following from page 121 of the UK Playbook for Fall 2020, "It is essential that performance evaluation take into account the extenuating circumstances brought about by the disruption for faculty in all title series and the extraordinary work accomplished by faculty in response to the disruption. Academic leaders shall reiterate that TCEs should be but one indicator of effective teaching in both periodic merit reviews and tenure/promotion decisions. Evaluation of teaching must go beyond student evaluations alone."

### **Directed Student Learning (excluding theses, dissertations)**

Kristin Carlton. Directed Individual/Independent Study. . Completed (August 2020 - December 2020).

Description: An undergrad student in the Lewis Honors College requested and was granted permission to complete a course agreement in Genetics to receive Honors credit for the course.

### **Academic Advising**

99 Academic year 2021-2022, 7 undergraduate students advised, 8 graduate student advised.

10 Fall 2021-2022, 9 undergraduate students advised, 8 graduate student advised.

30 Spring 2020-2021, 10 undergraduate students advised.

10 Fall 2020-2021, 5 undergraduate students advised, 2 graduate student advised.

10 Fall 2019-2020, 5 undergraduate students advised.

### **Program and Curriculum Development**



**2019**

Program/Curriculum Name - Entomology undergraduate course

Description: Syllabus designed and approved by departmental faculty.

**2020**

Program/Curriculum Name - (ENT 220) Plague, Pests, and Pestilence: History and Global Perspective

Description: Plague, Pests, and Pestilence: History and Global Perspective was approved and entered in UK course catalog (Summer 2020).

## **Service**

### **Department Service**

Director of Online MS Programs in Entomology, (September 2020 - Present).

#### **Committee Chair**

Diversity and Inclusion Committee, (August 2020 - Present).

#### **Committee Member**

Steering Committee, (September 2019 - Present).

#### **Judge**

Ohio Valley Entomological Association (OVEA) 2019 Annual Forum and Student Paper Competition, (October 18, 2019).

### **College Service**

#### **Committee Member**

Diversity, Equity and Inclusion, (December 2020 - Present).

#### **Panelist**

Ag is for All Conference Conference, (October 26, 2021).

## **Professional Development**

### **Professional Memberships**

Minorities in Agriculture, Natural Resources and Related Sciences. National. (October 2019 - Present).

### **Development Activities Attended**

#### **Workshop**

UK Online Summer Camp. (August 5, 2019 - August 7, 2019). Center for the Enhancement of Learning and Teaching (CELT). University. Lexington.

Daily sessions featured multiple speakers with concrete examples designed for a wide range of course development needs.



# Dr. Charles W. Fox

College of Agriculture, Food and Environment  
Department of Entomology

## Education

Ph.D. 15 December 1993- Integrative Biology, University of California, Berkeley

B.S. 19 June 1987- Zoology, University of California, Davis (Highest Honors)

## Work History

1999-present Department of Entomology, College of Agriculture, University of Kentucky, Lexington, KY. Professor (2006- pres); Acting Chair (sabbatical replacement; May - August 2011); Associate Professor (2001 - 2006); Director, Center for Ecology, Evolution and Behavior (CEEB; 2001- 2007); Assistant Professor (1999- 2001)

2004-present Editor, *Functional Ecology*, published by Wiley-Blackwell on behalf of the British Ecological Society (Executive Editor, Jun 2005- Jun 2010; Special Features and Reviews Editor, Jul 2010- pres; Editor, Feb 2004 - Jun 2005)

1996-1999 Assistant Professor, Louis Calder Center, Biological Field Station of Fordham University, Armonk, NY, & Department of Biological Sciences, Fordham University, Bronx, NY

1994-1996 NSF Postdoctoral Fellow & Research Assistant Professor, Department of Biological Sciences, University of South Carolina, Columbia, SC

1993-1994 Research Assistant Professor, Department of Biological Sciences, University of South Carolina, Columbia, SC

1994 Instructor, Midlands Technical College, Columbia, South Carolina

1988-1993 Graduate Student Instructor, Department of Zoology and Department of Integrative Biology, University of California, Berkeley, CA

1987-1988 Teaching Assistant, Department of Biology, University of California, Riverside, CA

## Research and Scholarship

### Intellectual Contributions

\* = Senior Author    ~ = Corresponding Author    + = Grad/Prof Student    # = Post Doc    ^ = Undergraduate

WOS = Web of Science    JIF = Journal Impact Factor    TC = Journal Total Cites

SNIP = Source Normalize Impact per Paper    SJR = Scimago Journal Rank

### Published

### Blog

Fox, C. W. (2020). The representation of women as authors of submissions to ecology journals during the COVID-19 pandemic, *Functional Ecologist (Official Blog of Functional Ecology)* <https://functionalecologists.com/2020/05/29/the-representation-of-women-as-authors-of-submissions-to-ecology-journals-during-the-covid-19-pandemic/>.

Lowenberg, D., Fox, C. W. (2019). Building on our successes: Past and present., *Dryad News and Views* (<https://blog.datadryad.org/2019/09/26/building-on-our-successes/>).

Fox, C. W. (2019). Single vs double-blind peer review: An experiment, *Functional Ecologist (Official Blog of Functional Ecology)* ([functionalecologists.com/2019/09/02/2295/](https://functionalecologists.com/2019/09/02/2295/)).

#### **Book, Chapter in Scholarly Book-New**

Carroll, S. P., Dingle, H., Famula, T. R., Fox, C. W. (2001). Genetic architecture of adaptive differentiation in evolving host races of the soapberry bug, *Jadera haematoloma* *Microevolution Rate, Pattern, Process, Springer, Dordrecht*, 257--272.

#### **Invited Editorial**

~ Fox, C. W., Knapp, A., Ferry, L. A., Rezende, E. L., Aime, E., Meyer, J. (2019). Double-blind peer review – an experiment, *Functional Ecology*, 33(1), 4-6. doi: 10.1111/1365-2435.13269

Fox, C. W. (2018). Towards a mechanistic understanding of global change ecology, *Functional Ecology*, 32, 1648-1651. doi: 10.1111/1365-2435.13182

Fox, C. W., Thompson, K., Irschick, D. J., Knapp, A. K., White, C. R., Aime, E., Meyer, J. A. (2017). 30 Years of Functional Ecology, *Functional Ecology*, 31, 4-6. doi: 10.1111/1365-2435.12811

#### **Journal Article, Academic Journal**

~ Fox, C. W., Duffy, M. A., Fairbairn, D. J., Meyer, J. A. (2019). Gender diversity of editorial boards and gender differences in the peer review process at six journals of ecology and evolution, *Ecology and Evolution*, 9(24), 13636-13649. doi: 10.1002/ece3.5794  
Author Role: CWF and JAM collected the data, CWF analyzed the data, CWF and MAD wrote the manuscript, and JAM and DJF commented on the manuscript.

~ Fox, C. W., Paine, C.E. Timothy (2019). Gender differences in peer review outcomes and manuscript impact at six journals of ecology and evolution, *Ecology and Evolution*, 9(6), 3599-3619. doi: 10.1002/ece3.4993  
Author Role: CWF collected and analyzed the data for the sections of the manuscript examining papers submitted to *Evolution* and the five journals of *British Ecological Society*. CETP collected and analyzed the data for the author survey and manuscript citations. Both CWF and CETP wrote the manuscript.

O'Neill, E. M., Beard, K. H., Fox, C. W. (2018). Body size and life history traits in native and introduced populations of coqui frogs, *Copeia*, 106, 161-170. doi: 10.1643/CE-17-642

Fox, C. W., Messina, F. J. (2018). Evolution of larval competitiveness and associated life-history traits in response to host shifts in a seed beetle, *Journal of Evolutionary Biology*, 31, 302-313.

- Schafer, M. A., Berger, D., Rohner, P. T., Kjaersgaard, A., Bauerfeind, S. S., Guillaume, F., Fox, C. W., Blanckenhorn, W. U. (2018). Geographic clines in wing morphology relate to colonization history in New World but not Old World populations of yellow dung flies, *Evolution*, 72, 1629–1644. doi: 10.1111/evo.13517
- Blanckenhorn, W. U., Bauerfeind, S. S., Berger, D., Davidowitz, G., Fox, C. W., Guillaume, Frederic, Nakamura, S., Nishimura, K., Sasaki, H., Stillwell, R. C., others (2018). Life history traits, but not body size, vary systematically along latitudinal gradients on three continents in the widespread yellow dung fly, *Ecography*.
- Fox, C. W., + Ritchey, J., Paine, T. (2018). Patterns of authorship in ecology and evolution: First, last and corresponding authorship vary with gender and geography, *Ecology and Evolution*. doi: 10.1002/ece3.4584
- Bauerfeind, S. S., Schafer, Martin A, Berger, D., Blanckenhorn, W. U., \* Fox, C. W. (2018). Replicated latitudinal clines in reproductive traits of European and North American yellow dung flies, *Oikos*, 127(11), 1619-1632.
- Fox, C. W., Paine, T. (2018). The effectiveness of journals as arbiters of scientific impact, *Ecology and Evolution*, 8, 9566-9585. doi: 10.1002/ece3.4467
- Fox, C. W., Zitomer, R., Deas, J. B., Messina, F. J. (2017). Asymmetric evolution of egg laying behavior following reciprocal host shifts by a seed-feeding beetle, *Evolutionary Ecology*, 31, 753-767. doi: 10.1007/s10682-017-9910-7
- Fox, C. W. (2017). Difficulty of recruiting reviewers predicts review scores and editorial decisions at six journals of ecology and evolution, *Scientometrics*, 113, 465-477. doi: 10.1007/s11192-017-2489-5
- Kebe, K., Alvarez, N., Tuda, M., Arnqvist, G., Fox, C. W., Sembene, M., Espindola, A. (2017). Global phylogeography of the insect pest *Callosobruchus maculatus* (Coleoptera: Bruchinae) relates to the history of its main host, *Vigna unguiculata*, *Journal of Biogeography*, 44, 2515-2526. doi: 10.1111/jbi.13052
- Fox, C. W., Albert, A. Y., Vines, T. H. (2017). Recruitment of reviewers is becoming harder at some journals: a test of the influence of reviewer fatigue at six journals in ecology and evolution, *Research Integrity and Peer Review*, 2, 3 (1-6).
- Fox, C. W., Burns, C., Muncy, A., Meyer, J. (2017). Author-suggested reviewers: Gender differences and influences on the peer review process at an ecology journal, *Functional Ecology*, 31, 270-280. doi: 10.1111/1365-2435.12665
- Burns, C., Fox, C. W. (2017). Language and socioeconomics predict geographic variation in peer review outcomes at an ecology journal, *Scientometrics*, 113, 1113-1127. doi: 10.1007/s11192-017-2517-5

Fox, C. W., Paine, C. E. Timothy, Sauterey, B. (2016). Citations increase with manuscript length, author number, and references cited in ecology journals, *Ecology and Evolution*, 6, 7717-7726. doi: 10.1002/ece3.2505

\* Fox, C. W., Burns, C., Muncy, A. D., Meyer, J. A. (2016). Gender differences in patterns of authorship do not affect peer review outcomes at an ecology journal, *Functional Ecology*, 30, 126-139. doi: 10.1111/1365-2435.12587

Fox, C. W., Burns, C., Meyer, J. A. (2016). Editor and reviewer gender influence the peer review process at an ecology journal, *Functional Ecology*, 30, 140-153. doi: 10.1111/1365-2435.12529

### **Magazine/Trade Publication**

Fox, C. W. (2019). BES-sponsored research - understanding peer review to make it better., *The Niche*, December 2019, 36-37.

Aime, E., Fox, C. W. (2019). Functional Ecology double-blind peer review trial, *The Niche*, September 2019, 9.

Fox, C. W. (2018). Is it getting harder to find reviewers?, *The Niche*, 49(4), 16.

### **Editorial, Journal**

- Fox, C. W., Meyer, J. (2021). The influence of the global COVID-19 pandemic on manuscript submissions and editor and reviewer performance at six ecology journals, *Functional Ecology*, 35(1), 4-10. doi: 10.1111/1365-2435.13734
- Fox, C. W., Mousseau, T. A. (2020). The Year in Evolutionary Biology 2020, *Annals of the New York Academy of Sciences*, 1476, 1-92.
- Fox, C. W., Mousseau, T. A. (2018). The Year in Evolutionary Biology 2018, *Annals of the New York Academy of Sciences*, 1422, 1-103.
- Fox, C. W., Mousseau, T. A. (2017). The Year in Evolutionary Biology 2017, *Annals of the New York Academy of Sciences*, 1389, 1-212.
- Fox, C. W., Irschick, D. J., Knapp, A. K., Thompson, K., Baker, L., Meyer, J. (2015). Functional ecology: the evolution of an ecological journal, *FUNCTIONAL ECOLOGY*, 29, 1-2. doi: 10.1111/1365-2435.12387
- Fox, C. W., Irschick, D. J., Knapp, A. K., Thompson, K., Baker, L., Meyer, J. (2014). Functional ecology: moving forward into a new era of publishing, *FUNCTIONAL ECOLOGY*, 28(2), 291-292.

#### **Published Comment**

Whitlock, M. C., Bronstein, J. L., Bruna, E. M., Ellison, A. M., Fox, C. W., McPeck, M. A., Moore, A. J., Noor, Mohamed A. F., Rausher, M. D., Rieseberg, L. H., Ritchie, M. G., Shaw, R. G. (2016). A Balanced Data Archiving Policy for Long-Term Studies, *Trends in Ecology and Evolution*, 31, 84-85. doi: 10.1016/j.tree.2015.12.001

### **Web Based Publication**

Fox, C. W. (2020). The representation of women as authors of submissions to ecology journals during the COVID-19 pandemic, *bioRxiv*. doi: 10.1101/2020.05.29.123455

### **Sponsored Projects**

#### **Awarded**

Fox C., W., Westneat D., Fellowship for Allyssa Kilanowski: Assessing Density in the Dark: Juvenile Insect Feeding Vibrations as a Cue for Dispersal and Consequences for Landscape Population Dynamics, Sponsored by National Institute of Food and Agriculture Submitted: June 28, 2019. Funding Dates: June 15, 2020 - June 14, 2023. | Awarded: \$179,181.00  
OSPA ID: 201906282042

#### **Closed**

Harwood J., D., Fox C., W., Obrycki J., J., Integrating IPM into IRM theory for improved resistance management and pest suppression, Sponsored by Iowa State University Submitted: December 19, 2015. Funding Dates: April 1, 2016 - March 31, 2018. | Awarded: \$120,000.00  
OSPA ID: 201512191002

### **Non-Sponsored Projects**

#### **Federal**

**Hatch**



## On-going

Fox, C. W., Influences of dispersal and environmental stress on life history and behavior of a stored products pest, National Institute of Food and Agriculture, (November 8, 2018 - September 30, 2023).

Fox, C. W., Influences of dispersal and environmental stress on life history and behavior of a stored products pest, (November 1, 2018 - September 30, 2023).

Fox, C. W., Inbreeding depression in mating biology following population bottlenecks in a storage pest, National Institute of Food and Agriculture, (October 1, 2012 - September 30, 2017).

## Presentations Given

### Invited Speaker

Fox C. W., (October 16, 2020). Department of Biology, University of Calgary, Zoom, Canada.

Fox C. W., (September 23, 2020). Sense About Science: Trust in peer review - what it means and why it matters, Sense About Science and Wiley.

Fox C. W., (October 4, 2019). Data sharing in ecology and evolutionary biology National Center for Evolutionary Analysis and Synthesis, Santa Barbara, CA, United States.

Fox C. W., (May 30, 2019). Society for Scholarly Publishing, Symposium: Best Laid Plans - Drafting and Implementing Effective Open Data Publishing Policies, San Diego, CA, United States.

### Workshop Leader

Fox C. W., (December 14, 2020). Workshop: Getting the most out of your data – data management best practice Festival of Ecology, British Ecological Society. International.

## Teaching

### Teaching

| Prefix Number - Section | Credit Hours      | # Enrolled | Code Term Year      |
|-------------------------|-------------------|------------|---------------------|
| ENT 670 - 001           | 2.00000 - 2.00000 | 8          | 30 Spring 2021-2022 |
| ABT 461G - 001          | 3.00000 - 3.00000 | 11         | 10 Fall 2021-2022   |
| ABT 461G - 001          | 3.00000 - 3.00000 | 11         | 10 Fall 2020-2021   |
| ABT 461G - 001          | 3.00000 - 3.00000 | 45         | 30 Spring 2019-2020 |
| ABT 461G - 002          | 3.00000 - 3.00000 | 3          | 30 Spring 2019-2020 |
| ENT 770 - 001           | 0.00000 - 1.00000 | 15         | 30 Spring 2019-2020 |

|               |                   |    |                     |
|---------------|-------------------|----|---------------------|
| ENT 395 - 002 | 1.00000 - 3.00000 | 1  | 10 Fall 2019-2020   |
| ENT 670 - 001 | 2.00000 - 2.00000 | 5  | 10 Fall 2019-2020   |
| ENT 748 - 001 | 0.00000 - 0.00000 | 2  | 10 Fall 2019-2020   |
| ENT 790 - 009 | 1.00000 - 6.00000 | 1  | 10 Fall 2019-2020   |
| ABT 461 - 001 | 3.00000 - 3.00000 | 32 | 30 Spring 2018-2019 |
| ENT 461 - 001 | 3.00000 - 3.00000 | 1  | 30 Spring 2018-2019 |
| ABT 395 - 010 | 1.00000 - 4.00000 | 2  | 50 Summer 2017-2018 |
| ABT 461 - 001 | 3.00000 - 3.00000 | 28 | 30 Spring 2017-2018 |
| ENT 748 - 003 | 0.00000 - 0.00000 | 1  | 30 Spring 2017-2018 |
| FOR 461 - 001 | 3.00000 - 3.00000 | 1  | 30 Spring 2017-2018 |
| ENT 748 - 001 | 0.00000 - 0.00000 | 1  | 10 Fall 2017-2018   |
| ENT 770 - 002 | 1.00000 - 1.00000 | 6  | 10 Fall 2017-2018   |
| ENT 780 - 001 | 2.00000 - 3.00000 | 1  | 10 Fall 2017-2018   |
| ENT 790 - 009 | 1.00000 - 6.00000 | 1  | 10 Fall 2017-2018   |
| ENT 670 - 001 | 2.00000 - 2.00000 | 1  | 30 Spring 2016-2017 |
| ENT 748 - 003 | 0.00000 - 0.00000 | 1  | 30 Spring 2016-2017 |
| ENT 748 - 001 | 0.00000 - 0.00000 | 4  | 10 Fall 2016-2017   |
| ENT 770 - 002 | 1.00000 - 1.00000 | 3  | 10 Fall 2016-2017   |
| ENT 670 - 001 | 2.00000 - 2.00000 | 12 | 30 Spring 2015-2016 |
| ENT 748 - 003 | 0.00000 - 0.00000 | 1  | 30 Spring 2015-2016 |
| ENT 767 - 003 | 2.00000 - 2.00000 | 1  | 30 Spring 2015-2016 |
| ENT 695 - 001 | 3.00000 - 3.00000 | 1  | 10 Fall 2015-2016   |
| ENT 748 - 001 | 0.00000 - 0.00000 | 2  | 10 Fall 2015-2016   |
| ENT 790 - 009 | 1.00000 - 6.00000 | 1  | 10 Fall 2015-2016   |

### Teacher Course Evaluations

| Prefix Number - Section | Responses | TCE Course Quality Mean | TCE Teaching Quality Mean | Code Term Year      |
|-------------------------|-----------|-------------------------|---------------------------|---------------------|
| ABT 461 - 001           | 11        | 3.45                    | 4.18                      | 30 Spring 2017-2018 |
| ABT 461G - 001          | 6         | 4.17                    | 4.67                      | 10 Fall 2021-2022   |
| ABT 461G - 001          | 14        | 4.00                    | 4.29                      | 30 Spring 2019-2020 |
| ENT 461 - 001           | 13        | 4.31                    | 4.23                      | 30 Spring 2018-2019 |
| ENT 670 - 001           | 10        | 3.80                    | 3.90                      | 30 Spring 2015-2016 |
| ENT 770 - 001           | 10        | 4.00                    | 4.50                      | 30 Spring 2019-2020 |
| ENT 770 - 002           | 5         | 3.40                    | 4.40                      | 10 Fall 2017-2018   |

Note: With regards to 2020 TCEs please consider the following from page 121 of the UK Playbook for Fall 2020, "It is essential that performance evaluation take into account the extenuating circumstances

brought about by the disruption for faculty in all title series and the extraordinary work accomplished by faculty in response to the disruption. Academic leaders shall reiterate that TCEs should be but one indicator of effective teaching in both periodic merit reviews and tenure/promotion decisions. Evaluation of teaching must go beyond student evaluations alone."

## **Theses and Dissertations**

### **Dissertation Committee Chair**

Richard Biemiller, Entomology, Status: Degree Awarded. (2016).

### **Dissertation Committee Co-Chair**

Allyssa Kilanowski, Biological Sciences, Status: In-Process. (2015 - Present).

Jacqueline Dillard, Biological Sciences, Status: Degree Awarded. (2012 - 2019).

### **Dissertation Committee Member**

Emily Nadeau, Entomology, Status: In-Process. (2020 - Present).

Allison McLaughlin, Biological Sciences, Status: In-Process. (2015 - Present).

Katherine Sasser, Biological Sciences, Status: In-Process. (2013 - Present).

Luc Dunoyer, Biological Sciences, Status: Degree Awarded. (2013 - 2020).

Michelle Giedt, Status: Degree Awarded. (2018).

Mohammad Ameri, Biological Sciences, Macquarie University, Sydney, Australia, Status: Degree Awarded. (2018).

Sarah Preston, Entomology, Status: Degree Awarded. (2018).

Grayson McWhorter, Entomology, Status: In-Process. (2017).

Justin Kratovil, Status: Degree Awarded. (2017).

Robin Bagley, Biological Sciences, Status: Degree Awarded. (2017).

### **Master's Thesis Committee Chair**

Josiah Ritchey, Entomology, Status: In-Process. (2016 - Present).

William Licht, Entomology, Status: Degree Awarded. (2017).

### **Master's Thesis Committee Member**

Ilgoo Kang, Entomology, Status: Degree Awarded. (2017).

Thorsten Hansen, Entomology, Status: Degree Awarded. (2017).

## **Academic Advising**

50 Summer 2021-2022, 2 undergraduate students advised.

10 Fall 2021-2022, 8 undergraduate students advised.

99 Academic year 2020-2021, 4 undergraduate students advised, 2 graduate student advised.

30 Spring 2020-2021, 8 undergraduate students advised.

99 Academic year 2019-2020, 5 undergraduate students advised, 2 graduate student advised.

99 Academic year 2018-2019, 5 undergraduate students advised, 3 graduate student advised, 0 professional students advised, 0 interns and residents advised.

99 Academic year 2016-2017, 6 undergraduate students advised, 3 graduate student advised, 0 professional students advised, 0 interns and residents advised.

99 Academic year 2015-2016, 6 undergraduate students advised, 3 graduate student advised, 0 professional students advised, 0 interns and residents advised.

## **Service**

### **Department Service**

Seminar Coordinator, (2000 - Present).

Director of Graduate Studies, (July 1, 2009 - June 30, 2018).

#### **Committee Member**

Advisory Committee, (2008 - September 2018).

### **College Service**

#### **Committee Member**

Agricultural Biotchechnology Advisory/Steering Committee, (2017 - 2020).

Graduate Curriculum Committee, (2014 - 2018).

### **Professional Service**

#### **Board of Directors of a Company**

Dryad, Board of Directors, Dryad Digital Repository (DataDryad.org), 2013 – 2019; Chair of the BoD (2018 – 2019); Secretary (2017 – 2018); Treasurer (2014 – 2017); Governance Committee (Chair, 2018 – 2019); Finance Committee (Chair, 2014 – 2017; member, 2017 – 2018); Membership Task Force (member, 2013 – 2017)., (2013 - 2020).

**Editor, Associate Editor**

Evolutionary Ecology Research, (2004 - Present).

Ecology and Evolution, (2004 - 2007).

**Editor, Book**

The Year in Evolutionary Biology series, (2012 - 2020).

**Editor, Journal Editor**

Functional Ecology, Executive Editor (Jun 2005 – Jun 2010, Sep 2013 – present); Senior Editor (Feb 2004 – Jun 2005 and Jul 2010 – Aug 2013), (2005 - Present).

**Program Organizer**

British Ecological Society, Organizer, Symposium – “Towards a mechanistic understanding of global change ecology” at the annual meeting of the British Ecological Society, December 2016., (2016).

## **Professional Development**

### **Awards and Honors**

*A Teacher Who Made a Difference*, University of Kentucky, College of Education. Teaching. (April 18, 2020).

# David J. Gonthier, Ph.D.

Assistant Professor, Department of Entomology  
College of Agriculture, Food and Environment  
University of Kentucky  
Curriculum Vitae for Tenure Performance Review 2022

## Academic & Professional Appointments

|                      |                                                                                                                                                             |
|----------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------|
| October 2017-present | Assistant Professor<br>Department of Entomology<br>University of Kentucky                                                                                   |
| 2014-17              | NSF Biology Postdoctoral Fellow<br>Department of Environmental Science, Policy, & Management<br>University of California, Berkeley                          |
| 2014-16              | University of California President's Postdoctoral Fellow<br>Department of Environmental Science, Policy, & Management<br>University of California, Berkeley |
| 2010-14              | Ph.D. Resource Ecology Management<br>School of Natural Resources and Environment<br>University of Michigan, Ann Arbor, MI                                   |
| 2010                 | M.S. Biology<br>Department of Environmental Science<br>University of Toledo, Toledo, OH                                                                     |
| 2007                 | B.S. Biology<br>Department of Biology<br>Hope College, Holland, MI                                                                                          |

## Research and Scholarship

### Sponsored Projects

#### Funding summary while at U.K.

While at U.K, 23 submitted proposals, 12 funded (6 nationally competitive, 2 state competitive, 1 internally competitive, 3 teaching-related), 10 not funded; 1 under consideration

| <b>Funding awarded while at U.K.</b>              | <b>Total</b> |
|---------------------------------------------------|--------------|
| Total grant funding awarded*                      | \$5,440,054  |
| Total grant funding awarded to U.K                | \$1,272,582  |
| Total grant funding awarded to D.G. program       | \$1,031,069  |
| Nationally competitive grants                     | \$908,528    |
| State competitive grants                          | \$107,692    |
| Competitive internal research and teaching grants | \$14,849     |

\*Total awarded across all collaborating institutions

## Awarded Projects

### Nationally competitive

**Gonthier, D.J.** (co-PI), Pescatore, A. (co-PI), Hayes, M. (co-PI). "Regenerative egg farming project." Natural Resource Conservation Service – Conservation Innovation Grant. Lead Institution: Handsome Brook Farms, \$400,000 total; \$32,000 to U.K. Funding dates: **Status: Funded (awaiting subaward processing).**

*\*As co-PI, D.G. will aid in the design, field work, and analysis of biodiversity conservation metrics on regenerative and non-regenerative pasture raised poultry farms. D.G. will mentor one post-doctoral researcher (partially funded by this subaward) to carry out field work and analysis.*

Jacobson, K. (PI), Barr, M. (co-PI), Breazeale, N. (co-PI), Brislen, L. (co-PI), **Gonthier, D.** (co-PI), Kusunose, Y. (co-PI). "Strengthening plant production through an interdisciplinary food system graduate training program". USDA NIFA National Needs Graduate Fellowship Program. UK is sole institution. \$262,500 to UK; ~\$40,000 to D.G. Funding Dates: 2021 – 2025. (DG is Co-PI, 0% effort). **Status: On-going.**

*\*As co-PI, D.G. aided in the writing of the proposal. D.G. will mentor one M.S. student and develop and teach curriculum as a part of this graduate fellowship program.*

**Gonthier, D.J.** (co-PI), Williams M., A. (co-PI). "Integrating Vegetable, Poultry, and Cover Cropping to Enhance Resiliency in Organic Production Systems". USDA NIFA Organic Research and Extension Initiative (OREI). Lead institution: Iowa State University, \$2,000,000 total. **\$285,000** to D.G. Funding Dates: 2019-2023. (D.G is co-PI, 5% effort). **Status On-going.**

*\*As co-PI, D.G. is the lead for the Kentucky portion of the multi-state project, including directing the project MS student (V. Halmos), managing field data collection, data management and analysis of a four-year study of integrated vegetable-poultry rotation experiment.*

**Gonthier, D.J.** (co-PI), Bessin, R.T. (co-PI), Williams, M. A. (co-PI). "Resilient Systems for Sustainable Management of Organic Cucurbits". USDA NIFA Organic Research and Extension Initiative (OREI). Lead institution: Iowa State University. \$2,000,000 total. **\$383,142** to D.G. Funding dates: 2019-2022. (D.G is co-PI, 5% effort). **Status: On-going.**

*\*As co-PI, D.G. is the lead for the Kentucky portion of the multi-state project, including directing the project MS student (K. Fiske), managing field data collection, data management, and analysis of a three-year study of commercial scale meso-tunnel pest control strategies.*

**Gonthier., D.J.** (co-PI). "Managing wild birds for improved strawberry production, pest control, and food safety outcomes in the California Central Coast," USDA NIFA-AFRI Foundational Program. Lead institution: University of California Davis, \$500,000 total. **\$32,386.00** to D.G. Funding Dates: 2017 - 2019. (D.G is co-PI, 0% effort). **Status: Completed.**

*\*As co-PI, D.G. led the Kentucky team, which included directing the project PhD student (K. Garcia) and managing data collection for the three-year project studying net effect of birds in strawberry production.*

**+Garcia, K.** (Ph.D. Student advised by D.G.). "Diet and management of wild birds in California Central Coast strawberries" NSF Graduate Research Fellowship. **\$138,000** to K. Garcia. Funding dates: 2018-2021. (D.G. is major advisor, 0% effort). **Status: Completed.**

*\*D.G. mentored K. Garcia for this nationally competitive fellowship award.*

## State competitive

**Gonthier, D.J.** (PI), **+Kuesel, R.** (co-PI), Woods, T. (co-PI). A remedy for insect and bird pests: Fine mesh netting canopies can be easy for use in direct to market and you-pick berries. Kentucky Department of Agriculture. Specialty Crop Grant. \$50,000 to UK, **\$32,987** to D.G. Funding dates: 2021 – 2023. (D.G. is PI, 0% effort). **Status: On-going.**

*\*As PI, D.G. conceived the research proposal and mentored R. Kuesel through the process of grant writing. D.G. oversees all field work, data analysis, and manuscript writing associated with this project.*

Williams M., A. (PI), Bessin R., T.(co-PI), **Gonthier D., J.** (co-PI), "Developing Sustainable Protection Systems for Flea Beetle Control." KDA Specialty Crop Block Grant, Sponsored by KY Department of Agriculture, **\$74,705.00** granted. Funding Dates: January 1, 2019 - September 29, 2021. Funding dates: 2018 – 2021. (D.G is co-PI, 4% effort, *Nationally Competitive*). **Status: Completed.**

*\*As co-PI, D.G. led field work, mentored project M.S. student (M. Brockman), oversaw data management and analysis, and manuscript writing.*

## Internally competitive

**Gonthier, D.J.** (PI), Tanaka, K. (Co-PI). "Estimating food waste within a Kentucky food chain." Food Connection Student Opportunity Grant. **\$5,000.** Funding dates: 2018 – 2019. (D.G is PI, 0% effort, *Internally Competitive*). **Status: Completed.**

*\*As PI, D.G. led grant writing, field work, data-analysis, and write up to document food losses and waste in CSA production fields and households.*

## Competitive funds for Teaching Support

**Gonthier, D. J.** (PI). "Profit-sharing coffee project: Linking students to coffee producers in the global south." Food Connection Student Opportunity Grant. **\$7,049.** Funding dates: 2021-2022. (D.G is PI, 0% effort, *Internally Competitive*). **Status: On-going.**

*\*As, PI, D.G. led grant writing, and will oversee the project and teaching activities.*

Goodin, M. (PI), **Gonthier, D.J.** (co-PI). Wake up and smell the coffee! Teaching Support. **\$800 to D.G.** Food Connection Student Opportunity Grant. Funding dates: 2020-2021. **Status: Completed.**

*\*As co-PI, D.G. contributed to grant writing and utilization of funds to enhance the GEN300 coffee course.*

**Gonthier, D. J.** "Sustainable pedagogies workshop", Sustainable pedagogies workshop: Sustainability Challenge Grant, **\$2,000.** Funding dates: 2018 – 2019. **Status: Completed.**

*\* D.G. received funding for participation in the workshop and working group to develop sustainability related course materials.*

## Hatch Funding

**Gonthier, D.J.** (PI). 2018- 2023. The impact of local and landscape farmland diversification on the services and dis-services of biodiversity." National Institute of Food and Agriculture Hatch Project: #UK008079.



## Pending Projects

### Nationally competitive

**Gonthier, DJ.** (co-PI). "Two strong wings, cover crops, & veggies: Developing the next generation of integrative farmers in California, Iowa, and Kentucky". USDA-Beginning Farmer and Rancher Development Program. Lead institution: U. California, Davis, \$750,000 total. **\$93,300** to D.G. Funding Dates: 2022-2025. (D.G is co-PI, 3% effort). **Status: pending.**

*\*As co-PI, D.G. contributed to grant writing, and will lead the Kentucky portion of the multi-state project, including disseminating outreach and extension materials to beginning Kentucky farmers.*

### Proposals not funded while at U.K.

**Gonthier, D.J.** (PI), Shade, J. (co-PI). "Assessment of challenges and opportunities for sustainable organic pastured egg production". USDA-Organic Ag Research and Extension Initiative. \$50,000 requested. **Not funded.**

**Gonthier, D. J.** (PI), Bessin, R. (Co-PI), Williams, M. A. (co-PI), "Organic Protection Systems for Spotted-Winged Drosophila in Blackberry and Raspberry", NSF CAMTech, \$150,000. **Not Funded.**

**Gonthier, D. J.** (PI), Rudolph, R. (Co-PI), Bessin, R. (Co-PI), Williams, M. (Co-PI), Woods, T. (Co-PI), "Killing two birds with one stone: The ecological and economic benefits of fine-mesh exclusion netting in blueberries", Southern Region Sustainable Agriculture Research and Education Grant, \$300,000. **Not funded.**

**Gonthier, D. J.** (PI), Williams, M. A. (Co-PI), Scott Hicks, D. (Co-Investigator), Kuesel, R. (Grad/Prof Student), "Developing Sustainable Organic Protection Systems for Caneberry Pests", Organic Farming Research Foundation, \$20,000. (May 1, 2019 - May 1, 2020). **Not funded.**

**Gonthier, D.J.** (PI), Fiske, K. (co-PI). "Maximizing crop protection and profitability in sustainable pest control systems". Southern Sustainable Agriculture Research and Education Graduate Student Grant. \$16,500. Funding dates 2022 – 2023. (D.G. is major advisor, 0% effort). **Status: Not funded.**

**+Kuesel, R. (PI)**. (PhD Student advised by D.G.). "Understanding key pest problems and finding novel solutions in berry production". USDA-AFRI EWD Predoctoral Fellowship. **\$114,000** to R. Kuesel. Funding dates: 2022-2024. (D.G. is major advisor, 0% effort). **Not funded.**

Fox J., F. (PI), **Gonthier D., J.** (co-PI), Ren W. (co-PI), "INFEWS/T1: Understanding and Communicating Food-Energy-Water Synergies in Local Foodsheds," NSF Innovations at the Nexus of Food, Energy, and Water Systems (INFEWS) Program. Sponsored by University of California Santa Cruz, \$735,000 requested, \$0.00 granted. Date Submitted: September 4, 2018. **Not funded.**

Snyder, W. (PI), ... **Gonthier, D. J.** (co-PI)... (of 24 co-PIs). "HealthyLIVES: Healthy Livestock Integration with Vegetables/Fruits for the Environment and Society", USDA NIFA Sustainable agricultural Systems: Coordinated Agricultural Projects Grants, \$10,000,000. **Not funded.**

Gleason, M. (PI), ... **Gonthier, D. J.** (co-PI)... (of 20 co-PIs), "Transforming Food Crop Production with Precision Pesticide Spraying", USDA NIFA Sustainable Agricultural

Systems: Coordinated Agricultural Projects Grants, \$10,000,000. **Not funded.**

Poffenbarger, H. J. (PI), Haramoto, E. R. (Co-PI), Bradley, C. (Co-PI), **Gonthier, D. J.** (Co-PI), Springer, M. T. (Co-PI), "Cover crop management for enhanced economic and environmental sustainability of Mid-South soybean production", Sustainable Agriculture Research and Education Program, \$299,768. **Not funded.**

### **Funding prior to U.K. (prior to 2017)**

#### **Funding awarded for postdoctoral research at U.C. Berkeley (Total \$263,000)**

**Gonthier, D.J.** (PI). The importance of functional and phylogenetic crop diversity to trade-offs and synergies in pollination, pest control, and yield. NSF Biology Postdoctoral Fellowship. Award: \$253,000. Funding dates: 2014 – 2017 (D.G. is 100% effort).

**Gonthier, D.J.** (PI). University of California Presidents Postdoctoral Fellowship. Does functional and phylogenetic crop diversity drive trade-offs or synergies in pollination, pest control, and yield? Award: \$10,000 research funds. Funding dates: 2014-2016. Stipend declined due to award being concurrent with NSF Postdoc.

#### **Funding awarded for PhD and MS research at U. of Michigan and U. Toledo (Total \$152,769)**

**Gonthier, D.J.** (PI), Perfecto, I. (co-PI). "Causes and consequences of biodiversity in coffee agriculture." NSF Dissertation Improvement Grant. Award: \$16,965. Funding dates: 2012-2013.

**Gonthier, D.J.** (PI). "Impacts of coffee genetic variation on the interactions of a tropical insect food web." NSF Graduate Research Fellowship. Award: \$126,000. Funding dates: 2010-2014.

**Gonthier, D.J.** U. Michigan – Undergraduate Research Opportunities Program Supplementary Funding. Award: \$500. Funding dates: 2013-2014.

**Gonthier, D.J.** U. Michigan – Undergraduate Research Opportunities Program Supplementary Funding. Award: \$500. Funding dates: 2012-2013.

**Gonthier, D.J.** U. Michigan – School of Natural Resource and Environment Research Funds. Award: \$1,500. Funding dates: 2011-2012.

**Gonthier, D.J.** U. Michigan – Rackham Graduate Student Research Grant. Award: \$1,500. Funding dates: 2011-2012.

**Gonthier, D.J.** U. Michigan – Rackham International Research Award. Award: \$4,000. Funding dates: 2011-2012.

**Gonthier, D.J.** Sigma-Xi – Grant in Aid of Research. Award: \$400. Funding dates: 2010.

**Gonthier, D.J.** Society of Integrative and Comparative Biology – Grant in Aid of Research. Award: \$1,000. Funding dates: 2009-2010.

**Gonthier, D.J.** Sigma-Xi – Grant in Aid of Research. Award: \$800. Funding dates: 2009-2010.

## Intellectual Contributions

### Peer-reviewed publication summary

| Publication at U.K. (2017-2022)              | Total | Mean per year |
|----------------------------------------------|-------|---------------|
| Peer-reviewed articles                       | 18    | 3             |
| Articles first-authored by graduate students | 4     | 0.7           |
| Articles co-authored by graduate students    | 11    | 1.8           |
| Citations                                    | 350   | 58.3          |
| H-Index = 13                                 |       | Mean*         |
| Impact factors                               |       | 5.2           |
| Journal Citation Indicators                  |       | 1.3           |

\*Mean across all publications at U.K.

### Peer-reviewed publications

Legend for peer-reviewed publications at the University of Kentucky:

+ Graduate or undergraduate student mentored by D.G.

\$ Research technician directed by D.G.

\* Corresponding author

‡ This work is supported by National Institute of Food and Agriculture, U.S. Department of Agriculture, Hatch Program, titled: "The impact of local and landscape farmland diversification on the services and dis-services of biodiversity" under UK008079.

D.G. contributions as co-author:

1 = technical expertise/methodology developed/oversaw research conducted

2 = provided experimental concept and design

3 = topical expertise provided, manuscript edited

4 = provided datasets for meta-analysis

5 = provided funding for study

6 = member of the first author's graduate committee

Journal rankings, **IF** = Journal Impact factor, **JCI** = Journal Citation Indicator, **TC** = Journal total citations, article citation number are all based on Web of Science

### Peer-reviewed book chapters

2021

+Kuesel, R.\*, Gonthier, D.J.<sup>1,3,5</sup> On the efficacy of protection netting for control of spotted-winged *Drosophila*. Edited by Garcia, Flavio Roberto Mello. **2021**. In *Drosophila suzukii* Management. Springer International Publishing, Cham., doi 10.1007/978-3-030-62692-1. Book chapter has no citations to date.

### Peer-reviewed journal article

2022

Olimpi, E.M.\*, Daly, H., +Garcia, K., Glynn, V.M., Gonthier, D.J.<sup>1,2,3</sup>, Kremen, C., M'Gonigle, L.K. and Karp, D.S., **2022**. Interactive effects of multiscale diversification practices on farmland bird stress. *Conservation Biology*: In Press. Rank among Biodiversity Conservation journals 3/60, IF = 6.6, JCI = 1.6, TC = 25,286, Article has no citations to date. ‡

Olimpi, E.M.\*, **+Garcia, K., Gonthier, D.J.**<sup>1,2,3</sup>, Kremen, C., Snyder, W.E., Wilson-Rankin, E.E. and Karp, D.S. **2022**. Semi-natural habitat surrounding farms promotes multifunctionality in avian ecosystem services. *Journal of Applied Ecology*, 59(4), pp.898-908. Rank among Biodiversity Conservation Journals 4/60, Rank among Ecology Journals 14/166, IF = 6.5, JCI = 1.7, TC = 25,441, Article has no citations to date. ‡

Smith, O.M.\*, Olimpi, E.M., Navarro-Gonzalez, N., Cornell, K.A., Frishkoff, L.O., Northfield, T.D., Bowles, T.M., Edworthy, M., Eilers, J., Fu, Z., **+Garcia, K., Gonthier, D.J.**<sup>3,4</sup>, Jones, S., Kennedy, C.M., Latimer, C.E., Owen, J.P., Sato, C., Taylor, J.M., Wilson-Rankin, E.E., Snyder, W.E., and Karp, D.S. **2022**. A trait-based framework for predicting foodborne pathogen risk from wild birds. *Ecological Applications*, 32(2), p.e2523. Rank among Ecology journals 31/166, IF = 4.7, JCI = 1.2, TC = 24,246, Article citations to date = 3.

Lu, A.\*, **Gonthier, D.J.**<sup>1,2,3</sup>, Sciligo, A.R., **+Garcia, K.**, Chiba, T., Juárez, G. and Kremen, C. **2022**. Changes in arthropod communities mediate the effects of landscape composition and farm management on pest control ecosystem services in organically managed strawberry crops. *Journal of Applied Ecology*, 59(2), pp.585-597. Rank among Biodiversity Conservation Journals 4/60, Rank among Ecology Journals 14/166, IF = 6.5, JCI = 1.7, TC = 25,441, Article has no citations to date.

## 2021

Morales, H.\*, Armbrecht, I., **Gonthier, D.**<sup>1,3</sup>, and Wyckhuys, K.A. **2021**. Editorial: Moving from a curative to preventative pest management paradigm. *Frontiers in Sustainable Food Systems* 3, 102. Rank among Food Science & technology Journals = 53/163, IF = NA (New journal cannot be calculated), JCI = 0.8, TC = 1,013, Article has no citations to date.

## 2020

**+Brockman, R.\*, +Kuesel, R., +Archer, K., +O'Hearn, K.**, Wilson, N., **\$Scott, D.**, Williams, M., Bessin, R., **Gonthier, D.J.**<sup>1,2,3,5</sup>. **2020**. The impact of plant essential oils and fine mesh row covers on flea beetle (Chrysomelidae) management in Brassicaceous greens production. *Insects* 11:714. Rank among Entomology journals 18/102, IF = 2.8, JCI = 1.1, TC = 3,936, Article has no citations to date. ‡

Potts, L.J.\*, Gantz, J.D., Kawarasaki, Y., Philip, B.N., **Gonthier, D.J.**<sup>3,6</sup>, Law, A.D., Moe, L., Unrine, J.M., McCulley, R.L., Lee, R.L., Denlinger, D.L., Teets, N.M. **2020**. Environmental factors influencing fine-scale distribution of Antarctica's only endemic insect. *Oecologia* 194(4): 529-539. Rank among Ecology journals 59/166, IF = 3.2, JCI = 0.9, TC = 37,835, Article citations to date = 4.

**+Garcia, K.\***, Olimpi, E., Karp, D., **Gonthier, D.J.**<sup>1,3</sup>. **2020**. The good, the bad, and the risky: Can birds be incorporated as biological control agents into integrated pest management programs? *Journal of Integrated Pest Management* 11(1):11. 529-539. Rank among Entomology journals 17/102, IF = 2.9, JCI = 1.2, TC = 837, Article citations to date = 11. ‡

Olimpi, E.M.\*, **+Garcia, K., Gonthier, D.J.**<sup>1,2,3</sup>, De Master, K., Echeverri, A., Kremen, C., Sciligo, A., Snyder, W., Wilson-Rankin, E., Karp, D.S. **2020**. Shifts in species interactions and farming contexts mediate net effects of birds in California strawberry systems. *Ecological Applications* 30(5):e02115. Rank among Ecology journals 31/166, IF = 4.7, JCI = 1.2, TC = 24,246, Article citations to date = 16. ‡

## 2019

**+Kuesel, R.\*, \$Scott Hicks, D., +Archer, K.**, Sciligo, A., Bessin, R., \* **Gonthier, D.** **J**<sup>1,2,3,5</sup>. **2019**. Effects of fine-mesh exclusion netting on pests of blackberry. *Insects* 10(8):249. Rank

among Entomology journals 18/102, IF = 2.8, JCI = 1.1, TC = 3,936, Article citations to date = 7. ‡

Olimpi, E.M.\*, Baur, P., Echeverri, A., **Gonthier, D.J.**<sup>1,2,3</sup>, Karp, D., Kremen, C., Sciligo, A., De Master, K. **2019**. Evolving food safety pressures in California's Central Coast region. **Frontiers in Sustainable Food Systems** 3, 102. Rank among Food Science & technology Journals = 53/163, IF = NA (New journal cannot be calculated), JCI = 0.8, TC = 1,013, Article citations to date = 15. ‡

Vandermeer, J.\*, Armbrrecht, I., de la Mora, A., Ennis, K., **Gonthier, D.J.**<sup>3</sup>, Hajian-Forooshani, Z., Hsieh, H.-Y., Iverson, A., Jackson, D., Jha, S., Jimenez-Soto, E., Lopez-Bautista, G., Larsen, A., Li, K., Liere, H., MacDonald, A., Marin, L., Mathis, K., Monagan, I., Morris, J., Ong, T., Pardee, G., Saraeny Rivera, I., Williams-Guillen, K., Yitbarek, S., Uno, S., Zemenick, A., Philpott, S., Perfecto, I. **2019**. The community ecology of herbivore regulation in an agroecosystem: lessons from complex systems, **Bioscience** 69:974-996. Rank among Biology Journals 4/93, IF = 8.6, JCI = 2.3, TC = 22,562, Article citations to date = 11.

Iverson, A.\*, **Gonthier, D.J.**<sup>1,2,3</sup>, Pak, D., Ennis, K., Burnham, R., Perfecto, I., Ramos Rodriguez, M. **2019**. A multifunctional approach for achieving simultaneous biodiversity conservation and farmer livelihood in coffee agroecosystems, **Biological Conservation** 238:108179. Rank among Biodiversity Conservation Journals = 6/60, Rank among Ecology Journals 19/166, IF = 6.0, JCI = 1.4, TC = 39,676, Article citations to date = 10.

**Gonthier, D.J.**<sup>\*1,2,3</sup>, Sciligo, A., Karp, D., Lu, A., + Garcia, K., Chiba, T., Juarez, G., Gennet, S., Kremen, C. **2019**. Bird services and disservices to strawberry farming in Californian agricultural landscapes. **Journal of Applied Ecology** 56: 1948-1959. Rank among Ecology Journals 14/166, IF = 6.5, JCI = 1.7, TC = 25,441, Article citations to date = 14. ‡

## 2018

Karp, D. S\*, ... **Gonthier, D.J.**<sup>3,4</sup> (Author 58)...(of 153 authors) **2018**. Crop pests and predators exhibit inconsistent responses to surrounding landscape composition. **Proceedings of the National Academy of Sciences** 115 (33): E7863-E7870. Rank among multidisciplinary sciences Journals 3/48, IF = 10.7, JCI = NA, TC = 315,820, Article citations to date = 247.

Hajian-Forooshani, Z., +**Kuesel, R., Gonthier, D. J.**<sup>\*1,2,3</sup> **2018**. Explaining the distribution of *Rhabdopterus jansonii* in coffee plantations: insights from diet breadth and preference. **Agroforestry Systems** 92(3):731-739. Rank among agronomy journals 27/91, IF = 2.6, JCI = 1.0, TC = 5,409, Article citations to date = 1.

## 2017

Ward, R. \*, **Gonthier, D.J.**<sup>1,3</sup>, Nicholls, C. **2017**. Ecological resilience to coffee rust: Varietal adaptations of coffee farmers in Copán, Honduras, (9-10 ed., vol. 41, pp. 1081-1098) **Agroecology and Sustainable Food Systems** 41: 1081-1098. Rank among Multidisciplinary Agriculture Journals 10/57, IF = 3.0, JCI = 0.7, TC = 1,149, Article citations to date = 11.

## Publications prior to U.K

Summary: 20 total publications, with 617 total citations, mean IF = 4.0, mean JCI = 1.1.

+**Fisher, K. \***, **Gonthier, D.J.**<sup>1,2,3</sup>, Ennis, K.K., Perfecto, I. **2017**. Floral resource availability from groundcover promotes bee abundance in coffee agroecosystems. **Ecological Applications** 27: 1715-1826. Rank among Ecology journals 31/166, IF = 4.7, JCI = 1.2, TC = 24,246, Article citations to date = 12.

- +Vaidya, C.\***, **+Cruz, M.**, **+Kuesel, R.**, **Gonthier, D.J.<sup>1,2,3,5</sup>**, Iverson, A., Ennis, K.K., Perfecto, I. **2017**. Local and landscape constraints on coffee leafhopper (Hemiptera: cicadellidae) diversity. **Journal of Insect Science** 17(2), 38. Rank among Entomology journals 40/102, IF = 1.9, JCI = 0.8, TC = 3,808, Article citations to date = 3.
- +Hajian-Forooshani, Z.\***, **+Kuesel, R.\*\***, **Gonthier, D.J.<sup>1,2,3,5</sup>** **2016**. Explaining the distribution of *Rhabdopterus jansoni* in coffee plantations: insights from diet breadth and preference. **Agroforestry Systems**, 1-8. Rank among Agronomy journals 27/91, IF = 2.6, JCI = 1.0, TC = 5,409, Article citations to date = 1.
- Maas, B\*, Karp, D, Bumrungsri, S., Darras, K., **Gonthier, D.<sup>1,3</sup>**, Huang, C., Lindell, C., Maine, J., Mestre, L., Michel, N., Morrison, E., Perfecto, I., Philpott, S., Sekercioglu, C., Silva, R.M., Taylor, P., Tschardtke, T., Van Bael, S., Whelan, C.J., Williams-Guillén, K. **2016**. Bird and bat predation services in tropical forests and agroforestry landscapes. **Biological Reviews** 91: 1081-1101. Rank among Biology journals 1/93, IF = 12.8, JCI = 2.9, TC = 17,047, Article citations to date = 112.
- Pak, D.\* , Iverson, A., Ennis, K.K., **Gonthier, D.<sup>1,2,3,5</sup>**, Vandermeer, J.H. **2015**. Parasitoid wasps benefit from shade tree structure and landscape complexity in Mexican coffee agroecosystems. **Agriculture, Ecosystems & Environment** 206: 21-32. Rank among Multidisciplinary Agriculture journals 1/57, IF = 5.6, JCI = 1.6, TC = 30.607, Article citations to date = 14.
- +Hajian-Forooshani, Z.\***, **Gonthier, D.J.<sup>1,2,3,5</sup>**, Marin, L., Iverson, A., Perfecto, I. **2014**. Local and landscape factors explain the biodiversity of arboreal spiders in coffee agroecosystems. **PeerJ** 2:e623. Rank among Multidisciplinary Sciences journals 27/72, IF = 3.0, JCI = 0.5, TC = 29,907, Article citations to date = 7.
- Iverson, A.\* , Marin, L., Ennis, K., **Gonthier, D.<sup>1,2,3</sup>**, Remfert, J., Conner-Barrie, B., Cardinale, B.J., Perfecto, I. **2014**. Do polycultures promote win-wins or tradeoffs in agricultural ecosystem services? A meta-analysis. **Journal of Applied Ecology** 51:1593-1602. Rank among Ecology Journals 14/166, IF = 6.5, JCI = 1.7, TC = 25,441, Article citations to date = 108.
- Gonthier, D.J.<sup>1,2,3,5\*</sup>**, Ennis, K.K., Iverson, A., Hsieh, H., Farinas, S., Batary, P., Rudolphi, J., Tschardtke, T., Cardinale, B.J., Perfecto, I. **2014**. Biodiversity conservation in agriculture requires a multi-scale approach: a quantitative review. **Proceedings of the Royal Society B** 281: 20141358. Rank among Biology journals 13/93, IF = 5.4, JCI = 1.3, TC = 64,655, Article citations to date = 168.
- +Kuesel, R.\***, **Gonthier, D.J.<sup>1,2,3,5</sup>**, **+Cruz, L.**, **+Vaidya, C.**, Iverson, A., Perfecto, I. **2014**. Local management and landscape use intensity associated with a coffee leaf-chewing beetle. **Agroecology and Sustainable Food Systems** 38: 552-540. Rank among Multidisciplinary Agriculture Journals 10/57, IF = 3.0, JCI = 0.7, TC = 1,149, Article citations to date = 1.
- Gonthier, D.J.<sup>1,2,3</sup>.**, Castañeda, F.E. **2013**. Large- and medium-sized mammal survey using camera traps in the Sikre River in the Río Plátano Biosphere Reserve, Honduras. **Tropical Conservation Science** 6:584-591. Rank among Biodiversity Conservation journals 34/60, IF = 2.0, JCI = 0.4, TC = 1,395, Article citations to date = 10.
- Gonthier, D.J.<sup>1,2,3,5</sup>**, Ennis, K.K., Philpott, S.M., Vandermeer, J., Perfecto, I. **2013**. Ants defend coffee from berry borer colonization. **BioControl** 58:815-820. Rank among Entomology journals 12/102, IF = 3.6, JCI = 1.4, TC = 3,646, Article citations to date = 45.

**Gonthier, D.J.**<sup>\*1,2,3</sup>, Dominguez, G.M., Witter, J., Spongberg, A.L., Philpott, S.M. **2013**. Bottom up effects of soil quality on a coffee arthropod interaction web. **Ecosphere** 4: Article 107. (DOI)10.1890/ES13-00072.1. Rank among Ecology journals 62/166, IF = 3.2, JCI = 0.9, TC = 10,223, Article citations to date = 8.

Murnen, C.\*, **Gonthier, D.J.**<sup>1,2</sup>, Philpott, S.M. **2013**. Food webs in the litter: Effects of food and nest addition on ant communities in coffee agroecosystems and forest. **Environmental Entomology** 42: 668-676. Rank among Entomology journals 27/102, IF = 2.4, JCI = 1.0, TC = 10,392, Article citations to date = 6.

Philpott, S.M.\*, **+Pardee, G.L., Gonthier, D.J.**<sup>1,2</sup> **2012**. Cryptic biodiversity effects: Importance of functional redundancy revealed through addition of food web complexity. **Ecology** 93:992-1001. Rank among Ecology journals 22/166, IF = 5.5, JCI = 1.4, TC = 74,376, Article citations to date = 30.

**Gonthier, D.J.**<sup>\*1,2,3,5</sup> **2012**. Do herbivores eavesdrop on ant chemical communication to avoid predation? **PLoS ONE** 7: e28703. Rank among Multidisciplinary Sciences journals 27/72, IF = 3.2, JCI = 0.6, TC = 857,751, Article citations to date = 10.

**Gonthier, D.J.**<sup>\*1,2,3</sup>, Witter, J., Spongberg, A.L., Philpott, S.M. **2011**. Effect of nitrogen fertilization on caffeine production in coffee (*Coffea arabica* L.). **Chemoecology** 21:123-130. Rank among Ecology journals 120/166, IF = 1.7, JCI = 0.5, TC = 1,194, Article citations to date = 12.

**Gonthier, D.J.**<sup>\*1,2,3</sup>, **+Pardee, G.L.**, and Philpott, S.M. **2010**. *Azteca instabilis* ants and the defence of a coffee shade tree: an ant-plant association without mutual rewards in Chiapas, Mexico. **Journal of Tropical Ecology** 26: 343-346. Rank among Ecology journals 133/166, IF = 1.4, JCI = 0.4, TC = 3,635, Article citations to date = 2.

**Gonthier, D.J.**<sup>\*1,2,3</sup> **2009**. Notes on seeds deposited in elephant dung at Tarangire National Park, Tanzania. **African Journal of Ecology** 47:252-256. Rank among Ecology journals 131/166, IF = 1.4, JCI = 0.3, TC = 2,798, Article citations to date = 7.

Swarthout, D.\*, Harper, E., Judd, S., **Gonthier, D.**<sup>1,2,3</sup>, Shyne, R., Stowe, T., Bultman, T. **2009**. Measures of leaf-level water-use efficiency in drought stressed endophyte infected tall fescue grasses. **Environmental and Experimental Botany** 66:88-93. Rank among Plant Sciences journals 20/235, IF = 5.6, JCI = 1.4, TC = 16,198, Article citations to date = 40.

**Gonthier, D.J.**<sup>1,2,3</sup>, Sullivan, T.J., Brown, K.L., Wurtzel, B., Lawal, R., VandenOever, K., Buchan, Z., Bultman, T.L.\* **2008**. Stroma-forming endophyte *Epichloë glyceriae* provides wound-inducible herbivore resistance to its grass host. **Oikos** 117:629-633. Rank among Ecology journals 41/166, IF = 3.9, JCI = 1.1, TC = 25,815, Article citations to date = 22.

### Outreach products while at U.K.

Outreach presentations, blog posts, and podcasts; +graduate student presenter or author mentored by DG

#### 2022

Abel, B., **Gonthier, D.** Integrating poultry into vegetable production rotations. Organic Association of Kentucky Annual Conference (January 28, 2022). Virtual Presentation.

**Gonthier, D.** Limiting pests using exclusion netting in fruits and vegetables. University of Kentucky IPM Training School (March 9, 2022). Virtual Presentation.

**+Fiske, K.**, Bessin, R., Williams, M., **Gonthier, D.** Row covers provide sustainable resiliency to cucurbit pests. IPM Coordinators Meeting, Denver, CO. (February 28, 2022). Poster.

Bessin, R., **Gonthier D.** Details matter: Using row covers for pest management in cucurbits. Current Cucurbit. Blog post (February 9, 2022). Iowa State University Website: <https://www.cucurbit.plantpath.iastate.edu/blog>. Blog post.

**+Fiske, K.** Row cover systems for cucurbits: Insights from research and grower's perspectives. Kentucky Fruit and Vegetable Conference (January 4, 2022). Virtual presentation.

**+Halmos, V.** Integrating poultry into vegetable rotations: Impacts on soil, productivity, and food safety. Kentucky Fruit and Vegetable Conference, Bowling Green, KY (January 2022). Oral presentation.

**+Halmos, V., Gonthier, D.** Developing sustainable protection systems for flea beetle control. Kentucky Fruit and Vegetable Conference, Bowling Green, KY. (January 2022). Oral presentation.

**+Fiske, K. Gonthier, D.,** Bessin, Williams, M. Row cover systems for cucurbits: Insights from research and grower's perspectives. Southeast Regional Fruit and Vegetable Conference (January 7, 2022). Virtual presentation.

## 2021

**Gonthier, D.** Current Cucurbit Podcast with Dr. Mark Gleason. Pollination! The pillar of a good yield; with Dr. David Gonthier. Episode 3 (October 4, 2021). Iowa State University Website: <https://www.cucurbit.plantpath.iastate.edu/current-cucurbit-podcast>. Podcast.

**Gonthier, D.** Using row covers to control garden insect pests. U.K. Graduate Student Garden and Family Housing Gardening Workshop Series (June 23, 2021). <https://www.facebook.com/GraduateStudentGardenUK/>. Virtual presentation.

**+Kuesel, R.** Fall bearing raspberry management for spotted wing Drosophila and the African fig fly. Kentucky Fruit and Vegetable Grower's Conference (January 12, 2021). Virtual presentation.

**+Fiske, K.** Reflecting on University of Kentucky's 2020 mesotunnel experiments. Current Cucurbit. Blog post (July 7, 2021). Iowa State University Website: <https://www.cucurbit.plantpath.iastate.edu/blog>. Blog post.

**+Fiske, K.** Optimizing row cover systems for cucurbits in Kentucky. Kentucky Fruit and Vegetable Grower's Conference (January 12, 2021). Virtual presentation.

## 2020

**Gonthier, D.,** Bessin, R. Balancing pollination and pest control in mesotunnel cucurbit systems. Current Cucurbit. Blog post (October 2, 2020). Iowa State University Website: <https://www.cucurbit.plantpath.iastate.edu/blog>. Blog post.

**+Kuesel, R.** Insect exclusion netting for blackberry protection. Kentucky Fruit and Vegetable Grower's Conference (January 6, 2020). Oral presentation.

**+Brockman, R.** Incorporating fine mesh row covers into insect management of vegetable crops. Kentucky Fruit and Vegetable Grower's Conference (January 7, 2020). Oral presentation.

## 2018

**+Kuesel, R.** Spotted winged Drosophila pest in caneberries. Woodford County Cooperative Extension Farm Tour. (2018). Oral presentation.



**+Kuesel, R.** Exclusion netting of pests in caneberries. University of Kentucky Horticulture Research Farm Twilight Tour (2018). Oral presentation.

## Conference presentations

*+Graduate student speaker mentored by D.G., otherwise D.G. presented oral or virtual presentations*

### 2021

**+Garcia, K.,** Scott, D., **Gonthier, D.J.** Ecological impacts of organic pasture raised poultry on cover crop and arthropod communities, Ecological Society of America (August 2, 2021). Virtual presentation.

**+Kuesel, R, Gonthier, D.** Physical pest barriers in bramble production - Fine mesh net for the management of *Drosophila suzukii* and *Popillia japonica*. North Central Branch Meeting of the Entomological Society of America (June 23, 2021). Virtual presentation.

**+Fiske, K., Gonthier, D.** Optimizing row cover systems for cucurbits in Kentucky. North Central Branch Meeting of the Entomological Society of America (June 23, 2021). Virtual presentation.

### 2020

**+Garcia, K.,** Olimpi, E.M., Karp, D.S. and **Gonthier, D.J.** Shifts in functional groups of birds across varying agricultural landscapes, North American Ornithological Conference, (August 14, 2020). Oral presentation.

### 2019

**+Garcia, K.,** Olimpi E.M, Karp D.S., **Gonthier, D.J.** The role of birds as biological control agents and intraguild predators of insects in California Central Coast strawberries, Entomological Society of America Annual Meeting, St. Louis, MO (November 17, 2019). Oral presentation.

**+Kuesel, R., +Archer, K., Gonthier, D.** Landscape influences on spotted-wing *Drosophila* (*Drosophila suzukii*) in central Kentucky. Entomology Society of America, St. Louis, MO (November 18, 2019). Oral Presentation.

**+Brockman, R., Gonthier, D.** Developing alternative control systems for flea beetles in specialty crops. Entomology Society of America, St. Louis, MO (November 18, 2019). Oral presentation.

Lu, A., **Gonthier, D.,** Sciligo, A., **+Garcia, K.,** Juarez, G., Chiba, T., Ouyang, F., Kremen, C. When enemies are friends: Conservation biocontrol of *Lygus hesperus* in organic strawberries. Entomological Society of America, St. Louis, MO (November 20, 2019). Oral presentation.

**Gonthier, D., +Kuesel, R., +Brockman, R., +Archer, K., +O'Hearn, K.,** Scott Hicks, D., Wilson, N. Sciligo, A., Bessin, R., Williams, M. Using physical barriers and essential oils for broad pest control in specialty crops. Entomology Society of America, St. Louis, MO (November 18, 2019). Oral presentation.

**+Garcia, K., Gonthier, D.,** Karp, D., Olimpi, E., Sciligo, A., Lu, A., Kremen, C. The services and disservices of birds in California Central Coast strawberries. Ecology Society of America Louisville, KY (August 15, 2019). Oral presentation.

**Gonthier, D.**, Castaneda, F. The impact of varietal intercropping on the coffee leaf rust in Honduran coffee. Ecological Society of America, Louisville, KY. (August 14, 2019). Oral presentation.

#### **2018**

**Gonthier, D.** The phylogenetic diversification of agriculture for pest and pathogen suppression. Entomological Society of America, International, Vancouver, Canada. (November 11, 2018). Oral presentation.

#### **2017**

**Gonthier, D. J.** Defining crop phylogenies and landscapes to test the phylogenetic resource concentration hypothesis. Entomological Society of America, Denver, CO. (November 5, 2017). Oral presentation.

#### **38 additional conference presentations prior to time at U.K. (prior to 2017)**

#### **Invited departmental seminars**

##### **While at U.K.**

**Gonthier, D.J.** Multifunctional agriculture: Balancing trade-offs to improve sustainability. University of Kentucky. Department of Entomology. (April 1, 2021).

**Gonthier, D.J.** Multifunctional agriculture: Balancing trade-offs to improve sustainability. University of Kentucky. Department of Plant and Soil Science. (March 19, 2021).

**Gonthier, D.J.** The phylogenetic diversification of agriculture for pest and disease suppression. University of California, Davis, CA. (January 24, 2018).

##### **Prior to U.K.**

**Gonthier DJ.** Managing agricultural biodiversity for pest control services. Cornell University, Department of Horticulture. (2016).

**Gonthier DJ.** Managing biodiversity and ecosystem services in agriculture. UC Berkeley. Department of environmental science, policy, and management. (2016).

**Gonthier DJ.** Managing biodiversity in agriculture. UC Merced. Sustainability Symposium Series. (2016).

**Gonthier DJ.** Managing agricultural biodiversity for multiple ecosystem services. UC Santa Cruz, Department of Environmental Studies. (2016).

**Gonthier DJ.** Managing biodiversity and ecosystem services in agriculture. UC Riverside, Department of Entomology. (2016).

**Gonthier DJ.** La conservación del control biológico de hormigas en café. The Zamorano Pan-American Agriculture School 'El Zamorano', Honduras. (Video-conference talk in Spanish). (2015).

**Gonthier DJ.** Cultivating conservation on a farmed planet. Conservation, Wildlife, & Fisheries Seminar. University of California, Berkeley. (2015).

**Gonthier DJ.** Applied phylogenetics: historical approaches as pest suppression tools in agriculture. Environmental Science, Policy, & Management Departmental Seminar

Series. University of California, Berkeley. (2015).

**Gonthier DJ.** Managing biodiversity in agriculture. UC President's Lake Arrowhead Retreat. UCLA Lake Arrowhead Conference Center. (2015).

**Gonthier DJ.** The causes and consequences of biodiversity in agriculture. Field Ecology Course, U. Michigan (2013).

**Gonthier DJ.** Pheromone avoidance hypothesis: do ant pheromones deter herbivores? Conservation Biology Seminar Series, School of Natural Resources and Environment, University of Michigan. (2010).

#### **Other awards & funds (prior to U.K)**

Charles Lathrop Pack Foundation Award, writing award in Natural Resources (2014).

Samuel A. Graham Award, for outstanding scholarship in Forest Biology (2014).

Nominated for University of Michigan's Distinguished Dissertation Award (2014).

Nominated to AAAS Program for Excellence in Science (2014).

Compact for Open-Access Publishing Equity, fee coverage (2013).

U. Michigan – School of Natural Resource and Environment Travel Grant (2013).

U. Michigan – Rackham Conference Travel Grant (2012).

Charles Lathrop Pack Foundation Award, writing award in Natural Resources (2012).

Compact for Open-Access Publishing Equity, fee coverage (2012).

Best student presentation, 20th Symposium of Myrmecology, Petropolis, Brazil. (2011).

U. Michigan – School of Natural Resource and Environment Travel Grant (2011).

U. Michigan – Rackham Conference Travel Grant (2011).

National Science Foundation – Graduate Research Fellowship Travel Award (2011).

Ayers-Brinser Award –for excellent study of natural resource policy and management (2011).

U. Toledo – Study Abroad Program Travel Grant (2010).

U. Toledo – Environmental Science Conference Travel Grant (2010).

U. Toledo – Study Abroad Program Travel Grant (2009).

Council of Undergraduate Research Quarterly – research highlight (2008).

# Teaching

## Teaching summary

| Course metrics                                        | Statistics | College mean* |
|-------------------------------------------------------|------------|---------------|
| Courses taught by D.G.                                | 7          |               |
| No. of students enrolled in courses                   | 110        |               |
| No. of undergraduate students enrolled in courses     | 95         |               |
| No. of graduate students enrolled in courses          | 15         |               |
| Mean no. of students per course                       | 15         |               |
| Mean Teacher-Course Evaluation course quality score   | 4.1        | 4.3           |
| Mean Teacher-Course Evaluation teaching quality score | 4.6        | 4.4           |

*\*Mean across all courses offered in the College of Agriculture, Food, and Environment during the semesters D.G. instructed*

## Formal courses instructed

### Spring 2022

**Agroecology PLS 390 – 001/SAG 390 – 001 & Advanced agroecology PLS 597 – 003** (taught simultaneously). Instructors: **Gonthier, D.**, Haramoto, E. (50/50 distribution of effort). Term: Spring 2022. Credits 3.

- 16 Undergraduate students enrolled in PLS 390 – 001
- 5 Undergraduate students enrolled in SAG 390 – 001
- 1 Graduate student enrolled in PLS 597 – 003
- Total enrollment of 22 students

### Fall 2021

**Wake up and smell the coffee! GEN 300 – 003.** Instructor: **Gonthier, D.** Term: Fall 2021. Credits 3.

- Total enrollment of 15 undergraduate students
- TCE Course quality = 4.3 (college mean = 4.2)**
- TCE teaching quality = 4.8 (college mean = 4.5)**

### Spring 2021

**Agroecology PLS 390 – 001/SAG 390 – 001 & Advanced agroecology PLS 597 – 003/ ENT 595 – 001** (taught simultaneously). Instructors: **Gonthier, D.**, Haramoto, E. (50/50 distribution of effort). Term: Spring 2021. Credits 3.

- 13 Undergraduate students enrolled in PLS 390 – 001
- 2 Undergraduate students enrolled in SAG 390 – 001
- 1 Graduate student enrolled in PLS 597 – 003
- 3 Graduate student enrolled in ENT 595 – 001
- Total enrollment of 19 students

## Fall 2020

**Wake up and smell the coffee! GEN 300 – 003.** Instructors: **Gonthier, D,** Goodin, M. (50/50 distribution of effort). Term: Fall 2020. Credits 3.  
-Total enrollment of 13 undergraduate students

## Fall 2019

**Wake up and smell the coffee! GEN 300 – 005.** Instructors: **Gonthier, D,** Goodin, M. (50/50 distribution of effort). Term: Fall 2019. Credits 3.  
-Total enrollment of 17 undergraduate students  
**-TCE Course quality = 3.7 (College mean = 4.3)**  
**-TCE teaching quality = 4.5 (College mean = 4.3)**

**Pests of field crops ENT 310.** Instructor: **Gonthier, D.** Term: Fall 2019. Credits 3.  
-Total enrollment of 11 undergraduate students  
**-TCE Course quality = 4.0 (College mean = 4.3)**  
**-TCE teaching quality = 4.4 (College mean = 4.3)**

## Fall 2018

**Advanced agroecology PLS 597 – 003.** Instructor: **Gonthier, D.** Term: Spring 2018. Credits 3.  
-3 Undergraduate students enrolled in PLS 597 – 003  
-10 Graduate student enrolled in PLS 597 – 003  
-Total enrollment of 13 students  
**-TCE Course quality = 4.5 (college mean 4.3)**  
**-TCE teaching quality = 4.6 (College mean 4.4)**

## Graduate and undergraduate research- and residency-based coursework

**ENT 767 Dissertation residency credit.** Instructor: **Gonthier, D.** Credits 2-3.  
-Spring 2022, 3 graduate students enrolled  
-Fall 2021, 2 graduate students enrolled  
-Spring 2021, 2 graduate students enrolled  
-Fall 2020, 2 graduate students enrolled  
-Spring 2020, 2 graduate students enrolled

**ENT 768 Residence degree for master's degree.** Instructor: **Gonthier, D.** Credits 1-6.  
-Fall 2021, 1 graduate student enrolled  
-Spring 2020, 1 graduate student enrolled  
-Fall 2020, 2 graduate students enrolled  
-Spring 2019, 2 graduate students enrolled

**ENT 780 Sp prob in ENT/Acarology.** Instructor: **Gonthier, D.** Credits 2-3.  
-Spring 2022, 1 graduate student enrolled  
-Fall 2021, 1 graduate student enrolled  
-Spring 2021, 1 graduate student enrolled  
-Summer 2020, 1 graduate student enrolled  
-Spring 2020, 1 graduate student enrolled  
-Fall 2020, 1 graduate student enrolled

**ENT 790 Sp prob in ENT/Acarology.** Instructor: **Gonthier, D.** Credits 1-6.  
-Fall 2021, 2 graduate students enrolled  
-Spring 2021, 2 graduate students enrolled

-Fall 2020, 2 graduate students enrolled  
-Spring 2020, 2 graduate students enrolled  
-Fall 2019, 1 graduate student enrolled  
-Spring 2019, 3 graduate students enrolled  
-Spring 2018, 1 graduate student enrolled

**SAG 395 – 002 Research in sustainable agriculture.** Instructor: **Gonthier, D.** Credits 1-6.  
-Fall 2021, 1 undergraduate student enrolled

**ENT 395 – 003 Undergraduate independent work in Entomology.** Instructor: **Gonthier, D.**  
Credits 1-3.

-Summer 2021, 1 undergraduate student enrolled  
-Spring 2021, 1 undergraduate student enrolled  
-Spring 2020, 1 undergraduate student enrolled

### Teaching experience prior to U.K.

Graduate Student Instructor, **Field Ecology**, U. Michigan (2013).

Graduate Lead Organizer, **Agricultural biodiversity & Meta-analysis**, Dimensions Biodiversity Distributed Graduate Seminar, U. Michigan (2011-2012).

Graduate Student Instructor, **Environmental Problems Lab**, U. Toledo (2010).

Teaching Assistant, **Intro. Environmental Science**, U. Toledo (2009).

Teaching Assistant, **Biodiversity Lab**, U. Toledo (2009).

Teaching Assistant, **Environmental Problems Lab**, U. Toledo (2009).

Instructional Assistant, **Ecology**, U. Michigan Biological Station (2007).

Instructional Assistant, **Field Parasitology**, U. Michigan Biological Station (2006).

### Graduate student education at U.K.

Summary: D.G. is chair or co-chair for 7 graduate students with the successful completion of 2 MS students, 1 PhD student successfully defended, 4 graduate students in-process; D.G. is committee member on 6 other graduate student committees (1 completed, 5 in-process)

#### Dissertation Committee Chair or Co-Chair

Karina Garcia, **Status: Successfully Defended.** PhD candidate, University of Kentucky, Department of Entomology. D.G. is chair. (January 6, 2018 – summer 2022).

*\*Evidence of success: 1 first-authored publication, 5 co-authored publications, awarded NSF Graduate Research Fellowship for \$138,000; Position attained: Postdoctoral research position secured at the University of Kentucky with D.G.*

Ryan Kuesel, **Status: In-Process.** PhD candidate, University of Kentucky, Department of Entomology. D.G. is chair. (January 6, 2018 – fall 2022).

*\*Evidence of success: 2 first-authored publications, 2 co-authored publications, primary author on awarded USDA KDA Specialty Crop Block Grant for \$50,000.*

Kantima Thongjued, **Status: In-Process.** PhD candidate, University of Kentucky, Department of Entomology. D.G. is co-chair with Julian Dupuis. (August 19, 2019 - Present).  
*\*Evidence of success: Awarded Richards Graduate Student Research Activity Award for \$750.*

Kathleen Fiske, **Status: In-Process.** PhD student, University of Kentucky, Department of Entomology. D.G. is chair. (January 1, 2020 – Present).  
*\*Evidence of success: Successfully delivered or published 5 outreach products.*

#### **Plan A Master's Thesis Committee Chair or Co-Chair**

Viktor Halmos, **Status: In-Process.** MS Student, University of Kentucky, Department of Entomology. In-Process. D.G. is chair. (January 1, 2021 – Present).  
*\*Evidence of success: Successfully delivered 2 outreach presentations at grower's meetings.*

Robert Brockman, **Status: Completed.** MS Student, University of Kentucky, Department of Entomology. D.G. is co-chair with Mark Williams. (August 24, 2018 - 2020).  
*\*Evidence of success: 1 first-authored publication; Position attained: Assistant Agriculture Extension Agent (Horticulture) – Cooperative Extension Service at North Carolina State University.*

#### **Online Master's Committee chair or co-chair**

Paula Sumner, **Status: Completed.** Online MS Student, University of Kentucky, Department of Entomology; D.G. is committee co-chair. (September 1, 2021 – Present).  
*\*Evidence of success: Position attained: Biology Teacher at Lafayette High School*

#### **Dissertation Committee Member**

Lauren Fann, **Status: In Process.** PhD Student, University of Kentucky, Department of Entomology. (2021 – Present).

Jack Devlin, **Status: In Process.** PhD Student, University of Kentucky Department of Entomology. 2020 – Present).

Ellie McCabe, **Status: In Process.** PhD Student, University of Kentucky Department of Entomology. (2020 – Present).

Caroline Kane, **Status: In Process.** PhD Student, University of Kentucky, Department of Entomology. (2020 – Present).

Adam Baker, **Status: Completed.** PhD Student, University of Kentucky, Department of Entomology. (December 8, 2017 - 2019).

#### **Master's Thesis Committee Member**

Wade Pike, **Status: In Process.** MS Student, University of Kentucky Department of Entomology. (2020 – Present).

#### **Directed Student Learning (excluding theses, dissertations)**

Ryan Kuesel. Completed (May 2021). D.G. mentored Kuesel through the submission of an USDA-AFRI EWD Predoctoral Fellowship. Status: Not funded.

Kathleen Fiske. Completed (January-May 2021) D.G. mentored Fiske through the submission of

a Southern Sustainable Agriculture Research and Education Graduate Student Grant.  
Status: Not funded.

Karina Garcia. Mentor. Completed (August 20, 2018 - August 20, 2023).  
Description: Mentored student in successful NSF Graduate Research Fellowship for \$138,000 to fund her dissertation. Status: Funded.

Karina Garcia. Mentor. Completed (September 1, 2017 - October 22, 2017).  
Description: Mentor of graduate student in writing Annie's Sustainable Agriculture scholarship, Ford Fellowship. Status: Not funded.

Ryan Kuesel. Mentor. Completed (September 1, 2017 - October 22, 2017).  
Description: Mentor of graduate student in writing NSF Graduate Research Fellowship, Annie's Sustainable Agriculture Scholarship. Status: Not funded.

## **Undergraduate student research mentoring and advising**

### **Undergraduate research mentoring**

#### **At U.K. (2017 to present)**

Catherine Esperza, Undergraduate student (2022 – present).

Ben Morrison, Undergraduate student (2022 – present).

Mateo Garcia, Undergraduate student (2022 – present).

Helder Avendano Gomez, Undergraduate student (2021 – present).

Sarah Jones, Undergraduate student, (2021 – present).

Alexis Gauger, Undergraduate student (2021 – 2022). To join D.G. lab as M.S. student in the fall 2022.

Chelsea Avery, Undergraduate student (2020-present). To start U. Louisville Dental School in fall 2022.

Megan Crabtree, Undergraduate student (2021).

Brittney Sortor, Undergraduate student (2021).

Alli Rankin, Undergraduate student (2018-2019).

Kendall Archer, Undergraduate student (2017 – 2019).

Kyla O'Hearn, Undergraduate student (2018). Now a PhD Student at Cornell University.

#### **Prior to U.K. (prior to 2017)**

Christina Lew, Undergraduate student, Work study, U California, Berkeley (2016-2017).

Karina Garcia, Research technician, U California, Berkeley (2015-2016). Now a PhD student at U.K. with D.G.

Gila Juarez, Undergraduate student, Biology Scholars Program & Undergraduate Research Apprentice Program, U California, Berkeley (2015-2016).



Hurui Kifle, Biology Scholars Program, U California, Berkeley (2015-2016).

Taiki Chiba, Volunteer undergraduate student, U California, Berkeley (2015-2016).

Lisette Solis, Undergraduate student, Undergraduate Research Apprentice Program, U California, Berkeley (2014-2015).

Geraldine Burrola, Undergraduate student, Undergraduate Research Apprentice Program, U California, Berkeley (2014-2015).

Wai Ting Chan, Sponsored Projects for Undergraduate Research Program, U California, Berkeley (2014-2015).

Jeneya Fertel, Undergraduate student, Undergraduate Research Apprentice Program, U California, Berkeley (2014-2015).

Zachary Hajian-Forooshani, undergraduate student, NSF REU EDQUEST & Undergraduate Research Opportunity Program, U. Michigan (2011-2014). Now a PhD student at U. Michigan.

Lena Cruz, undergraduate student, Undergraduate Research Opportunity Program, U. Michigan (2012-2014).

Chatura Vaidya, volunteer student, U. Michigan (2012-2014). Now a PhD student at U. Michigan.

Ryan Kuesel, undergraduate student, undergraduate Research Opportunity Program, U. Michigan (2012-2014). Now a PhD student at U.K. with D.G.

Gabriella Pardee, undergraduate student, U. Toledo (2009). NSF-Graduate Research Fellow at North Carolina State University, now postdoc at U. Texas.

### **Academic Advising at U.K.**

Spring 2022-2023. 3 undergraduate students advised, 5 graduate students advised. Advised graduate and undergraduate students on field data collection, data analysis, and manuscript preparation.

Fall 2021-2022. 3 undergraduate students advised, 5 graduate students advised. Advised graduate and undergraduate students on field data collection, data analysis, and manuscript preparation.

Summer 2020-2021. 5 undergraduate students advised, 6 graduate students advised. Advised graduate and undergraduate students on field data collection, data analysis, and manuscript preparation.

Spring 2020-2021. 2 undergraduate students advised, 6 graduate students advised. Advised graduate and undergraduate students on field data collection, data analysis, and manuscript preparation.

Fall 2019-2020. 1 undergraduate student advised, 5 graduate students advised. Advised graduate and undergraduate students on field data collection, data analysis, and manuscript preparation.

Summer 2019-2020. 1 undergraduate student advised, 5 graduate students advised. Advised graduate and undergraduate students on research and field data collection.

Spring 2019-2020. 2 undergraduate students advised, 5 graduate students advised. Advised graduate students on research project development, data management, and data analysis. Advised undergraduate student in ArcGIS analysis, data analysis, and data analysis.

Fall 2018-2019. 2 undergraduate students advised, 4 graduate students advised. Advised graduate students on research project development, data management, and data analysis. Advised undergraduate student in ArcGIS analysis, data analysis, and data analysis.

Summer 2017-2018. 1 undergraduate student advised, 2 graduate student advised, Advised graduate and undergraduate students on research project development, field work, and data management.

Spring 2017-2018. 1 undergraduate student advised, 2 graduate students advised, Advised graduate students on research project development, fellowship writing, and field work. Advised undergraduate student in ArcGIS analysis, data analysis, and manuscript preparation.

Fall 2017-2018. 1 undergraduate student advised, mentored undergraduate student in using ArcGIS to classify agricultural landscapes and estimate the value of production losses due to pests.

## **Program and Curriculum Development at U.K**

### **2022**

Program/Curriculum Name - ENT320 Horticultural Entomology. Program/Curriculum Name - GEN300 Wake up and smell the coffee. Description: Course material preparation. Lectures in Fall of 2022.

### **2021**

Program/Curriculum Name - GEN300 Wake up and smell the coffee. Description: Course material preparation. Lectures in Fall of 2021. Program/Curriculum Name – PLS390/SAG390 Agroecology & PLS597/ENT595 Advanced agroecology. Description: Course material preparation. Lectures and labs in spring of 2022.

### **2020**

Program/Curriculum Name – PLS390/SAG390 Agroecology & PLS597/ENT595 Advanced agroecology. Description: Course material preparation. Lectures and labs in spring of 2021.

### **2019**

Program/Curriculum Name - ENT310 Pests of field crops. GEN300 Wake up and smell the coffee  
Description: Course material preparation. Lectures and labs in Fall of 2019.

### **2018**

Program/Curriculum Name - PLS 597-003: Sp Tops in Plant and Soil Sci Advanced Agroecology  
Description: Course material preparation. Lectures and labs in Fall of 2018.

# Service

## Department Service at U.K.

### Committee Member

Faculty search co-chair for Sustainable Pest Management Position (with Dr. Jen White) (March 31, 2021 – May 25, 2022).

Departmental steering committee (January 22, 2019 - Present).

Curriculum committee (October 16, 2018 - Present).

Faculty search committee for extension entomologist position (July 30, 2018 - May 9, 2019).

## University Service

### Committee Member

Sustainable agriculture program steering committee (June 28, 2021 – Present).

Food systems initiative committee (April 28, 2019 - Present).

## Professional Service

### Editor, Journal Editor (Invited)

Associate editor, *Frontiers in Sustainable Food Systems*, subsection Agroecology and Ecosystem Services (May 4, 2021 – Present).

Editor of special topic: *Frontiers in Sustainable Food Systems*. Special topic: Moving from a Curative to Preventative Pest Management Paradigm (July 22, 2019 - August 22, 2020).

### Workshop, symposium, field trip organizer

Fann, L., +Kuesel, R., Gonthier, D. Expanding the pest management tool-kit: Adapting pest management alternatives for diverse farming communities. North Central Entomology Society of America, Virtual (June 22, 2021). Symposium organizer.

Sciligo, A., Gonthier, D. Member symposium: Finding common ground: non-chemical pest-management to protect organic and conventional crops. Entomology Society of America, Denver, CO (November 11, 2020). Symposium organizer and moderator.

McCulley, R., Jacobsen, K., Haramoto, E., Gonthier, D., Rittschof, C. "Agroecology in Kentucky: Organic agriculture, bees, cover crops, food waste and more. Ecological Society of America. Louisville, KY (August 11, 2019). Conference Field Trip Organizer and Speaker.

Jabbour, R., Ingerslew, K.S., Gonthier, D. "How crop diversification across space and time influences herbivory. Entomology Society of America, Vancouver, CA (November 11, 2018). Symposium organizer and moderator.

**Gonthier, D. J.**, Sciligo, A., Guzman, A., Skidmore, A., Stone, M., Waterstrat, F., McMaine, L., McMaine, R., Meyer, L., Dimension of Political Ecology Conference, "Barriers and incentives for organic and sustainable practices in Kentucky agriculture," University of Kentucky, National, Lexington, KY. (February 23, 2018). Panel Discussion.

### **Reviewer, Ad Hoc Reviewer**

Peer-reviewer for the journals: Agriculture and Forest Entomology; PLoS ONE; Nature; Agriculture, Ecosystems, & Environment; Annals of the Entomological Society; Basic and Applied Ecology; Oecologia; AIMS Environmental Science; Conservation Biology; Journal of Applied Entomology; Landscape Ecology; Biocontrol; Open Science; Ecological Indicators; Biotropica; Proceedings of the Royal Society B; Landuse Policy; HortScience; Journal of Applied Ecology; Proceedings of the National Academy of Sciences USA; Insects; Nature Plants; Ecology; Land Use Policy; Insects; Biocontrol; Journal of Applied Ecology; Nature Plants; Ecology; Frontiers in Sustainable Food Systems; Frontiers in Insect Science

### **Reviewer, Grant Proposal**

Southern Sustainable Agriculture Research & Education Grant (2018 – 2019, 2019 – 2020).

University of Kentucky Food Connection, Reviewer of Student Opportunities Grant (2018-2019).

University of California, Santa Cruz, Reviewer of Heller Agroecology Graduate Student Research Grants (2018, 2022).

### **Professional Societies**

Entomological Society of America  
Ecological Society of America  
Organic Association of Kentucky  
Kentucky Vegetable Growers Association

## **Dr. Nathan L. Haan**

College of Agriculture, Food and Environment  
Department of Entomology

### **Education**

**2017 PhD**, Environmental and Forest Sciences, School of Environmental and Forest Sciences, University of Washington, Seattle, WA.

**2010 MSc**, Natural Resources and Environment, School of Natural Resources and Environment, University of Michigan, Ann Arbor, MI.

**2007 BSc**, Biology, Calvin College, Grand Rapids, MI.

### **Work History**

**September 2022-present Assistant Professor**, University of Kentucky Department of Entomology

**2018-2022 Research Associate**, Michigan State University Department of Entomology

**2017-2018 Research Associate**, University of Washington School of Environmental and Forest Sciences

**2013-2017 PhD Student**, University of Washington School of Environmental and Forest Sciences

**2010-2012 Program Director**, Plaster Creek Stewards, Calvin College

**2008-2009 Caretaker**, University of Michigan Nichols Arboretum

**2008-2010 MSc Student**, University of Michigan School of Natural Resources and Environment

### **Research and Scholarship**

#### **Intellectual Contributions**

##### ***Published***

##### **Journal Article, Academic Journal**

~ = Haan as corresponding author

~Haan, N.L., Iuliano, B., Gratton, C., Landis, D.A. (2021). Designing agricultural landscapes for biodiversity services in North America. *Advances in Ecological Research* 64, 191-250.

Author Role: Equal author contributions. Dr. Haan wrote ~1/3 of manuscript and led review/editing.

Bloom, E.H., Graham, K., Haan, N.L., Heck, A., Gut, L., Landis, D.A., Wilson, J., Zhang, Y., Milbrath, M., Szendrei, Z., Isaacs, R. (2021). Responding to the US National Pollinator Plan: a case study in Michigan. *Frontiers in Ecology and the Environment*. Doi: 10.1002/fee.2430

Author Role: Dr. Haan wrote a section of the article and contributed to edits.

Alred, B., Landis, D.A., Haan, N.L., Szűcs, M. (2021). Does the presence of the biological control agent, *Hyponomeuta opulenta* (Lepidoptera: Erebididae) on swallow-worts deter monarch oviposition? *Environmental Entomology*. Doi:10.1093/ee/nvab121

Author Role: Dr. Haan contributed to study design, advised lead author on analysis, and edited the manuscript.

~Haan, N.L., Bowers, M.D., Bakker, J.D., (2021). Preference, performance, and chemical defense in an endangered butterfly using novel and ancestral host plants. *Scientific Reports* 11. doi: 10.1038/s41598-020-80413-y

Author Role: Dr. Haan designed study, collected data, performed analyses, and wrote the manuscript.

Zhang, Y., Haan, N.L., Landis, D.A. (2020). Landscape composition and configuration have scale-dependent effects on pest suppression services in agricultural landscapes. *Agriculture, Ecosystems and Environment* 302, 107085.

Author Role: Dr. Haan contributed to design of study, statistical analysis, and assisted with writing/editing.

Myers, A.T., Haan, N.L., Landis, D.A. (2020). Video surveillance reveals a diverse and largely nocturnal community of *Danaus plexippus* (L.) egg predators. *Journal of Insect Conservation* 24, 731-737.

Author Role: Dr. Haan assisted with analysis, writing, and editing.

~Haan, N.L., Landis, D.A. (2020). Effects of grassland disturbance on first-instar monarch butterfly survival, floral resources, and flower-visiting insects. *Biological Conservation* 243, 108492.

Author Role: Dr. Haan designed study, collected data, conducted analyses, and wrote the manuscript.

~Haan, N.L., Zhang, Y. Landis, D.A. (2020). Predicting landscape configuration effects on agricultural pest suppression. *Trends in Ecology and Evolution*. doi: 10.1016/j.tree.2019.10.003

Author Role: Dr. Haan conducted review of literature and wrote the manuscript.

Hermann, S.L., Blackledge, C., Haan, N.L., Myers, A.T., Landis, D.A. (2019). Predators of monarch butterfly eggs and neonate larvae are more diverse than previously recognized. *Scientific Reports* 9, 14304. doi: 10.1038/s41598-019-50737-5.

Author Role: Dr. Haan performed ~1/3 of data collection and contributed to writing.

~Haan, N.L., Landis, D.A. (2019). The importance of shifting disturbance regimes in monarch butterfly decline and recovery. *Frontiers in Ecology and Evolution*. doi: 10.3389/fevo.2019.00191.

Author Role: Dr. Haan wrote the manuscript.

~Haan, N.L., Landis, D.A. (2019). Grassland disturbance increases monarch butterfly oviposition and decreases arthropod predator abundance. *Biological Conservation* 233: 185-192.

Author Role: Dr. Haan collected data, conducted analyses, and wrote the manuscript.

~Haan, N.L., Bakker, J.D., Dunwiddie, P.W., Linders, M.J. (2018). Instar-specific effects of host plants on larvae of an endangered butterfly. *Ecological Entomology* 43: 724-753.

Author Role: Dr. Haan designed study, collected data, conducted analyses, and wrote the manuscript.

~Haan, N.L., Bakker, J.D., Bowers, M.D. (2017). Hemiparasites can transmit indirect effects from their host plants to herbivores. *Ecology* 99: 399-410.

Author Role: Dr. Haan designed study, collected data, conducted analyses, and wrote the manuscript.

Dunwiddie, P.W., Haan, N.L., Linders, M.J., Bakker, J.D., Fimbel, C., Thomas, T.J. (2016). Intertwined fates: opportunities and challenges in the linked recovery of two rare species. *Natural Areas Journal* 36: 207-215.

Author Role: Dr. Haan wrote sections of the manuscript.

## **Sponsored Projects**

### **Pending**

Haan, N.L., Lichtenberg, E.M., Stanbrook, R.A. Assessing arthropod-based ecosystem services in the Long-Term Agroecosystem Research Network. National Institute for Food and Agriculture. Submitted September 14, 2022. Requested: \$799,990  
OSPA ID: 202209121101  
Dr. Haan is PD on this project.

### **Awarded**

Bakker, J.D., and Haan, N.L. The role of hemiparasites in structuring ecosystems. (National Science Foundation, DEB-1556106). Awarded: \$200,000.

Dr. Haan was co-PI on this project.

Haan, N.L., Bakker, J.D., Dunwiddie, P.W., Linders, M.J. Army Compatible Use Buffer (ACUB): Taylor's Checkerspot Host Plant Suitability: Interactive effects of environment and phenology.

Awarded: \$47,500

Dr. Haan was project lead. This was a subaward from funding awarded to the Center for Natural Lands Management, Olympia, WA, by Joint Base Lewis McChord, US Army.

### **Not funded**

Landis, D.A., Haan, N.L. The role of disturbance in structuring monarch butterfly, milkweed, and predator interactions. National Institute of Food and Agriculture. Requested: \$499,682

Not awarded, but ranked as High Priority.

Dr. Haan was listed as co-PI

## **Presentations Given**

### **Invited Speaker**

Haan, N.L., and D.A. Landis. Local and landscape effects of bioenergy cropping on arthropod biodiversity and pest suppression. International Conference of Entomology, Helsinki, Finland (Online, June 18, 2022). Invited symposium.

Haan, N.L. Sustainable arthropod management and conservation for a changing world. Department of Entomology, University of Kentucky (April 19, 2022). Invited faculty interview.

Haan, N.L. Reimagining agricultural landscapes for arthropod conservation and ecosystem services. Kellogg Biological Station Seminar Series, Michigan State University (Online, December 4, 2020). Invited seminar speaker.

Haan, N.L., A.T. Myers, S.L. Hermann, and D.A. Landis. Predation, disturbance, and monarch butterfly conservation. Entomological Society of America Annual Meeting, St. Louis, MO (November 19, 2019). Invited symposium.

- Landis, D.A., Y. Zhang, and N.L. Haan. Biodiversity modeling: Impact of landscape metrics on pest suppression in bioenergy landscapes. Department of Energy Bioenergy Research Center Joint Modeling Workshop, Chicago, IL (May 2-3, 2019).
- Haan, N.L., and D.A. Landis. Monarch butterfly conservation. Natural and Applied Sciences Seminar. University of Wisconsin, Green Bay (October 25, 2019). Invited seminar speaker.
- Haan, N.L., A.T. Myers, S.L. Hermann, and D.A. Landis. Monarch butterfly conservation: the importance of predation and ecological disturbance. Ecological Society of America Annual Meeting, Louisville, KY (August 15, 2019). Invited symposium.
- Haan, N.L. Insect-plant interactions and the conservation of rare and declining butterflies. Entomology Department Seminar, Michigan State University, East Lansing, MI (January 14, 2019). Invited seminar speaker.
- Landis, D.A., A.T. Myers, and N.L. Haan. Altering regional disturbance regimes to enhance monarch butterfly survival. Entomological Society of America North Central Branch meeting, Madison, WI In symposium: Monarch butterfly conservation in the North-Central states: challenges and opportunities. (March 21, 2018). Invited symposium.

### **Podium Session**

- Haan, N.L., G.N.M. Benucci, C. Fiser, G. Bonito, D.A. Landis. Contrasting effects of bioenergy cropping systems on bioenergy crops. Annual Science Meeting, Great Lakes Bioenergy Research Center, Lake Geneva, WI (May 18, 2022). Accepted.
- Haan, N.L. and D.A. Landis. Altering disturbance regimes for monarch butterfly conservation. Entomological Society of America Annual Meeting, Vancouver, British Columbia (November 14, 2018). Accepted, international.
- Haan, N.L., and D.A. Landis. Altering disturbance regimes for monarch butterfly conservation. Ecological Society of America Annual Meeting, New Orleans, LA (August 7). Accepted, international.
- Haan, N.L., P.W. Dunwiddie, and J.D. Bakker. Novel and ancestral host plants and their effects on an endangered butterfly. Entomological Society of America Annual Meeting, Denver, CO (November 8, 2017). Accepted, international.
- Haan, N.L., P.W. Dunwiddie, and J.D. Bakker. Novel and ancestral host plants and their effects on the endangered butterfly, Taylor's checkerspot. Ecological Society of America Annual Meeting, Portland, OR (August 9, 2017). Accepted, international.
- Haan, N.L. Clarifying ambiguous interactions between a rare butterfly and its host plants. Graduate Student Symposium, University of Washington School of Environmental and Forest Sciences (March 4, 2016). Accepted, University.

### **Poster Session**

- Haan, N.L., and D.A. Landis. Biodiversity profiles for ten bioenergy cropping systems. Poster Presentation. KBS LTER All Scientist Meeting, Kellogg Biological Station, Michigan State University (September 23, 2021). Accepted, University.
- Haan, N.L., Y. Zhang, and D.A. Landis. Predicting effects of landscape configuration on agricultural pest suppression in future bioenergy landscapes. Poster Presentation. Great Lakes Bioenergy Research Center All Scientists Meeting, Lake Geneva, WI (May 21, 2019). Accepted.
- Haan, N.L., and D.A. Landis. Altering disturbance regimes for monarch butterfly conservation. Poster Presentation. The Art, Science, and Practice of Restoring Native Ecosystems, East Lansing, MI (January 11-12, 2019). Accepted. Regional.



## **Invited talks for public or technical audiences**

- Haan, N.L. Managing habitat for monarch butterflies. Horticulture Café, Michigan State University Extension (Online, July 11, 2022)
- Haan, N.L. Managing habitat for monarch butterflies. River City Wild Ones (Online, March 21, 2022)
- Haan, N.L. Implications from current research on managing monarch and other native pollinator habitat. Pollinator Partnership / Project Wingspan Webinar (November 9, 2021)
- Haan, N.L. and D.A. Landis. Monarchs, milkweed, and grassland disturbance. Monarch Joint Venture Webinar (March 21, 2021)
- Haan, N.L. Monarch butterflies and vegetation management. Pesticide Applicators Clinic, Michigan State University (online, December 3, 2020)
- Haan, N.L. Monarch butterfly conservation and roadside vegetation management. Michigan Department of Transportation Vegetation Management Conference (online, July 15, 2020)
- Haan, N.L. and D.A. Landis. Monarch butterflies and vegetation management. Pesticide Applicators Clinic, Michigan State University (November 27, 2019)
- Landis, D.A., N.L. Haan, A.T. Myers, and S.L. Hermann. Managing habitats to enhance monarch butterfly populations. Michigan Association of Conservation Districts Summer Conference. Bay City MI (June 3, 2019)
- Haan, N.L. The buzz about watersheds: common ground between watershed restoration and insect conservation. Calvin College (April 13, 2019)
- Haan, N.L. Monarch butterfly ecology and conservation. Red Cedar Wild Ones, Fenner Nature Center, Lansing, Michigan (March 20, 2019)
- Haan, N.L. Monarch butterfly ecology and conservation. Natural Areas Stewardship talk, Oakland Township, Michigan (February 7, 2019)
- Haan, N.L. Monarch butterfly ecology and conservation. Bees and Brews / Biology on Tap event (June 20, 2018)

## **Teaching**

**(No courses at UK to date)**

### **University of Washington – Instructor of record**

Instructor, Introduction to Restoration Ecology (300-level). Fall 2013.  
Instructor, Native Plant Production (400-level). Spring 2013.

### **Calvin College – Instructor of record**

Instructor, Plant Taxonomy (300-level). Fall 2012.

## **Service**

### **Department Service**

#### **Committee member**

- Department Planning Committee (2022- )
- Diversity, Equity, and Inclusion committee (2022; Michigan State University)
- Hiring Committee: Entomology Department Chair (2019; Michigan State University)

### **Reviewer, Journal Article**

Ecology Letters, Trends in Ecology and Evolution, Ecological Monographs, Ecography, Biological Conservation, Conservation Biology, Ecological Applications, Landscape Ecology, Basic & Applied Ecology, Ecosphere, Biology Letters, Oecologia, Frontiers in Ecology and Evolution, Scientific Reports, Ecological Entomology, Environmental Entomology, Fire Ecology, Conservation Science & Practice, Insects, Austral Ecology, Restoration Ecology, Ecological Restoration, American Midland Naturalist, Northwest Science

## **Professional Development**

### **Professional Memberships**

Entomological Society of America. National. (2017- )

Ecological Society of America. National. (2015- )

### **Courses**

Postdoctoral teaching scholar. Seminar course in evidence-based teaching approaches led by Diane Ebert-May, Department of Plant Biology, Michigan State University. Spring 2021.

# Dr. Jonathan Larson

College of Agriculture, Food and Environment  
Department of Entomology

## Education

University of Kentucky, Lexington, KY Doctor of  
Philosophy (PhD): Entomology, May 2014

Purdue University, West Lafayette, IN  
Bachelor of Science: Entomology, May 2009

## Work History

2019-present University of Kentucky, Department of Entomology; Lexington, KY  
Assistant Extension professor

Areas of Specialization: turf, ornamentals, nursery crops, arboriculture, greenhouses/  
high tunnels, households, and public health pests.

2014-2019 University of Nebraska, Douglas & Sarpy Counties Extension; Omaha, NE  
Assistant Extension Educator

Areas of Specialization: urban household pests, lawn and landscapes, public health  
pests, and youth education

## Research and Scholarship

### Intellectual Contributions

\* = Senior Author    ~ = Corresponding Author    + = Grad/Prof Student    # = Post Doc    ^ = Undergraduate

WOS = Web of Science    JIF = Journal Impact Factor    TC = Journal Total Cites  
SNIP = Source Normalize Impact per Paper    SJR = Scimago Journal Rank

### Published

#### Journal Article, Academic Journal

Skvarla, M., Larson, J., Dowling, A. (2020). A Review of Terrestrial and Canopy Malaise Traps,  
*Annals of the Entomological Society of America*.

### Sponsored Projects

#### Awarded

Rudolph R., E., Larson J., Gauthier N., A., Wright S., Mark T., B., 2021-2024 SCBG-UK-High

Tunnel: Evaluation of the Inter-Season Rotation of Tomato with Fresh-cut Flowers in a High Tunnel System for Improved Pest, Disease, and Soil Management, Sponsored by KY Department of Agriculture Submitted: March 24, 2021. Funding Dates: November 1, 2021 - September 29, 2024. | Awarded: \$48,664.00  
OSPA ID: 202103240937

Sass C., K., Tedder D., S., Crocker E., V., Larson J., Phillips L., R., Rieske-Kinney L., K., Arthur M., A., Crankshaw N., M., Stringer J., W., Conservation, Protection, and Enhancement of Forest Canopies in Rural Communities and Small Municipalities, Sponsored by KY Division of Forestry Submitted: February 2, 2021. Funding Dates: February 1, 2021 - June 30, 2023. | Awarded: \$406,337.00  
OSPA ID: 202102021145

Bradley C., Ritchey E., L., Larson J., Wise K., Gauthier N., A., Vincelli P., Bessin R., T., Rudolph R., E., Villanueva R., T., Legleiter T., R., Kentucky Extension IPM Implementation Program: 2021-2024, Sponsored by National Institute of Food and Agriculture Submitted: August 26, 2021. Funding Dates: September 1, 2021 - August 31, 2022. | Awarded: \$193,999.00  
OSPA ID: 202108261647

### **Closed**

Knott C., A., Ritchey E., L., Pfeufer E., Larson J., Springer M., T., Gauthier N., A., Bessin R., T., Dunwell W., C., Kentucky Extension IPM Implementation Program: 2017-2020, Sponsored by National Institute of Food and Agriculture Submitted: May 10, 2017. Funding Dates: September 1, 2014 - August 31, 2021. Requested: \$504,730.00, | Awarded: \$576,205.00  
OSPA ID: 201705100801

Larson J., Integration of Predator Releases with Insecticidal Soap Sprays for Management of the Sugarcane Aphid, Sponsored by University of Georgia Submitted: November 1, 2018. Funding Dates: March 15, 2019 - March 14, 2021. | Awarded: \$14,913.00  
OSPA ID: 201811011446

Rudolph R., E., Gauthier N., A., Larson J., Mark T., B., Evaluating the Rotation of Tomato with Fresh-cut Flowers in a High Tunnel System for Improved Pest, Disease, and Soil Management, Sponsored by North Carolina State University Submitted: November 26, 2019. Funding Dates: March 1, 2020 - February 28, 2021. | Awarded: \$30,000.00  
OSPA ID: 201911261217

### **Not Funded**

Knott C., A., Ritchey E., L., Pfeufer E., Larson J., Gauthier N., A., Bessin R., T., Dunwell W., C., 2020 Kentucky Extension IPM Implementation Program, Sponsored by National Institute of Food and Agriculture Submitted: May 23, 2020. | Awarded: \$0.00  
Description: This grant was funded by an extension to the previous year's project rather than a new account being created.  
OSPA ID: 202005231342

Rudolph R., E., Gauthier N., A., Larson J., Mark T., B., Wright S., Evaluating the Rotation of Tomato with Fresh-cut Flowers in a High Tunnel System for Improved Pest, Disease, and Soil Management, Sponsored by KY Department of Agriculture Submitted: February 10, 2020. | Awarded: \$0.00  
OSPA ID: 202002101320

Larson J., Rudolph R., E., Honey Bee Utilization of High Tunnels and Protecting Pollinators through Integrated Pest and Pollinator Management, Sponsored by National Honey Board Submitted: October 6, 2020. | Awarded: \$0.00

OSPA ID: 202010060845

Larson J., Rudolph R., E., Pollinator Utilization of High Tunnels and Grower use of Integrated Pest and Pollinator Management, Sponsored by North Carolina State University Submitted: December 2, 2020. | Awarded: \$0.00

OSPA ID: 202012020829

Larson J., Using Extension to Enhance Adoption of Biological Control in Kentucky High Tunnels, Sponsored by University of Georgia Submitted: November 13, 2020. | Awarded: \$0.00

OSPA ID: 202011131011

### **Pending**

Stevenson B., Larson J., Thorson J., S., McWhorter K., L., Teets N., M., Bessin R., T., Palli S., R., Dobson S., L., Fisher T., W., Christian W., J., Syed Z., Appalachian Vector-borne Disease Center of Excellence, Sponsored by Center for Disease Control and Prevention Submitted: January 21, 2022. | Awarded: \$0.00

OSPA ID: 202201211657

Bradley C., Ritchey E., L., Larson J., Wise K., Gauthier N., A., Vincelli P., Bessin R., T., Villanueva R., T., Legleiter T., R., Kentucky Extension IPM Implementation Program: 2021-2023, Sponsored by National Institute of Food and Agriculture Submitted: April 27, 2021. | Awarded: \$0.00

OSPA ID: 202104271334

Larson J., Phytotoxicity Rating Trial of Novel Greenhouse Insecticide and Miticides, Sponsored by University of Florida Submitted: October 1, 2021. Requested: \$5,000.00, | Awarded: \$0.00  
Description: This 5,000 grant was awarded to perform phytotoxicity trials on three species of plants in greenhouse settings. The data accumulated will be used by insecticide registration within companies to support new product registration or to expand the label of products.

OSPA ID: 202110011703

### **Scope Grants**

#### **Awarded**

Larson J., Bessin R., T., Nursery Crops Scope KY IPM Implementation Program: 2021-2024, Sponsored by National Institute of Food and Agriculture Submitted: October 1, 2021.  
Funding Dates: September 1, 2021 - August 31, 2022. | Current Budget Amount: \$11,577.00

Prime Grant OSPA ID: 202108261647

#### **Closed**

Knott C., A., Ritchey E., L., Pfeufer E., Larson J., Springer M., T., Gauthier N., A., Bessin R., T., Dunwell W., C., Kentucky Extension IPM Implementation Program: 2017-2020, Sponsored by National Institute of Food and Agriculture Submitted: September 14, 2020. Funding Dates: September 1, 2017 - August 31, 2021. | Current Budget Amount: \$14,362.00

Prime Grant OSPA ID: 201705100801

### **Presentations Given**

#### **Invited Speaker**

Larson, J.L. (November 2022) Earbud Extension: Using Podcasts for Science Communication. 2022 National Meeting of the Entomological Society of America, Vancouver, BC.

Larson J., (November 2020). Engaging the Sacred: Extension during the "murder hornet" explosion. 2020 National Meeting of the Entomological Society of America, digital presentation.

### **Workshop Leader**

Larson J., (November 2020). How to Get Started with Podcasting 2020 National meeting of the Entomological Society of America, Entomological Society of America.

## **Extension**

### **Extension Publications & Media**

\* = Senior Author    ~ = Corresponding Author    + = Grad/Prof Student    # = Post Doc    ^ = Undergraduate

#### **Submitted Peer-reviewed Numbered Extension Publications**

1. Larson, J.L. 2022. How to Manage Roseslugs. ENTFact-467.
2. Larson, J.L. 2022. The Challenges of Calico Scale Control. ENTFact-466.
3. Larson, J.L. 2022. Box Tree Moth and Kentucky. ENTFact-464.
4. Larson, J.L. 2022. Managing Japanese Maple Scale in Kentucky Nurseries. ENTFact-463.
5. Larson, J.L., R. Bessin, and E. Crocker 2022. Spotted Lanternfly: A Pest to Watch For. ENTFact-465.
6. Pasternak, A., J.L. Larson. 2021. Preparing for Asian Longhorned Tick in Kentucky. ENTFact-518.
7. Rudolph, R.E. J.L. Larson, A. Sheffield, J. Shepherd, T. Mark, and N. Gauthier. 2021 Rotating Cut Flowers Within a Tomato High Tunnel Production System. CCD-FS-23.
8. Gauthier, N., E. Crocker, J.L. Larson, K. Leonberger, and J. Dockery. 2021. Common Problems of Common Annuals and Perennials. ENTFact-462.
9. Gauthier, N., E. Crocker, J.L. Larson, K. Leonberger, and J. Dockery. 2021. Common Problems of Common Shrubs. ENTFact-461.
10. Gauthier, N., E. Crocker, J.L. Larson, K. Leonberger, and J. Dockery. 2021. Common Problems of Common Trees. ENTFact-460.
11. Crocker, E., T. Drearden, J.L. Larson, K. Leonberger, and N. Gauthier. 2020. Laurel Wilt Disease and Redbay Ambrosia Beetle. ENTFact-459.

#### **Revised Numbered Extension publications**

1. Larson, J.L. 2022. Dealing with Bagworms on Landscape Plants. ENTFact-440.
2. Larson, J.L. 2022. Identifying Boxwood Psyllid. ENTFact-454.
3. Larson, J.L. 2022. Dealing with Chiggers in the Landscape. ENTFact-630.
4. Larson, J.L. 2022. Cicada Killer Wasps. ENTFact-004.
5. Larson, J.L. and E. Crocker. 2022. Emerald Ash Borer (EAB) FAQs for Kentuckians. ENTFact-453.
6. Larson, J.L. 2022. European Hornet in Kentucky. ENTFact-600.
7. Larson, J.L. and L. Townsend. 2021. Cottony maple Scale Identification & Management. ENTFact-427.

8. Larson, J.L. and L. Townsend. 2021. Euonymus Scale Identification & Management. ENTFact-428.
9. Larson, J.L. and L. Townsend. 2021. Juniper Scale. ENTFact-429.
10. Larson, J.L. and L. Townsend. 2021. Lecanium Scale. ENTFact-430.
11. Larson, J.L. and L. Townsend. 2021. Magnolia Scale. ENTFact-431.
12. Larson, J.L. and L. Townsend. 2021. Obscure Scale. ENTFact-432.
13. Larson, J.L. and L. Townsend. 2021. Oystershell Scale. ENTFact-433.
14. Larson, J.L. and L. Townsend. 2021. Fletcher Scale Management. ENTFact-434.
15. Larson, J.L. and L. Townsend. 2021. Managing Tuliptree Scale. ENTFact-435.
16. Larson, J.L. and L. Townsend. 2021. Walnut Scale. ENTFact-436.
17. Pasternak, A., J.L. Larson, and M. Cipriani. 2021. Ticks and Disease in Kentucky. ENTFact-618.

## **Extension Education & Training Programs**

### **Invited and Published Extension Programming**

2022 to date: 39 extension entomology seminars for about 1,500 people

2021: 43 extension entomology seminars for about 2,400 people

2020: 49 extension entomology seminars for about 2,500 people

2019: 38 extension entomology seminars for about 1,500 people

### **Highlight programs**

#### *2022*

Larson, J.L., B. Newton, C. Harper. Kentucky Keepers: Citizen Science Monitoring & Education.

Six part Zoom series focused on recruiting and educating citizen science volunteers to monitor for spongy moth and spotted lanternfly in Kentucky.

Larson, J.L. and K. Leonberger. Most Common Ornamental Pests and Diseases.

Six part Zoom series for county Extension professionals focused on identifying and managing the most encountered pests/pathogens for homeowner ornamental plants.

Larson J.L. Check your Crevices: Ticks and Tickborne Disease in Kentucky.

One of my most requested programs, focused on tick identification and management. In 2022 was used as part of the US Forest Service safety training (third time speaking to them).

Larson, J.L. If you build it, will they come? Recruiting Beneficial Insects.

Invited presentation for the Long Island Agriculture Forum, focused on teaching growers to use integrated pest management methods to preserve and enhance beneficial insect populations.

#### *2021*

Larson, J.L. 2021 Pest Retrospective and Problems on the Horizon.

Invited presentation covering the most important insects of 2021, given at the MO Green Industry Conference, KY-TN Grain Conference, and several others.

Larson J.L. and K. Kesheimer. Fall Armyworm: The pest that ate 2021.

Invited team presentation for the University of Delaware turf continuing education program.

Larson, J.L. The "Bugs": of Christmas Tree Production: Pests, Allies, and Solutions.

Keynote address at the Kentucky Christmas Tree growers meeting.

Grubb, K. and J.L. Larson. Kentucky Extension Biological Control Certification Program. Six part Zoom series lead by plan B graduate student that focused on increasing the confidence of Extension agents in biological control and their recommendation of it to growers.

2020

Larson, J.L. Taking the Sting out of Stinging Insects.

Invited presentation for the Kansas Pesticide Safety program. Given to pest control professionals over Zoom for recertifying their applicator licenses.

Larson, J.L. Invisible Itches: The Pain and Problem of Delusory Parasitosis.

A talk for pest control professionals focused on dealing with clients exhibiting symptoms of delusory parasitosis. Invited presentation for KY Pest Control Short Course.

Larson, J.L. and R. Bessin. Insect Info: Zoom Updates for Agents.

A seven-part Zoom training to continue offering insect education opportunities for Kentucky Extension agents during the pandemic period.

Larson, J.L. Good Night, Sleep Tight: Bed Bug Biology and Control.

Invited presentation for Ohio Pesticide Commercial Applicator Recertification Conference.

## **Extension Media**

### **Newsletters**

Kentucky Pest News: 50 total newsletter articles, 2019-present

Representative articles

Larson, J.L. 2022. "Cupped Boxwood Leaves from Boxwood Psyllid". <https://kentuckypestnews.wordpress.com/2022/04/19/cupped-boxwood-leaves-from-boxwood-psyllid/>

Larson, J.L. 2021. "Back to School, Back with Head Lice?". <https://kentuckypestnews.wordpress.com/2021/08/17/back-to-school-back-with-head-lice/>

Larson, J.L. and R. Bessin. 2020. "Asian Giant Hornet in the News but not in Kentucky". <https://kentuckypestnews.wordpress.com/2020/05/05/asian-giant-hornet-in-the-news-but-not-kentucky/>

Larson, J.L. and R. Bessin. 2020. "Asian Giant Hornet in the News but not in Kentucky". <https://kentuckypestnews.wordpress.com/2020/05/05/asian-giant-hornet-in-the-news-but-not-kentucky/>

### **Podcasts**

Arthro-Pod: 61 total podcast episodes as executive producer and co-host, 2019-present

Approximately 1,100 subscribers, over 62,000 listens

### **Regional and National media**

2022 to date: 13 media interactions

2021: 29 total media interactions

2020: 10 total media interactions

2019: 5 Total media interactions

### **Highlight media contributions include:**

#### **2022**

Regional interviews on possible Joro spider invasion

<https://www.courier-journal.com/story/news/local/2022/03/11/joro-spider-kentucky-what-to-know-spreading-species/7002535001/>

National interview on Lonestar tick

<https://www.usatoday.com/story/news/nation/2022/05/11/tick-removal-meat-allergy/9720859002/>

National interview on hammerhead worms

<https://www.realtor.com/advice/home-improvement/hammerhead-flatworms-toxic-species-in-your-home-and-garden/>



2021

Regional press release on periodical cicadas

<https://uknow.uky.edu/campus-news/billions-cicadas-will-return-kentucky-late-spring>

National featured guest on TV program about periodical cicadas

<https://www.outdoorchannel.com/show/wildfed/videos/386209/wildfed-preview-cicadas-mulberries/460254>

Regional interviews on fall armyworm outbreak of 2021

<https://www.wkyt.com/2021/08/25/invasive-armyworms-taking-over-central-kentucky-yards/>  
2020

National interview on house centipedes

<https://www.realtor.com/advice/home-improvement/house-centipedes-pest-problem/>

Local interview on if mosquitoes can vector COVID-19

<https://www.wkyt.com/content/news/One-way-we-dont-have-to-worry-about-getting-COVID-19-Mosquitoes-569258221.html>

Regional press release on the Northern giant hornet, aka “murder hornet”

<https://news.ca.uky.edu/article/uk-entomologist-offers-information-about-%E2%80%9Cmurder-hornet%E2%80%9D>

**Extension Social Media/Infographics**

Social media platforms

Editor in chief for Kentucky Bugs Facebook page, 2019-present

Followed by 3,014 people

Twitter profile, @bugmanjon

Followed by 1,832 people

Editor in chief for UK Entomology YouTube channel, 2019-present

535 subscribers

Editor in chief for Kentucky Bugs TikTok channel, 2021-present

2,069 subscribers

Highlight Infographics

Larson J.L., 2021. Invasive Species Alert: Asian Longhorned Tick.

Posted to Facebook, seen over 100,000 times

Larson, J.L. and R. Bessin. 2021. Fall Armyworm and Lawns.

Posted to Facebook, seen over 8,000 times

Larson, J.L. 2020. What is a murder hornet and is it real?

Posted to Facebook, seen over 300,000 times

**Technical publications (non-refereed)**

1. Fech, J.C. and J.L. Larson. 2022. Identification and management of surface active insects, Sports Field Management Magazine.
2. Fech, J.C. and J.L. Larson. 2020. Protect trees and shrubs from ‘super pests’, Golf Course

**Extension Field & Community-Based Research**

- Valent Corporation: White grub insecticide efficacy trial. 2022. \$9,000
  - Testing of new materials for management of white grub pests in turf.
- PBI Gordon: White grub insecticide efficacy trial. 2022. \$10,000.
  - Testing of new materials for management of white grub pests in turf.

- Rainbow Eco-Science: Trials for Bagworm and Japanese maple scale control. 2021. \$5,000.
  - Evaluation of new application methods and new insecticide active ingredients for armored scale and bagworm pest issues in nursery production.
- Syngenta Corporation: WeevilTrack-Annual Bluegrass Weevil Monitoring. 2021. \$6,000.
  - Spearheading mapping and tracking of annual bluegrass weevil in the state.
- Rainbow Eco-Science: Trials for Bagworm and Japanese beetle control. 2020. \$5,000
  - Evaluation of new application methods and new insecticide active ingredients for adult Japanese beetle and bagworm pest issues in nursery production.

## Teaching

### Teaching

| Prefix Number - Section | Credit Hours      | # Enrolled | Code Term Year      |
|-------------------------|-------------------|------------|---------------------|
| ENT 770 - 002           | 0.00000 - 1.00000 | 6          | 30 Spring 2021-2022 |
| ENT 770 - 202           | 0.00000 - 1.00000 | 2          | 30 Spring 2021-2022 |
| ENT 530 - 001           | 3.00000 - 3.00000 | 7          | 10 Fall 2021-2022   |
| ENT 530 - 201           | 3.00000 - 3.00000 | 3          | 10 Fall 2021-2022   |
| ENT 790 - 005           | 1.00000 - 6.00000 | 1          | 10 Fall 2021-2022   |
| ENT 395 - 003           | 1.00000 - 3.00000 | 1          | 30 Spring 2020-2021 |
| ENT 748 - 002           | 0.00000 - 0.00000 | 1          | 30 Spring 2020-2021 |
| ENT 768 - 016           | 1.00000 - 6.00000 | 1          | 30 Spring 2020-2021 |
| ENT 770 - 201           | 0.00000 - 1.00000 | 10         | 30 Spring 2020-2021 |
| ENT 768 - 001           | 1.00000 - 6.00000 | 1          | 30 Spring 2019-2020 |

### Teacher Course Evaluations

| Prefix Number - Section | Responses | TCE Course Quality Mean | TCE Teaching Quality Mean | Code Term Year      |
|-------------------------|-----------|-------------------------|---------------------------|---------------------|
| ENT 530 - 001           | 6         | 4.33                    | 3.67                      | 10 Fall 2021-2022   |
| ENT 770 - 201           | 8         | 4.75                    | 5.00                      | 30 Spring 2020-2021 |

Note: With regards to 2020 TCEs please consider the following from page 121 of the UK Playbook for Fall 2020, "It is essential that performance evaluation take into account the extenuating circumstances brought about by the disruption for faculty in all title series and the extraordinary work accomplished by faculty in response to the disruption. Academic leaders shall reiterate that TCEs should be but one indicator of effective teaching in both periodic merit reviews and tenure/promotion decisions. Evaluation of teaching must go beyond student evaluations alone."

### Academic Advising

2019-present, faculty advisor for 2 graduate students.

## **Other Credit and Non-Credit Instructional Activities**

### **Guest lectures**

ENTM 202 (UC-Riverside)- Principles of Integrated Pest Management, Amy Murillo.

Lecture: Cooperative Extension and IPM: The History, The Mission, and Building a Program  
March 2022

PLS 465- Greenhouse and Controlled Environments Operations and Management, W. Garrett Owen.

Lecture: Common Greenhouse Pests: How to deal with them through IPM  
November 2021.

ABT 301- Writing and Presentation in the Life Sciences, Xuguo Zhou.

Lecture: Build a Better Presentation: Tips for effective communication  
October 2020, October 2021.

ENT 670- Scientific Publishing: Process and Ethics, Chuck Fox.

Lecture: Science Publishing and Social Media: Let's Get Internet Famous  
September 2019, February 2022.

ENT 530- Integrated Pest Management, John Obrycki.

Lecture: Intro to Insecticides  
September 2019.

## **Service**

### **Department Service**

#### **Committee Member**

Anna Pasternak, 2020-present, Major advisor Reddy Palli  
Johnalynn Gordon, 2021-present, Major advisor Zach DeVries  
Isabelle Lucero, 2021-present, Major advisor Zach DeVries  
Caroline Kane, 2021-present, Major advisor Clair Rittschoff  
Morgan Knutson 2022-present, Major advisor Lynne Rieske-Kinney

Committee for Inclusion and Diversity (June 2020 - Present).

Member of Entomology department steering committee, (January 2020 - Present).

#### **Faculty Mentor**

Julie Collins-Russo Plan B Master's program, (October 2021 - Present).

Katie Grubb Plan B Master's program, (January 2020 - December 2021).

### **Professional Service**

Chair for National Turfgrass Entomology Workshop (NTEW)

2022

Member of Communications Committee, Plant-Insect Ecosystem (P-IE) Section of Entomological Society of America

2021-present

Selection committee for Distinguished Achievement Award in Extension, Entomological Society of America  
2020-2021

## **Officer**

Treasurer of Ohio Valley Entomological Association, (October 2019 - Present).

## **Reviewer, Journal Article**

Journal of Agricultural and Urban Entomology (2022)

Entomological Society of America, Journal review for American Entomologist, (2020)

Highlights Magazine for Children, (August 2020)

Insects (MDPI), (February 2020)

## **Professional Development**

### **Professional Memberships**

Ohio Valley Entomological Association. Regional. (October 1, 2019 - Present).

Entomological Society of America. International. (2009 - Present).

**Dr. Subba R. Palli**

College of Agriculture, Food and  
Environment Department of Entomology

**Education**

1984-87, Ph.D. University of  
Western Ontario London, Ontario,  
Canada with Dr. M. Locke

**Work History**

**RESEARCH SCIENTIST** 1992-1998: Great Lakes Forestry  
Centre Canadian Forest Service, Sault Ste. Marie,  
Ontario, Canada

**SENIOR RESEARCH SCIENTIST** 1998-2002: RheoGene LLC  
Rohm and Haas Company, Spring House, P A 194 77

**ASSISTANT PROFESSOR** 2002-2005: Department of  
Entomology University of Kentucky  
Lexington, KY 40546

**ASSOCIATE PROFESSOR:** 2005-2008: Department of Entomology and Graduate  
Center for Toxicology  
University of Kentucky Lexington, K Y 40546

**PROFESSOR:** 2008: Department of Entomology and Graduate Center for  
Toxicology  
University of Kentucky Lexington, KY 40546

**Co-Director** 2013- NSF I/UCRC on Center for Arthropod pest management

**Chair,** 2015- Department of  
Entomology  
University of Kentucky Lexington, KY 40546

**HONORS AND AWARDS**

1997: Recipient of Research Award for Foreign Specialists administered by National  
Institute of Sericulture and Entomological Science, Tsukuba, Japan.

2008: Thomas Cooper Research Award, University of Kentucky. 2009: Bobby Pass  
Excellence in Grantsmanship Award, University of Kentucky.

2010: University Research Professor, University of Kentucky. 2011: High Impact  
Research/Extension Award, University of Kentucky.

2012: President, Physiology, Biochemistry, and Toxicology Section of Entomological  
Society of America.

2013: President, Bluegrass Indo-American Cultural Society.

2013: ESA Recognition Award in Insect Physiology, Biochemistry, and Toxicology.

2013: Prestigious Research Paper Award, University of Kentucky

2014: Selected as a Fellow of ESA  
2014: Fulbright-Nehru Academic and Professional Excellence Award  
2017: Elected as AAAS fellow  
2017: Received Nan Yao Soo award from ESA

## JOURNAL PUBLICATIONS

### Research and Scholarship

#### Published

##### Journal Article, Academic Journal

Gao Y, Alyokhin A, Nauen R, Guedes RNC, Palli SR. Challenges and opportunities in managing pests of potato. *Pest Manag Sci*. 2022 Sep;78(9):3729-3730. doi: 10.1002/ps.7081. PubMed PMID: 35932235.

Arya SK, Goodman CL, Stanley D, Palli SR. A database of crop pest cell lines. *In Vitro Cell Dev Biol Anim*. 2022 Aug 22;. doi: 10.1007/s11626-022-00710-w. [Epub ahead of print] PubMed PMID: 35994130.

Luo GH, Chen XE, Jiao YY, Zhu GH, Zhang R, Dhandapani RK, Fang JC, Palli SR. SoxC is Required for Ecdysteroid Induction of Neuropeptide Genes During Insect Ecdysis. *Front Genet*. 2022;13:942884. doi: 10.3389/fgene.2022.942884. eCollection 2022. PubMed PMID: 35899187; PubMed Central PMCID: PMC9309532.

Chen, X., Palli, S. R. (2022). Transgenic overexpression of P450 genes confers deltamethrin resistance in the fall armyworm, *Spodoptera frugiperda*, *Journal of Pest Science*, 95(3), 1197-1205. doi: 10.1007/s10340-021-01452-6

Gaddelapati, S. C., Albishi, N. M., Dhandapani, R. K., Palli, S. R. (2022). Juvenile hormone-induced histone deacetylase 3 suppresses apoptosis to maintain larval midgut in the yellow fever mosquito, *Proceedings of the National Academy of Sciences of the United States of America*, 119(11). doi: 10.1073/pnas.2118871119

Pasternak, A. R., Palli, S. R. (2022). Mapping distributions of the Lyme disease vector, *Ixodes scapularis*, and spirochete, *Borrelia burgdorferi*, in Kentucky using passive and active surveillance, *Ticks and Tick-borne Diseases*, 13(2). doi: 10.1016/j.ttbdis.2021.101885

Chen, X., Palli, S. R. (2022). Midgut-specific expression of CYP321A8 P450 gene increases deltamethrin tolerance in the fall armyworm *Spodoptera frugiperda*, *Journal of Pest Science*. doi: 10.1007/s10340-022-01483-7

Zhu, G. H., Albishi, N. M., Chen, X., Brown, R. L., Palli, S. R. (2021). Expanding the Toolkit

- for Genome Editing in a Disease Vector, *Aedes aegypti*: Transgenic Lines Expressing Cas9 and Single Guide RNA Induce Efficient Mutagenesis, *CRISPR Journal*, 4(6), 846-853. doi: 10.1089/crispr.2020.0052
- Zhu, S., Liu, F., Zeng, H., Li, N., Ren, C., Su, Y., Zhou, S., Wang, G., Palli, S. R., Wang, J., Qin, Y., Li, S. (2021). Insulin/IGF signaling and TORC1 promote vitellogenesis via inducing juvenile hormone biosynthesis in the American cockroach, *Development (Cambridge)*, 147(20). doi: 10.1242/dev.188805
- Luo, W., Liu, S., Zhang, W., Yang, L., Huang, J., Zhou, S., Feng, Q., Palli, S. R., Wang, J., Roth, S., Li, S. (2021). Juvenile hormone signaling promotes ovulation and maintains egg shape by inducing expression of extracellular matrix genes, *Proceedings of the National Academy of Sciences of the United States of America*, 118(39). doi: 10.1073/pnas.2104461118
- Chen, X., Palli, S. R. (2021). Hyperactive piggyBac Transposase-mediated Germline Transformation in the Fall Armyworm, *Spodoptera frugiperda*, *Journal of visualized experiments : JoVE*(175). doi: 10.3791/62714
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## Review, Journal

- Palli, S. R. (2021). Epigenetic regulation of post-embryonic development, *Current Opinion in Insect Science*, 43, 63-69. doi: 10.1016/j.cois.2020.09.011
- Zhu, K. Y., Palli, S. R. (2020). Mechanisms, applications, and challenges of insect RNA interference *Annual Review of Entomology*, 65, 293-311. doi: 10.1146/annurev-ento-011019-025224
- Palli, S. R. (2017). Annual Review of Entomology Volume 62, 2017 Introduction *Annual Review of Entomology, ANNUAL REVIEW OF ENTOMOLOGY, VOL 62, 62, V-VII.*
- Palli, S. R. (2017). New roles for old actors, ROS and PRMT1, *PROCEEDINGS OF THE NATIONAL ACADEMY OF SCIENCES OF THE UNITED STATES OF AMERICA*, 114(41), 10810-10812. doi: 10.1073/pnas.1715062114

## Sponsored Projects

### Awarded

- Palli S., R., Epigenetic Regulation of Hormone Action in Tribolium and Aedes, Sponsored by National Institute of General Medical Sciences Submitted: March 18, 2022. Funding Dates: June 3, 2021 - March 31, 2025. | Awarded: \$461,787.00  
OSPA ID: 202203181416
- Palli S., R., Determine the Cellular Route of Uptake and Trafficking of Naked and Nanoformulated dsRNA in Spodoptera frugiperda Sf9 Cells, Sponsored by GreenLight BioSciences Incorporated Submitted: July 14, 2021. Funding Dates: August 2, 2021 - June 30, 2023. | Awarded: \$308,000.00  
OSPA ID: 202107141457
- Palli S., R., I/UCRC: Center For Arthropod Management Technologies Phase II Site: University Of Kentucky, Sponsored by National Science Foundation Submitted: December 16, 2017. Funding Dates: August 1, 2013 - June 30, 2023. | Awarded: \$607,199.00  
OSPA ID: 201712160845
- Harrison D., Palli S., R., Phase II IUCRC at UF: Center for Arthropod Management Technologies - Single Cell Sequencing of Midguts from Pest Insects, Sponsored by University of Florida Submitted: March 17, 2022. Funding Dates: March 1, 2022 - May 31, 2023. | Awarded: \$85,000.00  
OSPA ID: 202203171026
- Palli S., R., IUCRC at the University of Florida: Improving Genome Editing in Hemipteran Pests, Sponsored by University of Florida Submitted: December 21, 2021. Funding Dates: January 1, 2022 - May 31, 2023. | Awarded: \$80,000.00  
OSPA ID: 202112210847



Palli S., R., Molecular Mode of Action of Juvenile Hormone Analogs, Sponsored by National Institute of Allergy and Infectious Diseases Submitted: October 12, 2020. Funding Dates: June 1, 2021 - May 31, 2023. | Awarded: \$398,750.00  
OSPA ID: 202010121550

Palli S., R., The Japanese Beetle Control Near Airports and Cargo Transportation Facilities, Sponsored by Animal and Plant Health Inspection Service Submitted: June 15, 2021. Funding Dates: June 1, 2021 - May 31, 2023. | Awarded: \$99,769.00  
OSPA ID: 202106151022

Lensing J., R., Palli S., R., KY FY22 Spongy Moth Survey, Sponsored by Animal and Plant Health Inspection Service Submitted: February 8, 2022. Funding Dates: May 1, 2022 - April 30, 2023. | Awarded: \$170,000.00  
OSPA ID: 202202081238

Palli S., R., The Fall Armyworm Functional Genomics: Genome Editing and RNAi, Sponsored by National Institute of Food and Agriculture Submitted: August 10, 2018. Funding Dates: March 15, 2019 - March 14, 2023. | Awarded: \$453,997.00  
OSPA ID: 201808101431

Palli S., R., Development of RNAi Methods to Control Exotic Woodboring Beetles, Sponsored by Animal and Plant Health Inspection Service Submitted: July 22, 2020. Funding Dates: September 30, 2020 - September 29, 2022. | Awarded: \$116,783.00  
OSPA ID: 202007220839

Palli S., R., Tick Surveillance, Sponsored by KY Department for Public Health Submitted: June 23, 2021. Funding Dates: July 1, 2020 - June 30, 2022. | Awarded: \$20,000.00  
OSPA ID: 202106231200

### **Closed**

Palli S., R., Epigenetic Regulation of Hormone Action in Tribolium and Aedes, Sponsored by National Institute of Allergy and Infectious Diseases Submitted: March 4, 2021. Funding Dates: June 3, 2021 - March 31, 2025. | Awarded: \$312,500.00  
OSPA ID: 202103041503

Palli S., R., Tick Surveillance, Sponsored by KY Department for Public Health Submitted: June 30, 2020. Funding Dates: July 1, 2020 - June 30, 2022. | Awarded: \$20,000.00  
OSPA ID: 202006300836

Palli S., R., Phasell IUCRC at the University of Florida: Center for Arthropod Management Technologies, Sponsored by University of Florida Submitted: February 25, 2020. Funding Dates: January 1, 2020 - February 28, 2022. | Awarded: \$154,800.00  
OSPA ID: 202002251705

Sanderson W., T., Christian W., J., Contreras M., A., Ingram R., C., Mazur J., Palli S., R., Purschwitz M., A., Stringer J., W., Swanson M., A., Vincent S., K., Southeast Center for Agricultural Health and Injury Prevention, Sponsored by National Institute of Occupational Safety and Health Submitted: September 18, 2018. Funding Dates: September 30, 2016 - September 29, 2021. | Awarded: \$3,528,782.00  
OSPA ID: 201809180952

Palli S., R., Tissue-Specific Promoters, Sponsored by University of Florida Submitted: January 11, 2019. Funding Dates: January 1, 2019 - June 30, 2021. | Awarded: \$164,000.00  
OSPA ID: 201901111107

Palli S., R., Epigenetic and posttranslational modifier regulation of Juvenile hormone action, Sponsored by National Institute of General Medical Sciences Submitted: March 3, 2015. Funding Dates: February 1, 2005 - June 2, 2021. | Awarded: \$1,128,308.00  
OSPA ID: 201503030759

Palli S., R., Development of RNAi-based Control Technologies for Use in Plant Health Emergencies, Sponsored by Animal and Plant Health Inspection Service Submitted: July 11, 2019. Funding Dates: June 30, 2019 - December 29, 2020. | Awarded: \$114,770.00  
OSPA ID: 2019071111158

Unrine J., M., Palli S., R., Improving Colloidal Stability of Nanoparticle Delivery Systems, Sponsored by Syngenta Crop Protection Submitted: April 11, 2017. Funding Dates: June 28, 2017 - August 30, 2020. | Awarded: \$264,209.00  
OSPA ID: 201704110749

Palli S., R., Tick Surveillance, Sponsored by KY Department for Public Health Submitted: April 10, 2019. Funding Dates: June 17, 2019 - June 30, 2020. | Awarded: \$20,000.00  
OSPA ID: 201904101231

Palli S., R., Tick Surveillance, Sponsored by KY Department for Public Health Submitted: June 3, 2020. Funding Dates: June 17, 2019 - June 30, 2020. | Awarded: \$20,000.00  
OSPA ID: 202006030803

Palli S., R., Unrine J., M., RNAi Methods for Zika Virus Vector Control, Sponsored by National Institute of Allergy and Infectious Diseases Submitted: July 27, 2016. Funding Dates: February 14, 2017 - January 31, 2020. | Awarded: \$385,000.00  
OSPA ID: 201607271601

Palli S., R., Transport of dsRNA in lepidopteran and hemipteran insects, Sponsored by University of Florida Submitted: December 18, 2017. Funding Dates: January 1, 2019 - December 31, 2019. | Awarded: \$82,500.00  
OSPA ID: 201712181046

Palli S., R., Development of RNAi-based Control Technologies for Use in Plant Health Emergencies, Sponsored by Animal and Plant Health Inspection Service Submitted: October 10, 2018. Funding Dates: September 30, 2018 - September 29, 2019. | Awarded: \$114,770.00 OSPA ID: 201810100905

Palli S., R., RNAi Methods For Controlling Stored Product Pests, Sponsored by Iowa State University Submitted: December 18, 2017. Funding Dates: January 1, 2018 - December 31, 2018. | Awarded: \$58,000.00  
OSPA ID: 201712181301

Palli S., R., Mechanisms of RNA interference, Sponsored by Iowa State University Submitted: February 5, 2014. Funding Dates: January 1, 2014 - December 31, 2018. Awarded: \$325,000.00 OSPA ID: 201402050900

Palli S., R., Center for Arthropod Management Technologies, Sponsored by National Science Foundation Submitted: March 2, 2013. Funding Dates: August 1, 2013 - December 31, 2018.  
| Awarded: \$308,000.00  
OSPA ID: 201303021143

Palli S., R., Development of Novel Insecticide Synergistic for Resistance Management, Sponsored by Agricultural Research Service Submitted: September 17, 2014. Funding

Dates: September 1, 2014 - September 30, 2018. | Awarded: \$342,000.00  
OSPA ID: 201409170851

Palli S., R., Development Of RNAi-based Control Technologies For Use In Plant Health Emergencies, Sponsored by Animal and Plant Health Inspection Service Submitted: September 1, 2017. Funding Dates: September 30, 2017 - September 29, 2018. | Awarded: \$91,999.00  
OSPA ID: 201709010840

Rieske-Kinney L., K., Abbott A., G., Palli S., R., Development of RNAi in Woody Plants for Broad Scale Management of Tree Pests, Sponsored by Forest Service Submitted: July 28, 2015. Funding Dates: August 18, 2015 - July 31, 2018. | Awarded: \$120,000.00  
OSPA ID: 201507280844

Palli S., R., Development of New RNAi-Based Control Technologies for Use in Plant Health Emergencies, Sponsored by Animal and Plant Health Inspection Service Submitted: June 10, 2016. Funding Dates: September 30, 2016 - September 29, 2017. | Awarded: \$82,500.00  
OSPA ID: 201606100751

Morris A., C., Cassone V., M., Famulski J., K., Galperin E., Harrison D., Jia J., Palli S., R., Smith J., J., Voss S., R., Light Sheet Microscope, Sponsored by Office of the Director Submitted: May 19, 2015. Funding Dates: July 1, 2016 - June 30, 2017. | Awarded: \$597,054.00  
OSPA ID: 201505191434

Palli S., R., Molecular Analysis of Xenobiotic Response in the Colorado Potato Beetle, Sponsored by National Institute of Food and Agriculture Submitted: June 10, 2010. Funding Dates: February 15, 2011 - February 14, 2016. | Awarded: \$456,364.00  
OSPA ID: 201006101046

Palli S., R., Molecular Analysis of Juvenile Hormone Action, Sponsored by National Institute of General Medical Sciences Submitted: November 10, 2008. Funding Dates: February 1, 2010 - January 31, 2016. | Awarded: \$852,776.00  
OSPA ID: 200811100948

## **Scope Grants**

### **Awarded**

Palli S., R., I/UCRC: Center For Arthropod Management Technologies Phase II Site: University Of Kentucky, Sponsored by National Science Foundation Submitted: September 29, 2020.  
Funding Dates: July 1, 2018 - June 30, 2023. | Current Budget Amount:  
\$7,200.00 Prime Grant OSPA ID: 201712160845

## **Closed**

Palli S., R., Phasell IUCRC at the University of Florida: Center for Arthropod Management Technologies, Sponsored by University of Florida Submitted: June 30, 2021. Funding Dates: January 1, 2020 - February 28, 2022. | Current Budget Amount: \$3,300.00

Prime Grant OSPA ID: 202002251705

Christian W., J., Palli S., R., Sanderson W., T., Developing a Tick-Borne Disease Surveillance and Mapping System for Kentucky, Sponsored by National Institute of Occupational Safety and Health Submitted: December 3, 2019. Funding Dates: September 30, 2016 - September 29, 2021. | Current Budget Amount: \$30,100.00

Prime Grant OSPA ID: 201809180952

REU: Center for Arthropod Management Technologies, Sponsored by National Science Foundation Submitted: August 23, 2013. Funding Dates: August 22, 2013 - July 31, 2018. | Current Budget Amount: \$8,000 Prime Grant OSPA ID: 201303021143

## **Federal**

### **Hatch**

#### **Closed**

Palli, S. R., Molecular Analysis of Insecticide resistance, (October 1, 2014 - September 30, 2019).

#### **On-going**

Palli, S. R., Mechanisms of RNA interference in insect pests, (November 20, 2019 - September 30, 2024).

Palli, S. R., Molecular Analysis of Insecticide resistance, National Institute of Food and Agriculture, (October 1, 2014 - September 30, 2019).

### **Hatch Multi-State**

#### **On-going**

Palli, S. R., Biology, Ecology & Management of Emerging Disease Vectors, (October 1, 2019 - September 30, 2024).

## **MEMBER OF EDITORIAL BOARD**

Journal of Insect Physiology (1998- )

The Canadian Entomologist, Associate Editor (2002- 2014)

Biopesticides International (2004--)

Archives of Insect Biochemistry and Physiology, Associate Editor (2005-)

Psyche-A Journal of Entomology (2007-)

The Open Anatomy Journal (2008- 2014 )

BMC Developmental Biology, Associate Editor (2009- )

Insect Biochemistry and Molecular Biology (2009- )  
Insects (2010---)  
PLoSOne (2011-- )  
Scientific Reports (2013--- )  
Annual Review of Entomology (2013-2019)  
Chief Editor, Frontiers in Insect Science-Molecular Genetics

#### **MEMBER GRANT REVIEW PANELS**

USDA-NRI (2005, 2006, 2008, 2019)  
NIH-VB/P THE (2014, 2015,2016,2017,2018,2019, 2021, 2022)

#### **MEMBERSHIP IN SCIENTIFIC SOCIETIES**

1. American Society for Cell Biology (1989-93)
2. Entomological Society of America (1988-91, 1998- )
3. American Society for Microbiology (1998-2002 )
4. American Society for Gene Therapy (1999- 2002 )

#### **SERVICE TO ESA**

1. Vice-president elect, vice-president, president and past president of PBT section (2011-2013).
2. Member publications council (2013 )
3. Member Nan-Yao Su Award for Innovation and Creativity in Entomology (2013 )
4. Chair, Lillian & Alex Feir Graduate Student Travel Award in Insect Physiology, Biochemistry, and Molecular Biology (2012).
5. Member of team who organized program symposia at 2006, 2009, 2010, 2012 ESA annual meetings.
6. Member ESA annual meeting program committee (2011-2012).
7. Member, Publication Council (2013-- )
8. Member, ESA Science Policy Committee (2014- )

## Teaching

| <b>Prefix Number - Section</b> | <b>Credit Hours</b> | <b># Enrolled</b> | <b>Code Term Year</b> |
|--------------------------------|---------------------|-------------------|-----------------------|
| BIO 199 - 003                  | 0.00000 - 1.00000   | 2                 | 30 Spring 2021-2022   |
| ENT 635 - 001                  | 4.00000 - 4.00000   | 8                 | 30 Spring 2021-2022   |
| ENT 695 - 202                  | 1.00000 - 4.00000   | 6                 | 30 Spring 2021-2022   |
| ENT 767 - 007                  | 2.00000 - 2.00000   | 4                 | 30 Spring 2021-2022   |
| ENT 767 - 011                  | 2.00000 - 2.00000   | 4                 | 10 Fall 2021-2022     |
| ENT 767 - 007                  | 2.00000 - 2.00000   | 3                 | 30 Spring 2020-2021   |
| ENT 790 - 007                  | 1.00000 - 6.00000   | 1                 | 30 Spring 2020-2021   |
| ENT 395 - 002                  | 1.00000 - 3.00000   | 1                 | 10 Fall 2020-2021     |
| ENT 767 - 011                  | 2.00000 - 2.00000   | 3                 | 10 Fall 2020-2021     |
| BIO 199 - 092                  | 0.00000 - 1.00000   | 2                 | 30 Spring 2019-2020   |
| BIO 635 - 001                  | 4.00000 - 4.00000   | 1                 | 30 Spring 2019-2020   |
| ENT 635 - 001                  | 4.00000 - 4.00000   | 14                | 30 Spring 2019-2020   |
| ENT 695 - 002                  | 1.00000 - 4.00000   | 4                 | 30 Spring 2019-2020   |
| ENT 695 - 202                  | 1.00000 - 4.00000   | 2                 | 30 Spring 2019-2020   |
| ENT 767 - 007                  | 2.00000 - 2.00000   | 4                 | 30 Spring 2019-2020   |
| ENT 780 - 007                  | 2.00000 - 3.00000   | 1                 | 30 Spring 2019-2020   |
| ENT 790 - 007                  | 1.00000 - 6.00000   | 1                 | 30 Spring 2019-2020   |
| ENT 767 - 011                  | 2.00000 - 2.00000   | 4                 | 10 Fall 2019-2020     |
| ENT 780 - 012                  | 2.00000 - 3.00000   | 1                 | 10 Fall 2019-2020     |
| ENT 790 - 011                  | 1.00000 - 6.00000   | 1                 | 10 Fall 2019-2020     |
| ENT 395 - 003                  | 1.00000 - 3.00000   | 1                 | 30 Spring 2018-2019   |
| ENT 767 - 007                  | 2.00000 - 2.00000   | 4                 | 30 Spring 2018-2019   |
| ENT 767 - 011                  | 2.00000 - 2.00000   | 1                 | 10 Fall 2018-2019     |
| ENT 770 - 002                  | 0.00000 - 1.00000   | 8                 | 10 Fall 2018-2019     |
| ENT 780 - 012                  | 2.00000 - 3.00000   | 1                 | 10 Fall 2018-2019     |
| ENT 790 - 011                  | 1.00000 - 6.00000   | 4                 | 10 Fall 2018-2019     |
| BIO 635 - 001                  | 4.00000 - 4.00000   | 2                 | 30 Spring 2017-2018   |
| ENT 635 - 001                  | 4.00000 - 4.00000   | 16                | 30 Spring 2017-2018   |
| ENT 767 - 007                  | 2.00000 - 2.00000   | 2                 | 30 Spring 2017-2018   |
| ENT 790 - 007                  | 1.00000 - 6.00000   | 1                 | 30 Spring 2017-2018   |
| BIO 561 - 001                  | 3.00000 - 3.00000   | 8                 | 10 Fall 2017-2018     |
| CPH 561 - 001                  | 3.00000 - 3.00000   | 6                 | 10 Fall 2017-2018     |
| ENT 561 - 001                  | 3.00000 - 3.00000   | 14                | 10 Fall 2017-2018     |
| ENT 767 - 011                  | 2.00000 - 2.00000   | 2                 | 10 Fall 2017-2018     |
| ENT 790 - 011                  | 1.00000 - 6.00000   | 1                 | 10 Fall 2017-2018     |
| ENT 767 - 007                  | 2.00000 - 2.00000   | 3                 | 30 Spring 2016-2017   |
| ENT 790 - 007                  | 1.00000 - 6.00000   | 1                 | 30 Spring 2016-2017   |
| ENT 767 - 011                  | 2.00000 - 2.00000   | 3                 | 10 Fall 2016-2017     |
| ENT 790 - 011                  | 1.00000 - 6.00000   | 1                 | 10 Fall 2016-2017     |

## Teacher Course Evaluations

| Prefix Number - Section | Responses | TCE Course Quality Mean | TCE Teaching Quality Mean | Code Term Year      |
|-------------------------|-----------|-------------------------|---------------------------|---------------------|
| ENT 635 - 001           | 6         | 4.83                    | 4.83                      | 30 Spring 2021-2022 |
| ENT 635 - 001           | 12        | 4.42                    | 4.50                      | 30 Spring 2019-2020 |
| ENT 635 - 001           | 13        | 4.62                    | 4.54                      | 30 Spring 2017-2018 |
| ENT 770 - 002           | 6         | 4.83                    | 5.00                      | 10 Fall 2018-2019   |

## Academic Advising

### GRADUATE STUDENT ADVISING

#### Major Advisor

##### Ph.D. Students

1. Yaoyu Jiao
2. Jin Mo Koo
3. Anna Pasternak

##### M.S. Students

1. Jun Seok Ryou
2. Calli Vandegriff

##### Post-doctoral fellows

Dr. Surjeet Arya  
Dr. Sundararajan Balasubraman  
Dr. Jiasheng Chen  
Dr. AnilKumar Moola  
Dr. Karthi Sengodan

# Dr. Lynne K. Rieske-Kinney

College of Agriculture, Food and Environment  
Department of Entomology

## Education

Ph.D. University of Wisconsin, 1995, Forest Entomology/ Forest Pathology (minor)  
M.S. University of Wisconsin, 1990, Forest Entomology  
B.S. Michigan State University, 1983, Entomology

## Work History

**Professor**, Department of Entomology, University of Kentucky. 2007 – present  
**Adjunct Professor and Graduate Faculty member**, Dept. of Forestry  
**Associate Professor**, Department of Entomology, University of Kentucky. 2002 - 2007  
**Adjunct Associate Professor and Graduate Faculty member**, Dept. of Forestry  
**Assistant Professor**, Department of Entomology, University of Kentucky. 1996 - 2002  
**Postdoctoral Fellow**, Department of Entomology, Colorado State University. 1995 - 1996 **Instructor**,  
Integrated Forest Pest Management (Entomology/Plant Disease 365/ Forestry 365). Department of  
Entomology, Colorado State University. Fall 1995  
**Teaching Assistant**, Introduction to Entomology (Entomology 301). Department of Entomology,  
University of Wisconsin. Fall 1991  
**Graduate Research Assistant**, Department of Entomology, University of Wisconsin. Ph.D. (1990-95); MS  
(1988-90)

## Research and Scholarship

### Intellectual Contributions

\* = Senior Author ~ = Corresponding Author + = Grad/Prof Student # = Post Doc ^ = Undergraduate

WOS = Web of Science JIF = Journal Impact Factor TC = Journal Total Cites  
SNIP = Source Normalize Impact per Paper SJR = Scimago Journal Rank

### Published

#### Journal Article, Academic Journal

- + Bragg Z.B., L.K. Rieske (2022). Spatial distribution and retention in loblolly pine seedlings of exogenous dsRNAs applied through roots. *International Journal of Molecular Science – RNA Interference-based tools for plant improvement and protection* 23(16), 9167; <https://doi.org/10.3390/ijms23169167>.
- + Kyre, B. R., Rieske, L. K. (2022). Using RNAi to silence heat shock protein has congeneric effects in North America's *Dendroctonus* bark beetles, *Forest Ecology and Management*, 520. doi: 10.1016/j.foreco.2022.120367
- + Hollowell, H., Rieske, L. K. (2022). Southern pine beetle-specific RNA interference exhibits no effect on model nontarget insects, *Journal of Pest Science*, 95(3), 1429-1441. doi:



10.1007/s10340-021-01473-1

- Tull, A. R., Gladfelter, H., + Pampolini, F., Rieske, L., Nelson, C. D., Merkle, S. (2022). Development of a New Genetic Transformation System for White and Green Ash Using Embryogenic Cultures, *Forests*, 13(5). doi: 10.3390/f13050671
- + Bragg, Z., Rieske, L. K. (2022). Feasibility of Systemically Applied dsRNAs for Pest-Specific RNAi-Induced Gene Silencing in White Oak, *Frontiers in Plant Science*, 13. doi: 10.3389/fpls.2022.830226
- + Wallace, M., Rieske, L. K. (2021). Validation of reference genes for quantitative PCR in the forest pest, *Ips calligraphus*, *Scientific Reports*, 11(1). doi: 10.1038/s41598-021-02890-z
- Norman-Burgdolf, H., Rieske, L. K. (2021). Healthy trees – Healthy people: A model for engaging citizen scientists in exotic pest detection in urban parks, *Urban Forestry and Urban Greening*, 60. doi: 10.1016/j.ufug.2021.127067
- + Pampolini, F. B., \* ~ Rieske-Kinney, L. K. (2020). Emerald ash borer specific gene silencing has no effect on non-target organisms., *Frontiers in Agronomy – Special issue: New Applications of Insecticidal RNAi*.
- + Kyre, B. R., Bentz, B. J., \* Rieske-Kinney, L. K. (2020). Susceptibility of mountain pine beetle (*Dendroctonus ponderosae* Hopkins) to gene silencing through RNAi provides potential as a novel management tool, *Forest Ecology and Management*, 473. doi: 10.1016/j.foreco.2020.118322
- + Olson, D. G., Townsend, L. H., Roemmele, E., \* Rieske, L. K. (2020). Another look at systemic neonicotinoid applications for emerald ash borer suppression, *Arboriculture and Urban Forestry*(46(5)), 347-357.
- # Leelesh, R., ~ Rieske-Kinney, L. K. (2020). Oral ingestion of bacterially expressed dsRNA can silence genes and cause mortality in a highly invasive, tree-killing pest, the emerald ash borer, *Insects*, 11(7), 1-10. doi: 10.3390/insects11070440
- + Pampolini, F., # Rodrigues, T. B., # Leelesh, R. S., Kawashima, T., \* ~ Rieske-Kinney, L. K. (2020). Confocal microscopy provides visual evidence and confirms the feasibility of dsRNA delivery to emerald ash borer through plant tissues, *Journal of Pest Science*. doi: 10.1007/s10340-020-01230-w
- + Kyre, B. R., # Rodrigues, T. B., \* ~ Rieske-Kinney, L. K. (2019). RNA interference and validation of reference genes for gene expression analyses using qPCR in southern pine beetle, *Dendroctonus frontalis*, *Scientific Reports*, 9(1). doi: 10.1038/s41598-019-42072-6
- + Savage, M. B., \* Rieske, L. K. (2018). Coleopteran communities associated with forests invaded by emerald ash borer, *Forests*, 9(2). doi: 10.3390/f9020069

- # Rodrigues, T. B., Duan, J. J., Palli, S. R., \* Rieseke, L. K. (2018). Identification of highly effective target genes for RNAi-mediated control of emerald ash borer, *Agrilus planipennis*, *Scientific Reports*, 8. doi: 10.1038/s41598-018-23216-6
- Deng, Y., Li, F., Rieseke, L. K., Sun, L.-L., Sun, S.-H. (2018). Transcriptome sequencing for identification of diapause-associated genes in fall webworm, *Hyphantria cunea* Drury, *GENE*, 668, 229-236. doi: 10.1016/j.gene.2018.05.023
- + Olson, D. G., \* Rieseke, L. K. (2018). Host range expansion may provide enemy free space for the highly invasive emerald ash borer, *Biological Invasions*. doi: <https://doi.org/10.1007/s10530-018-1853-6>
- Rodrigues, T. B., Rieseke, L. K., Duan, J. J., Mogilicherla, K., Palli, S. R. (2017). Development of RNAi method for screening candidate genes to control emerald ash borer, *Agrilus planipennis*, *Scientific Reports*, 7. doi: 10.1038/s41598-017-07605-x
- \* Lacki, M. J., Dodd, L. E., Skowronski, N. S., Dickinson, M. B., Rieseke, L. K. (2017). Relationships among burn severity, forest canopy structure and bat activity from spring burns in oak-hickory forests, *International Journal of Wildland Fire*, 26(11), 963-972. doi: 10.1071/WF16159
- + Davidson, W., \* Rieseke, L. K. (2016). Establishment of classical biological control targeting emerald ash borer is facilitated by use of insecticides, with little effect on native arthropod communities, *Biological Control*, 101, 78-86. doi: 10.1016/j.biocontrol.2016.06.010

### **Journal Article, Professional Journal**

- \* ~ Rieseke-Kinney, L. K., Borden, S., Damron, B., Williamson, N., Arthur, M. A., Kinney, A. (2019). College Campus as a Living Laboratory: Scrubbing Scales, Saving Trees, Engaging Students, *American Entomologist*, 65(1), 43-49. doi: 10.1093/ae/tmz010
- \* ~ Rieseke-Kinney, L. K., Borden, S., Damron, B., Williamson, N., Arthur, M. A., Kinney, A. (2019). College Campus as a Living Laboratory: Scrubbing Scales, Saving Trees, Engaging Students, *American Entomologist*, 65(1), 43-49. doi: 10.1093/ae/tmz010
- # Graziosi, I., Townsend, L. H., \* Rieseke, L. K. (2018). The EAB discovery trail: A novel approach to engage the public in emerald ash borer research, *American Entomologist*, 64(3), 190-193.

Graziosi, I., Davidson, W., \* Riese, L. K. (2017). The Battle Plan: Defining a strategy to manage the emerald ash borer in Kentucky forests, *Kentucky Woodlands*, 11(1), 20-21.

### **Editorial, Journal**

Rodrigues, T. B., Riese, L. K., Narva, K. E., Roberts, A., Vélez, A. M. (2022). Editorial: New Applications of Insecticidal RNAi, *Frontiers in Agronomy*, 4. doi: 10.3389/fagro.2022.903841

### **Report, Technical**

\* ~ Dodd, L. E., Dickinson, M. B., Lacki, M. J., Riese-Kinney, L. K., Skowronski, N. K., Thomas, S. C., Toomey III, R. S. (2019). A long-term evaluation of the interacting effects of fire and white-nose syndrome on endangered bats., *USFS Joint Fire Science Program*.(Project #14-1-05-22.), 34.

### **Sponsored Projects**

#### **Awarded**

Sass C., K., Tedder D., S., Crocker E., V., Larson J., Phillips L., R., Riese-Kinney L., K., Arthur M., A., Crankshaw N., M., Stringer J., W., Conservation, Protection, and Enhancement of Forest Canopies in Rural Communities and Small Municipalities, Sponsored by KY Division of Forestry Submitted: February 2, 2021. Funding Dates: February 1, 2021 - June 30, 2023. | Awarded: \$406,337.00  
OSPA ID: 202102021145

Crocker E., V., Arthur M., A., Riese-Kinney L., K., Sass C., K., Williams M., A., Undergraduate Certificate In Urban And Community Forestry, Sponsored by National Institute of Food and Agriculture Submitted: June 11, 2017. Funding Dates: April 1, 2018 - September 30, 2022. Requested: \$150,000.00, | Awarded: \$150,000.00  
OSPA ID: 201706111021

Regional Difference in Phenology May Affect Biological Control Efforts Targeting EAB, Sponsored by Animal and Plant Health Inspection Service Submitted: May 20, 2020. Funding Dates: August 1, 2020 - July 31, 2022. | Awarded: \$76,019.00 OSPA ID: 202005201027

Gene Silencing Using RNAi for Bark Beetle Management, Sponsored by Animal and Plant Health Inspection Service Submitted: May 20, 2020. Funding Dates: July 1, 2020 - June 30, 2022. | Awarded: \$153,173.00  
OSPA ID: 202005201025

#### **Closed**

Sass C., K., Riese-Kinney L., K., Arthur M., A., Urban Forest Initiative, Sponsored by KY Division of Forestry Submitted: October 13, 2020. Funding Dates: December 1, 2020 - June 30, 2021. | Awarded: \$10,000.00  
OSPA ID: 202010131420

Riese-Kinney L., K., Developing RNAi for Suppression of Exotic Wood-Boring Buprestids, Sponsored by Animal and Plant Health Inspection Service Submitted: May 20, 2020. Funding

Dates: July 1, 2020 - June 30, 2021. | Awarded: \$76,217.00 OSPA  
ID: 202005201026

Rieske-Kinney L., K., Development of RNAi for Suppression of Exotic Wood-boring Buprestids, Sponsored by Animal and Plant Health Inspection Service Submitted: July 15, 2019. Funding Dates: June 1, 2019 - May 31, 2021. | Awarded: \$94,348.00 OSPA  
ID: 201907151058

Rieske-Kinney L., K., Phenology of EAB and Parasitoids in Kentucky, Sponsored by Animal and Plant Health Inspection Service Submitted: July 15, 2019. Funding Dates: August 1, 2019 - January 31, 2021. | Awarded: \$66,692.00  
OSPA ID: 201907151059

Rieske-Kinney L., K., Developing RNAi for Suppression of Exotic Wood-Boring Buprestids, Sponsored by Animal and Plant Health Inspection Service Submitted: August 16, 2018. Funding Dates: August 1, 2018 - July 31, 2020. | Awarded: \$96,312.00  
OSPA ID: 201808161612

Arthur M., A., Rieske-Kinney L., K., Urban Forest Initiative, Sponsored by KY Energy and Environment Cabinet Submitted: July 26, 2019. Funding Dates: August 1, 2019 - June 30, 2020. | Awarded: \$10,000.00 OSPA  
ID: 201907261020

Rieske-Kinney L., K., Regional Difference in Plant and Pest Phenology May Affect Biological Control Efforts Targeting Emerald Ash Borer, Sponsored by Animal and Plant Health Inspection Service Submitted: August 16, 2018. Funding Dates: August 1, 2018 - January 31, 2020. | Awarded: \$57,692.00  
OSPA ID: 201808161611

Rieske-Kinney L., K., Norman-Burgdolf H., Healthy Trees - Healthy People, Sponsored by Animal and Plant Health Inspection Service Submitted: April 23, 2018. Funding Dates: June 1, 2018 - December 31, 2019. | Awarded: \$37,539.00  
OSPA ID: 201804230811

Arthur M., A., Rieske-Kinney L., K., The Urban Forest Initiative: Educating the Public to Connect Urban Trees to Stormwater Quality and Quantity, Sponsored by Lexington Fayette Urban County Government Submitted: May 12, 2017. Funding Dates: March 22, 2018 - September 22, 2019. | Awarded: \$34,954.00  
OSPA ID: 201705121012

Rieske-Kinney L., K., A long-term evaluation of the interacting effects of fire and White-Nose Syndrome on endangered bats, Sponsored by Eastern KY University Submitted: April 24, 2014. Funding Dates: July 29, 2014 - December 31, 2018. | Awarded: \$57,943.00 OSPA  
ID: 201404241331

Rieske-Kinney L., K., Abbott A., G., Palli S., R., Development of RNAi in Woody Plants for Broad Scale Management of Tree Pests, Sponsored by Forest Service Submitted: July 28, 2015. Funding Dates: August 18, 2015 - July 31, 2018. | Awarded: \$120,000.00 OSPA  
ID: 201507280844

Rieske-Kinney L., K., Townsend L., H., Integrating Biological and Chemical Control to Save Our Ash, Sponsored by KY Division of Forestry Submitted: April 25, 2016. Funding Dates: July 1, 2016 - June 30, 2018. | Awarded: \$133,733.00  
OSPA ID: 201604251408

Rieske-Kinney L., K., Webber K., H., Healthy Trees - Healthy People, Sponsored by Animal and Plant Health Inspection Service Submitted: January 30, 2017. Funding Dates: April 1, 2017 - March 31, 2018. | Awarded: \$34,396.00  
OSPA ID: 201701301141

Rieske-Kinney L., K., Vaillancourt L., J., Do blossom end rot fungus and Asian chestnut gall wasp interact on chestnut, Sponsored by Northern Nut Growers Association Submitted: December 19, 2015. Funding Dates: October 1, 2015 - December 31, 2017. | Awarded: \$6,700.00  
OSPA ID: 201512191001

Rieske-Kinney L., K., Arthur M., A., Urban Forestry Initiative with KY Communities, Sponsored by KY Division of Forestry Submitted: May 26, 2016. Funding Dates: July 1, 2016 - June 30, 2017. | Awarded: \$18,520.00  
OSPA ID: 201605261227

Rieske-Kinney L., K., Arthur M., A., Urban Forestry Initiative with KY Communities, Sponsored by KY Division of Forestry Submitted: March 30, 2016. Funding Dates: May 1, 2016 - June 30, 2016. | Awarded: \$1,480.00  
OSPA ID: 201603301408

Rieske-Kinney L., K., Townsend L., H., Integrating biological and chemical control to save our ash, Sponsored by KY Division of Forestry Submitted: June 26, 2015. Funding Dates: July 15, 2015 - June 30, 2016. | Awarded: \$149,500.00  
OSPA ID: 201506261447

Rieske-Kinney L., K., Biological Assessments of the Eastern Kentucky Training Site and H.R. Disney Training Site in Kentucky, Sponsored by Eastern KY University Submitted: November 6, 2014. Funding Dates: September 25, 2014 - June 30, 2016. | Awarded: \$11,689.00 OSPA ID: 201411061013

Rieske-Kinney L., K., Semiochemicals offer hope for managing the granulate ambrosiabeetle, an invasive pest of chestnut, Sponsored by Northern Nut Growers Association (Inactive) Submitted: April 18, 2014. Funding Dates: April 1, 2014 - January 31, 2016. | Awarded: \$6,924.00  
OSPA ID: 201404181650

### **Not Funded**

Rieske-Kinney L., K., Palli S., R., Development of RNAi in Woody Plants for Broad Scale Management of Tree Pests, Sponsored by Forest Service Submitted: July 21, 2017. | Awarded: \$0.00  
OSPA ID: 201707211505

Rieske-Kinney L., K., Environmental Fate Of Exogenous dsRNAs Designed To Suppress Emerald Ash Borer, A Highly Aggressive, Non-Native Tree Killer, Sponsored by National Institute of Food and Agriculture Submitted: February 24, 2021. | Awarded: \$0.00 OSPA ID: 202102240935

Rieske-Kinney L., K., High Quality Genomic Resources Will Enhance our Understanding of Dendroctonus Bark Beetle Evolution and Facilitate Innovative Management Approaches, Sponsored by Texas AgriLife Research Submitted: April 6, 2020. | Awarded: \$0.00 OSPA ID: 202004061517

Rieske-Kinney L., K., HiGh Quality Genomic Resources will Enhance our Understanding of Dendroctonus Bark Beetles, Sponsored by Texas AgriLife Research Submitted: July 5, 2019. | Awarded: \$0.00

OSPA ID: 201907052104

Rieske-Kinney L., K., Multitrophic Interactions Among Non-target Insect Herbivores, Their Natural Enemies, and Transgenic Blight Resistant American Chestnut Trees, Sponsored by State University of New York Submitted: June 6, 2016. | Awarded: \$0.00 OSPA

ID: 201606060812

## **Non-Sponsored Projects**

### **Under Review**

Rieske-Kinney, L.K., B. R. Kyre. Exploiting nutritional symbionts as a means of delivering fatal dsRNAs to tree-killing bark beetles. USDA AFRI A1112, (Aug 01, 2023 – July 31, 2027). \$658,373

Rieske-Kinney, L. K., Field trial to evaluate EAB specific gene silencing as a component of an IPM program to save ash, USDA Farm Bill 2022, (August 1, 2023 - July 31, 2024). Requested: \$86,375.

Rieske-Kinney, L. K., Laurel wilt disease biological control, USDA Farm Bill 2022, (August 1, 2023 - July 31, 2024). Requested: \$128,129.

Rieske-Kinney, L. K., Differential gene expression as a tool to develop climate resiliency and pest resistance in loblolly pine, USDA Farm Bill 2022, (August 1, 2023 - July 31, 2024). Requested: \$91,235.

### **Federal Not Funded**

Rieske-Kinney, L. K., Evaluating European and Asian Wood-boring Beetles for Emerald Ash Borer-Specific Gene Silencing, USDA Farm Bill 2019, (August 2019 - July 2020). Awarded: \$35932.

Yang, J., Abbott, A. G., Rieske-Kinney, L. K., Liang, L., Lhotka, J. M., Conrad, A., Patterns and Driving Mechanisms of Oak Species Spring Phenology and its Cascading Effects on Host-herbivory Relationship using an Integrated Landscape Genomics Approach, Department of Defense. Awarded: \$1957575.

Description: The pre-proposal was submitted to the FY17 Strategic Environmental Research and Development Program (SERDP). Full proposal was not invited.

### **On-going**

Rieske-Kinney, L. K. (Principal), Gene silencing using RNA interference for bark beetle management., USDA Farm Bill 2020, (August 1, 2020 - July 31, 2021). Awarded: \$151173.

Rieske-Kinney, L. K., Developing RNAi for suppression of exotic wood-boring buprestids, USDA Farm Bill 2020, (August 1, 2020 - July 31, 2021). Awarded: \$76217.

Rieske-Kinney, L. K., Regional differences in plant and pest phenology may affect biological control efforts targeting emerald ash borer, an aggressive, exotic tree killer., USDA Farm Bill, (August 2018 - August 2019). Awarded: \$96312.

Rieske-Kinney, L. K., Developing RNAi for suppression of exotic wood-boring buprestids, USDA Farm Bill 2018, (August 2018 - August 2019). Awarded: \$96312.

Norman-Burgdolf, H., Rieske-Kinney, L. K., Healthy Trees - Healthy People: A Tool to Increase Physical Activity and Improve Human and Urban Tree Health, USDA Farm Bill, (January 2017 - December 2017). Awarded: \$34396.00.

#### **Under Review**

Rieske-Kinney, L. K., Applying gene silencing using RNA interference for management of bark beetles, USDA Farm Bill 2021, (August 1, 2021 - July 31, 2022). Awarded: \$161690.

#### **Hatch Multi-State On-going**

Rieske-Kinney, L. K., Biological Improvement of Chestnut through Technologies that Address Management of the Species and its Pathogens and Pests, National Institute of Food and Agriculture, (February 12, 2019 - September 30, 2023).

Rieske-Kinney, L. K., Biological Improvement of Chestnut through Technologies that Address Management of the Species and its Pathogens and Pests, (February 12, 2019 - September 30, 2023).

Rieske-Kinney, L. K., Biological Improvement of Chestnut through Technologies that Address Management of the Species, its Pathogens and Pests, National Institute of Food and Agriculture, (January 22, 2014 - September 30, 2018).

#### **McIntire-Stennis Closed**

Rieske-Kinney, L. K., A sustainable approach for protecting our forests from emerald ash borer, with applications to other exotic wood-boring invaders, (October 1, 2014 - September 30, 2019).

#### **State On-going**

Rieske-Kinney, L. K. (Co-Principal), Arthur, M. A. (Co-Principal), Sass, C. K. (Co-Principal), Conservation, protection, and enhancement of forest canopies in rural communities and small municipalities., Kentucky Division of Forestry, (December 1, 2020 - June 30, 2023). Awarded: \$406339.

Description: In addition to the co-PIs there are ~12 other UK faculty and staff on the project, all of whom contributed effort with their salary to allow us to make the 1:1 match that the funding agency required.

Arthur, M. A. (Principal), Rieske-Kinney, L. K. (Co-Principal), Modeling replicable urban and community forestry programs in Kentucky, Kentucky Division of Forestry, KY Energy and Environment Cabinet, (December 1, 2020 - June 30, 2021). Awarded: \$10000.

### **University Closed**

Arthur, M. A. (Principal), Rieske-Kinney, L. K. (Co-Principal), Crocker, E. V. (Co-Principal), Williamson, N. (Co-Principal), Training Collegiate Arborist Teams (TreeCATS) to expand the visibility of urban tree benefits, UK Sustainability Challenge Grant program, (January 1, 2019 - December 31, 2019). Awarded: \$35000.

Description: Proposal pending to the UK Sustainability Challenge Grant program.

Arthur, M. A. (Co-Principal), Rieske-Kinney, L. K. (Co-Principal), Williamson, N. (Co-Investigator), Mobilizing tree ambassadors through campus and community engagement, teaching and research, UK Sustainability Challenge Grant program, (January 1, 2017 - December 31, 2017). Awarded: \$49774.

### **On-going**

Arthur, M. A. (Principal), Sass, C. K. (Co-Principal), Rieske-Kinney, L. K. (Co-Principal), Williamson, N. (Collaborator), Preparing our Urban Forests for our Changing Climate, UK Sustainability Challenge Grant Program, (May 1, 2020 - December 31, 2021). Awarded: \$15500.

Arthur, M. A. (Collaborator), Sass, C. K. (Collaborator), Rieske-Kinney, L. K. (Collaborator), Williamson, N. (Collaborator), Eades, A. (Collaborator), Hilbrecht, C. (Undergrad Student), TreeCATs: Collegiate Arborist Team and Training Workshop, UK Student Sustainability Council, (January 1, 2021 - September 30, 2021). Awarded: \$13942.

Arthur, M. A., Rieske-Kinney, L. K. (Co-Principal), Williamson, N. (Co-Investigator), From Roots to Branches: Expanding UK's capacity to care for and nurture urban forests and their people, UK Sustainability Challenge Grant program, (January 1, 2018 - December 31, 2018). Awarded: \$38898.

Segura Bell, A. C. (Co-Principal), Rieske-Kinney, L. K. (Principal), Bibbs, G. R. (Co-Principal), Webber, K. H. (Co-Principal), Ison, R. S. (Co-Principal), Connectivity promotes community: Refurbishing a major pedestrian conduit to improve safety, aesthetics, and sustainability, UK Sustainability, (January 2017 - December 2017). Awarded: \$10000.



## Intellectual Property

Rieske-Kinney, L. K., Kyre, B. R., Rodrigues, T. B., Gene silencing kills bark beetles threatening conifer forests that mitigate climate change, Patent/Copyright/ID Number: Appl. Serial No. 62/991,997

Rieske-Kinney, L. K., Rodrigues, T. B., Gene silencing kills emerald ash borer, an exotic, invasive tree-killing insect, Patent/Copyright/ID Number: UKRF2324 RIESKE-KINNEY Appl. No. 16/827,270 Attorney Docket No. 13177N-2324US

## Presentations Given

### Invited Speaker

- Pampolini F. B., Rodrigues T. B., Leelesh R. S., Kawashima T., Rieske-Kinney L. K., (November 2020). Confocal microscopy confirms the feasibility of gene silencing as a strategy for management of the emerald ash borer. Entomological Society of America annual meeting, Entomological Society of America, Orlando (Virtual), FL, United States. Invited, National.
- Kyre B. R., Rieske-Kinney L. K., (November 2020). Genetic variation may impact RNAi responses between geographically distinct southern pine beetle populations. Entomological Society of America annual meeting, Entomological Society of America, Orlando (Virtual), FL, United States.
- Kyre B. R., Pampolini F. B., Wallace M., Bragg Z., Hollowell H., Rieske-Kinney L. K., (November 2020). RNAi-induced gene silencing as a novel tool for management of bark beetles and wood borers Entomological Society of America annual meeting, Entomological Society of America, Orlando (Virtual), FL, United States. Invited, National.
- Rieske-Kinney L. K., (February 2020). Gene silencing as a novel tool for forest pest suppression Kentucky Forest Health Conference, Kentucky Forest Health Task Force, Lexington, KY, United States. Invited, State.
- Rieske-Kinney L. K., (June 2019). Exploring the potential for use of RNA interference for emerald ash borer management Southern Forest Tree Improvement Conference annual meeting, Southern Forest Tree Improvement Conference, Lexington, KY, United States. Invited, Regional.
- Rieske-Kinney L. K., (May 2019). Gene silencing using RNAi as a tool for managing bark and wood-boring beetles: Prospects for the future Sabbatical seminars, Other / Multiple Countries. Invited, National.
- Rodrigues T. B., Pampolini F., Leelesh R. S., Rieske L. K., (November 13, 2018). Gene silencing technology may facilitate emerald ash borer management Entomological Society of America, Entomological Society of America, Entomological Society of Canada, Entomological Society of British Columbia, Vancouver, Canada. Invited, International.
- Kyre B. R., Rieske L. K., (November 11, 2018). A molecular approach to a continental threat: Exploring gene silencing as a tool for southern pine beetle management Entomological Society of America, Joint meeting of the Entomological Society of America, the Entomological Society of Canada, and Entomological Society of British Columbia, Vancouver, Canada. Invited, International.
- Rieske L. K., (November 8, 2018). Can gene silencing provide a new tool for emerald ash borer management? Annual Gypsy Moth Review, Indianapolis, IN. National.

- Kyre B. R., Rieske L. K., (July 2018). A novel approach to an unyielding forest pest: Gene silencing in southern pine beetle Southern Forest Insect Work Conference, Southern Forest Insect Work Conference, San Antonio, TX.
- Pampolini F., Rieske L. K., (July 2018). Gene silencing as an approach for suppressing the invasive emerald ash borer Southern Forest Insect Work Conference, Southern Forest Insect Work Conference, San Antonio, TX.
- Pampolini F., Rieske L. K., (July 2018). Gene silencing as an approach for suppressing the invasive emerald ash borer Southern Forest Insect Work Conference, Southern Forest Insect Work Conference, San Antonio, TX. Invited, Regional.
- Rieske L. K., Arthur M., Williamson N., (November 2017). Growing urban and community forestry through the Urban Forest Initiative Entomological Society of America, Entomological Society of America, Denver, CO. National.
- Rieske L. K., (February 2017). Mitigating impacts of the emerald ash borer, a highly aggressive forest pest, using new and old approaches Academic seminar, West Virginia University Department of Plant and Soil Science, Morgantown, WV. University.
- Rieske L. K., (November 2016). An integrated approach to managing our EAB invasion 12th Continental Dialogue on Non-native Forest Insects and Diseases, Continental Dialogue on Non-native Forest Insects and Diseases, Indianapolis, IN. Invited, International.
- Williamson N., Arthur M., Rieske L. K., (November 2016). The Urban Forest Initiative: Growing urban forestry awareness, outreach, and education 12th Continental Dialogue on Non-Native Forest Insects and Diseases, Continental Dialogue on Non-Native Forest Insects and Diseases, Indianapolis, IN. Invited, International.
- Rieske L. K., (November 2016). A sustainable approach for managing the emerald ash borer, an aggressive forest and urban invader Academic seminar, University of Tennessee Dept. of Biology, Chattanooga, TN. Invited, Regional.

### **Podium Session**

- Hollowell H., Rieske-Kinney L. K., (November 2020). Effects of pest-specific gene silencing on non-target insects. Entomological Society of America annual meeting, Entomological Society of America, Orlando (Virtual), FL, United States. Accepted, National.
- Wallace M., Rieske-Kinney L. K., (November 2020). Evaluation of *Ips calligraphus* as a candidate for RNAi-mediated management Entomological Society of America annual meeting, Entomological Society of America, Orlando (Virtual), FL, United States. Accepted, National.
- Bragg Z., Rieske-Kinney L. K., (November 2020). Gene silencing in southern pine beetle (*Dendroctonus frontalis*): Evaluating spatial and temporal distribution of dsRNAs in host plants. Entomological Society of America annual meeting, Entomological Society of America, Orlando (Virtual), FL, United States. Accepted, National.
- Kyre B. R., Rieske-Kinney L. K., (November 2019). Congeneric effect of RNA interference leads to gene silencing in multiple *Dendroctonus* species Entomological Society of America annual meeting, Entomological Society of America, St. Louis, MO, United States. Accepted, National.
- Pampolini F., Rieske-Kinney L. K., (November 2019). Ecological risk assessment for RNA interference developed for emerald ash borer suppression Entomological Society of America annual meeting, Entomological Society of America, St. Louis, MO, United States. Accepted, National.
- Pampolini F., Rieske-Kinney L. K., (October 2019). Gene silencing for suppressing the emerald ash borer:

- an ecotoxicological study Ohio Valley Entomological Association annual meeting, Ohio Valley Entomological Association, Lexington, KY, United States. Accepted, Regional.
- Kyre B. R., Rieske-Kinney L. K., (October 2019). Southern pine beetle specific dsRNA affects gene expression in *Dendroctonus* beetles Ohio Valley Entomological Association annual meeting, Ohio Valley Entomological Association, Lexington, KY, United States. Accepted, Regional.
- Kyre B., Rieske-Kinney L. K., (July 2019). Southern pine beetle specific dsRNA affects gene expression in mountain pine beetle Southern Forest Insect Work Conference annual meeting, Southern Forest Insect Work Conference, Savannah, GA, United States. Accepted, Regional.
- Pampolini F. B., Rodrigues T. B., Kawashima T., Rieske-Kinney L. K., (July 2019). Visual evidence of the efficacy of gene silencing for emerald ash borer suppression Southern Forest Insect Work Conference annual meeting, Southern Forest Insect Work Conference, Savannah, GA, United States. Accepted, Regional.
- Norman-Burgdorf H., Rieske-Kinney L. K., (May 2019). Improving Human Health and Tree Health One Walk at a Time National Health Outreach Conference, Texas A&M University, Fort Worth, TX, United States. Accepted, National.
- Leelesh R. S., Rieske L. K., (November 2018). RNA interference provides hope for managing the invasive emerald ash borer: Current status and challenges Entomological Society of America, Joint meeting of the Entomological Society of America, the Entomological Society of Canada, and Entomological Society of British Columbia, Vancouver, Canada. Accepted, International.
- Olson D. G., Rieske L. K., (July 2018). Emerald ash borer host expansion: Trading an optimal host for enemy free space? Southern Forest Insect Work Conference, Southern Forest Insect Work Conference, San Antonio, TX. Accepted, Regional.
- Olson D. G., Rieske L. K., (November 2017). Emerald ash borer host range expansion Entomological Society of America, Entomological Society of America, Denver, CO. Accepted, National.
- Rodrigues T. B., Rieske L. K., Palli S. R., (November 2017). RNAi technology to manage emerald ash borer Entomological Society of America, Entomological Society of America, Denver, CO. Accepted, National.
- Olson D. G., Rieske L. K., (July 2017). Biological control of emerald ash borer in a novel host Southern Forest Insect Work Conference, Southern Forest Insect Work Conference, Melbourne, FL. Regional.
- Rivers S., Rieske L. K., (July 2017). Sub-lethal rates of insecticides: Efficacy for emerald ash borer suppression and potential consequences to a classical biological control agent Southern Forest Insect Work Conference, Southern Forest Insect Work Conference, Melbourne, FL. Accepted, Regional.
- Lacki M. J., Rieske-Kinney L. K., Dodd L. E., Skowronski N. S., Dickinson M. B., (2016). Modeling the activity of the Indiana bat (*Myotis sodalis*) at Mammoth Cave National Park using remotely-sensed descriptors of forest canopy conditions Mammoth Cave National Park's 10th Research Symposium, Mammoth Cave National Park, KY. Accepted, National.

### **Poster Session**

- Hollowell H., Pampolini F. B., Rieske-Kinney L. K., (July 2019). Evaluating pest-specific gene silencing for effects on a non-target pollinator Southern Forest Insect Work Conference annual meeting, Southern Forest Insect Work Conference, Savannah, GA, United States. Accepted, Regional.
- Crocker E. V., Williamson N., Arthur M. A., Rieske-Kinney L. K., Sass C. K., (May 21, 2019). New undergraduate certificate in urban and community forestry at the University of Kentucky Arboriculture & Urban Forestry Educators Symposium, Morton Arboretum, International Society of Arborists, Lisle, IL. Accepted, National.

- Graziosi I., Rieske L. K., (October 2018). The battle plan: Defining a strategy to mitigate the emerald ash borer invasion in Kentucky forests Preparing Europe for invasion by the beetles emerald ash borer and bronze birch borer, two major tree-killing pests, Organisation for Economic Cooperation Cooperative Research Programme: Biological resource management for sustainable agricultural systems, Vienna, Austria. Accepted, International.
- Rodrigues T. B., Pampolini F., Kawashima T., Rieske L. K., (July 2018). Confocal microscopy confirms the feasibility of gene silencing for emerald ash borer suppression 6th International Workshop on the Genetics of Tree-Parasite Interactions – Tree Resistance to Insects and Diseases: Putting Promise into Practice, International Union of Forest Research Organizations, Mt. Sterling, OH, United States. Accepted, International.
- Graziosi I., Rieske L. K., (July 2018). The imminent invasion of the emerald ash borer in southern Europe and the threat to native Oleaceae. 6th International Workshop on the Genetics of Tree-Parasite Interactions – Tree Resistance to Insects and Diseases: Putting Promise into Practice, International Union of Forest Research Organizations, Mt. Sterling, OH, United States. Accepted.
- Graziosi I., Santini A., Rieske L. K., (July 2, 2018). The emerald ash borer and the threat to native Oleaceae: An imminent invasion in southern Europe? European Congress of Entomology, European Congress of Entomology, Naples, Italy. Accepted, International.
- Lacki M. J., Griffiths R. E., Dodd L. E., Skowronski N. S., Rieske-Kinney L. K., Dickinson M. B., (2017). Interacting effects of prescribed fire and White-Nose Syndrome on bat activity across the forest landscape of Mammoth Cave National Park 22nd Annual Meeting of Southeastern Bat Diversity Network and Colloquium on the Conservation of Mammals in the Eastern United States, Southeastern Bat Diversity Network and Colloquium, Asheville, NC, United States. Accepted, Regional.
- Lacki M. J., Dodd L. E., Skowronski N. S., Dickinson M. B., Rieske-Kinney L. K., (2017). Modeling the activity of imperiled bats at Mammoth Cave NP using remotely sensed descriptors of habitat conditions 96th Annual Meeting of the National Academy of Science’s Travel Research Board, National Academy of Science, Washington, DC, United States. Invited, National.
- Leelesh R. S., Rieske L. K., (July 2017). Challenges to developing RNA interference for a forest pest, emerald ash borer Southern Forest Insect Work Conference, Southern Forest Insect Work Conference, San Antonio, TX. Accepted, Regional.

## Teaching

### Teaching

| Prefix Number - Section | Credit Hours      | # Enrolled | Code Term Year      |
|-------------------------|-------------------|------------|---------------------|
| ENT 767 - 009           | 2.00000 - 2.00000 | 4          | 30 Spring 2021-2022 |
| ENT 768 - 004           | 1.00000 - 6.00000 | 1          | 30 Spring 2021-2022 |
| BIO 667 - 001           | 3.00000 - 3.00000 | 2          | 10 Fall 2021-2022   |
| ENT 502 - 001           | 3.00000 - 3.00000 | 4          | 10 Fall 2021-2022   |
| ENT 667 - 001           | 3.00000 - 3.00000 | 6          | 10 Fall 2021-2022   |
| ENT 667 - 201           | 3.00000 - 3.00000 | 2          | 10 Fall 2021-2022   |
| ENT 767 - 001           | 2.00000 - 2.00000 | 3          | 10 Fall 2021-2022   |
| ENT 768 - 001           | 1.00000 - 6.00000 | 1          | 10 Fall 2021-2022   |

|               |                   |    |                     |
|---------------|-------------------|----|---------------------|
| ENT 780 - 002 | 2.00000 - 3.00000 | 1  | 10 Fall 2021-2022   |
| ENT 790 - 001 | 1.00000 - 6.00000 | 1  | 10 Fall 2021-2022   |
| FOR 502 - 001 | 3.00000 - 3.00000 | 19 | 10 Fall 2021-2022   |
| FOR 667 - 001 | 3.00000 - 3.00000 | 4  | 10 Fall 2021-2022   |
| ENT 767 - 009 | 2.00000 - 2.00000 | 2  | 30 Spring 2020-2021 |
| ENT 790 - 009 | 1.00000 - 6.00000 | 3  | 30 Spring 2020-2021 |
| ENT 502 - 001 | 3.00000 - 3.00000 | 3  | 10 Fall 2020-2021   |
| ENT 767 - 001 | 2.00000 - 2.00000 | 2  | 10 Fall 2020-2021   |
| ENT 770 - 001 | 0.00000 - 1.00000 | 6  | 10 Fall 2020-2021   |
| ENT 770 - 202 | 0.00000 - 1.00000 | 1  | 10 Fall 2020-2021   |
| ENT 790 - 001 | 1.00000 - 6.00000 | 3  | 10 Fall 2020-2021   |
| FOR 502 - 001 | 3.00000 - 3.00000 | 10 | 10 Fall 2020-2021   |
| ENT 767 - 009 | 2.00000 - 2.00000 | 2  | 30 Spring 2019-2020 |
| ENT 790 - 009 | 1.00000 - 6.00000 | 1  | 30 Spring 2019-2020 |
| BIO 667 - 001 | 3.00000 - 3.00000 | 1  | 10 Fall 2019-2020   |
| ENT 502 - 001 | 3.00000 - 3.00000 | 5  | 10 Fall 2019-2020   |
| ENT 667 - 001 | 3.00000 - 3.00000 | 10 | 10 Fall 2019-2020   |
| ENT 767 - 001 | 2.00000 - 2.00000 | 1  | 10 Fall 2019-2020   |
| ENT 790 - 001 | 1.00000 - 6.00000 | 2  | 10 Fall 2019-2020   |
| FOR 502 - 001 | 3.00000 - 3.00000 | 16 | 10 Fall 2019-2020   |
| FOR 667 - 001 | 3.00000 - 3.00000 | 5  | 10 Fall 2019-2020   |
| ENT 790 - 009 | 1.00000 - 6.00000 | 2  | 30 Spring 2018-2019 |
| ENT 502 - 001 | 3.00000 - 3.00000 | 4  | 10 Fall 2018-2019   |
| ENT 790 - 001 | 1.00000 - 6.00000 | 1  | 10 Fall 2018-2019   |
| FOR 502 - 001 | 3.00000 - 3.00000 | 19 | 10 Fall 2018-2019   |
| ENT 790 - 009 | 1.00000 - 6.00000 | 3  | 30 Spring 2017-2018 |
| BIO 667 - 001 | 3.00000 - 3.00000 | 3  | 10 Fall 2017-2018   |
| ENT 502 - 001 | 3.00000 - 3.00000 | 7  | 10 Fall 2017-2018   |
| ENT 667 - 001 | 3.00000 - 3.00000 | 4  | 10 Fall 2017-2018   |
| ENT 780 - 002 | 2.00000 - 3.00000 | 1  | 10 Fall 2017-2018   |

|               |                   |   |                     |
|---------------|-------------------|---|---------------------|
| FOR 502 - 001 | 3.00000 - 3.00000 | 5 | 10 Fall 2017-2018   |
| FOR 667 - 001 | 3.00000 - 3.00000 | 2 | 10 Fall 2017-2018   |
| ENT 748 - 009 | 0.00000 - 0.00000 | 1 | 30 Spring 2016-2017 |
| FOR 399 - 002 | 1.00000 - 6.00000 | 1 | 30 Spring 2016-2017 |
| ENT 402 - 001 | 3.00000 - 3.00000 | 2 | 10 Fall 2016-2017   |
| ENT 790 - 001 | 1.00000 - 6.00000 | 1 | 10 Fall 2016-2017   |

|               |                   |    |                   |
|---------------|-------------------|----|-------------------|
| FOR 402 - 001 | 3.00000 - 3.00000 | 17 | 10 Fall 2016-2017 |
|---------------|-------------------|----|-------------------|

## Teacher Course Evaluations

| Prefix Number - Section | Responses | TCE Course Quality Mean | TCE Teaching Quality Mean | Code Term Year    |
|-------------------------|-----------|-------------------------|---------------------------|-------------------|
| ENT 402 - 001           | 15        | 4.20                    | 4.33                      | 10 Fall 2016-2017 |
| ENT 402 - 001           | 8         | 3.00                    | 2.88                      | 10 Fall 2015-2016 |
| ENT 502 - 001           | 8         | 3.63                    | 3.75                      | 10 Fall 2019-2020 |
| ENT 667 - 001           | 5         | 4.40                    | 3.75                      | 10 Fall 2021-2022 |
| ENT 667 - 001           | 6         | 4.83                    | 4.83                      | 10 Fall 2019-2020 |
| ENT 667 - 001           | 7         | 3.29                    | 3.29                      | 10 Fall 2015-2016 |
| ENT 770 - 001           | 5         | 4.80                    | 4.80                      | 10 Fall 2020-2021 |

Note: With regards to 2020 TCEs please consider the following from page 121 of the UK Playbook for Fall 2020, "It is essential that performance evaluation take into account the extenuating circumstances brought about by the disruption for faculty in all title series and the extraordinary work accomplished by faculty in response to the disruption. Academic leaders shall reiterate that TCEs should be but one indicator of effective teaching in both periodic merit reviews and tenure/promotion decisions. Evaluation of teaching must go beyond student evaluations alone."

## Theses and Dissertations

### Dissertation Committee Chair

Mary Wallace, PhD Forest Entomology, "Exploring the potential for managing Scolytinae using RNAi.," Status: In-Process, publication nearing submission.

Award:

Cralle Foundation/ Joan Cralle Day Fellowship, 2019-2020, UK Graduate School. \$15000. July 2019., Expected Completion Date: Aug 2023. (August 2019 - Present).

Zachary Bragg, PhD Forest Entomology, "Uptake and movement of dsRNA developed for insect suppression through woody plant tissues.," Status: In-Process, Awards:

President's Prize, First Place, Entomological Society of America, November 2020; Second Place, Oral presentation, MS division, Ohio Valley Entomological Association, October 2019., Expected Completion Date: Aug 2023. (August 2019 - Present).

Bethany Kyre, PhD Forest Entomology, "Gene silencing in *Dendroctonus* bark beetles," Status: In-Process, 2 publications, a third nearing submission.

Awards:

Roger F. Anderson Award for Graduate Student Excellence, Southern Forest Insect Work Conference, Savanna, GA, July 2019; President's Prize, Second Place, Oral presentation, Entomological Society of America, November 2019; First Place, Oral presentation, PhD

division, Ohio Valley Entomological Association, October 2018, 2019; First Place, Oral presentation, PhD division, Southern Forest Insect Work Conf, Savannah, GA, July 2019; People's Choice, 3MT Competition, UK CAFE, April 2019; Publication Acceptance Scholarship, UK Dept of Entomology, March 2019, April 2020., Expected Completion Date: December 2022. (August 2018 – Dec 01 2022).

Flavia Pampolini, PhD Forest Entomology, "Gene silencing for emerald ash borer management: the path to deployment," Status: In-Process, 2 publications.

Awards:

Publication Acceptance Scholarship, UK Dept of Entomology, May 2020, November 2020; Publication Submission Scholarship, UK Dept of Entomology, November 2019. 2019-2020; Richards Graduate Student Research Activity Award (UK CAFE), \$745. October 2019., Expected Completion Date: December 2022. (January 2018 – Dec 01 2022).

### **Dissertation Committee Member**

Kane Lawhorn, PhD Biology, Univ of Louisville, "Beetle communities in lightning struck trees," Status: In-Process, Expected Completion Date: August 2023. (August 2019 - Present).

### **Master's Thesis Committee Chair**

Morgan Knutsen, MS Forest Entomology, "Use of RNAi for redbay ambrosia beetle management. Status: In progress, Award: President's Prize, First Place, Southern Forest Insect Work Conference, June 2022. Expected Completion Date: August 2022.

Hannah Hollowell, MS Forest Entomology, "Non-target effects of southern pine beetle-specific dsRNAs," Status: Degree Awarded, Two publications. Award: President's Prize, First Place, Entomological Society of America, November 2020., Completion Date: August 2021.

Sarah Pellechia, M.S. Forest Entomology, "Phenological asynchrony affects emerald ash borer parasitoid efficacy," Status: Degree Awarded, Award: First place, oral presentation MS division, Southern Forest Insect Work Conference, Savannah, GA, July 2019., Completion Date: May 2020.

David Olson, M.S. Forest Entomology, "Emerald ash borer host expansion: Trading an optimal host for enemy free space?," Status: Degree Awarded, Two publications.

Awards:

First Place, Oral presentation, Southern Forest Insect Work Conference, July 2017.  
First Place, Oral presentation, Ohio Valley Entomological Association, October 2017.  
Publication Submission Scholarship, UK Department of Entomology, March 2018. (March 2016 - May 2018).

Matthew Savage, M.S. Forest Entomology, "Shifting arthropod communities associated with emerald ash borer induced ash mortality.," Status: Degree Awarded, Two publications.

Awards:

Submission Publication Scholarship, UK Department of Entomology, February 2016.

2nd place oral presentation, Southern Forest Insect Work Conference, July 2015.

Kentucky Native Plant Society Student Research Grant Proposal. \$500. (August 2017).

### **Directed Student Learning (excluding theses, dissertations)**

Kylie Bickler. Research Intern Mentor. *Evaluations of dsRNA induced gene silencing*. In-Process (January 2020 - Present).

Description: Research mentor for undergraduate student research.

Theo Walden. Internship Advisor. *Woody plant vegetation dynamics following EAB invasion*.

Completed (June 2019 - August 2019).

Description: Intern from Forestry Management studies at L'Ecole Forestière de Meymac, in Meymac, France

Brianna Damron. Mentor. *Nature Therapy*. In-Process (June 2018 - June 2019).

Description: Urban Forest Initiative internship, co-mentor with Mary Arthur (Forestry)

Ramya Leelesh. Postdoctoral Supervision. *Continued development of RNAi technologies for emerald ash borer*. (March 2018 - February 2019).

Hannah Hollowell. Internship Advisor. *Colletotrichum infection affects Asian chestnut gall wasp fitness*. Completed (June 2018 - August 2018).

Description: Internship for NRES and Honors College

Charles (Colby) Langford. Directed Individual/Independent Study. *Non-target effects of emerald ash borer specific RNAi*. Completed (February 2018 - May 2018). Description: Research internship for NRES

Thais Rodrigues. Postdoctoral Supervision. *Development of RNAi technologies for emerald ash borer*. Completed (January 2016 - January 2018).

### **Program and Curriculum Development**

**2017**

Program/Curriculum Name - Urban and Community Forestry undergraduate certificate development

Description: Contributed to conceptualizing and developing submission of a USDA Higher Education Challenge Grant to support development of an undergraduate certificate in urban and community forestry.

**2018**

Program/Curriculum Name - Healthy Trees - Healthy People

Description: Healthy Trees – Healthy People is an award-winning outreach and education program I developed to train citizen scientists in exotic pest detection, tree identification, and tree health, while engaging and empowering them to take charge of their physical activity and their personal health. It involves guided and independent walks identifying trees at selected Lexington parks (two in 2017, three in 2018), while teaching participants about the risks associated with exotic and native pests, and also



encouraging physical activity. The project won a 2018 Environmental Award from the Lexington-Fayette Urban County Government Environmental Commission.

Program/Curriculum Name - Urban Forest Initiative Working Group

Description: Co-founder and co-leader of the Urban Forest Initiative Working Group (UFI), which has advocated for urban trees since 2014. The UFI Working Group engages government agencies (local, state, federal), public and private schools (K-College), non-profits, and for-profit entities for the common goal of increasing, protecting, and raising awareness of our urban trees. Free campus and community workshops and free public lectures engage the broader community in an understanding of the value and care of urban trees, and create opportunities for community building.

Program/Curriculum Name - Urban Forest Initiative Core Team

Description: Co-founder and co-leader of the Urban Forest Initiative (UFI). Since 2014 has advocated for urban trees on the UK campus and beyond. UFI's Core Team accomplishments include:

- Developing a cross-disciplinary Urban and Community Forestry Certificate for UK undergraduates. The Foundations course for the certificate is being taught for the first time Fall 2018
- Adopt-a-Tree for K-college teaches ecosystem benefits, provides a mechanism to connect with nature.
- Developing an UFI Toolkit containing curricular programming to engage K-Adult in the benefits and care of urban trees.

Program/Curriculum Name - Tree Week

Description: Organized and synthesized by the Urban Forest Initiative, Tree Week (Oct. 6-14, 2018) is the culmination of over 60 tree-centric activities originating from dozens of participating entities. <https://ukntrees.ca.uky.edu/treeweek2018>

## **2019**

Program/Curriculum Name - Tree Week 2019

Description: Year 2 of the Urban Forest Initiative, Tree Week (Oct. , 2019) is the culmination of tree-centric activities originating from dozens of participating entities. <https://ukntrees.ca.uky.edu/treeweek2019>

## **2020**

Program/Curriculum Name - ENT/FOR 502 Forest Entomology

Description: Transitioning existing in-person instruction to hybrid instruction in response to covid 19.

Program/Curriculum Name - Tree Week 2020

<https://ufi.ca.uky.edu/treeweek2020>

Description: Tree Week 2020 goes virtual in response to covid 19

# **Service**

## **Department Service**

### **Committee Chair**

Awards Committee, (October 2018 - September 2020).

Graduate Program Committee (May 2020 – Aug 2022).

Self-Study Document Committee Chair (Feb 2022 – present)

### **Committee Member**

Advisory committee, (September 2020 - Present).

Urban Entomologist Search Committee, (August 2018 - Present).

Advisory Committee, (September 2016 - September 2018).

Insect Systematist Search Committee, (January 2018 - July 2018).

### **College Service**

#### **Committee Chair**

CAFE Faculty Council, (August 2015 - May 2017).

### **Professional Service**

#### **Advisory committee**

Southern Forest Insect Work Conference, Advisory Councilor, (July 2015 - present). **Officer, President/Elect/Past**

Southern Forest Insect Work Conference, Chair, (July 2019 - July 2023).

#### **Workshop Organizer**

Southern Forest Insect Work Conference, Symposium organizer and moderator for 'Innovative approaches to forest pest management.', (February 2018 - July 2018).

Southern Forest Insect Work Conference, Symposium organizer and moderator for 'Factors confounding forest invasions', (February 2016 - July 2017).

### **Consulting**

Government, Review panel for the proposal to Genome Alberta, "TRIA-FoR: Transformative risk assessment and forest resilience using genomic tools for the mountain pine beetle outbreak.", Canada. (November 26, 2020 - December 11, 2020).

Description: Part of friendly review panel guiding proposal development.

# Professional Development

## Professional Memberships

Southern Forest Insect Work Conference. Regional. (1996 - 2020).

Entomological Society of America. International. (1988 - 2020).

## Development Activities Attended

### Sabbatical

(February 1, 2019 - July 31, 2019). International. Other / Multiple Countries.

Sabbatical Leave interacting with scientists in Portugal, Italy, and Czech Republic on synergistic activities and future collaborations. Thus far this has led to one co-organized Entomological Society of America symposium, one review paper in progress, and plans for additional collaboration.

### Workshop

Molecular Biology Summer Short Course. (July 22, 2018 - August 4, 2018). Smith College/ NEB

Biolabs Molecular Biology Boot Camp. International. Northampton, MA, United States.

Exposure to basic and advanced experiments in gene manipulation and gene expression through hands-on lab work with supporting lectures addressing concepts.

### Collaborators meeting

Kentucky Forestry Research Collaborators Meeting. (April 24, 2018 - April 25, 2018). USDA Forest Service/ KY Div. Forestry/ Univ. of Kentucky. Regional. Lexington.

USDA Forest Southern Research Station, Kentucky Division of Forestry, University of Kentucky 1.5 day meeting to discuss forest health issues and means of addressing them.

## Awards and Honors

*Bobby C Pass Research Professorship*. Scholarship/Research/Creative, Recognition Award, University. (July 1, 2020 - June 30, 2024).

# Dr. Clare C. Rittschof

College of Agriculture, Food and Environment  
Department of Entomology

## Education

UNIVERSITY OF FLORIDA, Gainesville, FL

May 2011, Ph.D. in Zoology with H. Jane Brockmann

*“Environmental heterogeneity and phenotypic variation: the evolution of male body size in a golden orb-web spider”*

CORNELL UNIVERSITY, Ithaca, NY

May 2006, B.A. *cum laude* in Biological Sciences, Distinction in all subjects, Phi Beta Kappa

## Work History

2021-present Associate Professor, Department of Entomology, University of Kentucky

Regular Title Series, 73% Research/22% Teaching/5% Service

Appointment date: Jan 5, 2016

Jan 2016-2021 Assistant Professor, Department of Entomology, University of Kentucky

Regular Title Series, 73% Research/22% Teaching/5% Service

Appointment date: Jan 5, 2016

Apr 2014-Dec 2015 Postdoctoral Associate, University of Illinois, Urbana-Champaign and  
Pennsylvania State University (with Gene Robinson and Christina Grozinger)

Sept 2011-Mar 2014 Postdoctoral Associate, University of Illinois, Urbana-Champaign (with Gene Robinson)

## Research and Scholarship

### Intellectual Contributions

\* = Senior Author    ~ = Corresponding Author    + = Grad/Prof Student    # = Post Doc    ^ = Undergraduate

WOS = Web of Science    JIF = Journal Impact Factor    TC = Journal Total Cites

SNIP = Source Normalize Impact per Paper    SJR = Scimago Journal Rank

### Published

#### Book, Chapter in Scholarly Book-New

\* Rittschof, C. C., \* Grozinger, C. M. (2020). The fundamental role of aggression and conflict in the evolution and organization of social groups *Social Cooperation and Conflict: Biological Mechanisms at the Interface*, Cambridge University Press.

#### Journal Article, Academic Journal

^Foose, A.M., +Westwick, R.R., Vengarai, M., \*Rittschof, C.C. (2022). The survival consequences of grooming in the honey bee *Apis mellifera*, *Insectes Sociaux*, 69, 279-287.

- Martin, M.J., Diem, S.J., Karwat, D.M.A., Krieger, E.M., Rittschof, C.C., Banyon, B., Aghazadeh, M., Asensio, O., Zeilkova, T.J., Garcia-Cazarin, M., Alvelo Maurosa, J.G., Mahmoud, H. (Accepted). The climate is changing. Engineering education needs to change as well. *Journal of Engineering Education*.
- Lee, M. J., Rittschof, C. C., Greenlee, A. J., Turi, K. N., Rodriguez-Zas, S. L., Robinson, G. E., Cole, S. W., Mendenhall, R. (2021). Transcriptomic analyses of black women in neighborhoods with high levels of violence, *Psychoneuroendocrinology*, 127. doi: 10.1016/j.psyneuen.2021.105174
- Grume, G. J., Biedenbender, S. P., Rittschof, C. C. (2021). Honey robbing causes coordinated changes in foraging and nest defence in the honey bee, *Apis mellifera*, *Animal Behaviour*, 173, 53-65. doi: 10.1016/j.anbehav.2020.12.019
- Carr, H. M., Palmer, J. H., ~ Rittschof, C. C. (2020). Honey bee aggression: Evaluating causal links to disease-resistance traits and infection, *Behavioral Ecology and Sociobiology*, 74(9). doi: 10.1007/s00265-020-02887-0
- Rittschof, C. C., Rubin, B. E.R., Palmer, J. H. (2019). The transcriptomic signature of low aggression in honey bees resembles a response to infection, *BMC Genomics*, 20(1). doi: 10.1186/s12864-019-6417-3  
Author Role:CCR designed the study, collected specimens, conducted bioinformatics analyses associated with differential gene expression and enrichment analyses, and wrote the manuscript. BER conducted the informatics assessment of pathogen presence as well as the gene ontology analysis, and participated in manuscript writing. JHP conducted molecular sample preparation. All authors read and approved the final manuscript.
- ^ Harrison, J. W., Palmer, J. H., \* ~ Rittschof, C. C. (2019). Altering social cue perception impacts honey bee aggression with minimal impacts on aggression-related brain gene expression., *Scientific Reports*, 9, 14642. doi: 10.1038/s41598-019-51223-8  
Author Role:  
C.C.R. designed all steps of the project, analyzed the data, and wrote the manuscript. J.W.H. collected data and wrote the manuscript. J.H.P. collected data. All authors reviewed the manuscript.
- \* ~ Rittschof, C. C., Vekaria, H. J., Palmer, J. H., Sullivan, P. G. (2019). Biogenic amines and activity levels alter the neural energetic response to aggressive social cues in the honey bee *Apis mellifera*., *Journal of Neuroscience Research*, 97(8), 991-1003. doi: 10.1002/jnr.24443  
Author Role:Conceptualization, C.C.R. and P.G.S.; Methodology, C.C.R. and P.G.S.; Formal Analyses, C.C.R.; Investigation, C.C.R., J.H.P. and H.J.V.; Resources, C.C.R.; Writing – Original Draft, C.C.R.; Visualization, C.C.R.; Project Administration, C.C.R., P.G.S.; Funding Acquisition, C.C.R., P.G.S.
- + Preston, S. R., Palmer, J. H., ^ Harrison, J. W., ^ Carr, H. M., \* ~ Rittschof, C. C. (2019). The impacts of maternal stress on worker phenotypes in the honey bee, *Apidologie*. doi: 10.1007/s13592-019-00680-1  
Author Role:  
S.R.P. carried out data collection, analysis, and manuscript writing. J.W.H. assisted in experimental setup and data collection. J.H.P. and H.M.C. conducted molecular analyses  
C.C.R. designed study, performed data analysis, and wrote manuscript.
- \* Rittschof, C. C., Hughes, K.A. (2018). Advancing behavioural genomics by considering timescale, *Nature Communications*, 9(1), 489-491. doi: 10.1038/s41467-018-02971-0

\* Rittschof, C. C., Vekaria, H.J., Palmer, J., Sullivan, P.G. (2018). Brain mitochondrial bioenergetics change with rapid and prolonged shifts in aggression in the honey bee, *Apis mellifera*, *Journal of Experimental Biology*, 221(8), 1-10. doi: 10.1242/jeb.176917

Rittschof, C. C., Schimeier, S. (2017). Insect models of central nervous system energy metabolism and its links to behavior, *GLIA*, 66(6), 1160-1175. doi: 10.1002/glia.23235

Rittschof, C. C. (2017). Sequential social experiences interact to modulate aggression but not brain gene expression in the honey bee (*Apis mellifera*), *Frontiers in Zoology*, 14. doi: 10.1186/s12983-017-0199-8

Rittschof, C. C., Robinson, G. E. (2016). Behavioral Genetic Toolkits: Toward the Evolutionary Origins of Complex Phenotypes, *Curr Top Dev Biol*, 119, 157-204. doi: 10.1016/bs.ctdb.2016.04.001

### **Journal Article, Professional Journal**

\* Rittschof, C. C., \* Esther, N. (2019). Entomological Society of America position statement on climate change, *Annals of the Entomological Society of America*, 112, 288-291. doi: 10.1093/aesa/saz013

### **Editorial, Journal**

Fernandez, M. P., Rittschof, C. C., Sierralta, J. A. (2021). Editorial: Invertebrate Neuroscience: Contributions From Model and Non-model Species, *Frontiers in Behavioral Neuroscience*, 15. doi: 10.3389/fnbeh.2021.726295

Rittschof, C. C., Sheehan, M. J. (2021). Editorial overview: Behavioral ecology of insects in a changing world, *Current Opinion in Insect Science*, 45, vi-viii. doi: 10.1016/j.cois.2021.07.001

Rittschof, C. C., Nieh, J. C. (2021). Honey robbing: could human changes to the environment transform a rare foraging tactic into a maladaptive behavior?, *Current Opinion in Insect Science*, 45, 84-90. doi: 10.1016/j.cois.2021.02.005

Westwick, R. R., Rittschof, C. C. (2021). Insects Provide Unique Systems to Investigate How Early-Life Experience Alters the Brain and Behavior, *Frontiers in Behavioral Neuroscience*, 15. doi: 10.3389/fnbeh.2021.660464

Rittschof, C. C. (2017). To bee or not to bee aggressive.

### **Web Based Publication**

Elsenhon, J., Alleyne, M., Anderson, T., Dreyer, J., Gandhi, K., Huseh, A., Rivers, A., Rittschof, C. C., Spafford, H., Krell, R. (2016). A Post-Election Washington D.C.: The ESA Science Policy Fellows' Perspective *Entomology Today*, *Entomological Society of America*.

### **Sponsored Projects**

#### **Awarded**

CAREER: Signal to Noise: How Complex Social Information Regulates Brain Genomics and

Behavior, Sponsored by National Science Foundation Submitted: August 7, 2020. Funding Dates: August 1, 2021 - July 31, 2026. | Awarded: \$1,123,924

OSPA ID: 202008071213

Rittschof C., C., Virus Testing for Kentucky Honey Bees, Sponsored by KY Governor's Office of Agricultural Policy Submitted: December 19, 2019. Funding Dates: May 8, 2020 - December 31, 2023. | Awarded: \$94,928.00

OSPA ID: 201912191542

### **Closed**

Rittschof C., C., Haramoto E., R., Can Commodity Crop Weed Management Practices Enhance Bee Abundance Diversity And Health On Agricultural Land?, Sponsored by Foundation for Food and Agriculture Research Submitted: August 17, 2017. Funding Dates: January 15, 2018 - January 14, 2022. Requested: \$120,900.00, | Awarded: \$120,900.00

OSPA ID: 201708171406

Rittschof C., C., Allogrooming May Induce Immune Gene Expression as a Component of Social Immunity in the Western Honey Bee (*Apis mellifera*), Sponsored by Sigma XI Scientific Research Society Inc Submitted: July 8, 2020. Funding Dates: June 15, 2020 - June 30, 2021. Requested: \$1,000.00, | Awarded: \$967.00

Description: We have received the funding from this award

OSPA ID: 202007080851

Rittschof C., C., Aggression in Honey Bees (*Apis mellifera*) May Be Socially Transmitted Through Familial Care That is Mediated by Multiple Pheromones., Sponsored by Animal Behavior Society Submitted: May 16, 2019. Funding Dates: May 20, 2019 - May 19, 2021. | Awarded: \$1,301.00

OSPA ID: 201905161017

Rittschof C., C., KSEF RDE: Identifying Mechanisms of Resilience to Health Stressors in the Honey Bee (*Apis mellifera*), Sponsored by KY Science and Technology Co Inc Submitted: December 17, 2015. Funding Dates: July 1, 2016 - June 30, 2017. | Awarded: \$29,863.00

OSPA ID: 201512170853

### **Not Funded**

Rittschof C., C., Sullivan P., G., Fan W.-M., T., DeVries Z., C., Syed Z., Breath to Brain: Metabolic Regulation of Foraging and Defensive Behaviors in the Honey Bee, Sponsored by National Science Foundation Submitted: June 7, 2020. Requested: \$757,828.00, | Awarded: \$0.00

OSPA ID: 202006071021

Rittschof C., C., CAREER: The Neural Energetics Of Aggression: From Bee Brains To Beekeepers, Sponsored by National Science Foundation Submitted: July 16, 2017. Requested: \$1,155,090.00, | Awarded: \$0.00

OSPA ID: 201707161043

Rittschof C., C., Haramoto E., R., Salmeron Cortasa M., Van Cleve J., Climate Factors and the Efficacy of Agricultural Land Management Strategies that Improve Bee Nutrition, Sponsored by National Institute of Food and Agriculture Submitted: July 24, 2019. | Awarded: \$0.00

OSPA ID: 201907241608

Rittschof C., C., Conserved neurogenomic mechanisms linking social stress to obesity, Sponsored by University of Illinois Submitted: December 6, 2017. | Awarded: \$0.00

OSPA ID: 201712060815

Rittschof C., C., Effects of Aggressive Personality on Collective Behaviors in the Honey Bee, Sponsored by Defense Advanced Research Projects Agency Submitted: March 31, 2016. Requested: \$499,322.00, | Awarded: \$0.00

OSPA ID: 201603310801

Rittschof C., C., Sullivan P., G., Syed Z., Energetic Regulation of Honey Bee Aggression, Sponsored by National Science Foundation Submitted: June 3, 2019. | Awarded: \$0.00  
OSPA ID: 201906030835

Rittschof C., C., Improving Honey Bee Health Resilience Through Early-Life Interventions, Sponsored by National Institute of Food and Agriculture Submitted: July 15, 2016. Requested: \$499,586.00, | Awarded: \$0.00  
OSPA ID: 201607151651

Rittschof C., C., Head E., Sullivan P., G., Integrating Peripheral Physiological Processes to Explain the Limits of Dynamic Mitochondrial Bioenergetics in the Aging Brain, Sponsored by National Institute on Aging Submitted: June 8, 2018. | Awarded: \$0.00  
OSPA ID: 201806080213

Rittschof C., C., Landscape Factors Impacting Wild Bee Conservation In Agroecosystems, Sponsored by National Institute of Food and Agriculture Submitted: August 11, 2020. | Awarded: \$0.00  
OSPA ID: 202008110941

Rittschof C., C., Social Modulation of Honey Bee Aggression: Mechanisms that Encode Time, Sponsored by Defense Advanced Research Projects Agency Submitted: October 28, 2016. Requested: \$300,058.00, | Awarded: \$0.00  
OSPA ID: 201610281147

Rittschof C., C., Haramoto E., R., Van Cleve J., The Contribution Of Winter Annual Plants To Social Bee Nutrition During Spring Colony Founding And Growth, Sponsored by National Institute of Food and Agriculture Submitted: March 19, 2020. | Awarded: \$0.00  
Description: The PI has received notice that this grant was not funded.  
OSPA ID: 202003191628

Rittschof C., C., Sullivan P., G., Using the honey bee to break barriers in neurodegenerative disease research, Sponsored by Chan Zuckerberg Foundation Submitted: January 11, 2020. | Awarded: \$0.00  
Description: The PI has received notice that this grant was not funded.  
OSPA ID: 202001110917

Rittschof C., C., Haramoto E., R., Van Cleve J., Could Blooming Winter Annuals On Farmlands Enhance Nutrition During Bumble Bee Spring Colony Founding And Honey Bee Winter Recovery?, Sponsored by National Institute of Food and Agriculture Submitted: June 17, 2021. | Awarded: \$0.00  
OSPA ID: 202106171511

Rittschof C., C., Fellowship for Caroline Kane: Linking Foraging and Nutrition to Viral Dynamics in the Honey Bee, Sponsored by Project Apis m Submitted: March 30, 2022. | Awarded: \$0.00  
OSPA ID: 202203301430

Rittschof C., C., Fellowship for Wade Pike: Determining Foraging Preferences of Apis Mellifera During Late-winter and Early-spring, Sponsored by Project Apis m Submitted: March 29, 2022. | Awarded: \$0.00  
OSPA ID: 202203291438

## Scope Grants

### Awarded

Rittschof C., C., Participant Support Costs: CAREER: Signal to Noise: How Complex Social



Information Regulates Brain Genomics and Behavior, Sponsored by National Science Foundation Submitted: May 5, 2022. Funding Dates: August 1, 2021 - July 31, 2026. | Current Budget Amount: \$36,000.00

Prime Grant OSPA ID: 202008071213

## Non-Sponsored Projects

### Closed

Rittschof, C. C., Brain metabolomics in honey bees, Neuroscience Research Priority Area (UKY CAFE), (June 2020 - June 2022). Awarded: \$25,000.

Rittschof, C. C., Brain mitochondrial respiration in honey bees, Research Activity Award (UKY CAFE), (June 2018 - September 2019). Awarded: \$2200.

Rittschof, C. C., Brain metabolic regulation of honey bee aggression, Vice President of Research (UK), (July 1, 2017 - June 30, 2018). Awarded: \$20000.

Rittschof, C. C., Honey bee aggression and brain energy metabolism: a behavioral plasticity mechanism that stands the test of time, National Science Foundation, (July 1, 2016 - July 30, 2016). Awarded: \$1000.

Westwick, R. (Grad/Prof Student), Rittschof, C. C. (Other), Aggression in honey bees may be socially transmitted through familial care that is mediated by multiple pheromones, Animal Behavior Society, (June 2019 - May 2020). Awarded: \$1301.  
Description: Funding for Rebecca's summer field research

### Not Funded

Rittschof, C. C. (Principal), Sullivan, P. G. (Co-Principal), Chandrasekaran, S. (Co-Principal), IOS preliminary proposal: Collaborative research: Brain metabolic regulation of aggression in the honey bee, National Science Foundation. Awarded: \$0.

Rittschof, C. C., Fahrback, S. (Collaborator), IOS Preliminary Proposal: Behavioral plasticity and honey bee aggression: mechanism meets ecology, National Science Foundation. Awarded: \$0.

Rittschof, C. C. (Principal), Cooper, R. (Collaborator), Fahrback, S. (Collaborator), IOS Preliminary Proposal: Variation in brain metabolic flux: causes and implications for signaling and behavior in the honey bee, National Science Foundation. Awarded: \$0.

Rittschof, C. C., Identifying mechanisms of resilience to health stressors in the honey bee (*Apis*

## Federal

### Not Funded

Grume, G. (Grad/Prof Student), Rittschof, C. C. (Other), Robbing behavior in honey bees, National Science Foundation - Graduate Research Fellowship Program.

Description: Funding for tuition and stipend for 4 years.

**Hatch**

**On-going**

Nutritional and social regulation of behavior and health in the honey bee, *Apis mellifera*, (October 1, 2021 - September 30, 2026).

Rittschof, C. C., Mechanisms of aggression and health resilience in the honey bee *Apis mellifera*, National Institute of Food and Agriculture, (June 2, 2017 - September 30, 2021).

**Foundation**

**Not Funded**

Denny, A. (Grad/Prof Student), Rittschof, C. C. (Principal), The impacts of farms on wild bee gene flow and population structure., International Union for the Study of Social Insects. Awarded: \$2500.

Denny, A. (Grad/Prof Student), Rittschof, C. C., Garden Club of America. Awarded: \$4000.

James, H. (Grad/Prof Student), Westwick, R. (Grad/Prof Student), Rittschof, C. C. (Principal), North American Pollinator Protection Campaign. Awarded: \$10000.

Rittschof, C. C. (Principal), Neural energetics and aggression in honey bees, Klingenstein Fund Early Career Neuroscience Fellowship. Awarded: \$225000.  
Description: Flexible research funding for neuroscientists

Rittschof, C. C. (Principal), Preston, S. (Grad/Prof Student), Transgenerational stress inheritance in the honey bee: the impacts of queen stress on worker behavior and health, North American Pollinator Protection Campaign. Awarded: \$10000.

Rittschof, C. C., Calcium buffering and metabolism in the bee brain, Whitehall Foundation.

Rittschof, C. C., Social life and the social brain: the causes and consequences of personality in

Rittschof, C. C., How do herbaceous floral resources on fallow croplands impact nutrition and pesticide exposure for vulnerable, early-spring honey bee colonies?, Project ApisM. Awarded: \$51331.

Rittschof, C. C., Energy hog? Dynamic brain metabolism regulates social behavior, Alfred P. Sloan Foundation. Awarded: \$75000.

Preston, S. (Grad/Prof Student), Rittschof, C. C. (Principal), Impacts of maternal stress on worker health, The Foundation for the Preservation of Honey Bees. Awarded: \$2000.  
Description: Research Scholarship

### **Industrial/Trade**

#### **Not Funded**

Westwick, R. (Grad/Prof Student), Rittschof, C. C. (Co-Investigator), Rockabye babe: understanding the role of nursing behavior in the development of Varroa mite resistance and aggression, Eastern Apicultural Society. Awarded: \$3500.

Rittschof, C. C., Environment matters: identifying non-genetic factors that influence Varroa resistance traits, North American Pollinator Protection Campaign: Honey Bee Health Taskforce. Awarded: \$10000.

Grume, G. (Grad/Prof Student), Rittschof, C. C. (Other), Stressors to nestmate recognition in the honey bee, American Beekeeping Federation. Awarded: \$3000.  
Description: Fellowship for research from the American Beekeeping Federation

Preston, S. (Grad/Prof Student), Rittschof, C. C. (Principal), Transgenerational stress inheritance in the honey bee: the impacts of queen stress on worker behavior and health, Eastern Apicultural Society. Awarded: \$10000.

Preston, S. (Grad/Prof Student), Rittschof, C. C. (Principal), Transgenerational stress inheritance in the honey bee: the impacts of queen stress on worker behavior and health, Garden Club of America. Awarded: \$4000.

Rittschof, C. C., Does variation in larval diet explain early-life social effects on aggression and health in honey bees?, Eastern Apicultural Society. Awarded: \$5045.

#### **Under Review**

Rittschof, C. C., Early-spring weeds on dormant corn and soybean fields: a widespread and diverse nutritional resource for honey bee colonies, Project Apis m. Awarded: \$78600.

### **Other**

#### **Not Funded**

Westwick, R. (Grad/Prof Student), Rittschof, C. C., Larval diet as a potential manipulator of aggression via brain mitochondrial plasticity in the honeybee, *Apis mellifera*, Sigma Xi.  
Awarded: \$500.

Description: Student research grant through Sigma Xi Society

Rittschof, C. C. (Principal), Grume, G. (Grad/Prof Student), Robbing in honey bees, Sigma Xi.  
Awarded: \$1000.

Description: Student Research Grant

### **Other Government**

#### **Not Funded**

Rittschof, C. C., De Paoli, E. (Co-Investigator), Schwoppe, R. (Co-Investigator), The role of chromatin structure in the honey bee social brain, Human Frontier Science Program Young Investigator Grant.

### **University**

#### **Closed**

Young, A. (PostDoct Student), Rittschof, C. C. (Principal), Lyman T. Johnson Postdoctoral Fellowship (UKY). Awarded: \$94956.

Rittschof, C., Bucks for Brains Undergraduate Research Support, University of Kentucky, (June 2016 - Present). Awarded: \$16500.

Description: Funding for summer undergraduate researchers

Rittschof, C. C. (Principal), Harrison, J. (Undergrad Student), Callaway, L. (Undergrad Student), Lamb, A. (Undergrad Student), Biedenbender, S. (Undergrad Student), Undergraduate research in neuroscience: Bucks for Brains, Office of Undergraduate Research, (June 1, 2017 - August 23, 2017). Awarded: \$4500.

Rittschof, C. C., Beginning Beekeeping Workshop, Student Sustainability Council, (June 1, 2017 - June 30, 2017). Awarded: \$750.

#### **Not Funded**

Rittschof, C. C. (Co-Principal), Westneat, D. (Co-Principal), The Biology of Functional Societies: Roles, Social Responsiveness, and Performance, IGNITE Program, University of Kentucky.  
Awarded: \$26600.

Description: IGNITE collaborative research grants (UK)

Rittschof, C. C. (Co-Principal), Westneat, D. (Co-Principal), Do queen and worker attributes interact to affect colony performance in honey bees?, IGNITE Program, University of Kentucky. Awarded: \$28000.

Biedenbender, S. (Undergrad Student), McWhorter, G. (Grad/Prof Student), Rittschof, C. C. (Principal), Odor transitions during kleptobiotic events may confound honey bee nestmate recognition, UK Office of Undergraduate Research. Awarded: \$2000.

## Presentations Given

Rittschof C. C., (November 2020). Wash your tarsi: linking social behavior and health outcomes in the honey bee Department of Entomology Seminar Series, Washington State University. Invited, National.

Denny A., Rittschof C. C., Haramoto E. R., (November 2020). Weeds for the bees: commodity crop weed management impacts on wild bee abundance Entomological Society of America Annual Meeting, Entomological Society of America. Accepted.

Rittschof C. C., (February 2020). Busy bees: integrative approaches to honey bee behavior and health Department of Entomology Seminar Series, Ohio State University, OH, United States. Invited, National.

Rittschof C. C., (December 1, 2017). Honey bee aggression: mechanisms of social response and their evolution Ecology, Evolution, and Behavior Seminar Series, Indiana University, Bloomington, IN. Invited, National.

Rittschof C. C., (October 6, 2017). Honey bee aggression: mechanisms of social response Department of Entomology weekly seminar series, Penn State University, State College, PA. Invited, National.

Rittschof C. C., (May 6, 2016). Social regulation of honey bee aggression: the role of brain energy metabolism Division of Biological Sciences Seminar Series, UC San Diego, San Diego, CA. Invited, National.

Rittschof C. C., (April 18, 2016). Social experiences and behavioral outcomes: integrative and comparative approaches Biology and Psychology Behavioral Neuroscience Seminar Series, Southern Connecticut State University, New Haven, CT. Invited, National.

## Invited Speaker

2022 Oregon State University Seminar Series. Integrative approaches to the study of animal behavior

2022 University of North Carolina Greensboro. Honey bee behavior and health.

2021 ESA symposium: What is the Role of a Scientific Society in 2021? (Remote) Early-career perspective: climbers can't ignore the landscape

2021 University of Georgia Department of Entomology Seminar Series (Remote) Connecting honey bee behavior and health, from molecules to landscapes

Rittschof C. C., (2021). Using genomics to explore the links between socially responsive behaviors and health in the honey bee Genomics and Biology of Social Insects, Cold Spring Harbor Lab. Invited. Rittschof C. C., (October 2021). What is the role of a scientific society in 2021? Early career perspective Annual Meeting, Entomological Society of America. Invited.

Rittschof C. C., Haramoto E. R., Denny A., (November 2020). Impacts of corn and soybean winter land management on early-spring honey bee growth and wild bee activity ESA Symposium: Pollinators and Soybeans: Impacts, Complications, and Future Directions, Entomological Society of America, United States. Invited, International.

Rittschof C. C., (November 2019). Busy bees: integrative approaches to honey bee behavior and health Department of Entomology and Biology Seminar Series, Virginia Polytechnic University and Institute, Blacksburg, VA. Invited, National.

- Rittschof C. C., (August 2019). Honey bee aggression: an adaptive behavior with health implications Jacobs Center for Productive Youth Development workshop: Cross-species comparisons in the study of human development, Jacobs Center for Productive Youth Development, Marbach, Germany. Invited, International.
- Rittschof C. C., (June 2019). Closing the loop: connecting discovery genomics to physiology and behavior National Science Foundation Sociogenomics Research Coordination Network, National Science Foundation, Ithaca, NY. Invited, National.
- Rittschof C. C., (April 2019). From the outside in: social regulation of behavior and health in the honey bee University of Illinois entomology seminar series, University of Illinois, Urbana-Champaign, IL. Invited, University.
- Rittschof C. C., (March 2019). Is low aggression a sickness behavior? ESA symposium: Integrative approaches to bee health, Entomological Society of America, Cincinnati, OH. Invited, Regional.
- Rittschof C. C., (March 2019). Scientists in the policy arena ESA symposium: Niche specialization: communicating science to targeted audiences, Entomological Society of America, Cincinnati, OH. Invited, Regional.
- Rittschof C. C., (February 2019). From the outside in: social regulation of behavior and health in the honey bee University of North Carolina-Greensboro Biology Seminar, University of North Carolina-Greensboro, Greensboro, NC. Invited, National.
- Rittschof C. C., (November 2018). Is low honey bee aggression a sickness behavior? Molecular evaluation of the brain and peripheral tissues. Entomological Society of America Annual Meeting, Entomological Society of America, Canada. Invited, International.
- Rittschof C. C., (June 2018). Sum of its parts: individuality in a highly social organism? It's not my fault: how the social environment shapes individual behavior and vice versa, University of Muenster Graduate School of Evolution, Muenster, Germany. Invited, International.
- Rittschof C. C., (April 2018). Is that plasticity, or just behavior? Understanding the regulation of highly dynamic phenotypes. Department of Biology Seminar Series, University of Cincinnati, Cincinnati, OH. Invited, National.
- Rittschof C. C., (March 10, 2018). Metabolic plasticity and behavior in honey bees International Conference on Brain Energy Metabolism, Centro de Estudios Científicos, Valdivia, Chile. Invited, International.
- Rittschof C. C., (February 2018). Is that plasticity, or just behavior? Understanding the regulation of highly dynamic phenotypes Department of Biology Seminar Series, York University, Toronto, Canada. Invited, International.
- Rittschof C. C., (December 2017). Is that plasticity, or just behavior? Understanding the regulation of highly dynamic phenotypes Seminar series in Ecology, Evolution and Behavior, Indiana University Department of Biology, Bloomington, IN. Invited, National.

#### **Keynote or plenary address**

- Rittschof C. C., (March 2019). The interwoven social lives of humans and honey bees Living with Animals, Eastern Kentucky University, Richmond, KY. Invited, International.

#### **Other (not exhaustive)**

- Rebecca W., Rittschof C. C., (2019). Bringing Up Baby: The role of nursing behavior in the social transmission of aggression in the honey bee (*Apis mellifera*) EcoLunch, University of Kentucky Biology Department. Accepted, University.
- Rittschof C. C., Grume G., (March 2018). Honey bee robbing behavior Entomological Society of America North Central Branch Meeting, ESA-NCB, Madison, WI. Accepted, Regional.

Rittschof C. C., (September 29, 2016). Social cues and diet may act through similar mechanisms to affect aggressive behavior in the honey bee (*Apis mellifera*) International Congress on Entomology, ICE/ESA, Orlando, FL, United States. Accepted, International.

Rittschof C. C., (January 6, 2016). Energy metabolism: mechanisms for plasticity in honey bee aggression Society for Integrative and Comparative Biology Annual Meeting, Society for Integrative and Comparative Biology, Portland, OR, United States. Accepted, National.

### **Podium Session**

Westwick R., Brackett G., Ison B., Rittschof C. C., (2021). Social signals and hive-level aggression interact to alter larval caretaking behaviors of nurse honey bees (*Apis mellifera*) Annual Meeting, Animal Behavior Society. Accepted.

Rittschof C. C., (2021). Could the honey bee “bee” a comparative system for neural energetics, behavior, and disease? EpiC/BEAM Group, University of Kentucky College of Medicine. University.

Westwick R., Brackett G., Ison B., Rittschof C. C., (2021). Social signals and hive-level aggression interact to alter larval caretaking behaviors of nurse honey bees (*Apis mellifera*) North Central Branch Meeting, Entomological Society of America. Accepted.

Rittschof C. C., Haramoto E. R., Potter D., (October 2021). Proximity to flowering weeds on fallow fields improves honey bee colony growth in the late winter/early spring Annual Meeting, Entomological Society of America. Accepted.

### **Poster Session**

Harrison J., Rittschof C. C., (2021). Metabolomics analyses in the honey bee Genomics and Biology of Social Insects, Cold Spring Harbor Lab. Accepted.

Westwick R., Rittschof C. C., (2021). The function of allogrooming in honey bees Genomics and Biology of Social Insects, Cold Spring Harbor Lab.

Kane C., Rittschof C. C., (2021). Viruses in Kentucky honey bees Genomics and Biology of Social Insects, Cold Spring Harbor Lab. Accepted.

Ison B., Westwick R., Brackett G., Rittschof C. C., (2021). Impact of Aggression Pheromone on Parental Care Behaviors of Nurse Bees in *Apis mellifera* Virtual Showcase of Undergraduate Scholars, University of Kentucky. Accepted.

Westwick R., Rittschof C. C., (2019). Uncovering the role of familial care in the social transmission of aggression in honey bees Animal Behavior Society National Meeting, Animal Behavior Society, Chicago, IL. Accepted, National.

Rittschof C. C., Preston S., (November 2018). Effects of transgenerational stress on honey bee workers Entomological Society of America Annual Meeting, Entomological Society of America, Denver, CO. Accepted, National.

Rittschof C. C., Harrison J., (May 2018). Effects of smoke exposure on brain gene expression profiles in honey bees Bluegrass Society for Neuroscience Annual Meeting, Bluegrass Society for Neuroscience, Lexington. Accepted, Local.

Rittschof C. C., Preston S., (March 2018). Effects of transgenerational stress on honey bee workers Entomological Society of America North Central Branch meeting, ESA-NCB, Madison, WI. Accepted, Regional.

Rittschof C. C., (July 18, 2016). Social cues and diet restriction act through similar neural mechanisms to affect aggression in the honey bee International Conference in Pollinator Biology, Health and Policy, Wyman's of Maine, Ernst Conservation Seeds, Almond Board of California, Syngenta, American Honey Producers Association, American Beekeeping Federation, California State Beekeepers

Association, as well as UC Davis' Department of Entomology and Nematology, Bee Biology Group, and Honey and Pollination Center, State College, PA, United States. Accepted, International.

Rittschof C. C., (April 21, 2016). Social cues and diet restriction act through similar neural mechanisms to affect aggression in the honey bee Bluegrass Society for Neuroscience Conference, Bluegrass Society for Neuroscience, Lexington, KY, United States. Accepted, University.

### Specialty Presentation

Rittschof C. C., Vekaria H., Palmer J., Sullivan P. G., (March 2018). Honey bee aggression and brain mitochondrial function Research talk series, Spinal Cord and Brain Injury Research Center, Lexington, KY. Invited, University.

Rittschof C. C., (November 7, 2017). Mitochondrial functional plasticity and behavioral regulation Entomological Society of America Conference, ESA, Denver, CO, United States. Invited, National.

Rittschof C. C., (March 25, 2017). Sequential Social Experiences Interact to Modulate Aggression but not Brain Gene Expression in the Honey Bee (*Apis mellifera*) Integrating Personality, Social Networks, and Collective Behavior, University of Kentucky Department of Biology, Lexington, KY, United States. Accepted, University.

Rittschof C. C., (March 11, 2017). Honey bee aggression and brain energy metabolism: understanding the temporal components of behavioral plasticity Early Career Scientists Symposium - The Ecology and Evolution of Phenotypic Plasticity, University of Michigan Department of Ecology and Evolutionary Biology, Ann Arbor, MI, United States. Invited, National.

Rittschof C. C., (August 3, 2016). Honey bee aggression and brain energy metabolism: a plasticity mechanism that stands the test of time International Society for Behavioral Ecology Congress, International Society for Behavioral Ecology, Exeter, United Kingdom. Invited, International.

## Teaching

### Teaching

| Prefix Number - Section | Credit Hours      | # Enrolled | Code Term Year      |
|-------------------------|-------------------|------------|---------------------|
| ENT 767 - 001           | 2.00000 - 2.00000 | 2          | 30 Spring 2021-2022 |
| ENT 768 - 014           | 1.00000 - 6.00000 | 1          | 30 Spring 2021-2022 |
| ENT 780 - 014           | 2.00000 - 3.00000 | 1          | 30 Spring 2021-2022 |
| ENT 790 - 014           | 1.00000 - 6.00000 | 2          | 30 Spring 2021-2022 |
| ENT 209 - 001           | 3.00000 - 3.00000 | 51         | 10 Fall 2021-2022   |
| ENT 395 - 001           | 1.00000 - 3.00000 | 1          | 10 Fall 2021-2022   |
| ENT 767 - 014           | 2.00000 - 2.00000 | 2          | 10 Fall 2021-2022   |
| ENT 768 - 014           | 1.00000 - 6.00000 | 2          | 10 Fall 2021-2022   |
| ENT 770 - 004           | 0.00000 - 1.00000 | 6          | 10 Fall 2021-2022   |
| ENT 790 - 014           | 1.00000 - 6.00000 | 2          | 10 Fall 2021-2022   |
| BIO 509 - 201           | 3.00000 - 3.00000 | 2          | 30 Spring 2020-2021 |
| ENT 395 - 002           | 1.00000 - 3.00000 | 1          | 30 Spring 2020-2021 |
| ENT 509 - 001           | 3.00000 - 3.00000 | 3          | 30 Spring 2020-2021 |



|               |                   |    |                     |
|---------------|-------------------|----|---------------------|
| ENT 509 - 201 | 3.00000 - 3.00000 | 5  | 30 Spring 2020-2021 |
| ENT 767 - 001 | 2.00000 - 2.00000 | 2  | 30 Spring 2020-2021 |
| ENT 768 - 010 | 1.00000 - 6.00000 | 1  | 30 Spring 2020-2021 |
| ENT 209 - 001 | 3.00000 - 3.00000 | 84 | 10 Fall 2020-2021   |
| ENT 767 - 014 | 2.00000 - 2.00000 | 2  | 10 Fall 2020-2021   |
| ENT 395 - 002 | 1.00000 - 3.00000 | 2  | 30 Spring 2019-2020 |
| ENT 790 - 014 | 1.00000 - 6.00000 | 2  | 30 Spring 2019-2020 |
| ENT 209 - 001 | 3.00000 - 3.00000 | 32 | 10 Fall 2019-2020   |
| ENT 395 - 001 | 1.00000 - 3.00000 | 1  | 10 Fall 2019-2020   |
| ENT 790 - 014 | 1.00000 - 6.00000 | 2  | 10 Fall 2019-2020   |
| BIO 509 - 001 | 3.00000 - 3.00000 | 1  | 30 Spring 2018-2019 |
| ENT 395 - 001 | 1.00000 - 3.00000 | 1  | 30 Spring 2018-2019 |
| ENT 509 - 001 | 3.00000 - 3.00000 | 4  | 30 Spring 2018-2019 |
| ENT 767 - 001 | 2.00000 - 2.00000 | 1  | 30 Spring 2018-2019 |
| ENT 790 - 014 | 1.00000 - 6.00000 | 1  | 30 Spring 2018-2019 |
| ENT 767 - 014 | 2.00000 - 2.00000 | 1  | 10 Fall 2018-2019   |
| ENT 770 - 001 | 0.00000 - 1.00000 | 8  | 10 Fall 2018-2019   |
| ENT 790 - 014 | 1.00000 - 6.00000 | 1  | 10 Fall 2018-2019   |
| BIO 580 - 002 | 1.00000 - 4.00000 | 9  | 30 Spring 2017-2018 |
| ENT 395 - 002 | 1.00000 - 3.00000 | 2  | 30 Spring 2017-2018 |
| ENT 780 - 014 | 2.00000 - 3.00000 | 1  | 30 Spring 2017-2018 |
| ENT 790 - 014 | 1.00000 - 6.00000 | 1  | 30 Spring 2017-2018 |
| ENT 395 - 001 | 1.00000 - 3.00000 | 1  | 10 Fall 2017-2018   |
| ENT 780 - 010 | 2.00000 - 3.00000 | 1  | 10 Fall 2017-2018   |
| ENT 790 - 014 | 1.00000 - 6.00000 | 2  | 10 Fall 2017-2018   |
| ENT 395 - 002 | 1.00000 - 3.00000 | 1  | 30 Spring 2016-2017 |
| ENT 780 - 014 | 2.00000 - 3.00000 | 1  | 30 Spring 2016-2017 |
| ENT 790 - 014 | 1.00000 - 6.00000 | 1  | 30 Spring 2016-2017 |
| ENT 790 - 014 | 1.00000 - 6.00000 | 1  | 10 Fall 2016-2017   |

## Teacher Course Evaluations

| Prefix Number - Section | Responses | TCE Course Quality Mean | TCE Teaching Quality Mean | Code Term Year      |
|-------------------------|-----------|-------------------------|---------------------------|---------------------|
| BIO 580 - 002           | 8         | 4.38                    | 4.88                      | 30 Spring 2017-2018 |
| ENT 209 - 001           | 31        | 4.48                    | 4.68                      | 10 Fall 2021-2022   |
| ENT 209 - 001           | 24        | 4.67                    | 4.78                      | 10 Fall 2020-2021   |
| ENT 209 - 001           | 18        | 4.83                    | 4.89                      | 10 Fall 2019-2020   |
| ENT 770 - 001           | 8         | 4.88                    | 4.75                      | 10 Fall 2018-2019   |
| ENT 770 - 004           | 5         | 5.00                    | 4.80                      | 10 Fall 2021-2022   |

Note: With regards to 2020 TCEs please consider the following from page 121 of the UK Playbook for Fall 2020, "It is essential that performance evaluation take into account the extenuating circumstances brought about by the disruption for faculty in all title series and the extraordinary work accomplished by

faculty in response to the disruption. Academic leaders shall reiterate that TCEs should be but one indicator of effective teaching in both periodic merit reviews and tenure/promotion decisions. Evaluation of teaching must go beyond student evaluations alone."

## **Theses and Dissertations**

### **Dissertation Committee Chair**

Anastasia Weger, Entomology, Status: In-Process. (August 2021 - Present).

Caroline Kane, Entomology, "Impact of nutrition on honey bee viruses," Status: In-Process. (July 2020 - Present).

Amanda Dunaway, Entomology, Status: In-Process. (August 2018 - Present).

Rebecca Westwick, Entomology, Status: In-Process. (August 2018 - Present).

### **Dissertation Committee Member**

Austin Merchant, Entomology, Status: In-Process. (September 2018 - Present).

YaoYu Jiao, Entomology, Status: In-Process. (September 2018 - Present).

Fernan Perez, Entomology, Status: In-Process. (August 2018 - Present).

Alex Cones, Biology, Status: In-Process. (May 2018 - Present).

Jizhe Shi, Entomology, Status: In-Process. (August 28, 2017 - Present).

Timothy Salzman, Biology, Status: In-Process. (February 1, 2017 - Present).

Bernadette Mach, Entomology, Status: Degree Awarded. (March 11, 2016 - June 2018).

### **Master's Thesis Committee Chair**

Wade Pike, Entomology, Status: In-Process. (August 2021 - Present).

James Harrison, Entomology, This is a technician. (January 2021 - Present).

Grayson McWhorter, Entomology, Status: Degree Awarded. (May 1, 2016 - May 2020).

### **Master's Thesis Committee Co-Chair**

Sarah Preston, Entomology, Status: Degree Awarded. (May 1, 2016 - July 2018).

### **Master's Thesis Committee Member**

Shannon Clafford, Entomology, Status: In-Process. (January 2021 - Present).

Josiah Ritchey, Entomology, Status: In-Process. (January 2018 - Present).

Doug Potter, Forestry, "Habitat suitability modeling of individual tree species as site selection criteria for apiaries producing varietal honey in Appalachia," Status: Degree Awarded, Expected Completion Date: December 2018. (February 2017 - May 2019).

Stephen Zumdick, Biology, Status: Degree Awarded. (September 1, 2017 - October 2017).

Emily Nadeau, Entomology, Status: Completed. (March 10, 2016 - July 17, 2017).

Thorsten Hansen, Entomology, Status: Degree Awarded. (January 26, 2016 - May 2017).

### **Outside examiner**

Jonathan Terbot, Biology. (May 2021).

Jacqueline Dillard, Biology, Status: Degree Awarded. (May 2019).

### **Directed Student Learning (excluding theses, dissertations)**

Abdallah Sher. Research Supervision. *Honey bee immune response*. In-Process (August 2021 - Present).

Elisabeth Rintamaa. Research Supervision. *Honey bee brain metabolomics and aggression*. In-Process (January 2021 - Present).

Ila Iniyavan. Research Supervision. *Honey bee aggression, varroa mites, and deformed wing virus*. In-Process (January 2021 - Present).

Taylor Napier. Directed Individual/Independent Study. *Honey bee robbing and forager behavior*. In-Process (September 2018 - Present).

Rebecca Westwick. Advisor. *How the social environment shapes aggression in honey bees*. In-Process (August 2018 - Present).

Description: Lyman T. Johnson Diversity Fellowship

Bethany Ison. Research Supervision. *Honey bee behavior and immune system function*. Completed (January 2021 - December 2021).

Anna Foose. Directed Individual/Independent Study. *Honey bee behavior*. Degree Awarded (June 2019 - December 2021).

Nikhil Pallem. Directed Individual/Independent Study. *Honey bee brain metabolism*. Completed (August 2020 - May 2021).

Rebecca Westwick. Advisor. *Honey bee social regulation and aggression*. In-Process (July 2020 - May 2021).

Description: Presidential Fellowship (UKY)

Cameron Brown. Directed Individual/Independent Study. *Honey bee behavior and wild bee identification*. Degree Awarded (January 2020 - May 2021).

Gavin Brackett. Directed Individual/Independent Study. *Honey bee nursing behavior*. Degree Awarded (September 2019 - May 2020).

Rebecca Westwick. Advisor. *Developmental Social Interactions in the Honey bee*. (March 2020).  
Description: NSF Graduate Research Fellowship Honorable Mention

Hanna Carr. Directed Individual/Independent Study. *Viral titers in honey bees*. Completed (January 15, 2017 - June 2019).  
Description: Helping student attain experience in molecular techniques in lab on volunteer basis. She is currently enrolled in ABT395 for the research she's doing in the lab.

Hanna Carr. Advisor. *Is low aggression a sickness behavior in honey bees?*. Completed (May 2019).  
Description: Second Place, Glen Collins Award

Ethan Martion. Advisor. *Honey bees and wild bees*. In-Process (February 2019 - May 2019).  
Description: High School student volunteering in the lab

Austin King. Advisor. *Honey bee behavior*. Completed (December 2018).  
Description: Student participated in lab meetings

Seth Biedenbender. Mentor. *Does odor confusion influence robbing behaviors in honey bees?*. Completed (January 15, 2017 - September 2018).  
Description: Mentoring student as part of the Chellgren Fellows Program. Student worked in the lab for a semester on a voluntary basis, developed and performed a summer independent study project, and participated in lab meeting discussions. I provided guidance and feedback about project development as well as presentation improvement. He is now taking research credit to write up and analyze his data. He works 9 h/week in lab.

Sarah Preston. Advisor. *Transgenerational stress response in the honey bee*. Degree Awarded (July 2018).  
Description: Winner - Entomological Society of America President's First Prize (poster prize) - Nov 2017  
3rd place - Entomological Society of America North Central Branch (poster prize) - Mar 2018

Sarah Preston. Supervise outreach material development. *Controlling Varroa mite in honey bee colonies*. Completed (May 1, 2016 - July 2018).  
Description: Advise graduate student Sarah Preston on preparation of outreach materials for presentations at K-12 schools and outreach talks to beekeepers.

Kimo Kimura. Advisor. *Honey bee molecular biology*. Completed (August 23, 2017 - May 2018).  
Description: Organize research experience in molecular biology. Student works 6 h/week in the lab for research credit.

Leah Callaway. Mentor. *Honey bee behavior and neuroscience*. Completed (June 15, 2017 - May 2018).  
Description: Student assists with basic summer beekeeping duties and learned molecular techniques in the lab. Student was full-time during the summer, now works 10 h/week for pay.

James Harrison. Research Supervision. *How does smoke impact honey bee physiology?*. Completed (June 1, 2017 - May 2018).

Description: Supervised this student's involvement in assisting a graduate student in thesis research activities. Developed an independent project in conjunction with this student as part of independent study course credit for the neuroscience major (BIO 394). He works 9 h/week for credit.

Rachel Henry. Mentor. *Pesticide effects on wild bees*. Completed (August 30, 2017 - March 2018).

Description: I am advising a DuPont High School student in the development of an independent project for an Advanced Placement research course. We communicate weekly.

Anna Langworthy. Directed Individual/Independent Study. *Varroa mite and honey bee health*. Completed (August 31, 2017 - December 2017).

Description: Bi-weekly one-on-one meetings with student to provide guidance for undergraduate research project development.

Sarah Preston. Advisor. . Degree Awarded (November 2017).

Description: Entomological Society of America President's 1st Prize

April Lamb. Research Supervision. *Neural energetics of honey bee aggression*. Completed (June 1, 2017 - August 23, 2017).

Description: Student assisted me with and my graduate students with honey bee behavioral experiments, pharmacological manipulations, and molecular biology.

Anaya Brown. Mentor. . Completed (August 27, 2016 - May 15, 2017).

Description: Provided high school student (STEAM Academy) opportunity to work in the lab as part of the KY Young Researchers Program. She worked two semesters - in the first, she worked 5 h/week, the second semester, 7 h/week.

Austin Merchant. Mentor. *Social insect biology*. Completed (August 25, 2016 - December 15, 2016).

Description: Student attended lab meeting journal club and I provided mentoring and advice about graduate school.

William Reedy. Internship Advisor. *Honey bee management*. Completed (May 1, 2016 - July 31, 2016).

Description: Student volunteered in lab to build and maintain beekeeping equipment, approximately 5 h/week over one summer.

## **Academic Advising**

50 Summer 2021-2022, 1 undergraduate students advised.

10 Fall 2021-2022, 6 undergraduate students advised.

30 Spring 2020-2021, 7 undergraduate students advised.

10 Fall 2019-2020, 4 undergraduate students advised, 3 graduate student advised, I am an ABT faculty advisor for 4 undergraduate students (these are not research mentees).

99 Academic year 2018-2019, 2 undergraduate students advised, 3 graduate student advised, Students working in the lab for research experience.

99 Academic year 2017-2018, 7 undergraduate students advised, 2 graduate student advised,  
Mentored in the lab for research experience.

99 Academic year 2016-2017, 3 undergraduate students advised, 2 graduate student advised.

## **Program and Curriculum Development**

**2017**

Program/Curriculum Name - ENT/BIO 509: Buds&Brains: Neuroscience of Pollination

Description: New course syllabus development and course approval process

**2018**

Program/Curriculum Name - ENT 209 Bees & People

Description: Developing 200 level survey course on bees and beekeeping.

## **Other Credit and Non-Credit Instructional Activities**

### **Guest Lecture**

Horticultural Entomology, (October 2021)

Description: Introduction to beekeeping

Scientific Method in Biotechnology, (February 2021)

Description: How do social experiences "get under the skin"?

Introduction to Biotechnology, Participants: Undergraduate Students, 30, (October 28, 2020)

Description: Biotechnology and behavior

Introduction to Biotechnology, (October 31, 2018)

Description: Genomics and social behavior

Integrative organismal entomology, Participants: Graduate Students, 5, (October 29, 2018)

Description: Pollinator Biology

Molecular Biology, Participants: Undergraduate Students, 20, (October 17, 2018)

Description: I hosted Farida Olden's class at my lab, giving a lecture on molecular biology and honey bee behavior, and showing some hands-on lab approaches.

ABT 201, Participants: Undergraduate Students, 20, (November 2, 2017)

Description: How do social interactions change the brain?

Integrative Organismal Entomology, Participants: Graduate Students, 12, (October 19, 2016)

Description: I instructed for two 50 min class periods on pollinator biology.

ABT 201, Participants: Undergraduate Students, 20, (September 15, 2016)

Description: How do social interactions change the brain?

### **Question/Answer session about academic career**

Professional Development, Participants: Graduate Students, 12, (October 16, 2020)

ENT 770: Professional Development, Participants: Graduate Students, 20, (September 22, 2017)

### **Question/Answer session about academic careers**

ENT 770: Career Opportunities and Tools of the Trade, Participants: Graduate Students, 20,  
(September 2, 2016)

### **Question/answer session about academic career**

Professional development seminar, Participants: Graduate Students, 10, (September 21, 2018)

### **Workshop**

Beginner's Beekeeping Workshop, Participants: Graduate Students, 5, Undergraduate Students, 2, Professionals, 5, (June 18, 2017)

Description: Combination of lecture and hands-on workshop on the fundamentals of starting beekeeping. Attendees including undergraduate and graduate students, faculty, and staff from UK. Course was developed in part to provide teaching experience for my graduate student. I organized the course and we co-taught it. This was a 2-day weekend workshop.

## **Service**

### **Department Service**

#### **Arranged visit for seminar speaker Brendan Hunt**

Seminar Speaker Host, (October 2021 - Present).

#### **Committee Chair**

Steering committee, (September 2018 - May 2021).

#### **Committee Member**

Diversity, Inclusion, and Equity Committee, (August 2020 - Present).

Curriculum Committee, (September 2018 - Present).

Ecological Research and Education Center Committee, (January 1, 2017 - Present).

ABT Lecturer Search Committee, (January 2019).

Graduate Program Committee, (July 5, 2016 - September 2018).

Arthropod Ecologist Search Committee, (March 24, 2016 - February 22, 2017).

#### **Invite speaker and organize schedule**

Seminar speaker host, (April 2018).

Seminar speaker host, (October 12, 2017).

Seminar series speaker host, (September 13, 2017 - September 15, 2017).

#### **Invite speaker and organize visit**

Seminar speaker host, (October 5, 2016 - October 7, 2016).

#### **Volunteer Hike Leader**

Insect Safari, (August 2019).

Insect Safari, (September 15, 2017).

Insect Safari, (September 2016).

## **College Service**

### **Committee Member**

CAFE Faculty Council, (March 2018 - May 2021).

Online MS in Science Translation and Outreach Executive Sub-committee, (February 2018 - May 2021).

CAFE Faculty Council Rules and Procedures Committee, (February 2019).

### **Faculty Advisor**

Agricultural and Medical Biotechnology Program, (January 23, 2017 - Present).

ABT freshman registration, (July 2019).

ABT Program Freshman Registration, (July 6, 2017).

### **Faculty Mentor**

ABT Program, Freshman meet and greet, (August 30, 2017).

### **Graduate Faculty Member**

Online MS in Science Translation and Outreach  
, (2019 - Present).

Organized portion of Farm Field Trip (Ecological Society of America), (August 2019).

How to prepare your daughter for a career in STEM panel - Exploring Your Horizons STEM camps, (April 2019).

Organized visit for Rand Paul staffers, (June 30, 2016).

## **University Service**

### **Committee Member**

Department of Biology Faculty Search Committee, (November 2021 - Present).

### **Faculty Mentor**

iamawomaninSTEM mentoring program, (February 13, 2017 - Present).

Neuroscience Major research, (January 1, 2017 - Present).

### **Guest Speaker, Internal**

NeuroCats Neuroscience Club (undergraduate), (February 2020).

Extended Office Hours Podcast with Regina Hamilton, (January 2020).



### **Judge for competition**

Judge for Society of Post-doctoral Scholars Research and Career Symposium, (September 2021).

Ad hoc reviewer, UK student sustainability council grant, (November 2018).

### **Professional Service**

#### **Board of Advisors of a Company**

ParaTechs, Protocol Advisory Board, (February 2018).

#### **Chairperson**

Entomological Society of America, Study Section Symposium:  
Mitochondria, Metabolism, and Homeostasis: From Molecular Mechanisms to Societies,  
(November 7, 2017).

#### **Committee Chair**

Entomological Society of America, Writing committee, Position Statement on Pollinator Health,  
(June 2019 - September 2019).

Entomological Society of America, Writing sub-committee on climate change position  
statement, (June 2018 - February 2019).

#### **Committee Member**

Entomological Society of America, Committee on Ethics and Rules, (2019 - Present).

Entomological Society of America, Science Policy Committee  
Position statements sub-committee  
Science policy fellows sub-committee  
Symposium sub-committee (organizer 2021), (April 13, 2017 - Present).

#### **Editor, Associate Editor**

Insect Molecular Biology, (September 2020 - Present).

Current Opinion in Insect Science, Organizer/Guest associate editor for special issue on  
Behavioral Ecology, (February 2020 - July 2021).

Frontiers in Behavioral Neuroscience, Organizer/Guest Editor for special issue on insect  
neuroscience, (January 2020 - May 2021).

PLoS Genetics, (August 2020).

#### **Editorial Review Board Member**

Scientific Reports, Scientific Reports (Peer-reviewed journal), (September 19, 2016 - Present).

#### **Member**

Entomological Society of America, Washington D.C. visit to meet with entomology related  
government agencies, (October 16, 2017 - October 18, 2017).

Entomological Society of America, Washington D.C. visit with congressional representatives, (May 15, 2017 - May 17, 2017).

Entomological Society of America, Visit to Washington DC to meet with congressional representatives, (November 14, 2016 - November 16, 2016).

Entomological Society of America, Visit to Washington DC to meet with entomology related non-profits, (May 16, 2016 - May 19, 2016).

#### **Judge**

Entomological Society of America, Student Transition Early Professional Outreach Award Judge, (January 1, 2016 - Present).

Quanta Magazine, (August 2018).

Ohio Valley Entomological Society, Student presentation judge, (October 2017).

#### **Program Organizer**

Entomological Society of America, Program Symposium Organizer, (October 2021).

#### **Reviewer, Ad Hoc Reviewer**

United Kingdom Research and Innovation - Biotechnology and Biological Sciences Research Council, (June 2021).

Israeli Science Foundation, NSFC-ISF Research Grants, (June 2018).

National Science Foundation, (September 29, 2017).

National Science Foundation, (October 15, 2016).

National Science Foundation, (October 14, 2016).

#### **Reviewer, Conference Paper**

Entomological Society of America, Judge for PBT Section (Early Career Award), (June 2021).

#### **Reviewer, Grant Proposal**

Marsden Fund, (August 2020).

Animal Behavior Society, Student Research Grant reviewer, (February 2018).

Animal Behaviour, Student Research Grants, (January 15, 2016).

#### **Reviewer, Journal Article**

Journal of Insect Physiology, (December 2021 - Present).

Nature Communications, (December 2021 - Present).

Nature Communications, (January 2021 - Present).

Science of the Total Environment, (November 2021).

Proceedings of the National Academy of Sciences, (August 2021).

Behavioral Ecology, (July 2021).

Animal Behaviour, (February 2021).

Biology Letters, (February 2021).

Nature Communications, (February 2021).

Scientific Reports, (September 2020).

Behavioral Ecology and Sociobiology, (August 2020).

Annals of the Entomological Society of America, (June 2020).

Behavioral Ecology and Sociobiology, (April 2020).

Viruses, (April 2020).

Genome Biology and Evolution, (March 2020).

Viruses, (March 2020).

Viruses, (February 2020).

Gene Reports, (January 2020).

Scientific Reports, (January 2020).

Genes, Brain, Behavior, (November 2019).

Scientific Reports, (November 2019).

Molecular Biology and Evolution, (October 2019).

Science Advances, (October 2019).

PLoS ONE, (August 2019).

Nature Communications, (March 2019).

Animal Behaviour, (February 2019).

Genome Biology and Evolution, (February 2019).

Proceedings of the Royal Society B, (January 2019).

Proceedings of the National Academy of Sciences, (September 2018).

Behavioral Ecology, (July 2018).

Genome Biology and Evolution, (July 2018).

Journal of Animal Ecology, (May 2018).

Proceedings of the Royal Society B, (May 2018).

Nature Communications, (April 2018).

Proceedings of the Royal Society B, (March 2018).

Scientific Reports, (January 2018).

BMC Biology, (December 2017).

Proceedings of the National Academy of Sciences, (December 2017).

Scientific Reports, (December 2017).

Scientific Reports, (November 2017).

Proceedings of the National Academy of Sciences, (October 2017).

Molecular Ecology, (May 8, 2017).

Scientific Reports, (March 27, 2017).

Molecular Ecology, (March 3, 2017).

Scientific Reports, (February 20, 2017).

Animal Behaviour, (February 17, 2017).

Proceedings of the Royal Society B, (February 17, 2017).

Journal of Experimental Biology, (January 16, 2017).

Journal of Insect Science, (December 13, 2016).

Journal of Insect Science, (November 17, 2016).

Scientific Reports, (November 17, 2016).

Nature communications, (November 7, 2016).

Ecology Letters, (October 2016).

Journal of Experimental Biology, (August 2016).

Nature communications, (August 15, 2016).

Molecular ecology, (August 4, 2016).

Journal of Experimental Biology, (June 28, 2016).

Open Bio, (April 1, 2016).

Proceedings of the Royal Society B, (March 31, 2016).

Axios Review, (January 6, 2016).

### **Session Chair**

Entomological Society of America, Panel Moderator for Entomology Advocacy Week (Senate Ag Committee Staffers), (August 2020).

Entomological Society of America, Grand Challenges Summit Discussion Sessions, (September 28, 2016).

### **Site Visit, Grant Review**

National Science Foundation, IOS Grant Panel, (October 2021 - Present).

National Science Foundation, DGE Grant Panel, (May 2021).

National Science Foundation, IOS grant review Panel, (April 5, 2017 - April 7, 2017).

### **Task Force Member**

Entomological Society of America, Science Policy Committee; EPA Smart Label Database, (August 3, 2017).

## **Public Service**

### **Discussant**

Nelson County Beekeepers, Q&A Panel on honey bee management, (June 2020).

NPR-WUKY, Interviewee - spoke about recently published study, (February 2020).

Arthro-pod Podcast with Jonathan Larson, Guest, (November 2019).

WRFL, GreenTalks Podcast, (October 2017).

### **Guest Speaker**

Kentucky Queen Breeders' Association, Drone and Queen Workshop, (March 2021 - Present).

Eastern Kentucky Winter Bee School, Talk by graduate student Rebecca Westwick, (2021 - Present).

Eastern Kentucky Winter Bee School, (2021 - Present).

Green Valley Beekeepers Association, (2021 - Present).

Huguenots Beekeepers Association, (2021 - Present).

National Academy of Sciences, Health and Medicine Division Committee to Enhance Diversity and Inclusion, (2021 - Present).

Nelson County Beekeepers, Guest lecture by my student Rebecca Westwick, (2021 - Present).

Vermont Beekeepers Association, (2021 - Present).

Virginia State Beekeepers Association, Talk at monthly meeting, (November 2020).

Eastern Kentucky Winter Bee School, Speaker - Invited: Honey bee viruses, (January 2020).

Eastern Kentucky Winter Bee School, Keynote Address (invited) - Honey bee robbing behavior, (January 2020).

Kentucky Queen Breeders Association, Guest Speaker: Honey bee viruses, (January 2020).

Lafayette High School STEM club, Discussed honey bee behavior and ecology with students, (January 2020).

Marion County Beekeepers Club, (2019).

University of Kentucky Everything is Science Outreach Talks, (2019).

University of Kentucky Everything is Science Outreach Talks, (2019).

Harrison County Beekeepers Club, (September 2018).

Franklin County Master Gardeners, (May 2018).

Nelson County Beekeepers Club, (May 2018).

KY State Beekeepers Association, (March 2018).

Adams County Ohio Beekeepers Association, Adams County Ohio Beekeepers Association, (June 15, 2017).

Madison County Beekeeping Club, Madison County Beekeeping Club, (February 27, 2017).

Northeastern Kentucky Beekeeping School, Northeastern Kentucky Beekeeping School, (February 25, 2017).

Bluegrass Beekeeping Association, Bluegrass Beekeeping Association, (December 12, 2016).

Ft. Harrod Beekeeping Club, Ft. Harrod Beekeeping Club, (November 28, 2016).

Heartland Apicultural Society, Heartland Apicultural Society, (July 14, 2016).

Kentucky State Beekeepers Association, Kentucky State Beekeepers Association, (April 9, 2016).

McCreary County Beekeepers Association, McCreary County Beekeepers Association, (March 11, 2016).

**Designed and hosted table with honey bee displays**

UKY Curiosity Fair, Honey bee behavior display table, (October 2019).

## **Media Contributions**

### **Magazine**

"LabAnimal." (May 2019). Contributed information on the challenges of keeping honey bees as a laboratory animal. United Kingdom.

### **Radio**

"WRFL Student Radio at UK." (October 11, 2017). Radio interview about beekeeping workshop held summer 2017 and funded by student sustainability council. KY, United States.

### **Other**

"Finding Genius Podcast." (2021).

## **Professional Development**

### **Professional Memberships**

International Society for Neuroethology. International. (September 15, 2017 - Present).

Blue Grass Society for Neuroscience. Regional. (January 5, 2016 - Present).

International Union for the Study of Social Insects. International. (November 2015 - Present).

Entomological Society of America. National. (May 2015 - Present).

International Behavioural and Neural Genetics Society. International. (2013 - Present).

Society for Integrative and Comparative Biology. National. (2009 - Present).

Animal Behavior Society. National. (2008 - Present).

International Society for Behavioral Ecology. International. (2008 - Present).

Sigma Xi Scientific Research Society. National. (2007 - Present).

### **Development Activities Attended**

#### **Seminar**

Unconscious Bias Part 1. (March 2021 - Present). University of Kentucky.

Mentoring Tips and Tricks. (February 10, 2017). Entomological Society of America. National. Webinar.

Webinar given by an ESA faculty member about effective communication with a lab research group.

Suicide prevention training (QPR). (September 14, 2016). College of Agriculture Food and Environment Student Success Team. College. Lexington, KY.  
Learned the steps to recognizing suicide risk and helping students get the immediate help they need.

### **Workshop**

Discrimination, Harassment, and Sexual Misconduct Advisor Training. (July 2021 - Present).  
University of Kentucky.

College of Medicine Mentoring Training. (June 2021 - August 2021). University of Kentucky  
College of Medicine.  
8 week training program on research mentoring

VaTech-UK grant proposal writing workshop Phase II. (April 2018 - June 2019). Assistant Dean of  
Research (Rick Bennett's office). Blacksburg, VA.  
Submitted competitive pre-proposal to participate; attended in-person workshop session;  
met with coordinator one on one; revised pre-proposal 3 times with coordinator; wrote and  
submitted full NSF-IOS grant.

UT-UK grant proposal writing workshop Phase II. (April 28, 2017 - June 2018). Assistant Dean of  
Research (Rick Bennett's office). College. Lexington, KY.  
Submitted competitive pre-proposal to participate; attended in-person workshop session;  
met with coordinator one on one; revised pre-proposal 3 times with coordinator; wrote and  
submitted full NIH R01 competitive grant.

It's not my fault: how the social environment shapes individual behavior and vice versa. (June  
25, 2018 - June 27, 2018). University of Munster. International. Munster, Germany.  
Workshop about comparative social behavior. I also gave an invited seminar at this event.

CELT Coffee talk - language of white supremacy. (October 2017). CELT. University. Lexington, KY,  
United States.  
Discussing issues of race in the classroom

UT-UK grant proposal writing workshop Phase I. (March 16, 2017 - March 17, 2017). Assistant  
Dean of Research (Rick Bennett's office). Regional. Knoxville, TN.  
Attended a one-day workshop on grant proposal preparation.

Cheating and plagiarism. (February 15, 2017). Center for the Enhancement of Learning and  
Teaching. University. LEXINGTON, KY.  
Review of plagiarism guidelines, discussion of common types of academic plagiarism many  
faculty are not aware of. Strategies to minimize plagiarism and check for it.

Teaching students with diverse levels of preparedness. (September 8, 2016). Center for  
Enhancement of Learning and Teaching. University. Lexington, KY, United States.



Talked about ways to accommodate diverse levels of academic preparedness, and how to follow a model promoting student improvement over time. There were several lectures and a discussion section.

Integrating Molecular Mechanisms and Quantitative Genetics in Order to Understand Consistent Individual Differences in Behavior. (July 24, 2016 - July 28, 2016). National Science Foundation. International. Urbana-Champaign, IL, United States.

This workshop brought together world wide experts in genomics, behavioral genetics, and behavioral plasticity and personality research to develop approaches to move the field forward. I co-authored a paper with Kim Hughes as a result of this workshop.

## **Awards and Honors**

*Finalist: Sarah Bennett Holmes Award for the well-being of women, University of Kentucky. Leadership. (2021 - Present).*

*National Academy of Sciences New Voices Committee, National Academy of Sciences. Scholarship/Research/Creative, Election as fellow. (May 2021 - May 2023).*

*Entomological Society of America Early Career Innovation Award, Entomological Society of America. Scholarship/Research/Creative, Internationally competitive award, International. (November 2020).*

*CAFE Prestigious Paper Award, University of Kentucky, College of Agriculture. Scholarship/Research/Creative, College level competitive award, College. (2018).*

*Animal Behavior Society Outstanding New Investigator, Animal Behavior Society (National). Scholarship/Research/Creative, Nationally competitive career-stage award, National. (August 2018).*

*University of Munster Graduate School of Evolution visiting research fellow, University of Munster. Scholarship/Research/Creative, Election as fellow, International. (June 2018).*

*International Conference of Brain Energy Metabolism Young Investigator travel award, International Conference of Brain Energy Metabolism. Scholarship/Research/Creative, Competitive fellowship, International. (March 2018).*

# DR. ZAINULABEUDDIN SYED

College of Agriculture, Food and Environment  
Department of Entomology

## Education

- 2002 **Ph.D.** in Sensory Physiology and Behavior  
University of Neuchâtel. Switzerland.  
Advisor: Dr. Patrick Guerin  
*Thesis Title:* Role of volatile chemostimuli in the sensory ecology of tsetse flies, *Glossina* spp., and host races of the larch bud moth, *Zeiraphera diniana* Guénée
- 1994 **M.Sc.** Agricultural Entomology  
AM University. India.  
Advisor: Dr. AM. Khan  
*Thesis Title:* Efficacy of certain pyrethroids and *Bacillus thuringiensis* against tobacco caterpillar, *Spodoptera litura* F
- 1992 **B.Sc.** Combined Sciences. Osmania University. India.

## Work History

- 2022 - **Associate Professor**  
Department of Entomology, University of Kentucky, Lexington, KY.
- 2018 - 2022 **Assistant Professor**  
Department of Entomology, University of Kentucky, Lexington, KY.
- 2011- 2018 **Assistant Professor**  
Department of Biological Sciences, University of Notre Dame, IN.
- 2005 - 2011 **Post-doctoral Scholar**  
Department of Entomology, University of California-Davis, CA.
- 2003 - 2005 **Post-doctoral Scholar**  
Institute of Neurobiology, Free University, Berlin, Germany.
- 1999 - 2002 **Doctoral Student**  
Institute of Biology, Neuchâtel University, Switzerland.
- 1995 - 1998 **Research Associate**  
Department of Entomology, Indian Institute of Rice Research, India.

## Research and Scholarship (since 2016)

### Intellectual Contribution

#### **Published**

Underline indicates member(s) of Syed laboratory, and categories are further broken down as follows: <sup>+</sup> Indicates graduate student under my supervision; <sup>#</sup> Indicates post-doc under my supervision; <sup>§</sup> Indicates undergraduate or high school student under my supervision; <sup>^</sup> indicates lab technician; \* indicates the corresponding author. Journal rankings are based on CiteScore obtained from Scopus and are provided for either the year of publication or the most recent ranking if rankings are unavailable for that year). (SNIP = Source Normalize Impact per Paper SJR = Scimago Journal Rank)

1. <sup>+</sup>Littler, A., <sup>+</sup>Pandey, P., <sup>+</sup>O'Dell Jr. K. \* and Syed, Z. (2022). Chemical ecology of oviposition dynamics in *Drosophila suzukii* (Diptera: Drosophilidae). *Journal of Economic Entomology*. 115 (4) 1029-1035.

Author Role: Conception and design of the study: L.A. and Z.S.; Acquisition of data: L.A., P.P. and Z.S.; Analysis and/or interpretation of data: L.A., P.P., OK. and Z.S; Writing and editing of the m/s: LA, PP, OK and ZS.

2. Josek, T., Sperrazza, J., Alleyne, M. and Syed, Z. (2021) Neurophysiological and behavioral responses of blacklegged ticks to host odors. *J Insect Physiol.* 128:104175. <https://doi.org/10.1016/j.jinsphys.2020.104175>.

Author Role: Conception and design of the study: JT, AM and Z.S.; Acquisition of data: JT and Z.S.; Analysis and/or interpretation of data: JT, SJ and Z.S. Writing and editing of the m/s: JT, SJ, AM and ZS.

3. Chauhan, K. R., McPhatter, L. P., <sup>+</sup> O'Dell, K., Syed, Z., Wheeler, A., Debboun, M. (2021). Evaluation of a novel user-friendly arthropod repellent gel, Verdegen. *Journal of Medical Entomology*. doi: 10.1093/jme/tjab065 (in press)

Scopus Metric Year: 2019 | Category: Veterinary: General Veterinary | CiteScore: 3.4 | Highest Percentile: 90 | Rank: #/N: 18/178 | SNIP: 0.87 | SJR: 0.896

Author Role: K.O. and Z.S. analyzed the data, contributed a figure, and contributed to writing the manuscript.

4. <sup>#</sup>Hickner, P. V., Timoshevskaya, N., <sup>+</sup>Nowling, R. J., Labbe, F., <sup>§</sup>Nguyen, A. D., McDowell, M. A., <sup>#</sup>Spiegel, C. N., \*Syed, Z. (2020). Molecular signatures of sexual communication in the phlebotomine sand flies. *PLoS Neglected Tropical Diseases*, 14(12). doi: 10.1371/journal.pntd.0008967

Scopus Metric Year: 2019 | Category: Public Health, Environmental and Occupational Health | CiteScore: 7.6 | Highest Percentile: 95 | Rank: #/N: 23/516 | SNIP: 1.494 | SJR: 2.148

Author Role: P.V.H. and Z.S designed research; P.V.H., R.J.N., A.D.N., C.N.S., Z.S. conducted the research; P.V.H., R.J.N., A.D.N., C.N.S., Z.S. analyzed the data; P.V.H., R.J.N. and Z.S. wrote the paper.

5. <sup>#</sup>Hickner, P. V., <sup>#</sup>Mittapalli, O., <sup>+</sup>Subramoniam, A., Sagel, A., Watson, W., Scott, M., Arp, A. P., de León, A. A., <sup>\*</sup>Syed, Z. (2020). Physiological and molecular correlates of the screwworm fly attraction to wound and animal odors. *Scientific Reports*. 10(1), 20771. doi: 10.1038/s41598-020-77541-w

Scopus Metric Year: 2019 | Category: Multidisciplinary | CiteScore: 7.2 | Highest Percentile: 93 | Rank: <sup>#</sup>/N: 8/111 | SNIP: 1.365 | SJR: 1.341

Author Role: P.V.H., O.M., A.P.A., A.P.L., W.W., M.J.S. and Z.S. designed research; P.V.H., O.M., A.S. (Panama), A.S. (University of Kentucky), A.P.L. and Z.S. conducted the research; P.V.H., O.M. and Z.S. analyzed the data; P.V.H., O.M., A.P.A. and Z.S. wrote the paper.

6. <sup>\*</sup>Scott, M. J., Benoit, J. B., Davis, R. J., Bailey, S. T., Varga, V., Martinson, E. O., <sup>+</sup> Hickner, P. V., **Syed, Z.**, Cardoso, G. A., Torres, T. T., Weirauch, M. T., Scholl, E. H., Phillippy, A. M., Sagel, A., Vasquez, M., Quintero, G., Skoda, S. R. (2020). Genomic analyses of a livestock pest, the New World screwworm, find potential targets for genetic control programs. *Communications Biology*, 3(1), 424. doi: 10.1038/s42003-020-01152-4

Scopus Metric Year: 2019 | Category: General Agricultural and Biological Sciences | CiteScore: 2 | Highest Percentile: 67 | Rank: <sup>#</sup>/N: 66/203 | SNIP: 1.233 | SJR: 2.15

Author Role: Chemosensory genome analyses, interpretation and write-up was performed by P.V.H. and Z.S.

7. Zhu, G. H., Zheng, M. Y., Sun, J. B., Khuhro, S. A., Yan, Q., Huang, Y., **Syed, Z.**, Dong, S. L. (2019). CRISPR/Cas9 mediated gene knockout reveals a more important role of PBP1 than PBP2 in the perception of female sex pheromone components in *Spodoptera litura*. *Insect Biochemistry and Molecular Biology*, 115. doi: 10.1016/j.ibmb.2019.103244

Scopus Metric Year: 2019 | Category: Insect Science | CiteScore: 6.7 | Highest Percentile: 97 | Rank: <sup>#</sup>/N: 4/142 | SNIP: 1.381 | SJR: 1.341

Author Role: Z.S. contributed to data analysis, data validation and manuscript editing.

8. Cloonan, K.R., Abraham, J., Angeli, S., **Syed, Z.** and Rodriguez-Saona, C., 2018. Advances in the chemical ecology of the spotted wing drosophila (*Drosophila suzukii*) and its applications. *Journal of Chemical Ecology*, 44(10), 922-939.

Scopus Metric Year: 2018 | Category: Agricultural and Biological Sciences: Ecology, Evolution, Behavior and Systematics | CiteScore: 4.1 | Highest Percentile: 77 | Rank: <sup>#</sup>/N: 134/603 | SNIP: 1.15 | SJR: 1.028

Author Role: Z.S. contributed data, interpretation and manuscript writing.

9. Cloonan, K. R., Hernández-Cumplido, J., De Sousa, A. L. V., Ramalho, D. G., Burrack, H. J., Della Rosa, L., Diepenbrock, L. M., Ballman, E., Drummond, F. A., Gut, L. J., Hesler, S., Isaacs, R., Leach, H., Loeb, G. M., Nielsen, A. L., Nitzsche, P., Park, K. R., **Syed, Z.**, Van Timmeren, S., Wallingford, A. K., Walton, V. M., Rodriguez-Saona, C. (2019). Laboratory and field evaluation of host-related foraging odor-cue combinations

to attract *Drosophila suzukii* (Diptera: Drosophilidae). *Journal of Economic Entomology*, 112(6), 2850-2860. doi: 10.1093/jee/toz224

Scopus Metric Year: 2018 | Category: Agricultural and Biological Sciences: Insect Science | CiteScore: 3.1 | Highest Percentile: 75 | Rank: #/N: 35/140 | SNIP: 1.055 | SJR: 0.826

Author Role: Z.S. contributed data, interpretation and manuscript writing.

### **Book, Chapter in Scholarly Book-New**

Syed Z., O'Dell, K. (2022). Finding a Repellent Against Ticks: Neurophysiological and Behavioral Approaches Advances in Arthropod Repellents, 131-140. Academic Press.

### **Sponsored Projects**

#### **Awarded**

Syed Z., Finding Tick Repellents: Development of neurophysiological and behavioral paradigms, Sponsored by University of Florida Submitted: April 24, 2021. Funding Dates: July 1, 2021 - May 31, 2023. | Awarded: \$80,000.00  
OSPA ID: 202104241209

Syed Z., Identifying Novel Tick Attractants and Repellents by Exploiting Their Olfactory and Eco-Physiology, Sponsored by National Institute of Allergy and Infectious Diseases Submitted: October 16, 2020. Funding Dates: June 7, 2021 - May 31, 2023. | Awarded: \$378,500.00  
OSPA ID: 202010161544

Syed Z., and Haynes K., F., Phase II IUCRC at the University of Florida: Center for Arthropod Management Technologies, Sponsored by University of Florida Submitted: January 18, 2022. Funding Dates: January 1, 2022 - May 23, 2023. | Awarded: \$80,000.00 OSPA ID: 202201181016

Syed Z., Functional Characterization of Sex-biased Odorant Receptors in Screwworm to Develop Sex Specific Baits, Sponsored by Agricultural Research Service Submitted: September 23, 2020. Funding Dates: September 1, 2020 - August 31, 2022. | Awarded: \$60,000.00 OSPA ID: 202009231223

Syed Z., Developing an Attractant for *Lygus hesperus* Derived from Post Plant Volatile Compounds, Sponsored by University of Notre Dame Submitted: August 22, 2018. Funding Dates: September 1, 2018 - August 31, 2022. | Awarded: \$236,375.00 OSPA ID: 201808222012

Syed Z., Identifying the signatures of cuticular hydrocarbon profiles of screwworm and related flies towards developing taxonomic identification keys and enhanced baits, Sponsored by Agricultural Research Service Submitted: August 31, 2018. Funding Dates: September 1, 2018 - June 30, 2022. | Awarded: \$95,000.00 OSPA ID: 201808311307

## Closed

Syed Z., Enhancing pollination by attracting and retaining leaf cutting bees, *Megachile rotundata*, in alfalfa seed production fields, Sponsored by Agricultural Research Service Submitted: July 11, 2018. Funding Dates: July 1, 2018 - June 15, 2021. | Awarded: \$14,098.00  
OSPA ID: 201807111100

Syed Z., Developing Sustainable Strategies to Manage Spotted Wing Drosophila in United States Fruit Crops, Sponsored by North Carolina State University Submitted: July 9, 2018. Funding Dates: September 1, 2018 - February 28, 2021. | Awarded: \$186,864.00 OSPA ID: 201807090933

Syed Z., Evaluation of attractive blends, lures and field deployable baits against *Drosophila suzukii* based on the identified volatiles, Sponsored by California Cherry Board Submitted: July 10, 2018. Funding Dates: August 1, 2018 - July 31, 2019. | Awarded: \$14,853.00 OSPA ID: 201807101813

## Not Funded

Rittschof C., C., Sullivan P., G., Fan W.-M., T., DeVries Z., C., Syed Z., Breath to Brain: Metabolic Regulation of Foraging and Defensive Behaviors in the Honey Bee, Sponsored by National Science Foundation Submitted: June 7, 2020. Requested: \$757,828.00, | Awarded: \$0.00 OSPA ID: 202006071021

Rittschof C., C., Sullivan P., G., Syed Z., Energetic Regulation of Honey Bee Aggression, Sponsored by National Science Foundation Submitted: June 3, 2019. | Awarded: \$0.00 OSPA ID: 201906030835

Syed Z., Implementing Sustainable Spotted Wing Drosophila (SWD) Management in US Fruit Crops to Address Emerging and Continuing Challenges, Sponsored by Rutgers University Submitted: April 27, 2019. | Awarded: \$0.00  
OSPA ID: 201904270930

Syed Z., Management of *Lygus hesperus* using plant derived attractants, Sponsored by National Institute of Food and Agriculture Submitted: April 16, 2021. | Awarded: \$0.00 OSPA ID: 202104160920

## Pending

Stevenson B., Larson J., Thorson J., S., McWhorter K., L., Teets N., M., Bessin R., T., Palli S., R., Dobson S., L., Fisher T., W., Christian W., J., Syed Z., Appalachian Vector-borne Disease Center of Excellence, Sponsored by Center for Disease Control and Prevention Submitted: January 21, 2022. | Awarded: \$0.00  
OSPA ID: 202201211657

McClintock T., S., Syed Z., Natural Odor Environment Effects on the Olfactory Epithelium, Sponsored by National Institute of Health Submitted: January 9, 2022. | Awarded: \$0.00 OSPA ID: 202201091016

McClintock T., S., Syed Z., Natural Odor Environment Effects on the Olfactory Epithelium, Sponsored by National Institute of Health Submitted: May 24, 2022. | Awarded: \$0.00 OSPA ID: 202205240939

McClintock T., S., Syed Z., The Olfactory Epithelium in Natural Odor Environments, Sponsored by National Institute of Health Submitted: September 22, 2021. | Awarded: \$0.00 OSPA ID: 202109221616

## Non-Sponsored Projects

### Federal Not Funded

Syed, Z. (Principal), Identifying novel natural tick attractants and repellents, Deployed War Fighter Protection (DWFP) Research Program (Armed Forces Pest Management Board, AFPMB).

Description: Request was made to study tick's olfactory system to isolate and identify attractants and repellents.

Syed, Z. (Principal), Identifying novel tick attractants and repellents by exploiting the sensory biology, Division of Vector-Borne Diseases, Centers for Disease Control and Prevention (CDC).

Description: Pre-proposal was submitted, but was not invited for the submission of full proposal.

### Hatch On-going

Syed, Z., Exploiting the sense of smell for the development of attractants and repellents against arthropod vectors of diseases, HATCH, (November 21, 2019 - September 30, 2024).

### Other Not Funded

Syed, Z. (Principal), Haynes, K. F. (Co-Investigator), A robust and comprehensive platform to identify pheromones and other attractants for the Fall armyworm, Center for Arthropod Management Technologies (CAMTech).

Description: Pre-proposal submitted. but was not invited for full submission.

Syed, Z. (Principal), Development of Tools and Techniques for Identifying Novel Natural Attractants and Repellents for Ants, Center for Arthropod Management Technologies (CAMTech).

Description: Two-year funding was requested. The pre-proposal was submitted and selected for the submission as a full proposal. Not funded.

Syed, Z., Finding Repellent Against Ticks: Development of neurophysiological and behavioral paradigms, Center for Arthropod Management Technologies (CAMTech), (July 1, 2021 - Present).

Description: Two-year funding request. The pre-proposal was submitted, and I received the request to submit a full proposal.

## Presentations Given

### Keynote or plenary address

1. **Syed, Z.** (2021) "*Insect olfaction in the era of genomes, transcriptomes and proteomes*". International virtual symposium on Insect Olfaction and Taste. Keynote speaker (Host: Wynand Van Der Goes Van Naters, Coral Warr and Walter Leal).

2. **Syed Z.** (2020) "*Chemical Ecology in the Era of Genomes, Transcriptomes and Proteomes*" Entomological Society of America - International Branch Virtual Symposium (Chemical Ecology), International Branch. Plenary lecture (Host: Baldwyn Torto).

### Student Choice speaker

1. **Syed, Z.** (2022). "*Chemical Ecology in the era of genomes, transcriptomes and proteomes*". Department of Entomology. Student Choice Speaker. Kansas State University (Host: Popenoe Entomology Club).

### Invited Speaker

1. **Syed, Z.** (2022) "*What and how does a pest drosophilid smell? An evolutionary history.*" Entomology Department, Penn State University (Host: Gary Felton).
2. **Syed, Z.** (2021). "*Sandflies, Songs and Pheromones*" 6<sup>th</sup> Meeting of the Latin American Association of Chemical Ecology (ALAEQ). Argentina. (Host: Romina Barrozo and Pablo Guerenstein).
3. **Syed, Z.** (2021). "*How 'nose' works? Chemical signaling and reception in 'simpler' systems*" Physiology Seminar Series – Fall 2021, Department of Physiology. College of Medicine. University of Kentucky. (Host: Tim McClintock)
4. **Syed, Z.** (2021). "*Insect olfaction in the era of genomes, transcriptomes and proteomes*". Virtual symposium on Insect Olfaction and Taste, Invited/Keynote speaker (Host: Wynand Van Der Goes Van Naters, Coral Warr and Walter Leal).
5. **Syed, Z.** (2021). "*Molecular signatures of sexual communication in the phlebotomine sand flies*". International Conference of Insect Science, Symposium of Insect Chemoreception. China. (Host: Chenzhu Wang and John Carlson).
6. **Syed, Z.** (2021). "*The odor world of a fly*". Department of Neurobiology, Physiology and Behavior, University of California-Davis, CA. (Host: Gabrielle Nevitt).
7. **Syed, Z.** (2020). "*Insights from Insect Chemical Ecology, Genomes, Transcriptomes and Proteomes for pest manipulations*". Institutional Seminar - USDA, Knipling-Bushland U.S. Livestock Insects Research Laboratory: Kerrville, TX (Host: Adalberto A Perez De Leon).
8. **Syed, Z.** (2020). "*How Repellents Work? Examples from ticks and mosquitoes*". Tennessee Mosquito and Vector Control Association Annual Meeting, Tennessee Mosquito and Vector Control Association TN. (Host: Adrianna Sharkey & Rebecca Trout Fryxell).
9. **Syed, Z.** (2019). "*Flies, Odors, Receptors and Perception*". Entomological Society of America Annual Meeting, ESA). (Hosts: Walter Leal and John Carlson)
10. **Syed, Z.** (2019). "*Molecular Signatures for Sexual Communication in Flies*". XXVI International Congress of Entomology. (Meeting cancelled due to COVID-19)



11. **Syed, Z.** (2019). "*Chemical Ecology in the Era of Genomes, Transcriptomes and Proteomes*". ESA International Branch Virtual Symposium (Chemical Ecology), Plenary Speaker. Virtual
12. **Syed, Z.** (2019). "*Insights from genomes, transcriptomes and proteomes for insect manipulations*". ESA North Central meet Symposium "Linking Genes to Behavior: Expanding the Targets for Behaviorally-Based Management of Insects". (Hosts: Erin Scully and Rob Morrison).
13. **Syed, Z.** (2019). "*Chemosensation in Insects: Evolutionary and Functional Origins*". Department of Entomology & Keck Center for Behavioral Biology. N.C. State University, Raleigh, NC. (Host: Coby Schall).
14. **Syed, Z.** (2019). "*Insects & Horses*". 8<sup>th</sup> Annual UK Equine Showcase. Lexington, KY.
15. **Syed, Z.** (2018). "*Fly model: Volatile world of olfactory ligands and reception*". School of Life Sciences. Arizona State University. (Host: Brian Smith)
16. **Syed, Z.** (2018). "*Volatile World of Olfactory Signals and Reception in Insects*". Departmental Seminar, Departmental. Ohio State University - Wooster, OH. (Host: Peter Piermarini).
17. **Syed, Z.** (2018). "*Volatile World of Olfactory Ligands and Reception*". Department of Biology, University of Kentucky, Lexington, KY. (Host: Catherine Linnen).
18. **Syed, Z.** (2018). "*Evolution of Signal and Reception in Blood Feeding Arthropods*". 28<sup>th</sup> European Chemoreception Research Organization Congress, International. Wurzburg, Germany. (Hosts: Conor McMeniman and Olena Riabinina).
19. **Syed, Z.** (2018). "*Molecular and Physiological Correlates of Peripheral Olfactory Modulation*". 34<sup>th</sup> International Symposium of Chemical Ecology, Budapest, Hungary. (Hosts: Rob Mitchell and Martin Andersson).
20. **Syed, Z.** (2018). "*Developing an Attractant for *Lygus hesperus* Derived from Host Plant Volatile Compounds*". The North American Alfalfa Improvement Conference. Logan, UT.
21. **Syed, Z.** (2017). "*From lab to the field: How basic understanding of chemical ecology, neuroethology and molecular biology can lead to developing field deployable baits*". Department of Entomology & Nematology. University of California-Davis. (Host: Frank Zalom/Joanna Chiu)
22. **Syed, Z.** (2017). "*Evolution of Chemical Communication in Insects*". Department of Entomology, Texas A&M University, College Station, TX. (Host: Dr. Ed Vargo).
23. **Syed, Z.** (2017). "*Bug Smell – Evolution of Chemical Communication*". Department of Entomology, University of Maryland, College Park, MD. (Host: Dr. Megan Fritz)
24. **Syed, Z.** (2017). "*Principles of Behavior*". Symposium on Methods in Behavioral Ecology. Penn State University, PA. (Host: Dr. Elizabeth Rowen)

25. **Syed, Z.** (2017). "*Enhancing pollination by attracting and retaining leafcutting bees (Megachile rotundata) in alfalfa seed production fields*". USDA-Western alfalfa seed Growers Association workshop. Las Vegas, NV. (Host: Dr. Theresa Pitts-Singer)
26. **Syed, Z.** (2016). "*Flies & Mosquitoes: Volatile world of olfaction*". Department of Entomology, Genetics and Neuroscience Programs, Michigan State University (Host: Dr. Ke Dong)
27. **Syed, Z.** (2016). "*Sugar feeding in Mosquitoes. Concepts and Application*". Hebrew University-Westham Co. Israel. (Host. Dr. Gunter Muller)
28. **Syed, Z.** (2016). "*How vector insects find their host? Insights from signals and Reception*". World Life Science Conference (Session: Insect vectors for animal, human, and plant diseases). November 2016. Beijing, China. (Host: Drs. Le Kang & John Hildebrand).
29. **Syed, Z.** (2016). "*Chemical Ecology of Vector-Host Interactions*". 1<sup>st</sup> Joint meeting of International Society of Chemical Ecology (ISCE) - the Latin American Association of Chemical Ecology (ALAEQ). July, Paraná, Brazil. (Host: John Hildebrand/Pablo Guerenstein). (*Declined*)

### Teaching (since 2018)

| Prefix Number - Section | Credit Hours | # Enrolled | Code Term Year      |
|-------------------------|--------------|------------|---------------------|
| ENT 768 - 015           | 1-6          | 1          | 30 Spring 2021-2022 |
| ENT/BIO/CPH 561         | 3            | 15         | 10 Fall 2021-2022   |
| ENT 770 - 001           | 0-1          | 7          | 10 Fall 2021-2022   |
| ENT 790 - 016           | 1-6          | 1          | 10 Fall 2021-2022   |
| ENT 768 - 011           | 1-6          | 1          | 30 Spring 2020-2021 |
| ENT/BIO/CPH 561         | 3            | 17         | 10 Fall 2020-2021   |
| ENT 768 - 001           | 1-6          | 1          | 10 Fall 2020-2021   |
| ENT/BIO/CPH 561         | 3            | 19         | 10 Fall 2019-2020   |
| ENT 770 - 001           | 0-1          | 10         | 10 Fall 2019-2020   |
| ENT 790 - 016           | 1-6          | 3          | 10 Fall 2019-2020   |
| ENT/BIO/CPH 561         | 3            | 20         | 10 Fall 2018-2019   |

### Teacher Course Evaluations

| Prefix Number - Section | Responses | TCE Course Quality Mean | TCE Teaching Quality Mean | Code Term Year    |
|-------------------------|-----------|-------------------------|---------------------------|-------------------|
| ENT 561 - 001           | 6         | 4.33                    | 4.83                      | 10 Fall 2020-2021 |
| ENT 561 - 001           | 5         | 3.60                    | 4.40                      | 10 Fall 2019-2020 |

|               |   |      |      |                   |
|---------------|---|------|------|-------------------|
| ENT 561 - 001 | 6 | 4.50 | 4.67 | 10 Fall 2018-2019 |
| ENT 770 - 001 | 6 | 4.00 | 4.17 | 10 Fall 2019-2020 |

Note: With regards to 2020 TCEs please consider the following from page 121 of the UK Playbook for Fall 2020, "It is essential that performance evaluation take into account the extenuating circumstances brought about by the disruption for faculty in all title series and the extraordinary work accomplished by faculty in response to the disruption. Academic leaders shall reiterate that TCEs should be but one indicator of effective teaching in both periodic merit reviews and tenure/promotion decisions. Evaluation of teaching must go beyond student evaluations alone."

## Theses and Dissertations

### Graduate student advising

1. Kenneth O'Dell, PhD. "Chemical ecology and sensory physiology of the tick, *Ixodes scapularis*" (November 2020 - Present).
2. Daniel Lingeman, MS. "Repellence Dynamics in *Amblyoma Americanum*" (August 2022 - Present).
3. Aerianna Littler, MS. "Chemical ecology of the spotted wing fly, *Drosophila suzukii*" (August 2020 – June 2022).
4. Pritika Pandey, PhD. "Molecular aspects of chemosensation in *Drosophila Suzuki*" Employee relocation. Student left the program to join her husband in a different state (April 2019 - August 2020).
5. Anjana Subramoniam, PhD. "Evolution of blood feeding in Arthropods," Changed major to Biology at UK. (August 2019 - May 2020).

### Graduate students committees

1. Dissertation Committee - Ryan Ridenbaugh, UK. (2021- Present)
2. Master's Thesis Committee – Simona Principato, UK. (2021 - Present)
3. Master's Thesis Committee – Isabelle Lucero, UK. (2021 - Present)
4. Dissertation Committee - Brandon Hall, Kansas State University. (2021 - Present)
5. Dissertation Committee - Najla Albishi, UK. (2019 - Present)
6. Dissertation Committee - Rebecca Westwick, UK. (2019 - Present)
7. Dissertation Committee - Ellie McCabe, UK. (2019 - Present)
8. Dissertation Committee - Ryan Kuesel, UK. (2018 - Present)
9. Master's Thesis Committee - Shankar Chereddy, UK. (2018 - 2020)
10. Dissertation Committee - Kim Vertacnik, UK. (2018 - 2020)
11. Dissertation Committee - Megan Thomas, UK. (2018 - 2020)
12. Master's Thesis Committee - Paul Baker, UK. (2017 - 2019)

### Post-doctoral Scholar Advising

1. Omprakash Mittapalli (April 2020 - present)
2. Lucie Conchou (September 2021 - present)
3. Santosh Revadi (September 2021- present)
4. Paul Hickner (April 2, 2018 - March 31, 2020)

Current Position: Scientist at USDA, Knippling-Bushland U.S. Livestock Insects Research Laboratory, Kerrville, TX.

### Undergraduate Student Advising

1. Bradford Hull (UK) – Summer 2018
2. Omar Azeem (McGill University, Canada) – Summer 2021
3. Maxxton Blackburn (UK) – Summer 2021

### Visiting Scientists

1. Jackson Audley (September 2018)  
Graduate Student, University of California-Davis, CA.
2. Dr. Carolina Spiegel (October 2019)  
Institute of Biology, Fluminense Federal University, Brazil.

## **Professional Service (since 2016)**

### **Departmental service (member of committees)**

1. Assistant Professor of Livestock and Public Health Entomologist Recruitment Committee (May 2021)
2. Graduate Program Committee (July 2020 - Present)
3. Future Departmental Hires Committee (Jan. 2019 - Present)
4. One Health Entomologist Recruitment Committee (Oct. 2019 - March 2020)
5. Urban Extension Entomologist Recruitment Committee (Sept. 2018 – June 2019)

### **Editorial service**

1. Subject Editor, *Journal of Medical Entomology* (2022 – present)
2. Guest Editor, *Proceedings of the National Academy of Sciences, USA* (PNAS) (2021)
3. Founding Editorial Board member, *Current Research in Insect Science* (2020 - Present)
4. Editorial Review Board Member, *Chemoecology* (2018 - Present)
5. Editorial Review Board Member, *Scientific Reports*, a Nature journal (2017 - Present)
6. Associate Editor, *Frontiers in Physiology* (2016 - Present)
7. Invited to be the subject Editor for *PLoS One* (2013; Declined)

### **Peer reviewer (Journals):**

Animal Behaviour, Annals of the Entomological Society of America, Current Biology, Environmental Entomology, Frontiers in Neuroscience, Journal of Comparative Physiology A, Journal of Economic Entomology, Journal of Chemical Ecology, Journal of Insect Physiology, Journal of Medical Entomology, Journal of Visualized Experiments (JoVE), Micron, *Nature Scientific Reports*, Neotropical Entomology, Pest Management Science. Physiological Entomology, Proceedings of the National Academy of Science USA (PNAS), Proceedings of the Royal Society B, Public Library of Science-One (PLoS One), Public Library of Science-NTD (PLoS NTD), *Nature Communications*, eLife, Science

### **Reviewer (grant proposals):**

1. National Institute of Health, USA
2. Israel Science Foundation, Israel
3. Czech Science Foundation, Czech Republic
4. National Science Foundation (Career Grant)
5. National Science Foundation's Graduate Research Fellowship (NSF-GRFP)

6. Wellcome Trust Sir Henry Dale Fellowship, UK
7. Netherlands Organisation for Scientific Research, Netherlands
8. Le Stadium, Institute for Advanced Studies, France

### **Awards and Honors**

- 2022 - Subject Editor, *Journal of Medical Entomology*  
2021 Guest Editor, *Proceedings of National Academy of Science*, USA (PNAS)  
2020 Plenary Lecture, ESA International Virtual Symposium (Chemical Ecology)  
2018 - 21 Councilor, International Society of Chemical Ecology  
2015 Chair, Editorial Board, *Journal of Medical Entomology*  
2013 & 17 Arthropod Genomics Symposium Session Chair  
2009 Post-doc of the year, University of California-Davis, CA  
2003 – 05 DFG Post-doctoral Fellowship. Germany  
1999 – 02 National Science Foundation Graduate Fellowship, Switzerland

### **Student Honours**

1. NSF Graduate Research Fellowship - 2016. Heather (Raven) Forrest Fruscalzo
2. Fulbright Study & Research grant - 2016. Savannah Kounelis
3. Undergraduate Summer Research Fellowship (University of Notre Dame) – 2016. Kathleen Davin \$4,500
4. College of Science Undergraduate Summer Research Fellowship (University of Notre Dame) – 2016. Bryce de Venecia \$4,500
5. College of Science Undergraduate Summer Research Fellowship (University of Notre Dame) – 2016. Anthony Nguyen \$4,500

## **Professional Development and Training**

- 021: Working with Students and Staff in Research/Creative Environments. College of Agriculture, Food and Environment Workshop. April 2021
- 2020: Writing winning grant proposals. Grants Writers' Seminar & workshop by Lauren Broyles. December 2020

# Dr. Nicholas M. Teets

College of Agriculture, Food and Environment  
Department of Entomology

## Education

2012 PhD in Entomology, Ohio State University, Columbus, OH

Advisor: Professor David L. Denlinger

*Thesis title:* Cellular and Molecular Mechanisms of Environmental Stress Tolerance in Insects

2007 B.S. in Zoology, Minor in Mathematics, Miami University, Oxford, OH

*Summa Cum Laude, Honors with Distinction*

Advisor: Professor Richard E. Lee, Jr.

*Thesis title:* *In vivo* and *in vitro* rapid cold-hardening in the Antarctic midge, *Belgica antarctica*: Evidence of a role for calcium

## Work History

2021-present Associate Professor, Department of Entomology, University of Kentucky

2016-2021 Assistant Professor, Department of Entomology, University of Kentucky

2013-2016 Postdoctoral Associate, Department of Entomology and Nematology, University of Florida,  
Advisor: Dr. Daniel A. Hahn

2012-2013 Postdoctoral Researcher, Department of Evolution, Ecology, and Organismal Biology, Ohio State University, Advisor: Dr. David L. Denlinger

## Research and Scholarship

### Intellectual Contributions

\* = Senior Author    ~ = Corresponding Author    + = Grad/Prof Student    # = Post Doc    ^ = Undergraduate

WOS = Web of Science    JIF = Journal Impact Factor    TC = Journal Total Cites

SNIP = Source Normalize Impact per Paper    SJR = Scimago Journal Rank

### Published

#### Journal Article, Academic Journal

+ ~ Devlin, J.J., +Unfried, K., #Lecheta, M.C., +McCabe, E.A., Gantz, J.D., Kawarasaki, Y., Elnitsky, M.A., Hotaling, S., Michel, A.P., Convey, P., Hayward, S.A.L., \*Teets, N.M. (2022). Simulated winter warming negatively impacts survival of Antarctica's only endemic insect. *Functional Ecology* 36, 1949-1960. [doi.org/10.1111/1365-2435.14089](https://doi.org/10.1111/1365-2435.14089)

Nadeau, E.A.W., Lecheta, M.C., Obrycki, J.J., \*Teets, N.M. (2022). Transcriptional regulation of diapause in the convergent lady beetle, *Hippodamia convergens*. *Insects* 13, 343. [doi.org/10.3390/insects13040343](https://doi.org/10.3390/insects13040343)

+ ~Dias, V. S., Cáceres, C., Parker, A. G., Pereira, R., Demirbas-Uzel, G., Abd-Alla, A. M.M., Teets, N. M., Schetelig, M. F., Handler, A. M., \*Hahn, D. A. (2021). Mitochondrial superoxide dismutase overexpression and low oxygen conditioning hormesis improve the performance

- of irradiated sterile males, *Scientific Reports*, 11, 1-15. doi: 10.1038/s41598-021-99594-1
- + ~ Spacht, D. E., Gantz, J. D., +Devlin, J. J., +McCabe, E. A., Lee, R. E., Denlinger, D. L., Teets, N. M. (2021). Fine-scale variation in microhabitat conditions influences physiology and metabolism in an Antarctic insect, *Oecologia*, 197(2), 373-385. doi: 10.1007/s00442-021-05035-1
- ^Littler, A. S., #Garcia, M. J., \*~Teets, N. M. (2021). Laboratory diet influences cold tolerance in a genotype-dependent manner in *Drosophila melanogaster*, *Comparative Biochemistry and Physiology -Part A : Molecular and Integrative Physiology*, 257. doi: 10.1016/j.cbpa.2021.110948
- \*~Teets, N. M., Meuti, M. E. (2021). Hello Darkness, My Old Friend: A Tutorial of Nanda-Hamner Protocols, *Journal of Biological Rhythms*, 36(3), 221-225. doi: 10.1177/0748730421998469
- + ~ Potts, L. J., Kostal, V., Simek, P., \* Teets, N. M. (2020). Energy balance and metabolic changes in an overwintering wolf spider, *Schizocosa stridulans*, *Journal of Insect Physiology*, 126, 104112.  
Author Role:
- + ~Potts, L. J., Košťál, V., Simek, P., \*~Teets, N. M. (2020). Energy balance and metabolic changes in an overwintering wolf spider, *Schizocosa stridulans*, *Journal of Insect Physiology*, 126. doi: 10.1016/j.jinsphys.2020.104112
- + ~ Potts, L. J., # Garcia, M. J., \* Teets, N. M. (2020). Chilling in the cold: Using thermal acclimation to demonstrate phenotypic plasticity in animals., *CourseSource*. doi: doi.org/10.24918/cs.2020.21
- # ~ Garcia, M. J., ^ Littler, A. S., ^ Sriram, A., \* Teets, N. M. (2020). Distinct cold tolerance traits independently vary across genotypes in *Drosophila melanogaster*, *Evolution*, 74(7), 1437-1450. doi: 10.1111/evo.14025
- # ~ Lecheta, M. C., # Awde, D. N., + O'Leary, T. S., + Unfried, L. N., ^ Jacobs, N. A., ^ Whitlock, M. H., + McCabe, E., Powers, B., Bora, K., Waters, J. S., Axen, H. J., Fietze, S., Lockwood, B. L., Teets, N. M., \* Cahan, S. H. (2020). Integrating GWAS and transcriptomics to identify the molecular underpinnings of thermal stress responses in *Drosophila melanogaster*, *Frontiers in Genetics*, 11. doi: 10.3389/fgene.2020.00658
- # ~ Awde, D. N., ^ Fowler, T. E., + Pérez-Gálvez, F., # Garcia, M. J., \* Teets, N. M. (2020). High-Throughput Assays of Critical Thermal Limits in Insects, *Journal of visualized experiments : JoVE*(160). doi: 10.3791/61186
- + ~ Mercer, N. H., Teets, N. M., Bessin, R. T., \* Obrycki, J. J. (2020). Supplemental Foods Affect Energetic Reserves, Survival, and Spring Reproduction in Overwintering Adult *Hippodamia convergens* (Coleoptera: Coccinellidae), *Environmental Entomology*, 49(1), 1-9. doi: 10.1093/ee/nvz137
- ~ Gantz, J. D., Philip, B. N., Teets, N. M., Kawarasaki, Y., + Potts, L. J., + Spacht, D. E., Benoit, J. B., \* Denlinger, D. L., \* Lee, E. (2020). Brief exposure to a diverse range of environmental stress enhances stress tolerance in the polyextremophilic Antarctic midge, *Belgica antarctica*, *bioRxiv*. doi: <https://doi.org/10.1101/2020.01.01.887414>

- \* ~ Teets, N. M., ^ Dalrymple, E. G., ^ Hillis, M. H., Gantz, J. D., + Spacht, D. E., Lee, R. E., Denlinger, D. L. (2020). Changes in energy reserves and gene expression elicited by freezing and supercooling in the antarctic midge, *Belgica antarctica*, *Insects*, 11(1). doi: 10.3390/insects11010018
- + ~ Potts, L. J., Gantz, J. D., Kawarasaki, Y., Philip, B. N., Gonthier, D. J., Law, A. D., Moe, L. A., Unrine, J. M., McCulley, R. L., Lee, R. E., Denlinger, D. L., \* Teets, N. M. (2020). Environmental factors influencing fine-scale distribution of Antarctica's only endemic insect, *Oecologia*. doi: 10.1007/s00442-020-04714-9
- # Nadeau, E. A.W., \* ~ Teets, N. M. (2020). Evidence for a rapid cold hardening response in cultured *Drosophila* S2 cells, *Journal of Experimental Biology*, 223(2). doi: 10.1242/jeb.212613
- \* ~ Teets, N. M., Gantz, J. D., Kawarasaki, Y. (2020). Rapid cold hardening: ecological relevance, physiological mechanisms and new perspectives, *The Journal of Experimental Biology*, 223. doi: 10.1242/jeb.203448
- # ~ AL-Amery, M., Downie, B., DeBolt, S., Crocker, M., Urschel, K. L., Goff, B. M., Teets, N. M., Gollihue, J., \* Hildebrand, D. F. (2019). Proximate composition of enhanced DGAT high oil, high protein soybeans, *Biocatalysis and Agricultural Biotechnology*, 21. doi: 10.1016/j.bcab.2019.101303
- \* ~ Teets, N. M., Kawarasaki, Y., + Potts, L. J., Philip, B. N., + Gantz, J. D., Denlinger, D. L., Lee, R. E. (2019). Rapid cold hardening protects against sublethal freezing injury in an Antarctic insect, *Journal of Experimental Biology*, 222(15), jeb206011. doi: 10.1242/jeb.206011
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- # Garcia, M. J., \* ~ Teets, N. M. (2019). Cold stress results in sustained locomotor and behavioral deficits in *Drosophila melanogaster*, *Journal of Experimental Zoology Part a-Ecological and Integrative Physiology*, 331(3), 192-200. doi: 10.1002/jez.2253
- \* + Spacht, D. E., Teets, N. M., Denlinger, D. L. (2018). Two isoforms of Pepck in *Sarcophaga bullata* and their distinct expression profiles through development, diapause, and in response to stresses of cold and starvation, *Journal of Insect Physiology*, 111, 41-46. doi: 10.1016/j.jinsphys.2018.10.008
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Teets, N. M., Hayward, S. A.L. (2021). Editorial on combatting the cold: Comparative physiology of low temperature and related stressors in arthropods, *Comparative Biochemistry and Physiology -Part A : Molecular and Integrative Physiology*, 260. doi: 10.1016/j.cbpa.2021.111037

## Sponsored Projects

### Awarded

Teets, N.M., Palli, S.R. Genotype by Environment Interactions Influencing the Efficacy of Insecticidal RNAi, Sponsored by USDA NIFA Biotechnology Risk Assessment Research Grants Program. Submitted: February 15, 2022. Funding Dates: September 1, 2022-August 31, 2025. | Awarded: \$481,057.

Downie A., B., Teets N., M., Development of Long-Term Preservation and Revival Protocols for *Drosophila*, Sponsored by Office of the Director Submitted: February 12, 2021. Funding Dates: August 15, 2021 - July 31, 2023. | Awarded: \$231,573.00  
OSPA ID: 202102121115

Michel A., Hayward S., Convey P., Teets N., M., Mechanisms of Adaptation to Terrestrial Antarctica through Comparative Physiology and Genomics of Antarctic and sub-Antarctic Insects, Sponsored by National Science Foundation Submitted: July 29, 2018. Funding Dates: August 1, 2019 - July 31, 2023. Requested: \$726,070.00, | Awarded: \$780,033.00  
Description: I am the PI on this international collaborative project. In addition the funds granted by NSF, our UK partners receive 300,000 pounds (~\$375,000) to support their efforts. As the lead PI I am overseeing the entire project, and my lab is leading the physiological objectives. Co-PI Michel is directing the population genetics aim, while Hayward and Convey are directing the comparative genomics.  
OSPA ID: 201807291820

Teets N., M., Impact of Genotype and Environmental Variables on Transgene Effectiveness for Conditional Lethality Systems in Insects, Sponsored by National Institute of Food and Agriculture Submitted: March 24, 2017. Funding Dates: September 1, 2017 - August 31, 2022. Requested: \$500,000.00, | Awarded: \$500,000.00  
OSPA ID: 201703241237

Helms-Cahan S., Lockwood B., Fietze S., Waters J., Axen H., Teets N., M., RII Track-2 FEC: From Genome to Phenome in a Stressful World: Epigenetic regulatory mechanisms mediating thermal plasticity in *Drosophila*, Sponsored by University of Vermont Submitted: January 19, 2018. Funding Dates: September 1, 2018 - July 31, 2022. Requested: \$879,118.00, | Awarded: \$879,118.00  
Description: This collaborative proposal involves investigators from four universities. The total grant award is \$4,771,722, with a \$879,118 subaward coming to University of Kentucky.  
OSPA ID: 201801190852

### Closed

Potts L., Grad/Prof Student, Teets N., M., Co-Investigator, Fellowship for Leslie Potts: Winter Warming Effects On Spiders As Biological Control Agents, Sponsored by National Institute of Food and Agriculture Submitted: June 6, 2017. Funding Dates: March 15, 2018 - March 14, 2021. Requested: \$95,000.00, | Awarded: \$95,000.00  
OSPA ID: 201706061121

Garcia M., J., Teets N., M., *Drosophila Suzukii* Population Collection: A Tool For Integrating Evolutionary Principles Into Pest Management, Sponsored by National Institute of Food and Agriculture Submitted: June 5, 2017. Funding Dates: April 1, 2018 - July 31, 2020. Requested: \$165,000.00, | Awarded: \$165,000.00  
OSPA ID: 201706051706

Teets N., M., Molecular Mechanisms of Diapause in the Corn Rootworm Complex, Sponsored by University of Florida Submitted: January 12, 2019. Funding Dates: January 1, 2019 - March 1, 2020. | Awarded: \$82,500.00  
OSPA ID: 201901121139

Teets N., M., Molecular Mechanisms of Diapause In The Corn Rootworm Complex, Sponsored by Iowa State University Submitted: December 16, 2017. Funding Dates: January 1, 2018 - December 31, 2018. | Awarded: \$75,000.00  
OSPA ID: 201712160847

Teets N., M., KSEF RDE: Calcium-Dependent Signaling Mechanisms Governing Rapid Cold Hardening in Insects, Sponsored by KY Science and Technology Co Inc Submitted: December 17, 2015. Funding Dates: July 1, 2016 - December 31, 2018. | Awarded: \$30,000.00  
OSPA ID: 201512170831

Teets N., M., Improving the Efficacy of Sterile Insect Technique by Enhancing Male Performance with Targeted Overexpression of Antioxidant Defense Systems, Sponsored by National Institute of Food and Agriculture Submitted: March 30, 2016. Funding Dates: February 15, 2016 - February 14, 2018. Requested: \$85,481.00, | Awarded: \$85,481.00  
OSPA ID: 201603301415

#### **Not Funded**

Ren W., Coyne M., S., Dvorak T., C., Hanley C., D., Kusunose Y., Sama M., Shi J., Teets N., M., Van Sanford D., A., Wagner G., J., Wendroth O., O.B., Williams M., A., Bringing Climate-Smart Agriculture Education into Kentucky Classrooms, Sponsored by National Institute of Food and Agriculture Submitted: April 25, 2019. | Awarded: \$0.00  
OSPA ID: 201904252012

Teets N., M., Downie A., B., Development of Long-Term Preservation and Revival Protocols for *Drosophila*., Sponsored by National Institute of Health Submitted: June 12, 2019. | Awarded: \$0.00  
OSPA ID: 201906122202

Teets N., M., Effects of Sublethal Freezing and Dehydration on the Transcriptome and Metabolism in the Antarctic Midge, Sponsored by National Science Foundation Submitted: December 9, 2020. | Awarded: \$0.00  
OSPA ID: 202012090959

Teets N., M., Identifying Mechanisms of Resistance to Improve RNAi-mediated Insect Pest Control, Sponsored by National Institute of Food and Agriculture Submitted: March 5, 2020. | Awarded: \$0.00  
Description: The investigators have received notice that this project will not be funded  
OSPA ID: 202003051412

Teets N., M., Population Biology and Evolutionary Potential of a Globally Invasive Pest, Sponsored by Foundation for Food and Agriculture Research Submitted: April 20, 2017. Requested: \$300,000.00, | Awarded: \$0.00  
OSPA ID: 201704200814

Teets N., M., Co-Principal, Practical Approaches for Bioconversion of Organic Waste into Fish Feed via Black Soldier Fly Larvae (*Hermetia illucens*), Sponsored by KY State University Submitted: May 15, 2017. Requested: \$173,894.00, | Awarded: \$0.00

OSPA ID: 201705151257

### **Pending**

Downie A., B., Hunt A., G., Kachroo A., McLetchie N., Teets N., M., Nagy P., D., Kachroo P., R., Kawashima T., Vaillancourt L., J., Acquisition of Controlled Environment Growth Facility for Plant Science Research and Training, Sponsored by National Science Foundation Submitted: May 1, 2022. | Awarded: \$0.00

OSPA ID: 202205012220

Stevenson B., Larson J., Thorson J., S., McWhorter K., L., Teets N., M., Bessin R., T., Palli S., R., Dobson S., L., Fisher T., W., Christian W., J., Syed Z., Appalachian Vector-borne Disease Center of Excellence, Sponsored by Center for Disease Control and Prevention Submitted: January 21, 2022. | Awarded: \$0.00

OSPA ID: 202201211657

Teets N., M., Palli S., R., Genotype by Environment Interactions Influencing the Efficacy of Insecticidal RNAi, Sponsored by National Institute of Food and Agriculture Submitted: February 10, 2022. | Awarded: \$0.00

OSPA ID: 202202100840

### **Scope Grants**

#### **Awarded**

Teets N., M., RII Track-2 FEC: From Genome to Phenome in a Stressful World: Epigenetic regulatory mechanisms mediating thermal plasticity in Drosophila, Sponsored by University of Vermont Submitted: July 23, 2021. Funding Dates: September 1, 2018 - July 31, 2022. | Current Budget Amount: \$25,000.00

Prime Grant OSPA ID: 201801190852

### **Non-Sponsored Projects**

#### **College**

##### **Closed**

Obrycki, J. J. (Principal), Teets, N. M. (Co-Principal), College of Agriculture, Food and Environment Research Activity Award, (January 1, 2017 - June 30, 2017). Awarded: \$5000.

#### **Federal**

##### **Not Funded**

Teets, N. M. (Principal), Genetic Basis of RNAi Efficiency in a Model Insect, Center for Arthropod Management Technologies. Awarded: \$158400.

Description: Proposal submitted to the NSF/IUCRC Center for Arthropod Management Technology

Teets, N. M. (Principal), IOS Preliminary Proposal: Physiological mechanisms of rapid cold hardening in insects: Integrating from cell biology to natural variation, National Science Foundation.

Description: Preliminary proposal for NSF IOS

Davis, A. (Principal), Teets, N. M. (Co-Principal), Kronforst, M. (Co-Principal), Are anthropogenic stressors damaging the fight-or-flight response of migrants? A case study using migratory monarch butterflies, National Science Foundation.

Description: Pre-proposal for NSF; declined

#### **Under Review**

Teets, N. M. (Principal), Palli, S. R. (Co-Principal), Influence of environmental conditions on the efficacy of insecticidal RNAi, Center for Arthropod Management Technologies, (July 1, 2021 - June 30, 2023). Awarded: \$160000.

Description: Pre-proposal submitted to the NSF/IUCRC Center for Arthropod Management Technology

Teets, N. M. (Principal), Dupuis, J. R. (Co-Principal), Population genetics of insecticide susceptibility in a globally invasive pest, Center for Arthropod Management Technologies, (July 1, 2021 - June 30, 2023). Awarded: \$160000.

Description: Pre-proposal submitted to the NSF/IUCRC Center for Arthropod Management Technology. Not recommended for full proposal.

Teets, N. M. (Principal), Downie, A. B. (Co-Investigator), Menze, M., Development of long-term preservation and revival protocols for *Drosophila*, National Institutes of Health, (May 2021 - April 2023). Awarded: \$412906.

Description: This project was not included in the data from OSPA

#### **Hatch**

##### **On-going**

Teets, N. M., Integrative research on the overwintering biology of insects, National Institute of Food and Agriculture, (October 29, 2016 - September 30, 2021).

#### **Foundation**

##### **Not Funded**

Teets, N. M. (Principal), Developing a Genetic Model of Freeze Tolerance to Improve Cryopreservation Efforts, Pew Charitable Trusts. Awarded: \$240000.00.

Teets, N. M. (Principal), Sloan Research Fellowship, Alfred O. Sloan Foundation. Awarded: \$60000.

Teets, N. M. (Principal), An Insect Model of Freeze Tolerance to Improve Human Cryopreservation Efforts, Arnold and Mabel Beckman Foundation. Awarded: \$750000.

Teets, N. M. (Principal), *Drosophila suzukii* Inbred Population Resource (DSIPR): A tool for studying climatic adaptation in an invasive fruit pest., Foundation for Food and Agricultural Research.

Description: Preliminary competition for FFAR New Investigator's Program

#### **Industrial/Trade**

## **Not Funded**

Teets, N. M. (Principal), French, B. W. (Co-Principal), Molecular Biomarkers of Extended Diapause in Northern Corn Rootworm., Center for Arthropod Management Technology. Awarded: \$140000.

## **Other**

### **Closed**

Chown, S. (Principal), Convey, P. (Collaborator), Hogg, I. (Collaborator), Janion-Scheepers, C. (PostDoct Student), Renault, D. (Collaborator), Stevens, M. (Collaborator), Simoes, F. (Grad/Prof Student), Hoskins, J. (Grad/Prof Student), Leihy, R. (Grad/Prof Student), Colinet, H. (Collaborator), Deharveng, L. (Collaborator), Edwards, E. (Collaborator), Faille, A. (Collaborator), Hulle, M. (Collaborator), van Vuuren, B. (Collaborator), Lebouvier, M. (Collaborator), le Roux, J. (Collaborator), Oberprieler, R. (Collaborator), Potapov, M. (Collaborator), Sgro, C. (Collaborator), Shaw, J. (Collaborator), Teets, N. M. (Collaborator), Terauds, A. (Collaborator), Settling Decades of Debate: A Functional Biogeography of the Antarctic, Antarctic Circumnavigation Expedition, (September 2016 - January 2018). Awarded: \$265000.

Description: The Antarctic Circumnavigation Expedition is funded by multiple countries but is housed in Australia. Dr. Teets was a key collaborator on the project, but did not receive any of the funding.

## **Other Government**

### **Not Funded**

Hayward, S. (Principal), Convey, P. (Co-Principal), Teets, N. M. (Collaborator), Denlinger, D. (Collaborator), Johnston, J. S. (Collaborator), Smith, J. J. (Collaborator), Comparative genomics of polar insects: a new international partnership in molecular ecophysiology and evolutionary biology, National Environment Research Council. Awarded: \$55.000.

## **University**

### **Not Funded**

Teets, N. M. (Principal), Equipment Proposal for Insect Respirometry System, University of Kentucky VP of Research. Awarded: \$49790.

## **Presentations Given**

### **Invited Speaker**

Teets, N.M. Sustainable agriculture, economic development, and entomology in South Greenland. University of Kentucky Department of Entomology Seminar Series, September 1, 2022, Lexington, KY.

Teets, N.M. Insects in cold places: Mechanisms of survival and sustainable pest control. A Thriving South – Nature, Community, Business Conference, August 23, 2022, Qaqortoq, Greenland.

Teets, N.M. Entomology in Antarctica: Adaptations facilitating survival on Earth's coldest continent. University of Aarhus Section for Zoophysiology Departmental Seminar, August 17, 2022, Aarhus, Denmark.

Teets, N.M. Impact of Genotype and Environmental Variables on Transgene Effectiveness for Conditional Lethality Systems in Insects. USDA BRAG Project Director's Meeting, April 27, 2022.

Nadeau, E.A.W., Teets, N.M., Obrycki, J.J. Transcriptional regulation of reproductive diapause in the convergent lady beetle. Entomological Society of America, Denver, CO. November 2, 2021.

Teets, N.M., Devlin, J.J., Michel, A.P. 2021. Adapted to the extreme: Climate change and Antarctica's only endemic insect. Entomological Society of America, Denver, CO. Delivered virtually in November 2021.

Teets, N.M. Entomology in Antarctica: Mechanisms of survival in the world's southernmost insect. Iowa State University Department of Entomology Seminar Series. Delivered remotely on November 8, 2021.

Teets, N.M. Entomology in Antarctica: Adaptations of the world's southernmost insect. University of Louisville Department of Biology Seminar Series. November 5, 2021.

Teets, N.M., Harner, D.H. Enhancing local environmental education programming through higher education research partnerships. Kentucky Association for Environmental Education webinar series, May 20, 2021.

Teets N. M., Lecheta M. C., (November 19, 2020). Molecular regulation of diapause in two corn rootworm species (*Diabrotica spp.*) Entomological Society of America Annual Meeting, Entomological Society of America, United States. Invited, National.

Bredlau J., Perez-Galvez F., Teets N. M., (November 17, 2019). Potential for resistance to conditionally lethal transgenes used for Sterile Insect Technique Entomological Society of America Annual Meeting, Entomological Society of America, St. Louis. Invited, National.

Teets N. M., (June 13, 2019). Mechanisms of environmental stress tolerance in Antarctica's only endemic insect Arthropod Genomics Symposium, Kansas State University, Manhattan, KS. Invited, National.

Teets N. M., (June 6, 2019). Impact of genotype and environmental variables on transgene effectiveness for conditional lethality systems in insects Biotechnology Risk Assessment Grants Program Annual Project Director's Meeting, USDA NIFA, Washington, DC. Invited, National.

Teets N. M., (May 2, 2019). Winter climate change and insects: Is warmer always better? Impact2019 Conference, Household Commercial Products Association, Washington, DC. Invited, National.

Teets N. M., Garcia M. J., Nadeau E. A.W., (November 14, 2018). From cells to populations: Towards an integrative understanding of how insects cope with low temperature stress. Entomological Society of America Annual Meeting, Entomological Society of America, Vancouver, Canada. Invited, International.

Teets N. M., (January 30, 2018). GMO 101: The future of agriculture, or are Mark and KC slowly killing us? Palmer Station Science Talks, Palmer Station. Invited, National.

Teets N. M., (November 15, 2017). Genetic approaches for improving the management of invasive fruit flies. Ohio State University Department of Entomology Seminar Series, Ohio State University Department of Entomology, Columbus, OH, United States. Invited, University.

Teets N. M., (September 22, 2017). Taking shape of insect cold tolerance: Genetic underpinnings and eco-evolutionary implications of variation in the shape of cold survival curves. UK Department of Biology EcoLunch, UK Department of Biology, Lexington, KY, United States. Invited, University.

Teets N. M., (April 11, 2017). Stress biology of insects: Genetic mechanisms and practical applications. University of Western Ontario Department of Biology Seminar Series, University of Western Ontario, London, Canada. Invited, University.

Teets N. M., (September 26, 2016). A primer on genome editing technologies and their use in insects. International Congress of Entomology, Entomological Society of America, Orlando, FL, United States. Invited, International.

Teets N. M., Hahn D. A., (September 25, 2016). Leveraging natural genetic variation to identify molecular mechanisms of cold tolerance. International Congress of Entomology, Entomological Society of



America, Orlando, FL, United States. Invited.

Teets N. M., (June 7, 2016). Making sexy flies with transgenics: Strategies to improve Sterile Insect Technique. Entomological Society of America North Central Branch Meeting, Entomological Society of America, Cleveland, OH, United States. Invited, Regional.

Teets N. M., (January 25, 2016). Insect stress biology: From basic mechanisms to practical applications. University of Cincinnati Department of Biology Seminar Series, University of Cincinnati Department of Biology, Cincinnati, OH, United States. Invited, University.

### **Keynote or plenary address**

Teets N. M., (September 30, 2020). Cryopreservation of multicellular animals: Lessons from extreme insects. Saltiel Life Sciences Symposium, University of Michigan, Ann Arbor, MI, United States. Invited, National.

### **Podium Session**

Unfried, L.N., Teets, N.M. Rapid cold hardening protects against sublethal cold injury but fails to preserve reproductive behaviors in *Drosophila melanogaster*. Society for Integrative and Comparative Biology, Phoenix, AZ, January 6, 2022.

Awde, D.N., Teets, N.M. Transcription correlates of thermal acclimation capacity in *Drosophila melanogaster*. Society for Integrative and Comparative Biology, Phoenix, AZ, January 5, 2022.

Teets, N.M., Devlin, J.J. Warmer winters may spell trouble for Antarctica's only endemic insect. Society for Integrative and Comparative Biology Virtual Meeting, January 2022.

McCabe, E., Teets, N.M. Evidence of spotted wing drosophila overwintering in Kentucky. Entomological Society of America, Denver, CO, November 1, 2021.

Devlin, J.J., Unfried, L., Lecheta, M.C., McCabe, E., Teets, N.M. Mild overwintering temperatures negatively impact survival of Antarctic insect. Entomological Society of America, Denver, CO, November 3, 2021.

Perez-Galvez, F.R., Awde, D.A., Kawarasaki, Y., Teets, N.M. Motion-detection computational approach to time-to-knockdown bioassay scoring. Entomological Society of America, Denver, CO, November 2, 2021.

Awde, D.N., Teets, N.M. Genetic variation in phenotypic plasticity of thermal limits in *Drosophila melanogaster*. Society for Integrative and Comparative Biology, January 2021. Presented virtually.

Unfried, L.M., Teets, N.M. Ability of RCH to protect against physiological damage from sublethal chilling in *Drosophila melanogaster*. Society for Integrative and Comparative Biology, January 2021. Presented virtually.

Perez-Galvez, F.R., Awde, D., McCabe, E.A., Teets, N.M. Computer assisted analysis to improve throughput and precision of knockdown time assays. Society for Integrative and Comparative Biology, January 2021. Presented virtually.

Teets, N.M., Spacht, D.E., Potts, L.J., Gantz, J.D., Lee, R.E., Denlinger, D.L. Microhabitat diversity influences physiology and phenology in an Antarctic insect. Society for Integrative and Comparative Biology, January 2021. Presented virtually.

Littler, Garcia M. J., Teets N. M., (January 2020). Does a well-balanced diet keep you going when the going gets cold? Society for Integrative and Comparative Biology Annual Meeting, Society for Integrative and Comparative Biology, Austin, TX. Accepted, National.

Teets N. M., Dalrymple E. G., Hillis M. H., Lee E., Denlinger D. L., (January 7, 2020). To freeze or not to freeze: Cold tolerance strategies in an Antarctic midge. Society for Integrative and Comparative Biology Annual Meeting, Society for Integrative and Comparative Biology, Austin, AK. Accepted, National.

Helms-Cahan S., Fietze S. E., Gerrard D. L., Bora K., Kaplan I., Perez M., Lockwood B. L., Teets N. M.,

- Waters J. S., Axen H. J., (January 4, 2020). Developmental temperature alters brain gene expression in adult *Drosophila melanogaster* Society for Integrative and Comparative Biology Annu, Society for Integrative and Comparative Biology, Austin, TX. Accepted, National.
- Awde D. N., Lecheta M. C., Unfried L. N., Jacobs N. A., Powers B., Bora K., Waters J. S., Axen H. J., Fietze S. E., Lockwood B. L., Cahan S. H., Teets N. M., (January 4, 2020). Genetic mechanisms of basal thermal tolerance in *Drosophila melanogaster*. Society for Integrative and Comparative Biology Annual Meeting, Society for Integrative and Comparative Biology, Austin, TX. Accepted, National.
- Garcia M. J., Teets N. M., (January 4, 2020). Genetic variation and molecular regulation of cold hardiness in spotted wing drosophila. Society for Integrative and Comparative Biology Annual Meeting, Society for Integrative and Comparative Biology, Austin, TX. Accepted, National.
- Teets N. M., Lecheta M. C., Awde D., (November 19, 2019). Genetic architecture of thermal tolerance in *Drosophila melanogaster* Entomological Society of America Annual Meeting, Entomological Society of America, St. Louis, MO. Accepted, National.
- Garcia M. J., Teets N. M., (November 19, 2019). Genetic variation and molecular regulation of cold hardiness in spotted-wing drosophila Entomological Society of America Annual Meeting, Entomological Society of America, St. Louis, MO. Accepted, National.
- Lecheta M. C., Teets N. M., (November 19, 2019). Transcriptional mechanisms of diapause in the corn rootworm complex Entomological Society of America Annual Meeting, Entomological Society of America, St. Louis, MO. Accepted, National.
- Littler A., Teets N. M., Garcia M. J., (November 18, 2019). Does a well-balanced diet keep you going when the going gets cold? Entomological Society of America Annual Meeting, Entomological Society of America, St. Louis, MO. Accepted, National.
- Potts L. J., Teets N. M., (November 18, 2019). Overwintering spiders: Biochemical and metabolic responses to the winter season Entomological Society of America Annual Meeting, Entomological Society of America, St. Louis, MO. Accepted, National.
- Nadeau E. A.W., Obrycki J. J., Teets N. M., (November 18, 2019). Transcriptional regulation of reproductive diapause in the convergent lady beetle Entomological Society of America Annual Meeting, Entomological Society of America, St. Louis, MO. Accepted.
- Teets N. M., (August 1, 2019). Nonlethal freezing injury in the Antarctic midge *Belgica antarctica* International Symposium on the Environmental Physiology of Ectotherms and Plants, International Symposium on the Environmental Physiology of Ectotherms and Plants, Buenos Aires, Argentina. Accepted, International.
- Teets N. M., Garcia M. J., Sriram A., Littler A., (January 6, 2019). Genetic variance in cold tolerance and its molecular underpinnings Society for Integrative and Comparative Biology Annual Meeting, Society for Integrative and Comparative Biology, Tampa, FL. Accepted, National.
- Teets N. M., Dias V. S., Schetelig M. F., Handler A. M., Hahn D. A., (January 6, 2019). Making macho males by transgenic overexpression of a mitochondrial antioxidant enzyme Society for Integrative and Comparative Biology Annual Meeting, Society for Integrative and Comparative Biology, Tampa, FL. Accepted, National.
- Teets N. M., Kawarasaki Y., Potts L. J., Gantz J. D., Philip B. N., Denlinger D. L., Lee R. E., (January 6, 2019). Rapid cold hardening provides sublethal benefits in an Antarctic extremophilic insect Society for Integrative and Comparative Biology Annual Meeting, Society for Integrative and Comparative Biology, Tampa, FL. Accepted, National.
- Potts L., Teets N. M., (January 4, 2019). Overwintering spiders: Physiological responses to the winter season Society for Integrative and Comparative Biology Annual Meeting, Society for Integrative and Comparative Biology, Tampa, FL. Accepted, National.
- Garcia M. J., Teets N. M., (January 4, 2018). Neuromuscular Performance as a Measure of Thermal Tolerance Society for Integrative and Comparative Biology Annual Meeting, Society for Integrative

- and Comparative Biology, San Francisco, CA, United States. Accepted, National.
- Teets N. M., Garcia M. J., (November 6, 2017). *Drosophila suzukii* Population Collection (DSPC): A tool for studying local adaptation in an invasive pest. Entomological Society of America Annual Meeting, Entomological Society of America, Denver, CO, United States. Accepted, National.
- Potts L., Teets N. M., (July 25, 2017). Biochemical adaptations of overwintering spiders American Arachnological Society Annual Meeting, American Arachnological Society, Queretaro, Mexico. Accepted, International.
- Teets N. M., (July 11, 2017). A tiny genome for a tiny midge: physiology and genomics of the world's southernmost insect Scientific Council on Antarctic Research Biology Symposium, Scientific Council on Antarctic Research, Leuven, Belgium. Accepted, International.
- Mercer N., Teets N. M., Bessin R. T., Obrycki J. J., (June 5, 2017). Impact of winter feeding on overwintering *Hippodamia convergens* (Coccinellidae) survival and spring reproduction. Entomological Society of America North Central Branch Meeting, Entomological Society of America, Indianapolis, IN, United States. Accepted, Regional.
- Simoes Dias V., Teets N. M., Schetelig M. F., Handler A. M., Hahn D. A., Araujo G., (September 29, 2016). Can transgenic flies overexpressing antioxidant enzymes blunt radiation-induced oxidative stress and improve mating success? International Congress of Entomology, Entomological Society of America, Orlando, FL, United States. Accepted, International.
- Chen C., Teets N. M., Powell T., Hahn D., (September 29, 2016). Metabolic mechanisms mediating the miserable months: Metabolomics of periodic arousal in insect diapause. International Congress of Entomology, Entomological Society of America, Orlando, FL, United States. Accepted, International.

#### Poster Session

- Unfried L. N., Teets N. M., (January 5, 2020). Benefits of rapid cold hardening at sublethal temperatures in *Drosophila melanogaster*. Society for Integrative and Comparative Biology Annual Meeting, Society for Integrative and Comparative Biology, Austin, TX. Accepted, National.
- Kawarasaki Y., Teets N. M., Philip B. N., Potts L. J., Gantz J. D., Denlinger D. L., Lee R. E., (January 5, 2019). Society for Integrative and Comparative Biology Annual Meeting, Society for Integrative and Comparative Biology, Tampa, FL. Accepted, National.
- Perez-Galves F. R., Teets N. M., (January 5, 2019). Genetic and environmental factors influencing the efficacy of transgenic Sterile Insect Technique Society for Integrative and Comparative Biology Annual Meeting, Tampa, FL. Accepted, National.
- Littler A., Sriram A., Garcia M. J., Teets N. M., (January 5, 2019). Out in the cold: Genetic correlation of cold tolerance traits in *Drosophila melanogaster* Society for Integrative and Comparative Biology Annual Meeting, Society for Integrative and Comparative Biology, Tampa, FL. Accepted, National.
- Teets N. M., (November 14, 2018). Sublethal benefits of rapid cold hardening in Antarctica's only endemic insect Entomological Society of America Annual Meeting, Entomological Society of America, Vancouver, Canada. Accepted, International.
- Nathan M., Teets N. M., Bessin R. T., Obrycki J. J., (November 6, 2017). Impact of winter feeding on overwintering *Hippodamia convergens* (Coccinellidae) survival and spring reproduction. ESA annual meeting, Entomological Society of America, Denver, CO, United States.
- Spacht D., Teets N. M., Denlinger D. L., (September 27, 2016). The role of PEPCK in insect diapause, development, and stress response. International Congress of Entomology, Entomological Society of America, Orlando, FL, United States. Accepted, International.

# Teaching

## Teaching

| Prefix Number - Section | Credit Hours      | # Enrolled | Code Term Year      |
|-------------------------|-------------------|------------|---------------------|
| ENT 395 - 002           | 1.00000 - 3.00000 | 1          | 30 Spring 2021-2022 |
| ENT 767 - 004           | 2.00000 - 2.00000 | 4          | 30 Spring 2021-2022 |
| ENT 768 - 002           | 1.00000 - 6.00000 | 1          | 30 Spring 2021-2022 |
| ENT 110 - 230           | 3.00000 - 3.00000 | 11         | 20 Winter 2021-2022 |
| ABT 101 - 001           | 1.00000 - 1.00000 | 57         | 10 Fall 2021-2022   |
| ENT 110 - 201           | 3.00000 - 3.00000 | 49         | 10 Fall 2021-2022   |
| ENT 767 - 006           | 2.00000 - 2.00000 | 3          | 10 Fall 2021-2022   |
| ENT 768 - 006           | 1.00000 - 6.00000 | 1          | 10 Fall 2021-2022   |
| ENT 780 - 007           | 2.00000 - 3.00000 | 1          | 10 Fall 2021-2022   |
| ENT 790 - 006           | 1.00000 - 6.00000 | 2          | 10 Fall 2021-2022   |
| ENT 110 - 210           | 3.00000 - 3.00000 | 5          | 50 Summer 2020-2021 |
| ENT 395 - 004           | 1.00000 - 3.00000 | 1          | 30 Spring 2020-2021 |
| ENT 767 - 004           | 2.00000 - 2.00000 | 2          | 30 Spring 2020-2021 |
| ENT 770 - 202           | 0.00000 - 1.00000 | 12         | 30 Spring 2020-2021 |
| ENT 780 - 003           | 2.00000 - 3.00000 | 1          | 30 Spring 2020-2021 |
| ENT 790 - 004           | 1.00000 - 6.00000 | 2          | 30 Spring 2020-2021 |
| ENT 110 - 230           | 3.00000 - 3.00000 | 7          | 20 Winter 2020-2021 |
| ABT 460 - 001           | 3.00000 - 3.00000 | 16         | 10 Fall 2020-2021   |
| ABT 460 - 201           | 3.00000 - 3.00000 | 3          | 10 Fall 2020-2021   |
| ABT 495 - 003           | 4.00000 - 4.00000 | 5          | 10 Fall 2020-2021   |
| ENT 110 - 201           | 3.00000 - 3.00000 | 52         | 10 Fall 2020-2021   |
| ENT 460 - 001           | 3.00000 - 3.00000 | 1          | 10 Fall 2020-2021   |
| ENT 767 - 006           | 2.00000 - 2.00000 | 2          | 10 Fall 2020-2021   |
| ENT 790 - 006           | 1.00000 - 6.00000 | 2          | 10 Fall 2020-2021   |
| ENT 110 - 210           | 3.00000 - 3.00000 | 5          | 50 Summer 2019-2020 |
| ENT 110 - 201           | 3.00000 - 3.00000 | 48         | 30 Spring 2019-2020 |
| ENT 767 - 004           | 2.00000 - 2.00000 | 2          | 30 Spring 2019-2020 |
| ENT 790 - 004           | 1.00000 - 6.00000 | 3          | 30 Spring 2019-2020 |
| ENT 110 - 201           | 3.00000 - 3.00000 | 32         | 10 Fall 2019-2020   |
| ENT 395 - 003           | 1.00000 - 3.00000 | 1          | 10 Fall 2019-2020   |
| ENT 767 - 006           | 2.00000 - 2.00000 | 2          | 10 Fall 2019-2020   |
| ENT 780 - 007           | 2.00000 - 3.00000 | 1          | 10 Fall 2019-2020   |
| ENT 790 - 006           | 1.00000 - 6.00000 | 3          | 10 Fall 2019-2020   |
| HON 152 - 005           | 3.00000 - 3.00000 | 9          | 10 Fall 2019-2020   |
| ENT 110 - 210           | 3.00000 - 3.00000 | 13         | 50 Summer 2018-2019 |
| ENT 395 - 002           | 1.00000 - 3.00000 | 1          | 30 Spring 2018-2019 |
| ENT 767 - 004           | 2.00000 - 2.00000 | 1          | 30 Spring 2018-2019 |

|               |                   |    |                     |
|---------------|-------------------|----|---------------------|
| ENT 770 - 002 | 0.00000 - 1.00000 | 10 | 30 Spring 2018-2019 |
| ENT 780 - 003 | 2.00000 - 3.00000 | 1  | 30 Spring 2018-2019 |
| ENT 790 - 004 | 1.00000 - 6.00000 | 2  | 30 Spring 2018-2019 |
| ENT 767 - 006 | 2.00000 - 2.00000 | 1  | 10 Fall 2018-2019   |
| ENT 790 - 006 | 1.00000 - 6.00000 | 2  | 10 Fall 2018-2019   |
| ENT 767 - 004 | 2.00000 - 2.00000 | 1  | 30 Spring 2017-2018 |
| ENT 790 - 004 | 1.00000 - 6.00000 | 2  | 30 Spring 2017-2018 |
| HON 152 - 002 | 3.00000 - 3.00000 | 14 | 30 Spring 2017-2018 |
| ENT 767 - 006 | 2.00000 - 2.00000 | 1  | 10 Fall 2017-2018   |
| ENT 790 - 006 | 1.00000 - 6.00000 | 1  | 10 Fall 2017-2018   |
| ENT 767 - 004 | 2.00000 - 2.00000 | 1  | 30 Spring 2016-2017 |
| ENT 770 - 001 | 1.00000 - 1.00000 | 7  | 30 Spring 2016-2017 |
| ENT 790 - 006 | 1.00000 - 6.00000 | 2  | 10 Fall 2016-2017   |

### Teacher Course Evaluations

| Prefix Number - Section | Responses | TCE Course Quality Mean | TCE Teaching Quality Mean | Code Term Year      |
|-------------------------|-----------|-------------------------|---------------------------|---------------------|
| ABT 101 - 001           | 30        | 4.33                    | 4.87                      | 10 Fall 2021-2022   |
| ABT 460 - 001           | 5         | 4.40                    | 4.80                      | 10 Fall 2020-2021   |
| ENT 110 - 201           | 18        | 4.56                    | 4.83                      | 10 Fall 2021-2022   |
| ENT 110 - 201           | 9         | 4.67                    | 4.89                      | 10 Fall 2020-2021   |
| ENT 110 - 201           | 23        | 4.52                    | 4.87                      | 30 Spring 2019-2020 |
| ENT 110 - 201           | 16        | 4.38                    | 4.56                      | 10 Fall 2019-2020   |
| ENT 110 - 210           | 7         | 4.43                    | 4.86                      | 50 Summer 2018-2019 |
| ENT 770 - 002           | 10        | 4.40                    | 4.70                      | 30 Spring 2018-2019 |
| ENT 770 - 202           | 10        | 4.50                    | 4.80                      | 30 Spring 2020-2021 |
| HON 152 - 002           | 12        | 4.50                    | 4.50                      | 30 Spring 2017-2018 |
| HON 152 - 005           | 9         | 4.44                    | 4.44                      | 10 Fall 2019-2020   |

Note: With regards to 2020 TCEs please consider the following from page 121 of the UK Playbook for Fall 2020, "It is essential that performance evaluation take into account the extenuating circumstances brought about by the disruption for faculty in all title series and the extraordinary work accomplished by faculty in response to the disruption. Academic leaders shall reiterate that TCEs should be but one indicator of effective teaching in both periodic merit reviews and tenure/promotion decisions. Evaluation of teaching must go beyond student evaluations alone."

## **Theses and Dissertations**

### **Dissertation Committee Chair**

Cleverson Lima, Entomology, "Comparative Physiology of Antarctic Insects," Status: In-Process. (August 2021 – Present).

Jack Devlin, Entomology, "Physiological Ecology of Antarctic Arthropods," Status: In-Process. (January 2020 - Present).

Ellie McCabe, Entomology, "Winter Ecology of Spotted Wing Drosophila," Status: In-Process. (August 2019 - Present).

Laura Unfried, Entomology, "Genetic Mechanisms of Thermal Plasticity in Drosophila," Status: In-Process. (August 2019 - Present).

Fernan Perez, Entomology, "Genetic and Environmental Factors Affecting the Efficacy of Transgenic Sterile Insect Technique," Status: In-Process. (January 2018 - Present).

Emily Nadeau, Entomology, "Functional Genomics of Insect Overwintering Biology," Status: Completed, Emily received the President's Prize from the Entomological Society of America for her outstanding poster at the 2017 national meeting. The award included a cash prize and member dues for 2018. (August 2017 - Present).

Leslie Potts, Entomology, "Physiological Ecology of Overwintering and Cold-Adapted Arthropods," Status: Completed, Leslie was awarded the UK Women's Club Fellowship in November 2017. This \$2,000 fellowship is given to female students who are underrepresented in their field of study. She also received a predoctoral fellowship from USDA. Leslie is currently a postdoctoral associate at the University of Alaska Fairbanks. (January 2016 - May 2020).

### **Dissertation Committee Member**

Jinmo Koo, PhD in Entomology, Status: In-Process. (September 2018 - Present).

Nathan Mercer, Entomology, "Management of Sugarcane Aphid (*Melanaphis sacchari*) Using Biological and Cultural Tactics in Kentucky," Status: Completed. (January 2016 - May 2020).

Travis McEachern, Biosystems and Agricultural Engineering, "Calorimetry of Black Soldier Fly Aggregations," Status: Degree Awarded. (October 2017 - December 2018).

Sarah Meierotto, Entomology, "Taxonomy and Biodiversity of Braconid Wasps," Status: Completed. (January 2016 - August 2018).

### **Master's Thesis Committee Member**

Emily Nadeau, Entomology, "Binding, Protection, and RNA Delivery Properties of Porous Silica Nanoparticles in *Spodoptera frugifera* Cells," Status: Degree Awarded. (January 2016 - August 2017).

### **Outside examiner**

Ammar Al-Bayati, Horticulture, "Breeding for Tomato Resistance to Spider Mite *Tetranychus urticae* Koch (Acari: Tetranychidae)," Status: Degree Awarded. (October 2018 - May 2019).

Scott Hotaling, Biology, "GENETIC PERSPECTIVES ON BIODIVERSITY IN ROCKY MOUNTAIN ALPINE STREAMS," Status: Degree Awarded. (June 2017 - August 2017).

Lauren des Marteaux, Biology (Western University, London, ON), "Mechanisms Underlying Variation in Insect Chill Tolerance: The Role of Ion and Water Transport," Status: Degree Awarded. (January 2017 - April 2017).

### **Directed Student Learning (excluding theses, dissertations)**

Goldie Blackson. Research Supervision. *Thermal tolerance in Drosophila*. In-Process (August 2020 - Present).

Description: Undergraduate Research Supervision

Annabelle Wilson. Research Supervision. *Conditional lethality systems in insects*. In-Process (January 2020 - Present).

Description: Undergraduate Research Supervision

Katie Collins. Research Supervision. *Conditional lethality systems in insects*. In-Process (January 2020 - Present).

Description: Undergraduate Research supervision

Tatum Fowler. Research Supervision. *Thermal Plasticity in Flies*. In-Process (September 2019 - Present).

Description: Research mentor for high school student from LaFayette Biotechnology Program

David Awde. Postdoctoral Supervision. *Genetic Mechanisms of Thermal Plasticity in Flies*. In-Process (May 2019 - Present).

Description: Postdoctoral supervisor

Leah Carpenter. Research Supervision. . In-Process (November 2018 - Present).

Description: Undergraduate research supervision

Melise Lecheta. Postdoctoral Supervision. *Transcriptional Regulation of Diapause in Corn Rootworms*. In-Process (March 2018 - Present).

Description: Postdoctoral mentor

Justin Bredlau. Postdoctoral Supervision. *Impact of Genetic Background on Conditional Lethality*. Completed (October 2018 - September 2020).

Description: Postdoctoral supervisor

Mark Garcia. Postdoctoral Supervision. . Completed (September 2016 - July 2020).

Description: Postdoctoral supervision

Taylor Sturgill. Research Supervision. . Completed (August 2019 - May 2020).

Description: Undergraduate Research Supervision

Aerianna Littler. Research Supervision. . Completed (January 2018 - May 2020).

Description: Research supervisor for undergraduate student

Faith Boles. Research Supervision. . Completed (January 2019 - December 2019).

Description: Undergraduate research supervision

Nicholas Jacobs. Research Supervision. *Heat Tolerance in Flies*. Completed (January 2019 - December 2019).

Description: Research supervisor for ABT 395 project

Miles Whitlock. Research Supervision. *Thermal Tolerance in Flies*. Completed (July 2018 - May 2019).

Description: Research supervisor for high school student

Randall Brewer. Research Supervision. *Winter Biology of Wolf Spiders*. Completed (September 2016 - May 2019).

Description: Research mentor for undergraduate student. Randall completed his ABT 395 independent project in my lab.

Aditya Sriram. Research Supervision. *Molecular Mechanisms of Thermal Tolerance in Flies*. Completed (October 2017 - September 2018).

Kylie Colvin. Research Supervision. *Cold Tolerance of Cultured Drosophila Cells*. Completed (December 2017 - May 2018).

Description: Research mentor for undergraduate student. Kylie completed her ABT 395 independent project in my lab.

Emma Dalrymple. Research Supervision. *Freeze Tolerance in Antarctic Midges*. Completed (January 2017 - May 2018).

Description: Research mentor for undergraduate researcher conducting research for credit

Maya Hillis. Research Supervision. *Freeze Tolerance in Antarctic Midges*. Completed (September 2016 - May 2018).

Description: Research mentor for high school student part of MSTC program at Dunbar High School

Nate Jula. Research Supervision. *Cold Tolerance of Flies*. Completed (March 2016 - May 2018).

Description: Supervisor for undergraduate research technician who is also conducting independent research

Katelyn Cox. Research Supervision. *Thermal Tolerance in Flies*. Completed (August 2016 - May 2017).

Description: Research mentor for undergraduate student for 2016-2017 school year

David Reedy. Research Supervision. *Thermal Tolerance in Flies*. Completed (May 2016 - September 2016).

Description: Research mentor for summer undergraduate student

Austin Lingle. Research Supervision. *Winter Biology of Wolf Spiders*. Completed (January 2016 - May 2016).

Description: Undergraduate research mentor for student volunteer

Hye-Ree Yoon. Research Supervision. *Winter Biology of Wolf Spiders*. Completed (January 2016 - May 2016).

Description: Undergraduate research mentor for student volunteer

## **Academic Advising**

50 Summer 2021-2022, 2 undergraduate students advised.

10 Fall 2021-2022, 7 undergraduate students advised.

30 Spring 2020-2021, 7 undergraduate students advised.



- 10 Fall 2020-2021, 6 undergraduate students advised, Advisor for Agricultural and Medical Biotechnology Program.
- 50 Summer 2019-2020, 6 undergraduate students advised, Advisor for Agricultural and Medical Biotechnology Program.
- 30 Spring 2019-2020, 6 undergraduate students advised, Advisor for Agricultural and Medical Biotechnology Program.
- 10 Fall 2019-2020, 4 undergraduate students advised, Advisor for Agricultural and Medical Biotechnology Program.
- 50 Summer 2018-2019, 4 undergraduate students advised, Advisor for Agricultural and Medical Biotechnology Program.
- 30 Spring 2018-2019, 4 undergraduate students advised, Advisor for Agricultural and Medical Biotechnology Program.
- 10 Fall 2018-2019, 2 undergraduate students advised, Advising for ABT program. In addition to assigned advisees, I also participate in group advising sessions for new students and incoming students.
- 51 1st summer 2017-2018, 2 undergraduate students advised, Advising for ABT program. In addition to assigned advisees, I also participate in group advising sessions for new students and incoming students.
- 30 Spring 2017-2018, 2 undergraduate students advised, Advising for ABT program. In addition to assigned advisees, I also participate in group advising sessions for new students and incoming students.
- 10 Fall 2017-2018, 2 undergraduate students advised, Advising for ABT program. In addition to assigned advisees, I also participate in group advising sessions for new students and incoming students.
- 52 2nd summer 2016-2017, 3 undergraduate students advised.
- 30 Spring 2016-2017, 2 undergraduate students advised.

## **Program and Curriculum Development**

**2017**

Program/Curriculum Name - HON 152 - Climate Change: Scientific Evidence, Biological Impacts, and Societal Responses

Description: I am designing a brand-new course on climate change for non-science majors in the Honors College. This course will be offered in Spring 2018, and it will hopefully be expanded to a wider audience in future offerings.

**2018**

Program/Curriculum Name - ENT 110 - Insect Biology (online version)

Description: I am converting our department's ENT 110 course, a UK Core Course in the Natural Sciences, into an online format. The online course will first be offered in Summer 2019.

**Other Credit and Non-Credit Instructional Activities****Guest Lecture**

Writing & Presentations for the Life Sciences, (October 14, 2020)

Description: Delivered a guest lecture on grant writing for ABT 301

Climate Change and Agriculture, (February 25, 2020)

Description: Delivered a guest lecture on insect responses to climate change

Issues in Agriculture, (November 5, 2019)

Description: Lectured about insects, climate change, and agriculture for GEN 100

Climate Change and Agriculture, Participants: Undergraduate Students, 15, (April 4, 2019)

Description: Delivered a guest lecture on insect responses to climate change

Integrative Organismal Entomology, Participants: Graduate Students, 6, (October 8, 2018)

Climate Change and Agriculture, Participants: Undergraduate Students, 20, (March 6, 2018)

Description: Delivered a guest lecture on insect crop pests, parasites, and their response to climate change

Climate Change and Agriculture, Participants: Undergraduate Students, 20, (March 9, 2017)

Description: Delivered a guest lecture on insect crop pests, parasites, and their response to climate change

Integrative Organismal Entomology, Participants: Graduate Students, 7, (October 12, 2016)

Description: Delivered a series of lectures on insect response to climate change to graduate entomology students

Scientific Method in Biotechnology, Participants: Undergraduate Students, 30, (October 6, 2016)

Description: Gave a lecture about my laboratory's research

**Service****Department Service****Committee Chair**

Department of Entomology Curriculum Committee, (August 2020 - Present).

**Committee Member**

Department of Entomology Steering Committee, (January 2019 - Present).

Department of Entomology Curriculum Committee, (May 2016 - August 2020).

Search Committee for Public Health Entomologist, (February 2017 - September 2017).

#### **Faculty Secretary**

Department of Entomology Faculty Secretary, (January 2016 - January 2018).

### **University Service**

#### **Committee Member**

Honors College Faculty, (August 2018 - Present).

Lewis Honors College Search Committee, (January 2020 - May 2020).

### **Professional Service**

#### **Committee Member**

Entomological Society of America, Judge for Lillian and Alex Feir Travel Award, (June 2019 - Present).

Entomological Society of America, Judge for John Henry Comstock Award, (January 2019 - Present).

#### **Conference-Related**

Entomological Society of America, Symposium Organizer, (January 2019 - November 2019).

Entomological Society of America, Judging Panel for Early Career Professionals Travel Award, (April 2016).

Entomological Society of America, Judging Panel for International Graduate Student Showcase, (February 2016).

#### **Editor, Associate Editor**

Physiological Entomology, Associate Editor for the journal *Physiological Entomology*, (January 2020 - Present).

Insects, Editorial board member for the journal *Insects*, (January 2019 - Present).

#### **Editor, Journal Editor**

Comparative Biochemistry and Physiology A, Guest Editor for special issue, (June 2020 - Present).

#### **Writer**

Entomological Society of America, ESA Position Statement on Climate Change Writing Committee, (April 2018 - October 2018).

#### **Reviewer, Ad Hoc Reviewer**

Canadian Innovation Foundation, Ad hoc reviewer for grant proposal, (November 2020).

National Science Foundation, Ad hoc reviewer for grant proposal, (November 2020).

National Science Foundation, Ad hoc reviewer for grant proposal, (May 2019).

#### **Reviewer, Book**

Elsevier, Reviewer for Book Proposal, (August 31, 2017).

#### **Reviewer, Conference Paper**

Society for Integrative and Comparative Biology, Judge for Student Poster Competition, (January 2019 - Present).

Entomological Society of America, Judge for student presentations, (June 2016 - Present).

Ohio Valley Entomological Association, Judge for student talks, (October 2018).

#### **Reviewer, Grant Proposal**

National Science Foundation, Review Panel for Division of Integrative Organismal Biology, (December 9, 2020 - December 11, 2020).

National Science Foundation, Ad Hoc Grant Reviewer, (August 9, 2017).

University of Texas San Antonio, External Reviewer for Grant Proposal, (July 5, 2017).

#### **Reviewer, Journal Article**

Journal Reviewer (>30 different journals and >75 manuscripts since 2016), (January 2016 - Present).

#### **Session Chair**

Entomological Society of America, Session Moderator for International Congress of Entomology, (September 26, 2017).

### **Public Service**

#### **Volunteer**

Various, Entomological Outreach (various engagements at local schools, community events, etc.), (January 2016 - Present).

Wellington Elementary School, Organized and led a "Virtual Bugs" remote field trip for 125 students, (October 16, 2020).

The Learning Center, Presentation in insects and Antarctica to 10 high school students, (May 22, 2020).

Wellington Elementary School, Created an insect display for "STEM Day," which was visited by 700 students, (February 28, 2020).

Everything is Science, Delivered a public presentation titled "Frozen Bugs on the White Continent: Entomology in Antarctica" for the annual Everything is Science event, (February 21, 2020).

Lafayette High School, Gave a presentation and led a hands-on lab activity for 90 high school biology students, (February 21, 2020).

Living Arts and Science Center, Designed and led a hands-on activity for "Exploration Night," which was attended by 200 students and parents, (April 17, 2019).

## Media Contributions

### Internet

"*SciShow*." (June 27, 2020). Helped write a script about the Antarctic midge for the popular YouTube channel *SciShow*. Video has been viewed >400,000 times., United States.

### Magazine

"*Smithsonian Magazine*." (September 10, 2019). Work on Antarctic midge featured in *Smithsonian Magazine* article titled "How Antarctica's Only Native Insect Survives the Freezing Temperatures.". United States.

### Newspaper

"*Antarctic Sun*

." (June 29, 2020). Interviewed for article titled "Insects in the Extreme" for the *Antarctic Sun*, a news outlet sponsored by the National Science Foundation., United States.

"*New York Times*." (September 9, 2019). Interviewed for *New York Times* article titled "How Does Antarctica's Only Native Insect Survive Extreme Cold?". New York City, NY, United States.

"*Lexington Herald Leader*." (September 2, 2019). Interviewed for *Lexington Herald Leader* article titled "Has climate change affected a bug that can stay frozen for 9 months?". Lexington, KY, United States.

### Radio

"WUKY." (December 21, 2019). Interviewed about mosquitoes and climate change for local NPR affiliate. Lexington, KY, United States.

### Other

"*Polar Opposites: Animal Adaptations for Survival at the Ends of the Earth*." (January 2020). Helped edit a children's book on polar adaptations to be published in 2021., United States.

# Professional Development

## Professional Memberships

Entomological Society of America. National. (January 2008 - Present).

Society for Integrative and Comparative Biology. International. (January 2006 - Present).

## Development Activities Attended

### Workshop

Taking the Leap: Inspiration and Practices for Teaching Online. (September 19, 2018 - October 17, 2018). The Center for Enhancement of Learning and Teaching. University. Lexington, KY. Series of five workshops covering various aspects of distance learning

Grant Writer's Workshop. (March 16, 2017 - March 17, 2017). University of Kentucky and University of Tennessee. Regional. Knoxville, TN, United States. Grant writing workshop to develop grantsmanship skills.

### Faculty Discussion Group Focused on Teaching

Faculty discussion group on teaching and learning hosted by Dr. Grabau. (August 2017 - May 2018). College. Lexington, KY.

Weekly reading and discussion group focused on teaching methods and student learning

## Awards and Honors

*Wethington Research Excellence Award*, University of Kentucky. Scholarship/Research/Creative, Wethington Research Excellence Award, University. (May 2020).

*Bobby Pass Excellence in Grantsmanship Award*, University of Kentucky, College of Agriculture. Scholarship/Research/Creative, Recognition Award, College. (2019).

*Faculty Mentor of the Week*. Service, University, Recognition Award, University. (2019).

*Invited Speaker, Arthropod Genomics Symposium*. Scholarship/Research/Creative, Invited Symposium Speaker, National. (2019).

*Travel Award to Attend Scientific Council on Antarctic Research Biology Symposium*, National Science Foundation. Scholarship/Research/Creative, Travel Grant, National. (July 11, 2017).

*Early Career Professional Research Award*, Entomological Society of America. Scholarship/Research/Creative, Recognition Award, National. (September 25, 2016).

# CURRICULUM VITAE

**Raul T. Villanueva**

Review Period: 2016-2022

## GENERAL INFORMATION

Assistant Professor, Department of Entomology since February 15<sup>h</sup>, 2016.  
(75% Extension and 25% Research).

### Education

Ph.D. Entomology, University of Florida, USA, 2002.

M.Sc. Biology, Queen's University, Kingston, Canada, 1997.

B.Sc. Agronomy, Universidad Agraria La Molina, Lima, Perú, 1987.

### Employment History

Assistant Professor, University of Kentucky, 2016-Present.

Assistant Professor, Texas A&M University, Weslaco, Texas, 2009 – 2016.

Research Associate, North Carolina State University, Raleigh, NC, 2006 – 2009.

Research Associate, North Carolina State University, Mills River, NC, 2002 – 2006.

## EXTENSION/OUTREACH/SERVICE (75% DOE)

### Extension publications:

**Table 1.** Numbers of extension publication in as peer-reviewed, based on works conducted at UK, and other institutions, MS submitted, being written, and type of contribution\*.

| Type of peer reviewed manuscript                              | First author | Coauthor  | Total      |
|---------------------------------------------------------------|--------------|-----------|------------|
| New extension publications peer-reviewed                      | 10           | 5         | 15         |
| Previous Work at other institutions.                          | 0            | 1         | 1          |
| Revisions and updated versions of insecticide recommendations | 5            | 0         | 5          |
| Wheat Newsletters and Science Reports                         | 13           | 0         | 13         |
| Corn and Soybean Newsletters and Science Research Reports     | 19           | 4         | 23         |
| Kentucky Pest News Blog (original articles)                   | 76           | 8         | 84         |
| Publications in printed and digital press (summarized all)    | 92           | 6         | 98         |
| TV and Radio                                                  | 5            | 0         | 5          |
| <b>TOTAL</b>                                                  | <b>220</b>   | <b>24</b> | <b>244</b> |

### New extension publications peer-reviewed

1. ENTfact 162: Hemp Russet mite a key pest of Hemp in Kentucky. **R. T. Villanueva**, Zenaida Viloría, Ronald Ochoa, and Andrew Ulsamer.
2. ENTfact 161: Management of Fall Armyworms in Double Crop Soybeans in Kentucky. **R. T. Villanueva**.
3. ENTfact 160: What do wasps do in hemp? A survey in Western Kentucky. Armando Falcon-Brindis, and **R. T. Villanueva**.
4. ENTfact 159: Red Cocklebur Weevil. **R. T. Villanueva**, and Armando Falcon-Brindis. <https://entomology.ca.uky.edu/ef159>
5. ENTfact 158: Threecornered Alfalfa Hopper in Soybeans. **R. T. Villanueva**.

6. ENTfact 459: Non-Native ambrosia beetles: damage and management. 2020. Z. Viloría, **R. T. Villanueva**, W. Dunwell, and R. Bessin. <https://entomology.ca.uky.edu/ef459>.
7. ID-268: Kentucky Grain Crop Production at a Glance. C. Knott, C. Bradley, C. Lee, T. Legleiter, S. McNeill, E. Ritchey, **R. T. Villanueva**, and K. Wise. <http://www2.ca.uky.edu/agcomm/pubs/ID/ID268/ID268.pdf>
8. ID-268P: Kentucky Grain Crop Production at a Glance-Poster. C. Knott, C. Bradley, C. Lee, T. Legleiter, S. McNeill, E. Ritchey, **R. T. Villanueva**, and K. Wise. <http://www2.ca.uky.edu/agc/pubs/ID/ID268P/ID268P.pdf>
9. ID-249: A comprehensive guide to soybean management in Kentucky. Insect Pests (pages 57-66). **R. T. Villanueva**, and R. Bessin. 2018. 80 pp.
10. Approaches to conduct balanced studies using hemp russet mites. 2021. **R. T. Villanueva**, A. Falcon-Brindis, Z. Viloría, and C. Bradley. In Proceedings of the 2nd Annual Scientific Conference the Science of Hemp: Production and Pest Management. P. 59, 2022.
11. Observations of insect and disease pests on field grown hemp in Kentucky. 2021. Ricciardi, M., **R. T. Villanueva**, N. Gauthier, R. Pearce. In Proceedings of the 2nd Annual Scientific Conference the Science of Hemp: Production and Pest Management, p. 45, 2022.
12. Parasitism of corn earworm by tachinid flies in industrial hemp. 2021. Falcon-Brindis, A., **R. T. Villanueva**, Z. Viloría, and C. Bradley. In Proceedings of the 2nd Annual Scientific Conference the Science of Hemp: Production and Pest Management, p 29, 2022.
13. Evaluation of biopesticides for the management of *Helicoverpa zea* in hemp. 2021. Viloría, Z., A. Falcon-Brindis, C. Bradley, and **R. T. Villanueva**. In Proceedings of the 2nd Annual Scientific Conference the Science of Hemp: Production and Pest Management. p. 60, 2022.
14. Arthropods Collected in Industrial Hemp Fields in Kentucky in 2019. 2019. **R. T. Villanueva**, Samantha Anderson, Colby Guffey, and Susan Fox. Proceedings of the 1st Annual Scientific Conference the Science of Hemp-2019.
15. Hemp Russet Mite: A Threat to Hemp in Kentucky. 2019. **R. T. Villanueva** Proceedings of The Science of Hemp Conference-2019.

### Previous Work at other institutions.

1. EAG -0511/18: Economic impact of the sugarcane aphid outbreak in south Texas. Zapata, S; R. Dudensing, **R. T. Villanueva**, D. Sekula and G. Esparza-Diaz. 2016. Texas AgriLife Extension Publication.

### Revisions

1. ENT-13 Insecticide recommendations for field corn. **R. T. Villanueva**.
2. ENT-16 Insecticide recommendations for soybeans. **R. T. Villanueva**.
3. ENT-24 Insecticide recommendations for grain sorghum. **R. T. Villanueva**.
4. ENT-47 Insecticide recommendations for small grains. **R. T. Villanueva**.
5. ENT-2 Insecticide recommendations for popcorn. **R. T. Villanueva**.



## **Wheat: Newsletters and Science Reports**

Wheat Science Newsletter (<https://wheatscience.ca.uky.edu/newsletters>).

Wheat reports (<https://wheatscience.ca.uky.edu/research>).

1. April 8, 2020. Scouting for aphids in Winter Wheat and Their Control During Spring in Kentucky **R. T. Villanueva**. Vol. 243, Issue 14.
2. August 28, 2019. Effects of rainfall or drought in the abundance of aphids in winter wheat. **R. T. Villanueva**. Vol. 23, Issue 4.
3. March 8, 2019. Do frequent rainfalls during winter reduce insect populations in the spring in field crops? **R. T. Villanueva**. <https://wheatscience.ca.uky.edu/newsletters>).
4. February 5, 2019. Hold on to your insecticide sprays to manage aphids in wheat in the harsh winter of 2019. **R. T. Villanueva**. Vol. 23, Issue 1.
5. April 10, 2018. Unnecessary use of pyrethroids in wheat can lead to aphid resistance and barley yellow dwarf virus outbreaks. **R. T. Villanueva**. Vol. 22, Issue 1.
6. April 11, 2017. Entomopathogenic fungus may cause high mortality on aphids. **R. T. Villanueva** and Y. Gonzalez Vol. 21, Issue 3.
7. March 21, 2017. Freeze effects on aphids and their parasitoids under the mild winter conditions of 2017. **R. T. Villanueva**. Vol. 21, Issue 2.
8. February 23, 2017. Wheat: earlier aphid occurrences may be a consequence of 2017's warm winter. **R. T. Villanueva**. Vol. 21, Issue 1.
9. 2018-2019. Scouting for aphids in wheat fields with or without insecticide seed treatment in March and April is critical to reduce BYDV in winter wheat. **R. T. Villanueva**.
10. 2017-2018. Comparing pyrethroids to manage aphids in insecticide treated and untreated wheat seed. **R. T. Villanueva**., Carl Bradley, Yaziri Gonzalez, and Rocio Davila.
11. 2017-2018. Changes of BYDV and CYDV infection in commercial wheat of western Kentucky. **R. T. Villanueva**., and C. Bradley. (<https://wheatscience.ca.uky.edu/research/2017-2018>).
12. 2016-2017. Insecticides are not the only option: natural enemies can cause high mortality on large aphid population outbreaks in small grains **R. T. Villanueva**, and Yaziri Gonzalez. (<https://wheatscience.ca.uky.edu/research/2016-2017>).
13. 2016-2017. Insecticide efficacy test and evaluation of damage by rice stink bug on barley. **R. T. Villanueva**, and Y. Gonzalez.

## **Corn and Soybean Newsletters and Science Research Reports**

### **2021**

1. Seedcorn maggot seen in abundant numbers in corn and soybeans. **R. T. Villanueva**.
2. Increased mollusk activity in corn and soybeans observed in the spring of 2021. **R. T. Villanueva**.
3. Abundance of sugarcane aphid was reduced in Sorghum in 2021. **R. T. Villanueva**, Chris Teutsch, and Susan Fox.
4. Fall armyworms affected double-crop soybeans in many counties of Kentucky in 2021. **R. T. Villanueva**.
5. Soybean gall midge, the “new pest” of soybeans in the Midwest, still not detected in Kentucky. **R. T. Villanueva**.

6. Outbreaks of fall armyworm soybeans in western Kentucky. **R. T. Villanueva.**
7. Speculations on the Causes of Fall Armyworm Outbreaks in 2021 and its Management in Soybeans in Kentucky. **R. T. Villanueva.**
8. Effects of various rates of potash and molluscicides in the management of slugs: laboratory and field studies. Josey Tolley, and **R. T. Villanueva**, Entomology Extension Specialist, and Edwin Ritchey.
9. Blister beetles in soybeans in Kentucky. **R. T. Villanueva.**
10. Description of the rapid colonization of western Kentucky by the brown marmorated stink bug 2020-2021. A. Falcon-Brindis, Z. Viloría, and **R. T. Villanueva.**
11. The ragweed weevil, a harmless visitor of soybean fields in Kentucky. **R. T. Villanueva.**
12. Evaluating sunflower as a trap crop for *Dectes* stem borer in western Kentucky. **R. T. Villanueva.**
13. Farmers Notice the sudden presence of fall armyworms in western Kentucky. **R. T. Villanueva.**
14. Evaluating molluscicides and carabid predation of slugs in soybeans. J. Tolley and **R. T. Villanueva.**
15. Brown marmorated stink bug increases its numbers in western KY soybeans in 2021. **R. T. Villanueva**, and A. Falcon-Brindis.

## **2020**

16. Response of the Japanese beetle to pyrethroids in soybeans. **R. T. Villanueva** and Z. Viloría.
17. Soybeans and corn might be injured by stink bugs in 2020. **R. T. Villanueva** and Z. Viloría.
18. High population occurrences of threecornered alfalfa hopper in soybeans in 2020. **R. T. Villanueva.**
19. Stink bug populations surpassing economic thresholds in soybeans in 2020. **R. T. Villanueva.**
20. Sporadic beetles that may affect earlier stages of corn: Corn flea beetles, Sugarcane beetles, and White Grubs. **R. T. Villanueva.**

## **2019**

21. Management of caterpillars in non-GMO corn in western and eastern Kentucky. **R. T. Villanueva**, and Ric Bessin.
22. Evaluating the effects of *Dectes texanus* in soybeans yields using exclusion cages in Kentucky. **R. T. Villanueva**, and I. Gomes.
23. Two-season study to compare preventive insecticide sprays for the management of stink bugs in soybean. **R. T. Villanueva**, and Y. Gonzalez.

## **Kentucky Pest News:**

A total of 83 original articles based on personal field observations, and my applied research and entomological expertise have been published. Some articles were coauthored with other specialists, students, or County Extension Agents. Kentucky Pest News is a freely accessed blog in the WWW, the URL is: <https://kentuckypestnews.wordpress.com/>.

## 2022

1. Concrete mites make their annual spring return to paved surfaces. May 17. **R. T. Villanueva.**
2. Wild bees contribute to the pollination of apple orchards in western Kentucky. May 10. A. Falcon-Brindis, and **R. T. Villanueva.**
3. Stink bugs in wheat may have an early awakening and affect corn and soybean seedlings. May 10. **R. T. Villanueva.**
4. Small, creepy, and beautiful predacious tigers of the soil. May 10. A. Falcon-Brindis and **R. T. Villanueva.**
5. Conducive weather for seedcorn maggot & slug outbreaks in field crops. April 12. **R. T. Villanueva.**
6. EPA mandates the phase-out of chlorpyrifos after February 28, 2022. February 22. **R. T. Villanueva.**

## 2021

7. Overwintering Asian lady beetles might extend their fly period in 2021. November 23. **R. T. Villanueva.**
8. The ragweed weevil, a harmless visitor of soybean fields in Kentucky. November 9. **R. T. Villanueva.**
9. Twice stabbed stink bug observed in maturing hemp. October 26. **R. T. Villanueva.**
10. Blister beetle: predatory behavior outweighs their feeding in Soybeans in Kentucky. October 19. **R. T. Villanueva.**
11. Spreading of the brown marmorated stink bug across west and central Kentucky: Distribution and trends. October 19. A. Falcon-Brindis and **R. T. Villanueva.**
12. What are the tiny mud pots on hemp petioles? October 5. A. Falcon-Brindis and **R. T. Villanueva.**
13. Overview of insect pests in maturing soybean fields in central Kentucky. September 14. A. Falcon-Brindis and **R. T. Villanueva.**
14. Status of stink bugs in full season and double crop soybeans in August 2021. September 7. **R. T. Villanueva,** and A. Falcon-Brindis.
15. Outbreak of fall armyworm did not affect hemp, but corn earworm and tobacco budworm might make their move soon. August 31. **R. T. Villanueva,** and A. Falcon-Brindis.
16. Status of several aphid species in grain, forage, and sweet sorghum in 2021. August 24. **R. T. Villanueva.**
17. Fall armyworm may have a persistent presence as oviposition lingers in August. August 17. **R. T. Villanueva,** and Z. Viloría.
18. The white marginated burrower bug in soybeans is a harmless insect. August 17. **R. T. Villanueva.**
19. Controlling slugs through the application of potash and molluscicides. August 10. J. Tolley, and **R. T. Villanueva.**
20. Abrupt presence of fall armyworms in double-crop soybeans in Kentucky. August 3. **R. T. Villanueva.**
21. The Kudzu bug and the search for its parasitoids. August 3. A. Ritchey and **R. T. Villanueva.**

22. Spider mites damage observed in soybeans in western Kentucky. July 20. **R. T. Villanueva.**
23. Soybean gall midge is spreading in the Midwest – A 2021 update. May 24. **R. T. Villanueva.**
24. Seedcorn maggot seen in abundant numbers in corn and soybeans. May 18. **R. T. Villanueva.**
25. Current weather conditions are suitable for increase mollusk activity in corn and soybeans. May 4. **R. T. Villanueva.**

## **2020**

26. Eurasian hemp borer making its way in Kentucky. November 3. **R. T. Villanueva,** and C. Whitney.
27. Brown marmorated stink bug expected to invade man-made structures in Western Kentucky this fall. October 12. **R. T. Villanueva.**
28. Colonization of western Kentucky by brown marmorated stink bug. September 22. **R. T. Villanueva** and Z. Viloría.
29. Predatory stink bug detected in western Kentucky. September 22. **R. T. Villanueva.**
30. Stink bug populations surpassing economic thresholds in soybeans in 2020. September 15. **R. T. Villanueva,** and Z. Viloría.
31. Threecornered alfalfa hopper found cutting soybeans. July 28. **R. T. Villanueva.**
32. Damage by corn flea beetles in seedling. June 23. **R. T. Villanueva.**
33. As rains stopped, thrips started to move into late-planted corn. June 20. **R. T. Villanueva.**
34. Periodical cicada: guardians of time. June 2. R. Bessin, and **R. T. Villanueva,**
35. Warrior II with Zeon Technology® approved for control of crane flies in alfalfa. March 24. **R. T. Villanueva,** and R. Bessin.
36. 2020: List of products for the management of insects and mites in commercial hemp. February 11. **R. T. Villanueva,** R. Bessin and Z. Viloría.
37. Two additional insecticides are registered under section 24(c) to manage insect pests on hemp in Kentucky. January 14. R. Bessin and **R. T. Villanueva.**

## **2019**

38. Heligen® is registered under section 24(c) to manage corn earworm in industrial hemp in Kentucky. October 1. **R. T. Villanueva,** and R. Bessin.
39. Tachinid flies might have been actively working this season in Kentucky. October 1. **R. T. Villanueva.**
40. Corn earworm outbreaks in industrial hemp in Kentucky: September –2019. September 17. **R. T. Villanueva,** S. Anderson, and Colby Guffey.
41. Soybean gall midge: an emergent pest in the Midwest. August 13. **R. T. Villanueva.**
42. Insecticides registered in Kentucky for insects affecting commercial hemp. August 13. **R. T. Villanueva.**
43. Hemp russet mite detected in several areas across Kentucky. August 6. **R. T. Villanueva** and B. Kennedy.
44. Pecan trees damaged by the hickory shoot curculio. June 4. **R. T. Villanueva.**
45. Sugarcane beetle reported feeding on seedling corn. June 4. **R. T. Villanueva.**
46. Fly species that thrive on decomposing organic matter and moist environments stand out in the 2019 planting season in different crop systems. May 14. **R. T. Villanueva.**

47. Damage by stink bugs observed in seedling corn. May 14. **R. T. Villanueva.**
48. Aphids not detected in wheat fields in western Kentucky yet. April 2. **R. T. Villanueva.**
49. Crane fly larvae might be on the rise in soggy alfalfa fields. April 2. **R. T. Villanueva,** and B. Kennedy.
50. Cannabis aphid found in hemp grown in greenhouses in western Kentucky. February 19. **R. T. Villanueva,** and B. Kennedy.
51. The Asiatic Garden beetle is a potential pest for Kentucky's field corn; it might cause field corn losses in Southwest Michigan. February 12. **R. T. Villanueva.**
52. Hold on to your insecticide sprays to manage aphids in wheat in the harsh winter of 2019. February 5. **R. T. Villanueva.**

## **2018**

53. Causes for green stem syndrome in soybeans are still a conundrum. November 6. **R. T. Villanueva** and C. Bradley.
54. Soybean stem borer infestations are being noticed by Kentucky growers: yield might be reduced. October 23. **R. T. Villanueva.**
55. Scout for armyworms. June 5. **R. T. Villanueva,** and R. Bessin.
56. Slugs in wheat fields: a management challenge for farmers and researchers. May 1. **R. T. Villanueva.**
57. Unnecessary use of pyrethroids in wheat can lead to aphid resistance and Barley Yellow Dwarf Virus outbreaks. April 3. **R. T. Villanueva.**

## **2017**

58. Soybean stem borer: an unnoticed bug that may cause problems during harvest and reduce yields in soybeans. September 19. **R. T. Villanueva,** and Y. Gonzalez.
59. Copious amounts of honeydew produced by sugarcane aphids attracts bees and other insects: do we need to be worried? September 12. **R. T. Villanueva.**
60. True and fall armyworms and black cutworms may be causing some damages in corn and pastures in Kentucky. August 15. **R. T. Villanueva.**
61. Sugarcane aphid: occurrence in August 2017, misidentification, and insecticides registered for grain, forage, and sweet sorghum. August 8. **R. T. Villanueva,** and R. Bessin.
62. Spike of Southwestern corn borer might need attention in corn fields in western Kentucky. August 8. **R. T. Villanueva.**
63. Sugarcane aphid detected on sweet sorghum. July 11. **R. T. Villanueva,** and R. Bessin.
64. Kudzu bug found in the Land Between the Lakes for first time. July 11. **R. T. Villanueva,** and Susan Fox (CEA-Lyon).
65. Replanted and double crop soybeans can be affected by mollusk outbreaks in Kentucky in 2017. June 28. **R. T. Villanueva.**
66. Scouting for true armyworms is highly recommended in small grains and early corn. April 25. **R. T. Villanueva.**
67. Ticks may be on the rise this year. April 11. **R. T. Villanueva.**
68. Ambrosia beetles are out looking for new hosts. April 11. **R. T. Villanueva.**
69. Entomopathogenic fungus may cause high mortality on aphids. April 4. **R. T. Villanueva,** and Y. Gonzalez.

70. Beware of true armyworms—mild winter provides conditions for potential injuries in small grains. March 28. **R. T. Villanueva.**
71. Freeze effects on aphids and their parasitoids under the mild winter conditions of 2017. March 21. **R. T. Villanueva.**
72. Earlier aphid occurrences on wheat may be a consequence of the 2017's warm winter. February 28. **R. T. Villanueva.**

## 2016

73. Ambrosia beetles are out looking for new hosts. November 4. **R. T. Villanueva.**
74. Bio-solids, poultry & swine manure amendments affect population densities of soil mites on corn & wheat fields in western Kentucky. August 30. **R. T. Villanueva.**
75. Tips for good grain storage management. August 30. **R. T. Villanueva.**
76. Surge of fall armyworms may affect pastures and cover crops in Kentucky. August 23. **R. T. Villanueva.**
77. Moist soils may cause outbreaks of slugs in late soybean planting August 9. **R. T. Villanueva.**
78. Insecticides registered against the sugarcane aphid on grain & sweet sorghum in Kentucky for 2016. August 2. **R. T. Villanueva** and R. Bessin.
79. Caterpillars may affect late corn planting in different areas of Kentucky in 2016. July 19. **R. T. Villanueva**, P. Lucas, and R. Bessin.
80. July 19, 2016. Fall-colored damage in bald cypress (*Taxodium distichum*) caused by rust mites in late spring. Z. Vilorio, **R. T. Villanueva**, and W. Dunwell.
81. Sugarcane aphid arrived at Kentucky a month earlier in 2016 than in 2015. July 19. **R. T. Villanueva.**
82. How to monitor and when to control the early abundance of thrips on soybean fields. June 28. **R. T. Villanueva.**
83. New aphid pest on grain sorghum – sugarcane aphid. June 2. **R. T. Villanueva.**
84. New cereal aphid (*Sipha maydis*) expands range of distribution. May 6. **R. T. Villanueva.**

## Publications in printed and digital press:

Articles from Kentucky Pest News were published by different agricultural magazines. Digital and printed media such as the *Ag-fax*, *Agnews*, *Mid-American Farmer Grower*, *Morning AgClips*, *Non-Till Farmer Magazine*, and *Progressive farmer*, reprinted and posted some of these articles. Examples are listed below.

### *Ag-fax*

#### 2022

1. Kentucky corn, soybeans: stink bugs in wheat may have an early awakening and affect seedlings. May 11. **R. T. Villanueva.**

#### 2021

2. Kentucky corn, soybeans: conditions suitable for increased mollusk activity. May 6. **R. T. Villanueva.**

#### 2020

3. Kentucky: 2020 Fall crop protection webinar series. October 20. University of Kentucky. K. Wise, C. Bradley, **R. T. Villanueva**, J.D. Green, and T. Legleiter.

4. Kentucky soybeans: stink bugs reaching dangerous levels. September 16. **R. T. Villanueva**, and Z. Vilorio.

#### **2019**

5. Hemp: corn earworm outbreaks. September 18. **R. T. Villanueva**, S. Anderson, and C. Guffey.
6. How does rainfall, drought affect aphid populations? August 30. **R. T. Villanueva**.
7. Hemp russet mite management. August 7. **R. T. Villanueva**, and B. Kennedy.
8. Sugarcane beetles feeding on seedlings. June 6. **R. T. Villanueva**.
9. Stink bugs damaging seedlings. May 15. **R. T. Villanueva**.
10. Cannabis aphid found in greenhouses. February 20. **R. T. Villanueva**, and B. Kennedy.
11. Kentucky: IPM training school, Hopkinsville, March 6. University of Kentucky. February 6. **R. T. Villanueva**.
12. Spraying for aphids? don't just rely on the calendar. February 6. **R. T. Villanueva**.
13. Illinois: 4 upcoming crop management conferences in Jan. and Feb. J. Soule. January 15.

#### **2018**

14. Green stem syndrome – what causes it? November 7. **R. T. Villanueva**, and C. Bradley.
15. Kentucky Wheat: Slugs – A management challenge for farmers and researchers. May 2. **R. T. Villanueva**.

#### **2017**

16. Kentucky sorghum: sugarcane aphids – identification and management. August 9. **R. T. Villanueva**, and R. Bessin.
17. Kentucky Corn: spike of southwestern corn borer might need attention. August 9. **R. T. Villanueva**, and R. Bessin.
18. Kentucky soybeans: heavy outbreak of slugs, snails. July 5. **R. T. Villanueva**.
19. Kentucky: UK wheat field day, Princeton, May 9. May 4. C. Laurent.
20. Kentucky: wheat production field school, March 8, April 26. February 6. E. Ritchey.

#### **2016**

21. Kentucky soybeans: moist soils may cause slug outbreaks in late fields. August 10. **R. T. Villanueva**.
22. Kentucky: wheat field day, Princeton, May 10. July 21. C. Laurent.
23. Sorghum: sugarcane aphid started in Texas and now: Hello, Kansas! April 25. E. Unglesbee.
24. Texas: Sugarcane aphid meeting, Weslaco, April 12. April Rod Santana.

#### ***Agrinews***

1. Slugging it out: Pests, weeds, and disease outlook for coming season. February 6, 2019. K. Binder.

#### ***Mid-American Farmer Grower (Claims 36,000 weekly views)***

#### **2021**

1. UK Scientists to host interactive virtual wheat meeting. Katie Pratt.
2. Current weather conditions are suitable for increase mollusk activity in corn and soybeans. **R. T. Villanueva**.

3. Seedcorn maggot seen in abundant numbers in corn and soybeans. **R. T. Villanueva.**
4. Soybean gall midge is spreading in the Midwest—a 2021 update. **R. T. Villanueva.**
5. Pest management field day to focus on grain crops. **R. T. Villanueva.**
6. Spider mites damage observed in soybeans in western Kentucky. **R. T. Villanueva.**
7. Kentucky grain farmers adapt to new climate normal. **R. T. Villanueva.**
8. Status of several aphid species in grain, forage, and sweet sorghum in 2021. **R. T. Villanueva.**
9. Status of stink bugs in full season and double crop soybeans in August 2021. **R. T. Villanueva.**
10. Blister beetles, predatory behavior outweigh their feeding in soybeans in Kentucky. **R. T. Villanueva.**
11. The ragweed weevil, a harmless visitor of soybean fields in Kentucky. **R. T. Villanueva.**
12. Overwintering Asian lady beetles might extend their fly period in 2021. **R. T. Villanueva.**

## **2020**

13. Warrior II with Zeon Technology® approved for control of crane flies in alfalfa. **R. T. Villanueva,** and R. Bessin.
14. Periodical cicada: guardians of time. R. Bessin, **R. T. Villanueva,** and D. Becker.
15. As rains stopped, thrips started to move into late-planted corn. **R. T. Villanueva.**
16. Damage by corn flea beetles in seedling. **R. T. Villanueva.**
17. Threecornered alfalfa hopper found cutting soybeans. **R. T. Villanueva,** and G. K. Drake.
18. Stink bug populations surpassing economic thresholds in soybeans in 2020. **R. T. Villanueva,** and Z. Viloría.
19. Colonization of western Kentucky by brown marmorated stink bug. **R. T. Villanueva,** and Z. Viloría.
20. Predatory stink bug detected in Western Kentucky. **R. T. Villanueva.**

## **2019**

21. Hold on to your insecticide sprays to manage aphids in wheat in the harsh winter of 2019. **R. T. Villanueva.**
22. Aphids not detected in wheat fields in western Kentucky yet. **R. T. Villanueva.**
23. Damage by stink bugs observed in seedling corn. **R. T. Villanueva**
24. Tachinid flies might have been actively working this season in Kentucky. **R. T. Villanueva,** and Y. Gonzalez.

## **2018**

25. Unnecessary use of pyrethroids in wheat can lead to aphid resistance and Barley Yellow Dwarf Virus outbreaks. **R. T. Villanueva.**
26. Soybean stem borer infestations are being noticed by Kentucky growers: yield might be reduced. **R. T. Villanueva.**
27. Causes for green stem syndrome in soybeans are still a conundrum. **R. T. Villanueva,** and C. Bradley.

## **2017**

28. Freeze effects on aphids and their parasitoids under the mild winter conditions of 2017. **R. T. Villanueva.**



29. Beware of true armyworms – mild winter provides conditions for potential injuries in small grains. **R. T. Villanueva.**
30. Scouting for true armyworms is highly recommended in small grains and early corn. **R. T. Villanueva.**
31. Entomopathogenic fungus may cause high mortality on aphids. Y. Gonzalez, and **R. T. Villanueva.**
32. Replanted and double crop soybeans can be affected by mollusk outbreaks in Kentucky in 2017. **R. T. Villanueva.**
33. Kudzu Bug found in the land between the lakes for first time. **R. T. Villanueva,** and S. Fox.
34. True and fall armyworms and black cutworms may be causing some damages in corn and pastures in Kentucky. **R. T. Villanueva.**
35. Soybean stem borer: an unnoticed bug that may cause problems during harvest and reduce yields in soybeans. **R. T. Villanueva.**

#### **2016**

36. True and fall armyworms and black cutworms may be causing some damages in corn and pastures In Kentucky. **R. T. Villanueva.**
37. How to monitor and when to control the early abundance of thrips on soybean fields. **R. T. Villanueva.**
38. Caterpillars may affect late corn planting in different areas of Kentucky in 2016. **R. T. Villanueva,** P. Lucas, R. Bessin.
39. Moist soils may cause outbreaks of slugs in late-season soybean planting. **R. T. Villanueva.**
40. Surge of fall armyworms may affect pastures and cover crops In Kentucky. **R. T. Villanueva.**

#### ***Morning AgClips***

#### **2021**

1. Overwintering Asian lady beetles might extend their fly period in 2021. November 29. **R. T. Villanueva.**
2. Schedule for the University of Kentucky 2021 fall crop protection webinar series. November 15. K. Wise, C. Bradley, J. D. Green, and T. Legleiter.
3. Status of stink bugs in full season and double crop soybeans in August 2021. September 13. **R. T. Villanueva,** and A. Falcon-Brindis.
4. Status of several aphid species in grain, forage, and sweet sorghum in 2021. August 26. **R. T. Villanueva.**
5. Controlling slugs through the application of potash and molluscicides. August 15. J. Tolley, **R. T. Villanueva,** and E. Ritchey.
6. The kudzu bug and the search for its parasitoids. August 9. A. Ritchey, and **R. T. Villanueva.**
7. Abrupt presence of fall armyworms in double-crop soybeans in Kentucky. August 8. **R. T. Villanueva.**
8. Spider mite damage observed in soybeans in Western Kentucky. July 22. **R. T. Villanueva.**
9. Kentucky grain farmers adapt to new climate normals. July 21. K. Pratt.
10. Pest Management Field Day to focus on grain crops. June 8. K. Pratt.

11. Soybean gall midge spreading in Midwest. May 25. **R. T. Villanueva.**
12. Weather conditions suitable for mollusk activity. May 11. **R. T. Villanueva.**
13. UK scientists to host interactive virtual wheat meeting. May 3. K. Pratt.

#### **2020**

14. Additional pesticides registered for hemp. January 22. R. Bessin, and **R. T. Villanueva.**

#### **2019**

15. Soybean gall midge, an emergent pest in the Midwest. August 19. **R. T. Villanueva.**

#### **2018**

16. Slugs in wheat fields. May 3. **R. T. Villanueva.**
17. Pyrethroids use in wheat. April 16. **R. T. Villanueva.**
18. Look for ambrosia beetles as spring begins. March 4. K. Pratt.

#### **2017**

19. Spike of SWCB might need attention. August 13. **R. T. Villanueva,** and R. Bessin.
20. Sugarcane aphid occurrence in Kentucky. August 14. **R. T. Villanueva,** and R. Bessin.
21. Soybean stem borer. September 21. **R. T. Villanueva,** and Y. Gonzalez.
22. Mollusk outbreaks in soybeans. July 5. **R. T. Villanueva.**
23. Scout for true armyworms. April 27. **R. T. Villanueva.**
24. Beware of true armyworms. April 9. **R. T. Villanueva.**
25. Mild winter and aphids. March 30. **R. T. Villanueva.**
26. Earlier aphid occurrences. March 13. **R. T. Villanueva.**

#### ***Non-Till Farmer Magazine***

1. Monitoring and controlling early abundance of thrips on soybean fields. July 7, 2016. **R. T. Villanueva.**

#### ***Progressive Farmer Magazine***

1. Large populations of true armyworm moths heading north early. April 18, 2017. **R. T. Villanueva.**
2. Sugarcane aphid spreading quickly northward. July 21, 2016. **R. T. Villanueva.**

#### ***Times Tribune***

1. Kentucky grain farmers adapt to new climate normals. July 24, 2021. Katie Pratt.
2. UK Scientists to host interactive virtual wheat meeting. May 9, 2021. Katie Pratt.

#### ***The Ledger***

1. 2021 Fall Armyworm Outbreak Affects Lyon County and State. **R. T. Villanueva.**

#### **Television or Radio:**

I participated in solicited interviews to deliver entomological information/outreach/news for general audience.

1. Radio 103.3 FM Princeton. July 28, 2021. Status of Field crops and hemp in Kentucky.
2. Channel 6 WPSD October 7, 2020: How to stay safe from ticks before heading outside: [https://www.wpsdlocal6.com/ott/news\\_on\\_demand/how-to-stay-safe-from-ticks-before-heading-outside/video\\_7faab2fe-0898-11eb-b622-33b21de9b2be.html](https://www.wpsdlocal6.com/ott/news_on_demand/how-to-stay-safe-from-ticks-before-heading-outside/video_7faab2fe-0898-11eb-b622-33b21de9b2be.html)

3. Radio 710 AM KUR, November 2019. Inquiries about Monarch butterfly migration
4. Radio AM 1490 WOMI Owensboro, July 2019; interview about basic knowledge and management for slugs and snails in backyards

## Funding

Extramural: \$858,738 total funding for my programs

**Table 2:** Funding obtained from different sources (competitive and non-competitive) for the 2016-2022 period.

| <u>National<br/>or<br/>Regional</u> | <u>USDA-<br/>ARS<br/>NACA</u> | KDA      | Commodity<br>boards | UK and<br>International | Industry<br>contributions | Others   | Total     |
|-------------------------------------|-------------------------------|----------|---------------------|-------------------------|---------------------------|----------|-----------|
| \$165,445                           | \$90,250                      | \$51,740 | \$273,056           | \$66,947                | \$114,800                 | \$96,500 | \$858,738 |

### National or Regional competitive (\$165,445)

1. Evaluation of a leatherjacket, a new pest of alfalfa. 2022. **R. T. Villanueva** (PI), J. Dupuis, and A. Falcon-Brindis. Southern IPM Center - Critical Needs and Emerging Issues: \$10,000.
2. Evaluation of sampling methods of stink bugs in Kentucky's soybean fields. 2021-2023. NCR-USDA \$10,000/yr. **R. T. Villanueva** (PI): \$20,000.
3. Regional IPM: IPM in Kentucky: Entomology section for field crops. 2021. USDA-NIFA. EIP Program. R. Bessin (PI), T. Legleiter, **R. T. Villanueva**, C. Bradley, and Kiersten Wise (Total grant amount to IPM field crop group \$74,550). For my program for scouting pests in field crops for three years (2022 to 2024) = \$ 6,137/yr: \$12,174.
4. Sensor data fusion approach for nondestructive classification of codling moth infested apples. 2019. NIFA. A. Adedeji (PI) **R. T. Villanueva**, and K. Donohue (CoPI's) (\$500,000). For my program: \$59,494.
5. Management of Dectes stem borer in Kentucky's Soybean Fields. 2019-2020. NCR-USDA. **R. T. Villanueva** (PI), \$15,070/yr: \$30,140.
6. Strengthening undergraduate training through experiential learning opportunities in applied agronomic research and extension. 2017. NIFA. \$4,500. C. Knott and C. Lee, (PI's), **R. T. Villanueva**, C. Bradley, E. Ritchey, T. Kawashima, T. Legleiter, M. Salmeron, and H. Poffenbarger (\$299,571). USDA-NIFA provides \$7,000 of funds for an intern salary and housing/year and funded for three years: \$21,000 + \$4,500: \$25,500.
7. Management of BMSB on US Specialty Crops. 2016. USDA-NIFA R. Bessin (PI), J. Obrycki, and **R. T. Villanueva**. (\$287,648/5 years) (this amount was not included in the extramural fund reported above).
8. Regional IPM: IPM in Kentucky: Entomology section for field crops. 2018-2020. USDA-NIFA. Crop Protection and Pest Management Competitive Grants Program. R. Bessin (PI), C. Knott, C. Lee, E. Haramoto, **R. T. Villanueva**, C. Bradley, E. Ritchey, T. Kawashima, T. Legleiter, and M. Salmeron. (\$2,712/yr) Provides funds for scouting pests for three years (2018 to 2020): \$8,137.

### **USDA-ARS Non-Assistance Cooperative Agreement Funding (\$90,250)**

1. Fostering a well-rounded and sustainable hemp industry in the United States. 2020. D. Harmon (PI), Eric Vanzant, R. Pearce, K. McLeod, T. Mark, and **R. T. Villanueva**. Amount funded \$787,500. Funded to my program from 2020 to 2022. \$90,205.

### **Competitive grants from the Kentucky Department of Agriculture (\$51,740)**

1. Developing management tools against invasive ambrosia beetles affecting apples and nurseries in Kentucky. 2019. KDA-Specialty Block Grant. **R. T. Villanueva** (PI), Z. Viloría, R. Bessin, and W. Dunwell: \$21,786.
2. Studies on ambrosia beetles affecting nursery crops and fruit trees in Kentucky. 2017. KDA-Specialty Block Grant. **R. T. Villanueva** (PI), R. Bessin, and W. Dunwell: \$29,954.

### **Competitive awards from commodity boards (\$273,056)**

1. Studying the management, and impact of the geographical expansion of brown marmorated stink bugs in soybeans in western KY. 2022. **R. T. Villanueva** (PI) and A. Falcon-Brindis: \$28,764.
2. Studies on molluscicides, potash, and ground beetles for slug management. 2022. **R. T. Villanueva** (PI), E. Ritchey, and Z. Viloría: \$18,140.
3. Evaluating return on investment of soybean disease management practices. 2022. C. Bradley (PI) and **R. T. Villanueva**, and J. Shockley. Funded with \$32,873. For my program: \$5,500.
4. Evaluating the presence of Dectes Stem borer in soybean fields, weeds and assessing the tolerance of cultivars in Kentucky: Year 2. 2021. **R. T. Villanueva** (PI) and Claire Venard: \$16,680.
5. Assessing Abundances and Control of Key and Emergent Pests in Soybeans. 2021. **R. T. Villanueva** (PI): \$14,294
6. Management of caterpillars on non-GMO corn: Year 3. 2021. Corn Growers Association. Raul Villanueva (PI) and Ric Bessin: \$18,000.
7. Assessing the management of bean leaf beetles and pod mottle virus infections in soybeans. 2020. Kentucky Soybean Producers Board. Raul Villanueva, (PI) \$8,144
8. Can KY soybean yield be increased with foliar fungicide and insecticide applications at R3? 2020. Kentucky Soybean Producers Board. Carrie Knott, Chad Lee, Carl Bradley, and **R. T. Villanueva** (CoPI) (\$66,850): For my program: \$5,250
9. Management of caterpillars on non-GMO corn: Year 2. 2020. Corn Growers Association. **R. T. Villanueva** (PI) and Ric Bessin: \$25,000.
10. Evaluating the presence of Dectes Stem borer in soybean fields, weeds and assessing the tolerance of cultivars in Kentucky. 2019. Kentucky Soybean Producers Board. **R. T. Villanueva**, (PI): \$15,712.
11. Management of stink bugs in soybean: Does one strategy fit all species? 2019. Kentucky Soybean Producers Board. **R. T. Villanueva**, (PI), R. Bessin, and J. Obrycki: \$24,760.
12. Management of caterpillars on non-GMO corn. 2018. Corn Growers Association. **R. T. Villanueva** (PI) and R. Bessin: \$15,000.
13. Causes and developing solutions on outbreaks of slugs in soybeans. Kentucky Soybean Producers Board. 2018. Villanueva, R. (PI), and J. Obrycki: \$12,918.

14. Management of stink bugs in soybean: Does one strategy fit all species? 2017. Kentucky Soybean Producers Board. **R. T. Villanueva**, (PI), R. Bessin, and J. Obrycki: \$41,693.
15. Aphid resistance to pyrethroids in western Kentucky's Wheat. 2017. Kentucky Small Grains Promotion Council. R. T. Villanueva (PI): \$4,738.
16. Timed insecticide spray to control aphids and reduce BYDV infections. 2017. Kentucky Small Grains Promotion Council. **R. T. Villanueva** and C. Bradley (PI's): \$15,149.
17. Looking for old and new foes to prevent BYDV transmission on wheat. 2016. Kentucky Small Grains Promotion Council. **R. T. Villanueva** and C. Bradley (PI's): \$3,314.

#### **University of Kentucky's competitive grants (\$63,447)**

1. Villanueva, R. (PI's). 2018. CAFÉ-Research Activity Award Funds. \$3,000
2. Screening the efficacy of grain protectants in controlling stored grain insects. 2019. Siemer Milling. **R. T. Villanueva** (PI): \$20,000.
3. Education abroad travelling grant. 2018. University of Kentucky Education Abroad **R. T. Villanueva** (PI): \$2,000.
4. Travel grants to graduate students to travel to Peru in 2019. UK Student Sustainability Council J., Ritchey, N. Mercer, and L. Potts. Funds were used to paid airplane tickets, and accommodation: \$12,675
5. Study and Outreach of food production methods in an Amish community in western Kentucky 2018. Villanueva, R. T. (PI), Y. Gonzalez, and I. Gomes. University of Kentucky's Food Connection Grant: \$6,500.
6. Engaging elementary students into horticulture with cooperation of master gardeners and through multidisciplinary approaches in rural KY. 2017. Sustainable Challenge Grant. Z. Vilorio, and **R. T. Villanueva** (PI's), E. Ritchey, R. Bessin, A. Martin, D. Becker, and W. Dunwell: \$19,272.

#### **International grants (\$3,500)**

1. Pakistan student training on soil mites. 2016. Doctoral Training Abroad. Student worked in a project for a year with a scholarship of \$24,000 (this amount was not included in the extramural fund reported above). Lab fees for my program: \$3,500.

#### **Industry contributions to conduct studies (\$114,800)**

1. Evaluate the dose response of European red mite (establish LC50) using a single novel compound. 2021. Syngenta \$20,000.
2. Evaluate BoteGHA® ES, SilMatrix® LC, and PFR-97™ 20% WDG for the control of hemp russet mites. Certis \$4,500.
3. Evaluate SuffOil-X® an spray oil emulsion against the control of hemp russet mites BioWorks Pending \$5,000.
4. Evaluate BAS 374AC, BAS 450 and BAS 560, BAS 450 on secondary corn insects; RES-S-2020-ZX-1ZE-E: Evaluate on secondary corn insects 2020. BASF Corp. \$26,100.
5. Testing phytotoxicity of Debug product on hemp. Agrologistics Systems Incorporated. 2020. \$3,000.
6. Study of wireworms in wheat. 2019. BASF Corp. Raul Villanueva (PI): \$7,200.

7. Characterize Lumiderm soybean seed treatment against seed corn maggot - Field Trials. 2017 Dupont. \$8,000.
8. Evaluate pest protection and yield benefits of Lumiderm® and Lumisena® in soybean seed treatments against aphid, BLB or Thrips- Field Trials. 2017. Dupont. \$12,000.
9. Characterize HGW86 and TUP19 Soybean Seed Treatment against Bean Leaf Beetle- Field Trials. 2016 Dupont. \$9,000.

#### **Others (\$96,500)**

1. Control of hemp russet mites on field hemp. 2022. Southern region programs IR-4 \$12,500.
2. Control of hemp russet mites on field hemp. 2021. Southern region programs IR-4: \$12,500.
3. Resonate Foods: Seed hemp donation. 2021 Working with this Company during last three years and collaborating in hemp research. \$1,500.
4. Integrative management actions against current and potential invasive arthropod pests of field crops in Kentucky. \$16,000 /yr for my program from 2018 to 2022 Hatch Grant. USDA-NIFA: \$40,200/year: \$64,000.
5. Multistate Soybean Entomology group 2017 to 2020 (at least \$1,000/yr for lodging, travel, and meal/year). Funds for 2020 is not included due to COVID-19: \$3,000.
6. Multistate Corn Entomology group 2018 to 2020 (at least \$1,000/yr for lodging, travel, and meal/year). Funds for 2020 is not included due to COVID-19: \$3,000.

#### **Proposals submitted but not funded:**

1. Carrie Knott, Carl Bradley, Sam McNeill, Katie Van Valin, **R. T. Villanueva**, and Kiersten Wise. 2021. upgrading infrastructure to include a grain drying and storage complex. \$160,000.
2. **Villanueva, R. T.** 2021. Developing digital imagery tools to tally eriophyid pests using hemp russet mites as a model organism. CAMTech. \$40,000.
3. **Villanueva, R. T.** 2021. Assessing the impact of cover crops on aphid abundance and BYDV incidence to adjacent commercial wheat fields. \$26,269.
4. **Villanueva, R. T.**, J. Dupuis, C. Teutsch, J., and Z. Vilorio. 2020. Assessment of the larval infestation and management of the European crane fly in alfalfa. National Alfalfa & Forage Alliance. Round 2. \$99,999.
5. Jackai, L. N. Gauthier, M. Tyler, and **R. T. Villanueva**. 2021. Organic Hemp Production: Effects of agronomic and cultural practices on plant health and grower profits across four regions \$ 159,694.
6. **Villanueva, R. T.** (PI). 2020. Evaluation of insecticide seed treatment and sustainable management decisions. \$34,227.
7. Pearce, R., N. Cauthier, T. Mark, and **R. T. Villanueva** Studies on hemp cultivar Pyxus Corp. 2020. \$195,109.
8. **Villanueva, R. T.**, K. Wise, T. Legleiter C. Bradley, and C Knott. 2019. University of Kentucky: strategic plan for research, office of the vice president for research - equipment competition. \$69,645.
9. Webb, B. (PI) and **R. T. Villanueva**, and D. Gonthier. 2019. concept note: hemp pest rapid response consortium (HPRRC). \$100,000.

10. **Villanueva, R. T.** 2019. Developing an IPM for Aphids in wheat planted with insecticide treated seeds. KSGPC: \$35,282.
11. Dunwell, W. E. Ritchey, and **R. T. Villanueva.** 2018. Introducing elementary students to sustainable lifestyle habits through horticultural crop gardening and agricultural practices. USDA SPECA: \$199,990.
12. Litsinger, R. and **R. T. Villanueva.** 2018. Synergistic food web harvesting. KY Agricultural Development Fund: \$13,586.
13. **Villanueva, R. T.** 2018. Managing aphids and comparing yields on insecticide treated seed vs. untreated wheat seed. KSGPC: \$27,762.
14. Poffenbarger, H., **R. T. Villanueva,** R., E. Haramoto, C. Bradley, M. Springer, and D. Gonthier. 2018. Management of ambrosia beetles in ornamental and fruit tree nurseries in Kentucky and Tennessee. SARE: \$196,794.
15. Villanueva, R. T., R. Bessin, W. Dunwell, Z. Vilorio, and K. Amarasekare. 2018. Management of ambrosia beetles in ornamental and fruit tree nurseries in Kentucky and Tennessee. SARE: \$286,064.
16. **Villanueva, R. T.,** J. Shockley, J. Obrycki, S. Stewart, and N. Seiter. 2018. IPM, soil management, and economic assessments on slug outbreaks in soybean in mid-west us determining the causes and developing solutions outbreaks in double crop production systems. USDA CPPM: \$324,720.
17. **Villanueva, R. T.,** and C. Teutsch. 2018. Guns to grass: transitioning America's veterans to grassland agriculture. USDA- Advocacy & Outreach: \$199,426.
18. **Villanueva, R. T.,** University of Kentucky: Strategic plan for research, Office of the Vice President for Research - Equipment Competition (2 Grants submitted) 2017: 30,000.
19. **Villanueva, R. T.,** J. Obrycki, and R. Bessin. 2017. Determining causes and developing solutions for recent Mollusk on outbreaks of slugs in soybeans. SRIPM Enhancement Grant Program: \$29,998.
20. **Villanueva, R. T.,** R. Bessin, J. Obrycki, and S. Stewart. 2017. Management of Sugarcane aphid infesting sweet sorghum in Kentucky and Tennessee. USDA-SCRI: \$82,857.
21. Adedeji, A., **R. T. Villanueva,** and A. Patwardhan. 2017. Sensor data fusion approach for nondestructive classification of codling moth infested apples. AFRI: \$280,838.
22. Villanueva, R. T., R. Bessin, and J. Obrycki. 2017. Management of the sugarcane aphid (SCA), *Melanaphis sacchari*, infesting sweet sorghum in Kentucky. SRIPMC-EGP: \$50,000.
23. Obrycki, J. (PI), R. Bessin, S. Saha, L. Canas, and **R. T. Villanueva.** 2016. Enhancing the use of biological control for pest management in high tunnel vegetable and floral production systems. SARE-SREP: \$50,000.
24. **Villanueva, R. T.,** and E. Ritchey. 2016. Effects of biosolids on the biodiversity of soil and foliage arthropods in grain fields of western Kentucky CAMTech: \$65,000.
25. Adedeji, A., **R. T. Villanueva,** and A. Patwardhan. 2016. Nondestructive classification of codling moth infested apples using hyperspectral imaging and acoustic emission techniques. USDA-AFRI: 399,733.

26. **Villanueva, R. T.**, Knott, Dunwell, Ritchey, Bradley, Shockley, and Pfeufer. 2016. Enabling beginning farmers, and veterans on learning effective methodologies for successful farming in western Kentucky. USDA–BFR: \$434,873.

## Publications

### Refereed journal articles (since 2016) (\*Indicates contribution)

**Table 3.** Numbers of publication in refereed journals, based on works conducted at UK, and other institutions, manuscripts submitted, being written, and type of contribution\*.

| Type of peer reviewed manuscript                      | Author or Corresponding author | Contributed with data and edits | Total |
|-------------------------------------------------------|--------------------------------|---------------------------------|-------|
| Based on work conducted at the University of Kentucky | 3                              | 5                               | 8     |
| Based on work conducted at other institutions         | 3                              | 2                               | 5     |
| Articles submitted (under revision)                   | 3                              | 4                               | 7     |
| Articles currently in process of writing              | 7                              | 1                               | 8     |
| TOTAL                                                 | 15                             | 12                              | 28    |

\*For contributions on each article, the description of my role is included below.

#### Based on work conducted at the University of Kentucky

1. Falcon-Brindis, A., John O. Stireman III, Zenaida J. Viloría, and **R. T. Villanueva\***. (2022). Tachinid fly parasitism of outbreaking populations of corn earworm, *Helicoverpa zea* (Boddie) (Lepidoptera: Noctuidae), in cultivated hemp. Accepted. J. Insects in May 2022. (\*Contributed with original observation, idea and design of study, co-writing of manuscript, edits for this publication, and corresponding authorship).
2. Ekramirad, N., Y. A. Khaled, L. Doyle, J. Loeb, K. D. Donohue, **R. T. Villanueva**, and A. A. Adedeji. 2022. Nondestructive detection of codling moth infestation in apples using pixel-based NIR hyperspectral imaging with machine learning and feature selection. *Foods* 11(8), 1 - 16. (\*Contributed coordinating the timely delivery of apples infested with codling moths, and edits for this publication).
3. Viloría, Z. J., R. Bessin, P. O’Neal, C. Ranger, W. Dunwell, and **R. T. Villanueva\***. 2021. Scolytinae in nursery and fruit crops of western Kentucky and seasonal population patterns of four invasive ambrosia beetles. *J. Entomological Science*. 56(3): 374-386. (\*Contributed with data acquisition, analysis, co-writing of manuscript with Dr. Viloría, final edits for this publication, and corresponding authorship).
4. Ekramirad, N.; A.Y.; Khaled, C.A. Parrish, K.D. Donohue, **R. T. Villanueva**, and A.A. Adedeji. 2021. Development of pattern recognition and classification models for the detection of vibro-acoustic emissions from codling moth infested apples. *Postharvest Biology and Technology* 181: 111633 <https://doi.org/10.1016/j.postharvbio.2021.111633>. (\*Contributed coordinating the timely delivery of apples infested with codling moths, and edits for this publication).



5. **Villanueva\* R. T.**, N. Gauthier, and M. Ahmed. 2020. First record of *Coccus hesperidum* L. (Hemiptera: Coccidae) in industrial hemp in Kentucky. Florida Entomologist 103: 514-515. <https://doi.org/10.1653/024.103.00415>. (\*Contributed with idea to develop MS, data acquisition, analysis, writing of manuscript, edits for this publication, and corresponding authorship).
6. Musser, Fred; A. Catchot, S. Conley, J. Davis, C. Difonzo, J. Greene, G. Lorenz, D. Owens, D. Reising, P. Roberts, T. Royer, N. Seiter, R. Smith, S. Stewart, S. Taylor, K. Tilmon, **R. T. Villanueva**, and M. Way. 2020. 2019 Soybean insect losses in the United States. Midsouth Entomologist. Midsouth Entomologist 13:1-23. Available at: [https://www.researchgate.net/publication/340950846\\_2019\\_Soybean\\_Insect\\_Losses\\_in\\_the\\_United\\_States](https://www.researchgate.net/publication/340950846_2019_Soybean_Insect_Losses_in_the_United_States). (\*Contributed with data and edits for the Kentucky part of this publication). [PDF last accessed Oct 13, 2020].
7. Adedeji, A. A., N. Ekramirad, A. Rady, A. Hamidisepehr, K. Donohue, Kevin. **R. T. Villanueva**, C.A. Parrish, and M. Li, Mengxing. 2020. Non-destructive technologies for detecting insect infestation in fruits and vegetables under postharvest condition: A critical review. Foods 9(7), 927. Available at <https://doi.org/10.3390/foods9070927>. (\*Contributed coordinating the timely delivery of apples infested with codling moths, and edits for this publication).
8. Musser, Fred; A. Catchot, S. Conley, J. Davis, C. Difonzo, J. Greene, G. Lorenz, D. Owens, T. Reed, D. Reising, P. Roberts, T. Royer, N. Seiter, S. Stewart, S. Taylor, K. Tilmon, **R. T. Villanueva**, and M. Way. 2019. 2018 Soybean insect losses in the United States. Midsouth Entomologist. 12: 1-24. (\*Contributed with data and edits for the Kentucky part of this publication) [PDF last accessed Oct 13, 2020]. Available at: [https://www.researchgate.net/publication/340950846\\_2019\\_Soybean\\_Insect\\_Losses\\_in\\_the\\_United\\_States](https://www.researchgate.net/publication/340950846_2019_Soybean_Insect_Losses_in_the_United_States)

Based on work conducted at other institutions

1. Esparza-Diaz, G.; T. Marconi, C. Avila, **R. T. Villanueva**. 2021. Persistence of the exotic mirid *Nesidiocoris tenuis* (Hemiptera: Miridae) in South Texas. Insects 2021, 12, 715. <https://doi.org/10.3390/insects12080715>. (\*Contributed with original idea and design of study, data analysis, co-writing of manuscript, edits for this publication, and corresponding authorship).
2. Zapata, S.D., R. Dudensing, D. Sekula. G. Esparza-Diaz, and **R. T. Villanueva**. 2018. Economic impact of the sugarcane aphid outbreak in south Texas. Journal of Agricultural and Applied Economics. 50 (1) 104-128 1-25. DOI: <https://doi.org/10.1017/aae.2017.24>. (\*Contributed with data acquisition, analysis, co-writing of MS, edits for this publication).
3. Armstrong, J. S., L. Mbulwe, D. Sekula-Ortiz G., **R. T. Villanueva**, and W. L. Rooney. 2016. Resistance to *Melanaphis sacchari* (Hemiptera: Aphididae) in forage and grain sorghums. Journal of Economic Entomology, 110:1-7. <https://doi.org/10.1093/jee/tow261>. (\*Contributed with data acquisition, analysis, writing of manuscript, edits for this publication).
4. **Villanueva\* R. T.**, and G. Esparza-Diaz. 2016. Phytoseiids as potential natural enemies of the potato psyllid in organic potato production in south Texas. Journal of the Acarological Society of Japan, 25: 137-145. (\*Contributed with main idea to

- develop study and MS, data acquisition, analysis, writing of MS, edits for this publication).
5. Kütük, Halil; M. Karacaoğlu, M. Tüfekli, **R. T. Villanueva**. 2016. Failure of biological control of *Frankliniella occidentalis* on protected eggplants using *Amblyseius swirskii* in the Mediterranean region of Turkey Turkish. J. of Agriculture and Forestry, 40: 13-17. (\*Contributed with discussion of project, writing of manuscript, and final edits for this publication).

Articles submitted (peer reviewed)

1. **A. Falcon-Brindis**, Z. Vilorio, and **R. T. Villanueva\***. Novel approach to tally *Aculops cannabicola* (Acari: Eriophyidae) to conduct studies on eriophyids. Submitted to J. Economic Entomology in April 2022. (\*Contributed with original idea and design of study, written the manuscripts with coauthors, discussion, and final edits).
2. Parrish, C.A., Ekramirad, N., Khaled, Y.A., Eberhart, P.S., Donohue, K., Villanueva, R., and Adedeji, A.A. Effects of noise reference integration on deep learning models for codling moth infestation detection. IEEE Transactions on Instrumentation and Measurement. (\*Contributed coordinating the timely delivery of apples infested with codling moths, and edits for this publication).
3. Esparza-Diaz, G \*, **R. T. Villanueva\***, Joseph E. Munyaneza, and Ismael E. Badillo-Vargas, and Novel interaction of *Nesidiocoris tenuis* as a biological control agent of *Bactericera cockerelli* in potato crops. Submitted to J. of Pest Science in April 2022. (\*Contributed with original idea and design of study, written the manuscripts with coauthors, discussion, and final edits).
4. Khaled, Y.A., N. Ekramirad, C. A. Parrish, P. S. Eberhart, L. Doyle, L., K. D. Donohue, **R. T. Villanueva**, and A. A. Adedeji, Nondestructive detection of codling moth infestation in apples using acoustic impulse response signals. Journal of Computers and Electronics in Agriculture. Submitted May 2022. (\*Contributed coordinating the timely delivery of apples infested with codling moths, and edits for this publication).
5. Cruz-Aldaco, K., G. Esparza-Diaz, S. R Sánchez-Pena, and **R. T. Villanueva\***. Novel entomopathogenic fungi as biological control agents of the invasive aphid *Melanaphis sacchari* Zehntner (Hemiptera: Aphididae). Resubmitted to Florida Entomologist in April 2022. (\*Contributed with original idea and design of study, data analysis, co-writing of manuscript, edits for this publication, and corresponding authorship).
6. Musser, Fred; A. Catchot, S. Conley, J. Davis, C. Difonzo, J. Greene, G. Lorenz, D. Owens, T. Reed, D. Reisig, P. Roberts, T. Royer, N. Seiter, S. Stewart, S. Taylor, K. Tilmon, **R. T. Villanueva\***, and M. Way. 2021. 2021 Soybean insect losses in the United States. Submitted to Midsouth Entomologist in April 2022. (\*Contributed with data and edits for the Kentucky part of this publication).
7. Gutiérrez I., G. Zhu, J. F. Walgenbach, A. Acebes-Doria, A. M. Agnello, D. G. Alston, H. Andrews, E. H. Beers, J. C. Bergh, R. Bessin, B. R. Blaauw, G. D. Buntin, E. C. Burkness, J. P. Cullum1, K. M. Daane, L. E. Fann, J. Fisher, P. Girod, L. J. Gut, G. C. Hamilton, J. R. Hepler, R. Hilton; K. A. Hoelmer, W. D. Hutchison, P. J. Jentsch, S. V. Joseph, G. G. Kennedy, G. Krawczyk, T. P. Kuhar, J. C. Lee, T. C.

Leskey, A. T. Marshal, J. M. Milnes, A. L. Nielsen, D. K. Patel, H. D. Peterson, D. D. Reising, J. P. Rijal, A. A. Sial, L. R. Spears, J. M. Stahl, K. M. Tatman, S. V. Taylor, G. Tillman, M. D. Toews, **R. T. Villanueva\***, C. Welty, N. G. Wiman, J. K. Wilson, F. G. Zalom, and D. W. Crowder. Evaluating invasion risk and population dynamics of the brown marmorated stink bug across the conterminous USA. Resubmitted to Pest Management Science in February 2022. (\*Contributed with data).

Articles being written (peer reviewed).

1. Knott, Carrie, C. A. Bradley, C. Lee, and **R. T. Villanueva\***. Prophylactic R3 pesticide applications not profitable when pest pressure is low. (\*Data contribution and edits).
2. **Villanueva\*, R. T.**, and I Gomes. Impact of *Dectes texanus* LeConte (Coleoptera: Cerambycidae) on physiological yield of Soybean. (\*Helped planning tests, contributed to studies, discussions and rewriting of manuscript).
3. Ricciardi, M. Z. Viloría, R. Pearson, N. Gauthier, and **R. T. Villanueva\***. Studies and report of the presence of *Hirsutella thompsonii* affecting hemp russet mites in Kentucky. (\*Discovered and isolation of entomopathogen in my laboratory, provided mites and ideas, edited and will be and corresponding author).
4. **Villanueva\*, R. T.**, and Y. Gonzalez. Comparing sweep net and bucket for sampling stink bugs and assessing the species composition in soybeans in central and western Kentucky. (\*Helped planning and design tests, collecting data, contributed to studies, discussions and rewriting of manuscript).
5. Dupuis, J., **R. T. Villanueva\***, and J. Gelhaus. Resolving the taxonomy of a crane fly pest new to alfalfa. (\*Discovered the pest, data contribution, and edited MS).
6. **Villanueva\*, R. T.**, Y. Gonzalez, and I. Gomes. Supporting food production and education in an Amish community in Kentucky through outreach and training of young agricultural professionals. (\*Author's idea, helped rewriting).
7. Tolley, J. W. Bailey, and **R. T. Villanueva\***. Evaluating the efficacy of tobacco subproducts to control slugs. (\*Designed test, analyzed and discussed data and helping writing manuscript).
8. **Villanueva\*, R. T.**, R. Bessin, W. Dunwell, and Z. J. Viloría. 2021. Scolytinae in nursery and fruit crops of western Kentucky and seasonal population patterns of four invasive ambrosia beetles. *J. Entomological Science*. 56(3): 374-386. (\*Contributed with data acquisition, analysis, co-writing of manuscript with Dr. Viloría, final edits for this publication, and corresponding authorship).

### Proceedings Peer Reviewed

**Table 4.** Proceedings based on works conducted at UK, works conducted at other institutions, type of contribution, and totals.

| Type of peer reviewed proceedings                 | Author or Corresponding author | Contributed with data and edits | Total |
|---------------------------------------------------|--------------------------------|---------------------------------|-------|
| Based on work conducted at University of Kentucky | 5                              | 2                               | 7     |
| Based on work conducted at other institutions     | 0                              | 1                               | 1     |

1. Viloría, Zenaida, R. Bessin, W. Dunwell, and **R. T. Villanueva**. 2021. Using apple bolts to test insecticide efficacy against ambrosia beetles. Combined Proceedings IPPS 71:00-00. 2021. In print.
2. Esparza-Díaz, G, and **R. T. Villanueva**. Organic management of *Phthiacnemia picta* (Drury) (Coreidae) and *Murgantia histrionica* (Hahn) (Pentatomidae). XI Congreso Nacional De Agricultura Sostenible, October 18-21, 2021. Veracruz,
3. Ekramirad, N., A. Y. Khaled, L. E. Doyle, C. A. Parrish, **R. T. Villanueva**, K. Donohue, and A. A. Adedeji. 2021. NIR hyperspectral imaging with machine learning to detect and classify codling moth infestation in apples. In 2021 ASABE Annual International Virtual Meeting (p. 2-8). American Society of Agricultural and Biological Engineers. doi: <https://doi.org/10.13031/aim.2100066>
4. Ekramirad, N., C. A. Parrish, **R. T. Villanueva**, K. D. Donohue, and A. A. Adedeji. 2020. Low Frequency Signal Patterns for Codling Moth Larvae Activity in Apples. In 2020 ASABE Annual International Virtual Meeting (p. 1). American Society of Agricultural and Biological Engineers. doi:10.13031/aim.202001028
5. Viloría, Zenaida, R. Bessin, W. Dunwell, G. Travis, C. Ranger, and **R. T. Villanueva**. 2019. Evaluation of pyrethroids and new strategies to deter ambrosia beetle attacks in nurseries. SNA Res. Conf. Proceedings 63:180-186.
6. Viloría, Z., W. Dunwell, R. Bessin, E. Ritchey, **R. T. Villanueva**, D. Becker, and A. Martin. 2019. Engaging elementary students into horticulture with Cooperation of Master Gardeners through multidisciplinary approaches in rural Kentucky. SNA Res. Conf. Proceedings. 63:71-78.
7. Viloría, Zenaida, W. Dunwell, R. Bessin, E. Ritchey, **R. T. Villanueva**, D. Becker, and A. Martin. 2018. Engaging elementary students into science-based agriculture in the University of Kentucky's Research and Education Center at Princeton. In Conference Proceedings Annual International Meeting Plant Propagators' Society – Eastern Region 2018. Annual Meeting of International Plant Propagator's Society Proceedings. 174-178 pp.
8. Viloría, Z., G. Travis, W. Dunwell, and **R. T. Villanueva**. 2018. Seasonal emergence of invasive ambrosia beetles in Western Kentucky in 2017©. Acta Horticulturae. 1212: 195-198. <https://doi.org/10.17660/ActaHortic.2018.1212.41>

### Abstracts, Professional Meetings, and Patents:

**Table 5.** Abstracts, professional meetings, and patents, from 2016 to 2022.

| Type              | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 | 2022* | Total |
|-------------------|------|------|------|------|------|------|-------|-------|
| Abstracts         | 4    | 6    | 3    | 3    | 0    | 5    | 7     | 28    |
| Profess. Meetings | 5    | 4    | 7    | 8    | 2    | 5    | 7     | 38    |
| Patents           | 0    | 0    | 0    | 0    | 0    | 1    | 0     | 1     |
| Total             | 9    | 10   | 10   | 11   | 2    | 11   | 14    | 67    |

### Abstracts

1. **Villanueva, R. T.**, A. Falcon Brindis, Zenaida Viloría, and C. Bradley. Hemp Russet Mites: tallies using images, testing pesticide efficacies, and detection of an airborne entomopathogen. March 30, 2022.
2. **Villanueva, R. T.**, A. Falcon Brindis, and Zenaida Viloría. Expansion of BMSB and Impact on Soybean Management in Kentucky. March 27, 2022.

3. Falcon Brindis, A. and **R. T. Villanueva**, Virtual Poster. Evaluating sunflower as a trap crop for *Dectes* stem borer. San Juan, Puerto Rico. Feb 27-March 3, 2022
4. **Villanueva, R. T.**, A. Falcon-Brindis, Z. Viloría, and C. Bradley. What have we learned on hemp arthropods in two years in Kentucky? International IPM Symposium Feb 27-March 3, 2022
5. Viloría, Z., A. Falcon-Brindis, C. Bradley, and **R. T. Villanueva**. Evaluation of biopesticides for the management of *Helicoverpa zea* in hemp. ESA-Central Branch Minneapolis. March 22, 2022.
6. **Villanueva, R. T.**, A. Falcon-Brindis, and Z. Viloría. Dispersion of the brown marmorated stink bug may cause changes in stink bug species composition in soybeans in Kentucky. ESA-Central Branch Minneapolis. March 21, 2022.
7. Falcon-Brindis, A., **R. T. Villanueva**, Z. Viloría, and C. Bradley. Parasitism of corn earworm by tachinid flies in hemp. ESA-Central Branch Minneapolis. March 21, 2022.
8. Viloría, Z., A. Falcon-Brindis, C. Bradley, and **R. T. Villanueva**. Evaluation of biopesticides for the management of *Helicoverpa zea* in hemp. The 2nd Annual Scientific Conference the Science of Hemp: Production and Pest Management. November 16, 2021.
9. **Villanueva, R. T.**, A. Falcon-Brindis, Z. Viloría, and C. Bradley. Approaches to conduct balanced studies using hemp russet mites. The 2nd Annual Scientific Conference the Science of Hemp: Production and Pest Management. November 16, 2021.
10. Esparza-Díaz, G., and **R. T. Villanueva**. Organic management of *Phthiactnemias picta* (Drury) (Coreidae) and *Murgantia histrionica* (Hahn) (Pentatomidae). XI Congreso Nacional De Agricultura Sostenible, October 18-21, 2021. Veracruz, Mexico.
11. Al Khaled, Y. A., N. Ekramirad, K. Donohue, **R. T. Villanueva**, C. A. Parrish, L. Doyle, and A. A. Adedeji. 2021. Detection of codling moth infestation in apple using acoustic impulse response signals. A paper in the proceedings, presented (oral) during at 2021 Annual International Virtual Meeting of American Society of Agricultural and Biological (ASABE). July 12-16, 2021. Paper #: 2100070.
12. Ekramirad, N.; A. Y. Khaled, L. E. Doyle, C. A. Parrish, K. D. Donohue, **R. T. Villanueva**, and A. A. Adedeji. 2021. NIR hyperspectral imaging with machine learning to detect and classify codling moth infestation in apples. 2021 ASABE Virtual. July 12-16, 2021. DOI: <https://doi.org/10.13031/aim.202100066>
13. Gomes, I., and **R. T. Villanueva**. 2019. Effect of *Dectes texanus* in the physiological yield of soybeans in Kentucky. Student Competition. Annual Meeting of ESA. Saint Louis MO.
14. Gonzalez, Y., and **R. T. Villanueva**. 2019. Comparing sustainable and prophylactic management tactics to control stink bugs in soybeans. Student Competition. Annual Meeting of ESA. Saint Louis MO.
15. Gonzalez, Y., I. Gomes, and **R. T. Villanueva**. 2019. Supporting food production through extension in an Amish community and educating new agricultural professionals in Kentucky. Invited Poster Sustainability. Annual Meeting of ESA. Saint Louis MO.

16. Fann, L., R. T. Bessin, and **R. T. Villanueva**. 2018. Predation and parasitism assessment of sentinel and naturally occurring egg masses of the brown marmorated stink bug, *Halymorpha halys*. Student Competition. Annual Meeting of ESA. Vancouver, Canada.
17. Gomes, I., **R. T. Villanueva**, R. Bessin, J. Obrycki, Y. Gonzalez, and R. Davila. 2018. Biology and parasitism of *Dectes texanus* in soybeans in western and central Kentucky. Student Competition. Annual Meeting of ESA. Vancouver, Canada.
18. Gonzalez, Y., and **R. T. Villanueva**. 2018. Evaluation of insecticide efficacy and damage by *Oebalus pugnax* (Hemiptera: Pentatomidae) on barley. Student Competition. Vancouver, Canada.
19. Vilorio, Z., **R. T. Villanueva**, and W. Dunwell. 2017. Invited Symposium: P-IE Section Symposium: Interactions of bark and ambrosia beetles with their fungal symbionts and naive hosts: exploring biological, ecological, and physiological vulnerabilities. Annual Meeting of ESA. Denver Co.
20. **Villanueva, R. T.** 2017. Invited to Symposium: Entomology and Extension: Presenting research findings to clientele. Annual Meeting of ESA. Denver Co.
21. Gonzalez, Y., and **R. T. Villanueva**. 2017. Mild 2016-17 season deemed suitable for entomopathogenic fungus and parasitoid activity on aphid populations in barley. Annual Meeting of ESA. Denver Co. D3329.
22. Esparza-Díaz, G., **R. T. Villanueva**, Joseph E. Munyaneza, and Ismael E. Badillo-Vargas. 2017. Evaluation of a potential new biological control agent of *Bactericera cockerelli*. Proceedings of the 65 ESA SW Branch p. 55.
23. Cruz-Aldaco, K., **R. T. Villanueva**, et al. 2017. Laboratory bioassays of entomopathogenic fungi against *Melanaphis sacchari*. Proceedings of the 65 ESA SW Branch p. 58.
24. Fann, L. R. Bessin, and **R. T. Villanueva**. 2017. Predation and parasitism of sentinel egg masses of the brown marmorated stink bug in established and more recently colonized areas of KY. 2017. Annual Meeting of ESA. Denver Co. Presentation #0708.
25. Esparza-Díaz, G., **R. T. Villanueva**, and L. Paetzold. 2016. Study of haplotype complex of the potato psyllid and *Candidatus Liberibacter solanacearum* on the Sierra Madre Oriental, México. In Conference Proceedings of 70th Annual Meeting of the Subtropical Agriculture and Environments Society. 40 pp.
26. Zapata, S., **R. T. Villanueva**, R. Dudensing, D. Sekula and G. Esparza-Díaz. 2016. What is the economic impact of the sugarcane aphid outbreak in South Texas? In Conference Proceedings of 70th Annual Meeting of the Subtropical Agriculture and Environments Society. 40 pp.
27. Esparza-Díaz, G., **R. T. Villanueva**, Joseph E. Munyaneza, and Ismael E. Badillo-Vargas. 2017. Evaluation of a potential new biological control agent of *Bactericera cockerelli*. Proceedings of the 65 ESA SW Branch p. 55.
28. Armstrong, S., **R. T. Villanueva**, W. Rooney, and D. Sekula. 2016. Host plant resistance in forage sorghums to the sugarcane aphid. Proceedings of the 64 ESA SW Branch. Tyler, TX. p. 38.

## Presentations at professional meetings (i.e., Entomological Society of America):

Joint Meeting of the Southeastern ESA Branch and The Caribbean Plant Pathology Society.  
March 27-31, 2022.

1. **Villanueva, R. T.**, A. Falcon Brindis, Z. Viloría, and C. Bradley. Hemp Russet Mites: tallies using images, testing pesticide efficacies, and detection of an airborne entomopathogen. March 30, 2022.
2. **Villanueva, R. T.**, A. Falcon Brindis, and Z. Viloría. Expansion of BMSB and Impact on Soybean Management in Kentucky. March 27, 2022.
3. Falcon Brindis, A., and **R. T. Villanueva**. Virtual Poster. Evaluating sunflower as a trap crop for *Dectes* stem borer. San Juan, Puerto Rico.

North Central ESA Branch Minneapolis MN Meeting March 20-23, 2022.

1. Viloría, Z., A. Falcon-Brindis, C. Bradley, and **R. T. Villanueva**. Evaluation of biopesticides for the management of *Helicoverpa zea* in hemp. ESA-Central Branch Minneapolis. March 22, 2022.
2. Falcon Brindis, A. Z. Viloría, and **R. T. Villanueva**. Parasitism of corn earworm by tachinid flies in hemp. ESA, North Central Branch Meeting. Minneapolis, MN.
3. **Villanueva, R. T.**, A. Falcon Brindis, and Z. Viloría. Expansion of BMSB changes stink bug species composition and its management in soybeans in KY. Minneapolis MN March 21, 2022.

International IPM Symposium. Denver. Co. February 27- March 2, 2022.

1. **Villanueva, R. T.**, A. Falcon Brindis, Z. Viloría, and C. Bradley. What have we learned on hemp arthropods in two years in Kentucky? March 1, 2022.

International Plant Propagation Conference, Chicago. 12 October 2021.

1. Viloría, Z., **R. T. Villanueva**, R. Bessin and W. Dunwell. Using apple bolts to test insecticide effectiveness against ambrosia beetles.

International Congress of Science and Technology (Dominican Republic) 9 -11 June 2021.

1. Villanueva, R. T. Destructive potential of the south American palm weevil (*Rhynchophorus palmarum*) in the Caribbean region.

Virtual North Central Branch Meeting of Entomological Society of America. June 21-23, 2021

1. Bradley, C., Z. Viloría, and **R. T. Villanueva**. Efficacy of four biopesticides for the management of cannabis aphids in hemp grown in greenhouses.
2. Villanueva, R.T, and Z. Viloría. Expansion of the brown marmorated stink bug to western Kentucky soybean fields.
3. Viloría, Z., **R. T. Villanueva**, R. Bessin, and W. Dunwell. Using apple bolts to test insecticide effectiveness against ambrosia beetles.

Online Entomological Society of America Meeting Annual Meeting, 2020.

1. **Villanueva, R. T.**, Z. Viloría, R. Klueppel, and C. Bradley. Biology, Damage, Suitability as Prey of Ladybugs, and Chemical Control of the Cannabis Aphid. November 11-25.
2. Viloría, Z., **R. T. Villanueva**, R. Bessin, C. M. Ranger, and W. Dunwell. Efficacy of pyrethroid and double MOA insecticides against ambrosia beetles. Entomological Society of America Meeting. Online Conference. November 11-25.

ESA-Saint Louis, Missouri, 2019.

1. **Villanueva, R. T.**, and Z. Viloría. Working with “the foe”: Aphid management in wheat grown from insecticide treated seeds.
2. Viloría, Z., Ric Bessin, W. Dunwell, C. Ranger, and **R. T. Villanueva**. Ambrosia beetles: Efficiency of pyrethroids and the stimulation of reproduction by wood vinegar.
3. Gomes, I. and **R. T. Villanueva**. Effect of *Dectes texanus* in the physiological yield of soybeans in Kentucky.
4. Gonzalez, Y., and **R. T. Villanueva**. Comparing sustainable and prophylactic management tactics to control stink bugs in soybeans.
5. Gonzalez, Y., I. Gomes, and **R. T. Villanueva**. Supporting food production through extension in an Amish community and educating new agricultural professionals in Kentucky.
6. Bioassays of entomopathogenic fungi against *Melanaphis sacchari*. K. Cruz-Aldaco, G. Esparza-Díaz, **R. T. Villanueva**, and S. Sánchez-Peña.

ESA-Cincinnati, Ohio, 2019.

1. Gomes, I., and **R. T. Villanueva**. Management of *Dectes texanus* in soybeans in western Kentucky. (D050)
2. Gonzalez, Y., and **R. T. Villanueva**. Efficacy of insecticide impregnated netting for the management of stink bugs (Hemiptera) on soybean in Kentucky (D020).

ESA-Vancouver, Canada, 2018.

1. Gomes, I., **R. T. Villanueva**, R. Bessin, J. Obrycki, Y. Gonzalez, and R. Davila. Biology and parasitism of *Dectes texanus* in soybeans in western and central Kentucky. I
2. Gonzalez, Y., **R. T. Villanueva**, and R. Bessin. Evaluation of insecticide efficacy and damage by *Oeobalus pugnax* (Hemiptera: Pentatomidae) on barley.
3. Fann, L., R. T. Bessin and **R. T. Villanueva**. Predation and parasitism assessment of sentinel and naturally occurring egg masses of the brown marmorated stink bug, *Halymorpha halys*.
4. Davila, R., **R. T. Villanueva**, and Z. Viloría. Assessing slug presence in a double crop system (wheat and soybeans) in western Kentucky (D3358).
5. **Villanueva, R. T.**, Y. Gonzalez, and I. Gomes. Study and outreach of IPM and food production methods in an Amish community in western Kentucky. D3554.
6. Viloría, Z., **R. T. Villanueva**, R. Bessin, W. Dunwell, G. Travis, and C. Ranger. Invasive ambrosia beetle populations in central and western Kentucky: Some strategies to deter their attack. D3569.
7. **Villanueva, R. T.**, Predation of two eriophyid species by phytoseiids and insects in Florida citrus. Member Symposium: The Legacy of James McMurtry: Current Research in Phytoseiid Ecology.

ESA-Denver, Colorado 2017

1. **Villanueva, R. T.**, Breaking idiosyncrasies to deliver entomological research findings through extension programs.



2. Fann, L., Ric Bessin, and **R. T. Villanueva**. Predation and parasitism of sentinel egg masses of the brown marmorated stink bug in established and more recently colonized areas of Kentucky.
3. Gonzalez, Y., and **R. T. Villanueva**. Mild 2016-17 season deemed suitable for entomopathogenic fungus and parasitoid activity on aphid populations in barley. (D3329).
4. Vilorio, Z., W. Dunwell, G. Travis, and **R. T. Villanueva**. Phenology of invasive ambrosia beetles associated to nursery crops in western Kentucky.

International Congress of Entomology Orlando, Florida, 2016.

1. Esparza-Díaz, G., J. Munyaneza, and **R. T. Villanueva**. Assessing *Nesidiocoris tenuis* as a potential biological control agent of *Bactericera cockerelli*.

South Western ESA Branch, Tyler, TX. Meeting March 25, 2016

1. Esparza-Díaz, G., **R. T. Villanueva**, J. E. Munyaneza, and I. E. Badillo-Vargas. 2017. Evaluation of a potential new biological control agent of *Bactericera cockerelli*. Proceedings of the 65 ESA SW Branch p. 55,
2. Armstrong, S., **R. T. Villanueva**, W. Rooney, and D. Sekula. 2016. Host plant resistance in forage sorghums to the sugarcane aphid. Proceedings of the 64 ESA SW Branch. Tyler, TX. p. 38.

Annual Meeting of the Subtropical Agriculture and Environments Society. February 25, 2016

1. Esparza-Díaz, G., **R. T. Villanueva**, and L. Paetzold. 2016. Study of haplotype complex of the potato psyllid and *Candidatus Liberibacter solanacearum* on the Sierra Madre Oriental, México. In Conference Proceedings of 70th Annual Meeting of the Subtropical Agriculture and Environments Society. 40 pp.
2. Zapata, S., **R. T. Villanueva**, R. Dudensing, D. Sekula and G. Esparza-Díaz. 2016. What is the economic impact of the sugarcane aphid outbreak in South Texas? In Conference Proceedings of 70th Annual Meeting of the Subtropical Agriculture and Environments Society. 40 pp.

#### Patents:

1. Vibro-acoustic sensing of apple infestation. Provisional patent assigned, to K. D. Donohue, C. A. Parrish, N. Ekramirad, A. A. Adedeji, P. I. S. Eberhart, Y. A. Khaled, and **R. T. Villanueva**. November 2021.

#### Videos and/or digital media

##### Videos:

1. **Raul Villanueva** explains the low abundance of sugarcane aphids in sorghum in 2021 in Kentucky: <https://www.youtube.com/watch?v=karoYjDWePA>
2. Armando Falcon-Brindis describes beneficial tachinid flies help control corn ear worms in hemp: <https://www.youtube.com/watch?v=I6WOHkqTC38>
3. **Raul Villanueva** explains the 2021 Outbreaks of Fall Armyworm and the absence of damages in field corn: [https://www.youtube.com/watch?v=vheUKoH\\_dyI](https://www.youtube.com/watch?v=vheUKoH_dyI)
4. **Raul Villanueva** explains the presence of hemp russet mite in hemp grown outdoors for CBD: <https://www.youtube.com/watch?v=Bwx8XAFsYrI>

5. **Raul Villanueva** explains minor damages occurring with fall armyworm in hemp in Western Kentucky: <https://youtu.be/LFxFTMEb6h8>
6. Yaziri Gonzalez, a graduate presents information on her thesis project in 2018: <https://youtu.be/QUY-VymJO7A>
7. Yaziri Gonzalez, a graduate presents information on her preliminary evaluation of insecticide impregnated netting in 2018: <https://www.youtube.com/watch?v=J5lOmIB-66Q>
8. Izabela Gomes a graduate student presents part of her thesis conducted at the REC at Princeton: Dectes Stem Borer in 2018: <https://www.youtube.com/watch?v=esGXh4mYThc>
9. **Raul Villanueva** shows the damages observed by the soybean stem borer *Dectes texanus* in 2017. As well some aspects of the life cycle of this insect are shown: [youtube.com/watch?v=alTcO6VSE5w](https://www.youtube.com/watch?v=alTcO6VSE5w)
10. **Raul Villanueva** presents updates in 2017 for aphids, seed treatment, viruses, and insecticides on small grains: <https://www.youtube.com/watch?v=f4LvDGGfJjM>
11. **Raul Villanueva** talks about Secondary Pests of Corn Increase During Drought Periods in Late Corn (KATS) (6/15/20): <https://www.youtube.com/watch?v=-dWKcEGP5KQ&feature=youtu.be>
12. **Raul Villanueva** explains the decision about the use of insecticide seed treatment, a thought or easy decision to use on wheat?.2018: <https://www.youtube.com/watch?v=1cU3FfrE1SA>
13. **Raul Villanueva** talks about earlier aphid occurrences on wheat may be a consequence of the 2017's warm winter. [https://www.youtube.com/watch?v=f\\_ZUxb5fIlo](https://www.youtube.com/watch?v=f_ZUxb5fIlo)
14. **Raul Villanueva** talks the spring aphid populations UKREC Princeton Wheat Field Day 2017. <https://www.youtube.com/watch?v=sqxyNpTzTOI>
15. **Raul Villanueva** presents about Managing Insects During Grain Storage. 2017 <https://www.youtube.com/watch?v=Z73nbGSV3ls>
16. Natural enemies and insecticide seed treatments. REC Princeton Wheat School Sep. 2017. <https://www.youtube.com/watch?v=owOAKQea5Kk>
17. **Raul Villanueva** describes the damages caused by slugs in soybeans in 2017 in soybean fields of Kentucky. <https://www.youtube.com/watch?v=rpVjhFyDorw>
18. **Raul Villanueva** describes on the Expansion of Kudzu Bug in Kentucky 2017. [https://www.youtube.com/watch?v=Fcq5\\_0vTj74](https://www.youtube.com/watch?v=Fcq5_0vTj74)

### **Blogs/posts:**

1. Winter 2019. Slugging it out: Nocturnal habits make slugs invisible to attack vegetables and soybeans. Ag Families Magazine.
2. April 4, 2017. Entomopathogenic fungus may cause high mortality on aphids. 194 views and posted in MAFG and AgClips.
3. June 28, 2017. Replanted and double crop soybeans can be affected by mollusk outbreaks in Kentucky in 2017. 256 views and posted in MAFG, and MAgClips.
4. September 19, 2017. Soybean stem borer: an unnoticed bug that may cause problems during harvest and reduce yields in soybeans. 167 views and posted in MAFG.

## Outreach and Service:

1. 2022 Provided information in the opportunities for careers in the agriculture to at least 150 high school students participating in this half a day event at the Webster County High School, in Dixon, KY. April 21, 2022.
2. 2022 Personnel of my entomological team provided outreach programs to elementary school children in Caldwell Co. April 2, 2022.
3. 2022. Taught and coached the Academic Team of the Trigg County High School in Cadiz, that participated in the Kentucky Association for Academic Competition held on Frankfort on Feb 14, 2022 (Connie Hendon).
4. 2021. Public Lands Day, Discover Fort Campbell's Cultural & Natural Resources, October 2.
5. 2019. Dream girls: Science, Technology, Engineering, and Math (STEM) for Lyon Co.
6. 2019. Cool and Crawly Critters Day, Land Between the Lakes.
7. 2019, 2018, 2017, and 2016. Hummingbird Festival, Land Between the Lakes.
8. 2019, 2018, 2017, and 2016. Kentucky Association of Conservation Districts. Program for 3<sup>rd</sup> Grade Elementary Students at Lyon Co.
9. 2017. Insect safari at the arboretum: Moonlight edition. Lexington
10. 2017. Technical assistance on sugarcane aphid in Nicaragua (Technoserve), online
11. 2017. Requested comments on eradication of fire ants that showed its presence in some areas of Land Between the Lakes

## Awards and honors:

1. Teutsch, Alexander, and **R. T. Villanueva**. August 5-6, 2019. First place overall at Mid-South Association of Wheat and Feed Grain Scientists. Starkville, Mississippi.
2. Gonzalez, Yaziri, and Izabela Gomez. Advisees won the Tracy Farmer Institute for Sustainability and the Environment Sustainability Forum as Best Student Poster on December 6, 2018.
3. Friends of Southern IPM Pulling Together Award for working in a Multi-state Sugarcane Aphid Team in 2016.

## Editorships

Reviewer of Peer-reviewed manuscripts in: Journal of Economic Entomology, Biological Control, Environmental Entomology, Florida Entomologist, Plant Health Review.

## Out-of-State Invited Presentations

1. Hemp Russet Mites: tallies using images, testing pesticide efficacies, and detection of an airborne entomopathogen. The Caribbean Plant Pathology Society. **Villanueva, R. T.**, A. Falcon Brindis, Z. Vilorio, and C. Bradley. San Juan, Puerto Rico. March 30, 2022.
2. Expansion of BMSB and Impact on Soybean Management in Kentucky. South Eastern Branch ESA. **Villanueva, R. T.**, A. Falcon Brindis, and Z. Vilorio. San Juan, Puerto Rico. March 27, 2022.
3. What have we learned on hemp arthropods in two years in Kentucky? International IPM Symposium. **Villanueva, R. T.**, A. Falcon Brindis, Z. Vilorio, and C. Bradley. Denver. Co. March 1, 2022.

4. Departmental Seminar, Entomology, University of Maryland. Intricacies of the Soybean Stem Borer: Biology, Management, and Effects on Yields. **Villanueva, R. T.** February 26, 2021.
5. Kentuckiana Crop Production: Dectes stem borer: biology, natural enemies, effects on yields and management. French Lick. IN. **Villanueva, R. T.** December 2020.
6. ANR Conference OH-KY: Greenhouse hemp production: insects and mites. Sharonville, Ohio. **Villanueva, R. T.** February 6, 2020.
7. Crop Management Conference: Slugs, and the soybean stem borer - Are they becoming more problematic? Mount Vernon, IL. **Villanueva, R. T.** January 22, 2019.
8. Kentuckiana Crop Production: *Slugs, their Predators, and the Soybean Stem Borer in KY.*, French Lick. IN. **Villanueva, R. T.** November 14, 2018.
9. ESA-Member symposium: the legacy of James McMurtry: Current Research in Phytoseiid Ecology. Predation of two eriophyid species by phytoseiids and insects in Florida citrus. **Villanueva, R. T.** Presented at the November 14, 2018.
10. ESA-Symposium Entomology and Extension: presenting research findings to clientele: Breaking idiosyncrasies to deliver entomological research findings through extension programs. Presented a Denver Co. **Villanueva, R. T.** November 5, 2017.
11. International workshop in Food & Health Security: Reducing the impact of invasive species: challenges from a hot spot. Lima, **Villanueva, R. T.** Peru. October 2016.
12. Citrus Asian psyllid can be devastating for the Citriculture in Peru. La Molina, Peru. October 2016.
13. Mid-South Association of Wheat and Feed Grain Scientists: Sugarcane Aphid Success in S. Texas, how it was done? Sweet sorghum in Kentucky? Madison, AL. **Villanueva, R. T.** July 2016.
14. Texas A&M: Sugarcane aphid informative meeting: Phenology and Insecticide Choices to Manage the SCA in 2016 in the Rio Grande Valley. Weslaco, TX. **Villanueva, R. T.** April 2016.

## RESEARCH (25% DOE)

### Research scholarship

**Table 6.** Type and number of students, postdocs, scholars, interns whom I worked

| Type of personnel                | Numbers                        |
|----------------------------------|--------------------------------|
| Graduates advised as chair       | 2 (graduated in 2019 and 2020) |
| Graduate committee participation | 3 (1 Master, 2 PhD)            |
| Postdocs                         | 1                              |
| Visiting Scientist               | 2                              |
| Interns                          | 6                              |
| High School                      | 2                              |
| Other former workers             | 2                              |

### Graduate student advised:

1. Izabela Gomes, MSc. Enrolled August 2017. Graduated December 2019. Advisor. The title of her thesis is: *Biology and management of the soybean stem borer, Dectes texanus LeConte, in Kentucky*

2. Yaziri Gonzalez. MSc. Enrolled August 2018. Graduated December 2020. Advisor. Before her graduation she coauthored two articles in the KPN: [Colonization of Western Kentucky by Brown Marmorated Stink Bug](#) and [Tachinid Flies Might Have Been Actively Working this Season in Kentucky](#). The title of her thesis is: *Management of stink bugs (Hemiptera: Pentatomidae) on soybean in Kentucky*
3. Lauren Fann, Ph. D. Candidate, Enrolled January 2017. Co-advisor until 2020 (switched to a Ph. D.).
4. Nathan Mercer, Ph. D. Committee member, graduated in May 2020.
5. Nader Ekramirad Ph. D. Enrolled in 2019. Biosystems and Agricultural Engineering, Committee member.

#### Post-doctoral personnel:

1. Armando Falcon-Brindis (2021 to date). Dr. Falcon is a Research analyst that is working on hemp and field crops under my program. He arrived in July 2021, and he had already contributed to some KPN publications and sent two manuscripts for a peer reviewed journals (JEE and Insects) on Hemp russet mites and tachinid parasitism of corn earworm. Furthermore, together we are writing two new peer-reviewed articles in Dectes and expansion of brown marmorated stink bug.

#### Interns:

1. Josey Tolley (2021). She is currently a senior at Murray State University. As an intern in my program and despite the COVID-19 pandemic, she worked on several studies of slugs and searched for carabid beetles in soybeans, corn, and learned about entomology and insects in field crops and hemp. She was assigned to partially prepare questions for the High School Crop Scouting Competition in 2021. She is a coauthor on a KPN ([Controlling Slugs Through the Application of Potash and Molluscicides](#)) contribution and a Newsletter ([Effects of Various Rates of Potash and Molluscicides in the Management of Slugs](#)), and a research report ([Evaluating Molluscicides and Carabid Predation of Slugs in Soybeans](#)).
2. Rachael Klueppel (2020). She was a sophomore at the University of Kentucky. As an intern in my program and despite the COVID-19 pandemic, she scouted for insects affecting soybeans and corn, and conducted a project on the development of lady bugs on hemp aphids. She was assigned to partially prepare questions for the High School Crop Scouting Competition in 2020. She was a coauthor of a poster for the ESA 2020 titled "*Biology, Damage, Suitability as Prey of Ladybugs, and Chemical Control of the Cannabis Aphid.*"
3. Alexander Teutsch (2019). He was a sophomore at the University of Kentucky. As an intern of the USDA-NIFA program he conducted a project, under my supervision, that was awarded first place overall at Mid-South Association Conference in held in Mississippi (see award section) competing against graduate students.
4. Kaleb Tamez (2018) He was a senior at the University of Texas in San Marcos. As an intern of the USDA-NIFA program he developed a project on the effects of insecticide impregnated netting and toxicity to Japanese beetles.
5. Yaziri Gonzalez (2018), worked scouting and collecting field data from January to December in 2018. In August 2019, she started her MSc. studies conducting research

on stink bug affecting soybeans at UK in my program. Working in 2018 as intern she worked monitoring insect traps to be published in the KPN blog.

6. Lauren Fann (2016), worked scouting and collecting field data from April to July in 2016. Currently she is a PhD candidate conducting research on the brown marmorated stink bug in Lexington with Dr. Bessin.

Visiting scientists advised:

1. Rocio Davila (2018) Researcher Visiting Scholar from Peru for 1 year. She finished her MSc in Entomology at North Carolina State University in 2021. Currently she is working in an Internship for the Center of Excellence for Regulatory Science in Agriculture in Raleigh, NC.
2. Muhammad Asif Qayyum (2016) Researcher Visiting Scholar from Pakistan worked in my program for 1 year between 2016 and 2017. Currently he is an Assistant Professor at the Department of Plant Protection, Ghazi University, Dera Ghazi Khan, Pakistan.

High School students:

1. Avery Ritchey (2021). She is currently a 10<sup>th</sup> Grade student at Caldwell Co. High School. She worked supporting several studies in my program such as taking data, scouting, and weeding. She was assigned a small project to detect parasitoids in Kudzu eggs and was able to write a small note for the KPN blog ([The Kudzu Bug and The Search for Its Parasitoids](#)).
2. Clara Bradley (2020). She is currently a freshman at the University of KY. When she worked in my program she was in her last year of high school. She worked supporting taking data, scouting, and weeding, and participated providing questions for the High School Crop Scouting Competition and working with an undergraduate student.

Other former workers:

1. Caleb Whitney (2021), BSc in Entomology from the Ohio State University. Started working for the Department of Agriculture of Ohio on December 2021 and switched to USDA in May 2022. While in my program he learn about scouting, insecticides in field crops and hemp and coauthored an article for the KPN blog: [Eurasian Hemp Borer Making its Way in Kentucky](#)
2. Nathan Yielding (2016-17), intern worked on field trials, scouting, and collecting field data from June 2016 to January 2017. Currently, he is an FBI agent working in Washington DC.

## TEACHING

During this 6-year period, I delivered 21 lectures at the University of Kentucky, Murray State University, and La Molina in Peru.

1. ENT-770: Topical Seminar: Agriculture Entomology Study Abroad in Peru Spring 2019. Participated in all lectures and contributed as main lecturers in 3 of them.
2. ENT 770: Introduction to Graduate School and Professional Development, invited by Dr. K Haynes. (September 2020, and September 2021).
3. Murray State University. Entomology program in the REC at Princeton presented to students of Dr. David Ferguson (4 lectures 2016, 2017, 2018, and 2020).

4. ENT-310: Insect Pests of Field Crops (1 lecture in 2019), invited by Dr. David Gonthier.
5. PLS-531: Field School in Crop Pest Management: 2016, 2017, 2018, and 2019 (2 lectures each year).
6. ENT-695: Special Topics in Entomology: Integrative Organismal Entomology 2017 and 2018 (1 lecture each year).
7. Invited lecture in La Molina, Universidad Agraria in Peru: Entomological topics of concern for Peru. July 2018.

## **Administrative and Professional Development**

### Professional Meetings/Training Attended:

1. Co-organizer of the 1st Annual Scientific Conference: The Science of Hemp: Production and Pest Management, Lexington, KY. October 10-11, 2019.
2. Attended the Henderson County pollinator protectors meeting at the Audubon State Park Museum in August 2019.
3. Annual Meeting of the North Central Branch of the Entomological Society of America, 2016, 2017, and 2018.
4. Mid-South Association of Wheat and Feed Grain Scientists. Madison, AL. July 2017, and August 2019.
5. Multistate Research Project, S1055 Meeting. Memphis, TN. Orlando, FL. and Cleveland, OH in 2017, 2018, and 2019.
6. SERA meeting in Mobile AL, 2019.
7. OVEA in Columbus OH and Indianapolis IN, in October 2017 and 2018.
8. University of Kentucky and the University of Tennessee, Joint grant writing seminar and workshop on March 16-17, 2017, in Knoxville.
9. ESA meetings attended, in Denver CO in 2017, Vancouver, Canada in 2018, and Saint Louis MO in 2019.

### In-service duties

#### Departmental Committees:

1. Diversity and Inclusion Committee Member. 2020.
2. Steering Committee Member to plan future faculty hiring in the Department of Entomology, 2019.
3. Search committee member for Urban Ecosystem Entomologist at UK in 2021.
4. Search committee member for Insect Systematist at UK in 2018.
5. Search committee member for Extension Entomologist at UK in 2018.
6. Search committee member for Insect Ecologist at UK in 2017.
7. Search committee member for Arthropod Systematics at UK in 2017.
8. Committee member of the graduate student admissions in Entomology at UK 2016 and 2017.

#### Research and Education Center at Princeton:

1. Co-chair of the storage space committee 2016-2022.
2. Chair of the pesticide room committee 2016-2022.

#### University Service:

1. Requested to participate in the recruitment evaluation and interview of a candidate for the College of Social of Work at Lexington December 2017.

Professional Society Memberships:

1. Board Member of the Acarological Society of America. 2018 to 2020.
2. Member of the Entomological Society of America.
3. Committee Member of the Kentucky CCA.
4. Member of the Latin-American Society of Acarology.



**Raul T. Villanueva**

**Narrative**

Review Period: 2016-2022

**EXTENSION/OUTREACH/SERVICE (75% DOE)**

**Extension narrative**

I am the Entomology Specialist for field crops and hemp at the University of Kentucky’s Research and Education Center located in Princeton, KY. Most of the wheat, corn, and soybeans are grown in this region in Kentucky. My extension programs focus principally on assisting farmers that grow wheat, soybean, corn, and sorghum in the entire state. In addition, since July 2019, I began to lead the extension and applied research program for arthropods in hemp across the state. As the only faculty member of the Department of Entomology in western KY, I respond to all types of concerns related to entomology or arthropods in fruit, ornamental, vegetable, and specialty crops, and arthropods of importance for human health and structural pests.

In my programs, I provide education, research-based information, and technical assistance that have direct and significant impact on pest management for field crop farmers, consultants, and Agriculture and Natural Resource County Extension Agents. I emphasize attention to the environmental stewardship while implementing sustainable and judicious pest management efforts for field crops and hemp.

During the six years that I participated in 185 events of different types (Table 1). In Extension and Service, I participated in 101 events (presentations, field days, walks, etc.) that took place in western, central, and eastern Kentucky. They also included conferences, meetings, and trainings to support extension personnel, county extension agents, agricultural consultants, growers, school communities, and master gardeners. I gave 63 research presentations and 21 teaching lectures during this period.

**Table 1.** Type and number of events, for adults or children, field days, from 2016 to 2020, and contact numbers for events.

| Type of events | Extension | Service | Research | Teaching | Total |
|----------------|-----------|---------|----------|----------|-------|
| Field days     | 24        | -       | -        | -        | 24    |
| For children   | 15        | 8       | -        | -        | 20    |
| For Adults     | 48        | 6       | 63       | 21       | 136   |
| <b>Total</b>   | 87        | 14      | 63       | 21       | 185   |

The demand for my participation in extension, research, service, and teaching activities has been increasing since my first year. From 16 events in 2016 to 23, 31, 37, 29 and 31 in 2017, 2018, 2019, 2020, and 2021, respectively. The decline in 2020 and 2021 may be related to the COVID-19 pandemic restrictions. These data alone are indicators that my educational program and technical services to the agricultural communities are meeting the expectations in the region; and contributing to the success of the Kentucky’s agriculture. My field crop programs have been well supported by the three commodity boards (Small grains, Soybeans and Corn). I have received a total of

\$273,056 (see Commodity Board Support section) to conduct several studies of significant importance to field crop farmers in Kentucky. I have forged strong relationships with our clientele. For example, in view of the total destruction of our REC facilities by the 2021 tornado, a hemp farmer and cooperator (A. Schiavino, Resonate Foods) is providing a high tunnel, water, and electricity free of charge to my program. Mr. Schiavino not only allows me to use his facilities but allows other faculty to use this high tunnel for other studies.

The main objectives of my entomology extension programs are: **(1)** to assist and educate Kentucky’s field crop and hemp farmers; **(2)** to answer inquiries from the community on entomological issues; **(3)** to deliver science-based information on arthropod biology and management; **(4)** to support the industry and farming clientele on entomology; and **(5)** to educate future generations of the agricultural workforce in applied research and extension entomology. The following information briefly described my extension accomplishments; the impact of my field crop extension program is summarized in Table 2. Surveys completed after my oral presentations show that my talks were well received, 69% to 86% of attendees stated they would make changes in their practices based on information presented.

**Table 2.** Responses to corn and soybean field day events at the REC at Princeton, from 2016 to 2021, categorizing helpfulness of talk, and changes for the next season in response to presentation.

| Year | How helpful was this information                                                                  | Slightly to very helpful | Fairly to very helpful | N <sup>o</sup> respondents | Changes for next season based on information presented |
|------|---------------------------------------------------------------------------------------------------|--------------------------|------------------------|----------------------------|--------------------------------------------------------|
| 2016 | ID of stink bugs and influence of seed-treated soybeans with neonicotinoids and border management | 87.4%                    | 60.0%                  | 95                         | 78.3%                                                  |
| 2017 | Seed treatments on soybeans (north vs south)                                                      | 95.5%                    | 70.9%                  | 110                        | 83.1%                                                  |
| 2018 | Broadening management knowledge of stink bugs, dectes stem borer & slugs in soybeans              | 93.1%                    | 75.9%                  | 58                         | 85.9%                                                  |
| 2019 | Management of Dectes in soybeans and insect pests in conventional corn                            | 86.0%                    | 56.1%                  | 57                         | 71.0%                                                  |
| 2021 | Scouting for European corn borer & updates on soybean pest                                        | 100.0%                   | 91.2%                  | 34                         | 69.2%                                                  |

### Most Significant Extension Accomplishments During the Review Period

My extension program has educated farmers in diverse topics related to insect pests and biological control. I often visit them to learn about their problems and identify causes. Extension agents also play an important role in this interaction. County Extension Agents participated providing initial contacts with farmers and contributed to the dissemination of our research outcomes. I have worked very closely with Susan Fox (Lyon Co.), Graham Cofield (Trigg Co.), Samantha Anderson (then at Graves Co.), Kathryn Wimberley (McCracken Co.), and Clint Hardy (Davies Co) on corn and soybean and pest problems. As well as with Brenda Kennedy (Plant Diagnostician at Princeton) identifying insects and symptoms on plant samples. Here, I briefly describe my extension work aimed to solve problems for each commodity.

**Soybeans:** stink bugs, slugs, and soybean stem borer (*Dectes*) are perhaps the most significant pests for soybean producers in Kentucky. In response to inquiries from soybean growers of Kentucky, I have worked with them and extension agents to identify the problems and then spoken about the latest findings of my research:

- Stink bugs: My program presents information to farmers on how to identify different species of stink bugs, monitor these pests using nets and buckets. We reported the recent expansion of the brown marmorated stink bug to western KY and provided information on insecticide efficacy tests on studies conducted in at REC-Princeton.
- Slugs: Although slugs were considered an occasional pest, nowadays their incidence is more frequent and devastating. My findings on the effectiveness of molluscicides were transferred immediately to farmers who also learned the importance of biological control by carabid beetles. My studies on potash showed them that this fertilizer was not effective for slug control as they thought it was.
- Soybean farmers observed a great abundance of soybean stem borers in their fields in 2017. I evaluated *Dectes* infestation in commercial fields and found more than 70% of plants had *Dectes* larvae. Based on my research, growers now know the phenological patterns of *Dectes* in long season and short season soybeans in the region. Farmers learned that *Dectes* damage may not reduce yields however, if rains and winds are frequent near the harvest season yields might be affected.

**Corn:** the use of GMO corn has contributed to the reduction of ear damage caused by caterpillars. Thus, complaints about lepidopteran corn pests have been rare since I moved to Kentucky. My work on conventional corn, however, has been presented to corn growers in their annual meeting. Furthermore, I have assisted corn growers on different emergent issues such as recommendations for stink bugs during plant emergence, corn aphid control, and management of seed corn maggot, armyworms, corn rootworms, and beetles. Extension publications on these pests were posted on the Kentucky Pest Newsletter (see KPN section on CV).

**Hemp.** several extension publications were obtained from this program. As a result of this collaboration, we are currently studying a promising biological control fungus that was found and isolated by my group and identified by Dr. Gauthier laboratory. I have earned invitations by Agriculture and Natural Resources (ANR) county extension agents across Kentucky and other states to talk about the findings of our hemp program. I participated as a speaker in field days in 2019 and 2020, and an online field day in 2021, the Hemp of Science Conference in 2019 and 2021. I was invited to participate in the 2022 X International IPM Symposium in Denver, an event heavily attended and organized by extension personnel nationwide, and the Caribbean Division of the American Phytopathology Society, Puerto Rico. I received several requests to participate in events in other states and served as Co-Pi on multistate grants. My work on hemp russet mite has even passed state lines, and I received congratulations on evaluations of acaricides to control russet mites from an Oregon producer of hemp clones.

**Sorghum and sugarcane aphid:**

- One of the problems I helped to solve in the region was the sugarcane aphid management in sweet sorghum. Due to the devastating damage of this pest, sweet sorghum planted acreage was drastically diminished to be grown at small scale such as Amish production

for molasses. I worked with an Amish community in Trigg Co., and Graham Cofield (CEA) to train this community about pest management, particularly sugarcane aphid. Amish farmers followed my guidance to effectively manage the sugarcane aphid since 2016. Nowadays, they keep applying my recommendations on insecticide usage, modifying their own application equipment (spray booms pulled by mules) and techniques.

#### **Ambrosia beetles and nursery problems:**

- This program informed farmers the ambrosia beetle species responsible of their tree losses, something they did not know. Two nursery farmers and a garden center owner received weekly reports on granulate ambrosia beetle counts in their property from March-September since 2016-2018, which was a valuable information for their spray program during the critical time of beetle emergence. They were informed how to build a trap and carry out the monitoring by themselves. Information was produced on the phenology of four more aggressive invasive species for the first time completed for this region. In 2019 and 2020, we focused on the efficacy of insecticides to manage these pests. These out come have been presented in horticulture meetings.

**Working with the Industry.** My extension program was also supportive of the agrochemical industry and its direct linkage with the farmers. My work with the agrochemical industry involves the conduction of applied research and efficacy of insecticides in an integrated pest management program. Also, I collaborated with the registration of insecticides in Kentucky under the emergency section 24c: Sulfoxaflor (Transform®) was registered since 2016 for control of the sugarcane aphid in forage and grain sorghum, whereas a *Helicoverpa zea* nucleopolyhedrovirus ABA-NPV-U (Heligen®) was registered for the management of corn earworms in commercial hemp in 2019. Transform® may have been utilized on approximately 10,000 acres each year from 2016 to 2019 for forage and grain sorghum, and Heligen® may have used on 18,000 acres of industrial hemp in 2019. In 2020, I supported alfalfa farmers and industry in the registration of lambda-cyhalothrin (22.8%) (Warrior II with Zeon Technology® a group 3 pyrethroid) under FIFRA section 2(ee) to be used for crane flies.

**Training for Commercial Pesticide Applicators.** On several training that I participated for Commercial Pesticide Applicators' training (CPT) at McCracken County Extension Office, >90% of trainees ranked my presentation as helpful to maintain their license/certification CEU and >72% said that the training will help to improve their job performance in 2016, 2017, and 2019.

#### **Extension scholarship**

##### Educational Programs:

- Participating on Fall Crop Protection Webinar Series in 2020 and 2021. These were on field crop protection topics that were hosted through the Southern Integrated Pest Management Center. In 2020, I presented on the “Geographic expansion of the brown marmorated stink bug in Kentucky” and in 2021 “Studies on the management of bean leaf beetle, three cornered alfalfa hoppers and the fall armyworm outbreak in soybeans”. These two presentations had satisfactory reviews from the audience.

- Member and instructor in the Kentucky Agriculture Training School (KATS: <https://kats.ca.uky.edu/>) (formerly known as Wheat School Program) since 2016. I covered topics on the management of pests of stored grain, insect abundances after the winter season, scouting and identification of pests and natural enemies. I took part of hands-on programs in May 2019 and 2021 about “Early and Mid-Season Scouting for Insect Pests of Corn and Soybean”, my trainings were qualified as very beneficial to extremely beneficial by 83.3% of attendees (10 out of 12) and 81.3% (12 out of 16), respectively in 2019 and 2021. In March 2020, I also taught on the “*Aphid scouting and evaluation of natural enemies on wheat*”, with very similar ratings 83% of approval.
- Presenting in multi-county training programs to extension, agribusiness personnel, producers and UK’s students on topics covering arthropod management in crop fields, IPM for farmers, Certified Crop Farmers (CCA), and County Extension Agents (CEA) in Kentucky and adjacent states (Illinois and Indiana). On these programs attendees rate my program from good to excellent.
- I conducted two international online extension presentations for the industry (Advanta Inc Mexico and Advanta Inc. South America) to educate personnel and clientele in the management of the sugarcane aphid in Mexico and South America in 2020. In 2021, I was asked to visit Mexico as result of successful reviews on my presentations, however the COVID pandemic jeopardized this international participation.
- I gave an online extension presentation in 2020 for the city of Brownsville, Texas to educate personnel and clientele on the management of the invasive South American palm weevil. In 2021, I gave a deep presentation on the same topic for scientists in the Caribbean Region. In 2022, I am invited to visit Dominican Republic to advise them on the South American palm weevil and to talk about the banana rust mite, *Phyllocoptruta musae* program, a new invasive pest in the Caribbean region.

## **Outreach programs**

### **Education to K-12**

I strongly believe that education is a key factor to prepare new generation of professionals in agriculture (entomology majors and graduate students), but it is equally important to involve K-12 students. Since my arrival in 2016, I conducted outreach programs for elementary students in Lyon County in a program organized by C. Fralick (District Administrator for Lyon County). In March 2022, I provided information about professional agriculture opportunities to at least 150 students at the Webster Co. High School. In February 2022, I trained an academic team of the Trigg County High School to identify insect problems and to debate these topics as entomologists. This team advanced to the final round of the state of KY competition. I participated with KY High School Crop Scouting Competition lead by Dr. Kiersten Wise in 2019, 2020 and 2021. In these events, I worked with postdocs, graduate students, undergraduate, and intern students in my program to develop the entomology section. During this three-year program, my section received great reviews from surveyed high school students.

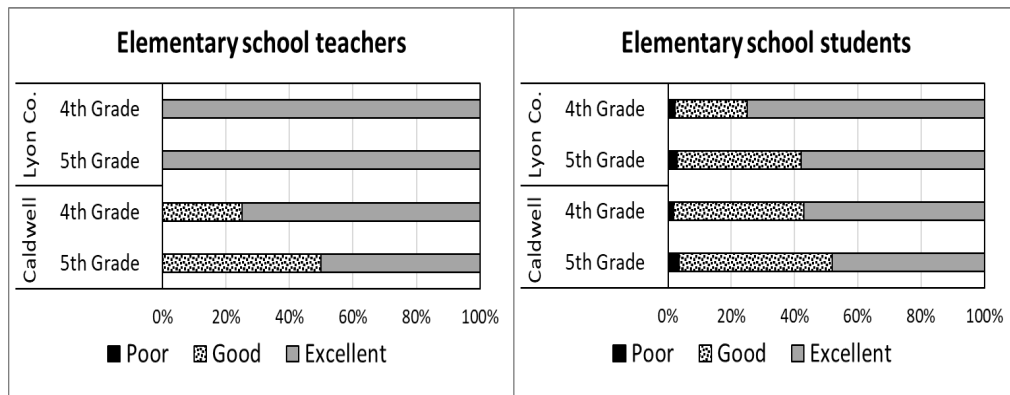
In 2018, I Co-Led a UK multidisciplinary team to complete an educational program funded by the Sustainable Challenge Grant. This program was addressed to fourth and fifth grade students of Lyon and Caldwell County Schools and Master Gardeners of at least seven counties of

western Kentucky. The main goal was to instill interest in entomology and other agricultural sciences in the students. Master gardeners received hands-on training on diverse topics. Surveys showed that elementary students and teachers ranked the event from good to excellent (Table 3 and Figure 1). The insect activities were the highest rated regarding their fit into their *pensum* and students' preferences, whereas Master gardeners ranked the events as excellent.

About this program Ms. Megan Radivonyk (Lyon County Elementary School Teacher) said “*This has been quite a learning experience for our students.... I don’t think most of them have ever done something like this before. They have all really enjoyed it*”.

**Table 3.** Data collected on knowledge acquisition on several topics presented to by 4<sup>th</sup> and 5<sup>th</sup> grade elementary students of Lyon and Caldwell counties on two training periods in 2018.

| Training Period | Knowledge acquisition | Topics (% Responders) |         |                   |            |
|-----------------|-----------------------|-----------------------|---------|-------------------|------------|
|                 |                       | Pruning               | Insects | Plant diseases    | Soil tests |
| Summer 2018     | Nothing new           | 0                     | 0       | 0                 | 0          |
|                 | Some new              | 26.3                  | 52.6    | 21.1              | 6.6        |
|                 | A great deal          | 73.6                  | 47.3    | 78.9              | 93.3       |
| Training Period | Knowledge acquisition | Landscape             | Insects | Plant propagation | Bats       |
| Fall 2018       | Nothing new           | 3.7                   | 18.5    | 4.2               | 5.0        |
|                 | Some new              | 40.7                  | 55.5    | 33.3              | 0.0        |
|                 | A great deal          | 55.5                  | 25.9    | 62.5              | 95.0       |



**Figure 1.** Evaluation of field days at the UK-REC Botanical Garden in spring of 2018 by elementary school teachers and 4<sup>th</sup> and 5<sup>th</sup> grade students of Lyon and Caldwell counties.

### Outreach to Amish community and training of new entomologists

I developed a program to support an Amish community that included the participation of my two graduate students (Izabela Gomes and Yaziri Gonzalez). This program aimed to: (1) broaden extension programs to produce vegetable and specialty crops (sweet sorghum) in Amish production systems, and (2) expose these graduate students to extension and outreach experiences. This community received my recommendations and welcomed my two female graduate students to conduct outreach programs. In 2017, I organized a field day, with the collaboration of the CEA Graham Cofield, on entomological issues, whereas in 2018 and 2019

my graduate students organized two field days for this community. The students oversaw the completion of this event; schedules, selection of topics to be covered, and speakers. Speakers were brought from Princeton and Lexington campuses. Surveys conducted by the two students showed signs of change on their agricultural practices to grow crops, such as the release of natural enemies in their vegetable program, rotation of crops, learning about diseases, adopting good practices for soil analysis, and the adequate use of manure. Working with the Trigg Co. Amish community has given us (students and advisor) the opportunity to broaden the University of Kentucky extension program to an underserved community and contribute to improve their production without changing their traditional techniques.

## **RESEARCH (25% DOE)**

### **Current Applied Research:**

#### Research narrative

Field applied entomological research is incorporated into my program to assess significant entomological problems and assist farmers to solve their pest problem. My applied research program involves specialists that share common appointments from the UK and other research and/or educational organizations. My research program also includes mentoring graduate and undergraduate students from UK and other institutions to conduct research on issues relevant to Kentucky farmers. My peer-reviewed publications included collaborative work with faculty from UK Lexington, USDA, and colleagues working in field crops from other institutions. I have a total of 13 peer-reviewed articles published, seven recently submissions to peer-reviewed journals (Table 3 on CV). I am the corresponding author or first author of 9 of these 20 manuscripts. Also, my collaborators and I are in the process of writing eight additional peer-reviewed articles. For specific contributions on each article see CV section.

### **Pass and current research:**

#### *Field Crop Works:*

1. Implementing IPM practices on wheat when the insecticide seed treatment (IST) technology is used; aphid abundance in fall and spring, insecticide applications, management and BYDV infections, and effects on natural enemies (not funded).
2. Scouting insects in stored wheat and efficacy test of insecticides (Funded by Siemer Milling grant).
3. Evaluation of conventional corn in comparison to different GMO traits, a parallel study conducted in Lexington and Princeton (funded by the Kentucky Corn Growers Association in 2019).
4. Using codling moth on apples to test noninvasive sensing methods, acoustic emission, and hyperspectral imaging, for rapid detection of larva-infested apples and evaluation of codling moth infestations in organic vs. conventional commercial apples under laboratory conditions (funded by USDA-NIFA).

### **Most Significant Research Priorities During the Review Period**

**Wheat:** I've been working on developing sustainable management practices that will help farmers to successfully keep key pest under control. Most wheat growers (>80%), in Kentucky and rest of the country, use insecticide seed treatments (IST) as a standard practice to control insects in the initial stages of the crop. Several aphid species are the most important wheat pest in the field due to transmission of barley yellow dwarf virus. This preventative IST may offer protection for 20 to 40 days; however, some growers still spray fields without scouting. Unnecessary insecticide sprays end up in higher input costs and alteration of natural enemy populations. The long-term implications of this practice demand multi-year research. We found out that aphid abundance has been low during the last six years. More importantly, my studies found that population peaks occur in either late March or April. These findings entail changes in the management of aphids in fall and the spring. Here, I am aimed to produce changes for the sustainable application of insecticides when IST are used. This change should incorporate insect thresholds and recommended manufacturer rates for aphids (or other pests: armyworms or wireworms).



**Soybean:** It has been a priority in my program to work on stink bugs, soybean stem borer (Dectes), and slugs.

- Stink bug species composition in soybean fields in western and central counties was determined by Y. Gonzalez under my supervision. Thus far, our main findings are: - brown marmorated stink bug (BMSB) was the predominant species in the central region and the green stink bug (GSB), was more abundant in the west (however, this is changing with the expansion of the BMSB to western KY), - the use of calendar sprays results in greater insecticide usage without gains in yield. Furthermore, I recently started a 3-year collaboration project with colleagues from the North Central Region to conduct further studies on stink bugs in soybeans.
- My program (studies conducted by I. Gomes) has accomplished a comprehensive study on Dectes stem borer that includes phenological patterns, life history, behavior, field distribution, of this beetle in long and short season soybeans in central and western Kentucky. Also, it was shown that injures or tunnels in pith do not affect soybean yields. During the last two years this project expanded with the participation of two colleagues Kevin Rice (U. of Missouri) and Robert Wright (U. of Nebraska-Lincoln). This two-year project deals with use of sunflowers as a trap crop and the development of new strategies to control this pest. We recently identified a weevil (cocklebur weevil) in western Kentucky that interferes with the life cycle completion of Dectes in sunflowers. It outcompetes Dectes in numbers/plant and disrupts its movement downward the main root where it overwinters.
- Soybean growers have reported considerable losses due to slug attacks on germinating soybean plants. Replanting has been implemented increasing costs and causing delays. As soon as this problem began, I started looking for quick solutions by testing molluscicides. My work on slugs is supported by the KY grower, it is focus on the effective use of molluscicides, finding the role of carabid beetles -an intern from Murray SU detected predation of all slug instars by carabids, and evaluated the efficacy of potash and tobacco subproducts.

**Hemp:** pesticides available for control of key pests in indoor and outdoor hemp productions is limited. Since 2019, my program has been focused on arthropod identification, damage, and biological and chemical control of key pests such as hemp russet mite and corn earworm. For hemp russet mite, a microscopic pest, studies are being conducted to developed reliable tallies using images obtained with portable stereomicroscope. This methodology has been a model for other labs. Likewise, the methodology to establish and keep an active mite colony has been valued by other hemp research teams. Biological control of hemp russet mite is also undergoing using a fungus isolated in my program at Princeton and currently kept by Dr. Gauthier at UK. Also, we have a recent publication on the corn earworm parasitism by tachinid flies (see CV).

**Alfalfa:** I identified a severe damage in an alfalfa filed in Butler Co, in 2019 and 2020. This was caused by leatherjacket larvae. At the beginning, the cause of this problem was unknown. The entire plants were affected: lateral roots were completely consumed, as well as the foliage, crowns, and stems reducing alfalfa stand. This is the first report of damages caused by tipulids in alfalfa. Using binomial identification keys, the tipulid was identified as *Tipula paludosa* (an invasive species to the northeast and northwest US and Canada). However, using molecular tools this insect is classified in a different group. Studies are being conducted to clarify many aspects of this insect as well as its proper identification.

## TEACHING

Although, I do not have a teaching appointment, I included teaching activities as a complement of my Extension and Research program. This activity allows me to reach young people, share with them my expertise as a field applied research entomologist, and be up to date with current advances in entomology and new technologies. I recruited three current graduate students (two from south Texas and one from Brazil); their enrollment expanded the diversity in the Department of Entomology at UK. The student from Brazil (Izabela Gomes) finished her master's degree in entomology in December 2019, whereas Yaziri Gonzalez finished in 2020. These students and I wrote a grant for the Food Connection Council at UK and were awarded \$6500 to work in extension and outreach with an Amish community at Trigg Co. Currently, I am a committee member of the Ph D. candidate Nader Ekramirad Ph. D. of the Biosystems and Agricultural Engineering Department. Also, I have also mentored undergraduate students, and K-12 students. They are being part of my teaching mandate (see CV section). I had six undergraduate and two K-12 students since 2012.

During this 6-year period, I delivered 21 lectures as guest speaker at University of Kentucky, Murray State University, and La Molina in Peru. In 2019, in collaboration with Drs. Obrycki and Bessin, I developed a 1-credit course (ENT-770: Topical Seminar: Agriculture Entomology Study Abroad in Peru) for the spring semester of 2019. In this class, we had lectures in Lexington that later were complemented with an 8-day trip to Peru. This course had a great support and enthusiasm from six graduate students in the Department of Entomology. Funds for \$12,675 was received from the Student Sustainability Council to pay most of the expenses incurred in this trip. This event was completed satisfactorily. The enrolled students expanded their views about production systems abroad, learned about self-subsistence agriculture, farming under diverse ecological niches, and study the arthropod diversity in semiarid, high elevation plateaus, and tropical regions of Peru. Table 4 shows the classes I participated from 2016 to 2021.

**Table. 4.** Numbers of lectures I participated at the University of Kentucky, Murray State University, and Universidad Agraria La Molina in Peru.

| <b>Lectures Names</b>                                                            | <b>2016</b> | <b>2017</b> | <b>2018</b> | <b>2019</b> | <b>2020</b> | <b>2021</b> | <b>Total</b> |
|----------------------------------------------------------------------------------|-------------|-------------|-------------|-------------|-------------|-------------|--------------|
| <b>ENT-770:</b> Topical Seminar: Agriculture Entomology Study Abroad             | -           | -           | -           | 3           | -           | -           | 3            |
| <b>ENT 770:</b> Introduction to Graduate School and Professional Development     | -           | -           | -           | -           | 1           | 1           | 2            |
| <b>Murray State University.</b> Entomology Lecture on IPM                        | 1           | 1           | 1           | -           | 1           | -           | 4            |
| <b>ENT-310:</b> Insect Pests of Field Crops                                      | -           | -           | -           | 1           | -           | -           | 1            |
| <b>PLS-531:</b> Field School in Crop Pest Management                             | 2           | 2           | 2           | 2           | -           | -           | 8            |
| <b>ENT-695:</b> Special Topics: Integrative Organismal Entomology                | -           | 1           | 1           | -           | -           | -           | 2            |
| <b>Universidad Agraria La Molina</b> Importance of Asian citrus psyllid in Peru. | -           | -           | 1           | -           | -           | -           | 1            |
| <b>Total</b>                                                                     | <b>3</b>    | <b>4</b>    | <b>5</b>    | <b>6</b>    | <b>2</b>    | <b>1</b>    | <b>21</b>    |

# Dr. Jennifer A. White

College of Agriculture, Food and Environment  
Department of Entomology

## Education

Ph.D. in Ecology, Evolution and Behavior, U. of Minnesota. 2005 Major advisor: David Andow

M.S. in Biology, with distinction, Northern Arizona University. 1997 Major advisor: Thomas Whitham

B.S. in Biology, summa cum laude, U. of Minnesota. 1994

## Work History

Professor, University of Kentucky Department of Entomology 2021-present

Associate Professor, University of Kentucky Department of Entomology 2014-2021

Assistant Professor, University of Kentucky Department of Entomology 2008-2014

Adjunct Associate Professor, University of Oklahoma, Dept. Entomology and Plant Pathology 2020

NIH Postdoctoral Excellence in Research and Teaching (PERT) Fellow, University of Arizona, Department of Entomology. Faculty advisor: Molly Hunter 2006

## Administrative Assignments

Director of Undergraduate Studies, Entomology. August 1, 2019 - Present

Responsibilities: Attend to duties regarding undergraduate curriculum, advise Entomology majors.

## Research and Scholarship

### Intellectual Contributions

\* = Senior Author    ~ = Corresponding Author    + = Grad/Prof Student    # = Post Doc    ^ = Undergraduate

WOS = Web of Science JIF = Journal Impact Factor    TC = Journal Total Cites  
SNIP = Source Normalize Impact per Paper    SJR = Scimago Journal Rank

### Published

#### Journal Article, Academic Journal

# Lenhart, P. A., White, J. A. (2020). Endosymbionts facilitate rapid evolution in a polyphagous herbivore, *Journal of Evolutionary Biology*, 33(10), 1507-1511. doi: 10.1111/jeb.13697

Holt, J. R., Styer, A., White, J. A., Scott Armstrong, J., Nibouche, S., Costet, L., Malacrinò, A., Antwi, J. B., Wulff, J., Peterson, G., McLaren, N., Medina, R. F. (2020). Differences in

- microbiota between two multilocus lineages of the sugarcane aphid (*Melanaphis sacchari*) in the continental United States, *Annals of the Entomological Society of America*, 113(4), 257-265. doi: 10.1093/aesa/saaa003
- + Rosenwald, L. C., # Sitvarin, M. I., \* ~ White, J. A. (2020). Endosymbiotic *Rickettsiella* causes cytoplasmic incompatibility in a spider host, *Proceedings of the Royal Society B: Biological Sciences*, 287(1930). doi: 10.1098/rspb.2020.1107rspb20201107
- \* ~ White, J. A., Styer, A., + Rosenwald, L. C., + Curry, M. M., + Welch, K. D., + Athey, K. J., # Chapman, E. G. (2020). Endosymbiotic bacteria are prevalent and diverse in agricultural spiders, *Microbial Ecology*, 79(2), 472-481. doi: 10.1007/s00248-019-01411-w
- Angelella, G., Nalam, V., Nachappa, P., White, J. A., \* Kaplan, I. (2018). Endosymbionts differentially alter exploratory probing behavior of a nonpersistent plant virus vector, *Microbial Ecology*, 76(2), 453-458. doi: 10.1007/s00248-017-1133-5
- Desneux, N., Asplen, M. K., + Brady, C. M., Heimpel, G. E., Hopper, K. R., Luo, C., Monticelli, L., Oliver, K. M., \* White, J. A. (2018). Intraspecific variation in facultative symbiont infection among native and exotic pest populations: Potential implications for biological control, *Biological Control*, 116, 27-35. doi: 10.1016/j.biocontrol.2017.06.007
- Hopper, K. R., Kuhn, K. L., Lanier, K., Rhoades, J. H., Oliver, K. M., White, J. A., Asplen, M. K., Heimpel, G. E. (2018). The defensive aphid symbiont *Hamiltonella defensa* affects host quality differently for *Aphelinus glycinis* versus *Aphelinus atriplicis*, *Biological Control*, 116, 3-9. doi: 10.1016/j.biocontrol.2017.05.008
- \* Obrycki, J. J., + McCord, J., + Mercer, N., White, J. A. (2018). Photoperiodic induction of adult diapause in North American populations of the convergent lady beetle (Coleoptera: Coccinellidae), *Environmental Entomology*, 47(6), 1596-1600. doi: <https://doi.org/10.1093/ee/nvy128>
- # Lenhart, P. A., + Jackson, K. A., \* White, J. A. (2018). Heritable variation in prey defence provides refuge for subdominant predators, *Proceedings of the Royal Society, B*, 285(1879), 20180523. doi: 10.1098/rspb.2018.0523
- # Lenhart, P. A., \* White, J. A. (2017). A defensive endosymbiont fails to protect aphids against the parasitoid community present in the field, *Ecological Entomology*, 42(5), 680-684. doi: 10.1111/een.1241
- + Jackson, K. A., + McCord, J. S., \* White, J. A. (2017). A window of opportunity: Subdominant predators can use suboptimal prey, *Ecology and Evolution*, 7(14), 5269-5275. doi: 10.1002/ece3.3139
- White, J. A., + McCord, J. S., + Jackson, K. A., Dehnel, A. C., # Lenhart, P. A. (2017). Differential aphid toxicity to ladybeetles is not a function of host plant or facultative bacterial symbionts, *Functional Ecology*, 31(2), 334-339. doi: 10.1111/1365-2435.12736
- Gebiola, M., White, J. A., Cass, B. N., Kozuch, A., Harris, L. R., Kelly, S. E., Karimi, J., Giorgini, M., Perlman, S. J., Hunter, M. S. (2016). Cryptic diversity, reproductive isolation and cytoplasmic incompatibility in a classic biological control success story, *Biological Journal of the Linnean Society*, 117(2), 217-230. doi: 10.1111/bij.12648

## Sponsored Projects

### Awarded

White J., A., Van Cleve J., NSFDEB-BSF: Uneasy Alliances: Emergent Properties and Feedback Mechanisms among Manipulative Endosymbiotic Communities, Sponsored by National Science Foundation Submitted: August 23, 2019. Funding Dates: August 1, 2020 - July 31, 2024. | Awarded: \$714,344.00  
OSPA ID: 201908231051

White J., A., REPS supplement for NSFDEB-BSF: Uneasy Alliances: Emergent Properties and Feedback Mechanisms Among Manipulative Endosymbiotic Communities, Sponsored by National Science Foundation August 1, 2021-July 31, 2022. | Awarded: \$30,000.00  
OSPA ID: 202106220843

### Closed

White J., A., Do bacterial symbionts play a role in insecticide resistance in a polyphagous aphid pest?, Sponsored by Iowa State University Submitted: January 6, 2017. Funding Dates: January 1, 2017 - December 31, 2018. | Awarded: \$150,000.00  
OSPA ID: 201701060911

White J., A., Toxic aphids: how bacterial symbionts influence coccinellid defense and biological control of *Aphis craccivora*, Sponsored by National Institute of Food and Agriculture Submitted: February 5, 2013. Funding Dates: December 15, 2013 - December 14, 2018. | Awarded: \$454,573.00  
OSPA ID: 201302051353

White J., A., KSEF RDE: Developing a spider model system for understanding interactions among endosymbionts, Sponsored by KY Science and Technology Co Inc Submitted: December 13, 2015. Funding Dates: July 1, 2016 - June 30, 2018. | Awarded: \$30,000.00  
OSPA ID: 201512131007

White J., A., Understanding the Mechanisms for Aphid-derived Toxicity Toward Ladybeetles, Sponsored by KY Science and Technology Co Inc Submitted: January 21, 2013. Funding Dates: July 1, 2013 - June 30, 2015. | Awarded: \$29,984.00  
OSPA ID: 201301211458

White J., A., The Effect of an Aphid Bacterial Symbiont on Interactions Among Soybean Aphid, Sponsored by National Institute of Food and Agriculture Submitted: June 9, 2010. Funding Dates: February 15, 2011 - February 14, 2014. | Awarded: \$149,940.00  
OSPA ID: 201006090925

White J., A., Ecological Ramifications of Defensive Symbiosis in an Invasive Aphid Pest,

Sponsored by University of Minnesota Submitted: April 14, 2009. Funding Dates: September 1, 2009 - August 31, 2012. | Awarded: \$46,148.00

OSPA ID: 200904141047

White J., A., KSEF RDE: Molecular Characterization of the Microbial Community of Invasive Arthropods, Sponsored by KY Science and Technology Co Inc Submitted: June 15, 2010.

Funding Dates: July 1, 2010 - June 30, 2012. | Awarded: \$61,871.00

OSPA ID: 201006150906

White J., A., KSEF RDE: Molecular Characterization of the Microbial Community of Invasive Arthropods, Sponsored by KY Science and Technology Co Inc Submitted: January 23, 2009.

Funding Dates: July 1, 2009 - June 30, 2011. | Awarded: \$49,683.00

OSPA ID: 200901231445

### **Not Funded**

White J., A., Are Facultative Bacterial Symbionts Lost During Introduction? A Survey of Symbionts in Exotic Versus Native Ranges of Introduced Arthropods, Sponsored by US

Department of Agriculture Submitted: April 13, 2009. | Awarded: \$0.00

OSPA ID: 200904131334

White J., A., CAREER: Ecologically relevant variation of bacterial endosymbionts among arthropod populations, Sponsored by National Science Foundation Submitted: July 18, 2012.

| Awarded: \$0.00

OSPA ID: 201207180558

White J., A., Collaborative Proposal: MSB-ECA: From microbiome to macroclimate- scaling multiple drivers of distribution and abundance of aphid populations in central North

America, Sponsored by Kent State University Submitted: October 6, 2017. | Awarded: \$0.00

OSPA ID: 201710061504

### **Scope Grants**

#### **Awarded**

White J., A., Van Cleve J., NSFDEB-BSF: Uneasy Alliances: Emergent Properties and Feedback Mechanisms among Manipulative Endosymbiotic Communities, Sponsored by National Science Foundation Submitted: July 23, 2021. Funding Dates: August 1, 2020 - July 31, 2024.

| Current Budget Amount: \$65,250.00

Prime Grant OSPA ID: 201908231051

### **Non-Sponsored Projects**

#### **On-going**

White, J. A., Aphid provisioning, Industrial/Trade, (January 1, 2018 - December 31, 2018).

Awarded: \$300.

Description: We provide aphids to a variety of collaborators. For industry clientele, we

charge according to a fee schedule that depends on the difficulty of the request, typically \$40 per shipment.

## **Federal**

### **Hatch**

#### **Closed**

White, J. A., Bacterial symbionts and defensive traits in insects, (November 6, 2014 - September 30, 2019).

#### **On-going**

White, J. A., Endosymbiont interactions and emergent phenotypes in arthropods, (November 12, 2019 - September 30, 2024).

## **Other**

### **Closed**

White, J. A., Hamiltonella screening in sugarcane aphid, Academic collaboration - Texas A&M, (January 1, 2018 - December 31, 2018). Awarded: \$513.74.  
Description: We provided a symbiont screening service according to a fee schedule based on hours of effort and supplies used.

White, J. A., Gut symbiont screening in red palm weevil, Academic collaboration - Arabian Gulf University, (January 1, 2018 - December 31, 2018). Awarded: \$2548.60.  
Description: We provide a symbiont screening service for academic collaborators. Fees are based on hours invested and supplies expended.

## **University**

### **Closed**

White, J. A. (Co-Principal), Stevenson, B. (Co-Principal), Identifying non-pathogenic tick endosymbionts for potential use in applied vector management, UK Office of Research, (July 1, 2018 - February 1, 2019). Awarded: \$21086.  
Description: Pilot grant to generate preliminary data for subsequent submission to a Federal Agency.

Hirsch, H. L. (Principal), Schardl, C. L. (Co-Investigator), White, J. A. (Co-Investigator), McCulley, R. L. (Co-Investigator), Calie, P. (Co-Investigator), Integrating Collegiate Ecological and Molecular Research in the K-12 STEM Curriculum, KY Council on Postsecondary Education, (August 1, 2016 - July 31, 2017). Awarded: \$10000.

## **Presentations Given**

### **Invited Speaker**

White J. A., (May 11, 2021). Microbial symbionts as drivers of arthropod ecology and biological control. Departmental seminar, Department of Entomology, Kansas State University (virtual). Invited, University.  
White J. A., (February 17, 2020). Microbial symbionts as drivers of arthropod population and community ecology Departmental seminar, Department of Entomology and Plant Pathology, Oklahoma State University, Stillwater, OK, United States. Invited, University.  
White J. A., (April 19, 2019). Microbial symbionts as drivers of arthropod population and community

ecology Departmental seminar, Department of Entomology, University of Minnesota, St. Paul, MN, United States. Invited, University.

White J. A., (November 12, 2018). Endosymbiont insights into trophic interactions Annual Meeting of the Entomological Society of America, Vancouver, Canada. Invited, International.

Athey K., Chapman E., White J. A., (November 12, 2018). Pitfalls and lessons from next generation sequencing techniques for molecular gut content analysis Annual Meeting of the Entomological Society of America, Vancouver, Canada. Invited, International.

White J. A., Rosenwald L., Styer A., (March 20, 2018). Untangling the web: interacting microbial communities in agricultural spiders Annual Meeting of the North Central Branch of the Entomological Society of America, Entomological Society of America, Madison, WI, United States. Invited, Regional.

White J. A., (February 9, 2018). Tangled webs: microbial symbiont dynamics within and among spider hosts Ecolunch, Lexington, United States. University.

White J. A., (October 17, 2017). Untangling the web: Endosymbiotic bacterial effects on spider biology Departmental seminar, University of Kentucky Department of Microbiology Immunology and Molecular Genetics, Lexington, KY. University.

### **Keynote or plenary address**

White, J.A., Lenhart, P.A., Jackson, K.J., McCord, J. Aphidophagous communities respond to intraspecific variation in aphid defense. (planned for Sept 19, 2022; cancelled due to family emergency). Fifteenth meeting of the International conference on Aphidophaga. Lleida, Spain. Invited, International.

White J. A., (May 14, 2018). Eco-evolutionary feedbacks between prey defenses and the enemy community. First International Congress of Biological Control, International Organization of Biological Control, Beijing, China. Invited, International.

### **Podium Session**

White, J. A., Rosenwald, L., Granillo, Z., Griffith, J. (November 2021). Does the strength of *Rickettsiella*-induced cytoplasmic incompatibility change as a function of male age? Annual Meeting of the Entomological Society of America, Denver, CO, United States. Accepted, National.

Rosenwald L. C., White J. A., (June 2020). Pervasive and persistent: a survey of symbiotypes in regional populations of *Mermessus fradeorum* (Linyphiidae). Annual meeting of the American Arachnological Society (virtual), Other / Multiple Countries. Accepted, International.

White J. A., Kratovil J., (November 20, 2019). The genome of the *Arsenophonus* endosymbiont of cowpea aphid (*Aphis craccivora*) provides insights into host plant specialization. Annual Meeting of the Entomological Society of America, St. Louis, MO, United States. Accepted, National.

Rosenwald L. C., White J. A., Kratovil J., (November 18, 2019). Geographic diversity of endosymbiotic infection in a linyphiid spider. Annual Meeting of the Entomological Society of America, St. Louis, MO, United States. Accepted, National.

Rosenwald L. C., White J. A., (June 2019). A novel bacterial symbiont manipulates the reproduction of a Linyphiid spider, *Mermessus fradeorum*. Annual meeting of the American Arachnological Society, Lexington, VA, United States. Accepted, National.

White J. A., Styer A., Rosenwald L. C., Curry M. M., Welch K. D., Athey K. J., Chapman E. G., (June 2019). Endosymbiotic bacteria are prevalent and diverse in agricultural spiders Annual meeting of the American Arachnological Society, Lexington, VA, United States. Accepted, National.

Holt J., White J. A., Nibouche S., Costet L., Malacrino A., Medina R., (November 12, 2018). Characterization of the sugarcane aphid microbiome in the continental U.S. Annual Meeting of the Entomological Society of America, Vancouver, Canada. Accepted, International.



Rosenwald L., White J. A., (November 12, 2018). Do Rickettsiella symbionts manipulate reproduction of a linyphiid spider? Annual Meeting of the Entomological Society of America, Vancouver, Canada. Accepted, International.

White J. A., Curry M., Rosenwald L., Styer A., (June 21, 2018). Too many cooks spoil the brew? Co-infection context influences reproductive manipulation of a linyphiid spider The Ninth International Wolbachia Meeting, Salem, MA, United States. Accepted, International.

Lenhart P., White J. A., (November 8, 2017). Intra-specific variation in defense determines predator community composition Annual Meeting of the Entomological Society of America, The Entomological Society of America, Denver, CO, United States. Accepted, National.

White J. A., Styer A., Rosenwald L., (November 6, 2017). Tales from the web: Diverse bacterial symbiont infections in a linyphiid spider Annual Meeting of the Entomological Society of America, The Entomological Society of America, Denver, CO, United States. Accepted, National.

Holt J., Styer A., Antwi J., Armstrong J. S., Wulff J., White J. A., Armstrong J. S., Costet L., Peterson G., McLaren N., Medina R., (November 5, 2017). Characterization of the sugarcane aphid microbiome in the continental U.S. Annual Meeting of the Entomological Society of America, The Entomological Society of America, Denver, CO, United States. Accepted, National.

Hansen T., White J. A., (November 5, 2017). Identifying mechanisms of host plant specialization in Aphis craccivora and its bacterial symbionts Annual Meeting of the Entomological Society of America, The Entomological Society of America, Denver, CO, United States. National.

Hansen T., White J. A., (June 5, 2017). Identifying mechanisms of host plant specialization in Aphis craccivora and its bacterial symbionts Annual Meeting of the North Central Branch of the Entomological Society of America, Entomological Society of America, Indianapolis, IN, United States. Regional.

### Poster Session

White, J. A., Laura Rosenwald, L., Mowery, M., Chapman, E., Carpenter, L., Lubin, Y., Segoli M., Milne M., Watson P. (June 2022). Maternally-inherited symbionts in spiders: diverse, novel, and mysterious. Annual meeting of the American Arachnological Society, Davis, CA, United States. National.

Proctor, J, White J.A. (June , 2022). Male rearing temperature affects success of cytoplasmic incompatibility induction by endosymbiotic bacteria in a linyphiid spider host. Annual meeting of the American Arachnological Society, Davis, CA, United States. National

Rosenwald L., White J. A., (March 19, 2018). Differential defenses in prey: the effects of consuming aphids by a Linyphiid spider Annual Meeting of the North Central Branch of the Entomological Society of America, Entomological Society of America, Madison, WI, United States. Regional.

## Teaching

### Teaching

| Prefix Number - Section | Credit Hours      | # Enrolled | Code Term Year      |
|-------------------------|-------------------|------------|---------------------|
| ENT 395 - 001           | 1.00000 - 3.00000 | 2          | 30 Spring 2021-2022 |
| BIO 300 - 001           | 3.00000 - 3.00000 | 3          | 10 Fall 2021-2022   |
| BIO 300 - 002           | 3.00000 - 3.00000 | 3          | 10 Fall 2021-2022   |
| ENT 300 - 001           | 3.00000 - 3.00000 | 8          | 10 Fall 2021-2022   |
| ENT 300 - 002           | 3.00000 - 3.00000 | 6          | 10 Fall 2021-2022   |

|               |                   |    |                            |
|---------------|-------------------|----|----------------------------|
| ENT 595 - 201 | 1.00000 - 4.00000 | 6  | 10 Fall 2021-2022          |
| ENT 395 - 010 | 1.00000 - 3.00000 | 1  | 50 Summer 2020-2021        |
| ENT 395 - 001 | 1.00000 - 3.00000 | 1  | 30 Spring 2020-2021        |
| ENT 625 - 202 | 3.00000 - 3.00000 | 4  | 30 Spring 2020-2021        |
| ENT 770 - 202 | 0.00000 - 1.00000 | 12 | 30 Spring 2020-2021        |
| BIO 300 - 001 | 3.00000 - 3.00000 | 4  | 10 Fall 2020-2021          |
| BIO 300 - 002 | 3.00000 - 3.00000 | 1  | 10 Fall 2020-2021          |
| ENT 300 - 001 | 3.00000 - 3.00000 | 5  | 10 Fall 2020-2021          |
| ENT 300 - 002 | 3.00000 - 3.00000 | 1  | 10 Fall 2020-2021          |
| BIO 300 - 001 | 3.00000 - 3.00000 | 2  | 10 Fall 2019-2020          |
| ENT 300 - 001 | 3.00000 - 3.00000 | 9  | 10 Fall 2019-2020          |
| ENT 300 - 002 | 3.00000 - 3.00000 | 1  | 10 Fall 2019-2020          |
| ENT 770 - 002 | 0.00000 - 1.00000 | 10 | 30 Spring 2018-2019        |
| HON 395 - 001 | 1.00000 - 6.00000 | 1  | 30 Spring 2018-2019        |
| BIO 300 - 001 | 3.00000 - 3.00000 | 5  | 10 Fall 2018-2019          |
| BIO 300 - 002 | 3.00000 - 3.00000 | 5  | 10 Fall 2018-2019          |
| ENT 300 - 001 | 3.00000 - 3.00000 | 10 | 10 Fall 2018-2019          |
| ENT 300 - 002 | 3.00000 - 3.00000 | 8  | 10 Fall 2018-2019          |
| BIO 300 - 001 | 3.00000 - 3.00000 | 5  | 10 Fall 2017-2018          |
| BIO 300 - 002 | 3.00000 - 3.00000 | 5  | 10 Fall 2017-2018          |
| ENT 300 - 001 | 3.00000 - 3.00000 | 6  | 10 Fall 2017-2018          |
| ENT 300 - 002 | 3.00000 - 3.00000 | 6  | 10 Fall 2017-2018          |
| ENT 395 - 002 | 1.00000 - 3.00000 | 1  | 10 Fall 2017-2018          |
| ENT 790 - 012 | 1.00000 - 6.00000 | 1  | 30 Spring 2016-2017        |
| BIO 300 - 001 | 3.00000 - 3.00000 | 5  | 10 Fall 2016-2017          |
| BIO 300 - 002 | 3.00000 - 3.00000 | 3  | 10 Fall 2016-2017          |
| ENT 300 - 001 | 3.00000 - 3.00000 | 9  | 10 Fall 2016-2017          |
| ENT 300 - 002 | 3.00000 - 3.00000 | 7  | 10 Fall 2016-2017          |
| ENT 770 - 001 | 1.00000 - 1.00000 | 13 | 10 Fall 2016-2017          |
| ENT 790 - 012 | 1.00000 - 6.00000 | 1  | 10 Fall 2016-2017          |
| ENT 790 - 012 | 1.00000 - 6.00000 | 1  | 30 Spring 2015-2016        |
| ENT 790 - 012 | 1.00000 - 6.00000 | 2  | 10 Fall 2015-2016          |
| ENT 770 - 002 | 1.00000 - 1.00000 | 8  | 10 Fall 2014-2015          |
| ENT 790 - 012 | 1.00000 - 6.00000 | 1  | 10 Fall 2014-2015          |
| ENT 748 - 012 | .00000 - .00000   | 2  | 30 Spring 2013-2014        |
| ENT 767 - 012 | 2.00000 - 2.00000 | 1  | 30 Spring 2013-2014        |
| ENT 395 - 001 | 1.00000 - 3.00000 | 1  | 10 Fall 2013-2014          |
| ENT 767 - 012 | 2.00000 - 2.00000 | 1  | 10 Fall 2013-2014          |
| ENT 790 - 012 | 1.00000 - 6.00000 | 1  | 10 Fall 2013-2014          |
| ENT 748 - 012 | .00000 - .00000   | 1  | 30 Spring 2012-2013        |
| ENT 767 - 012 | 2.00000 - 2.00000 | 1  | 30 Spring 2012-2013        |
| ENT 770 - 001 | 1.00000 - 1.00000 | 8  | 30 Spring 2012-2013        |
| ENT 790 - 012 | 1.00000 - 6.00000 | 3  | 30 Spring 2012-2013        |
| ENT 767 - 012 | 2.00000 - 2.00000 | 1  | 10 Fall 2012-2013          |
| ENT 790 - 012 | 1.00000 - 6.00000 | 1  | 10 Fall 2012-2013          |
| ENT 790 - 010 | 1.00000 - 6.00000 | 1  | 51 1st summer<br>2011-2012 |

|               |         |   |                     |
|---------------|---------|---|---------------------|
| ENT 767 - 012 | 02 - 02 | 1 | 30 Spring 2011-2012 |
| ENT 790 - 012 | 01 - 06 | 3 | 30 Spring 2011-2012 |
| ENT 767 - 012 | 02 - 02 | 1 | 10 Fall 2011-2012   |
| ENT 790 - 012 | 01 - 06 | 3 | 10 Fall 2011-2012   |
| ENT 770 - 001 | 01 - 01 | 7 | 10 Fall 2009-2010   |

## Teacher Course Evaluations

| Prefix Number - Section | Responses | TCE Course Quality Mean | TCE Teaching Quality Mean | Code Term Year      |
|-------------------------|-----------|-------------------------|---------------------------|---------------------|
| ENT 300 - 001           | 5         | 4.80                    | 5.00                      | 10 Fall 2021-2022   |
| ENT 300 - 001           | 9         | 4.78                    | 4.89                      | 10 Fall 2019-2020   |
| ENT 300 - 001           | 7         | 4.43                    | 4.71                      | 10 Fall 2018-2019   |
| ENT 300 - 001           | 5         | 4.50                    | 4.60                      | 10 Fall 2017-2018   |
| ENT 300 - 001           | 6         | 4.33                    | 4.33                      | 10 Fall 2016-2017   |
| ENT 300 - 002           | 5         | 4.00                    | 4.20                      | 10 Fall 2021-2022   |
| ENT 300 - 002           | 6         | 4.83                    | 4.83                      | 10 Fall 2018-2019   |
| ENT 300 - 002           | 5         | 4.40                    | 4.60                      | 10 Fall 2016-2017   |
| ENT 595 - 201           | 5         | 5.00                    | 5.00                      | 10 Fall 2021-2022   |
| ENT 770 - 001           | 6         | 5.00                    | 4.83                      | 10 Fall 2016-2017   |
| ENT 770 - 001           | 8         | 3.38                    | 3.75                      | 30 Spring 2012-2013 |
| ENT 770 - 001           | 7         | 3.43                    | 3.57                      | 10 Fall 2009-2010   |
| ENT 770 - 002           | 10        | 4.40                    | 4.60                      | 30 Spring 2018-2019 |
| ENT 770 - 002           | 8         | 4.00                    | 3.88                      | 10 Fall 2014-2015   |
| ENT 770 - 202           | 10        | 4.50                    | 4.90                      | 30 Spring 2020-2021 |

Note: With regards to 2020 TCEs please consider the following from page 121 of the UK Playbook for Fall 2020, "It is essential that performance evaluation take into account the extenuating circumstances brought about by the disruption for faculty in all title series and the extraordinary work accomplished by faculty in response to the disruption. Academic leaders shall reiterate that TCEs should be but one indicator of effective teaching in both periodic merit reviews and tenure/promotion decisions. Evaluation of teaching must go beyond student evaluations alone."

## Theses and Dissertations

### Dissertation Committee Member

Hannah Stowe, Entomology at University of Nebraska, Status: In-Process (Sept 2021-Present)

Kristie Schmidt, Entomology, Status: In-Process (September 2020-Present).

Melissa Carpenter, Biology at Drexel University, Status: In-Process. (March 2020 - Present).

Haley Butler, Entomology at Oklahoma State University, Status: In-Process. (February 2020 - Present).

Laura Unfried, Entomology, Status: In-Process. (October 2019 - Present).

Amanda Dunaway, Entomology, Status: In-Process. (October 2018 - Present).

Lauren Fann, Entomology, Status: Degree Awarded. (May 2019 – July 2022).

Emrah Ozel, Entomology, Status: Degree Awarded. (September 2018 – December 2021).

Leslie Potts, Entomology, Status: Degree Awarded. (August 2016 - April 2020).

Kathryn Lethbridge, Microbiology Immunology and Molecular Genetics, Status: Degree Awarded. (August 2017 - June 2019).

Bernadette Mach, Entomology, Status: Degree Awarded. (March 2015 - June 2018).

Kacie Athey, Entomology, Status: Degree Awarded, I was a later addition to Kacie's committee. (December 2016 - April 2017).

#### **Master's Thesis Committee Chair**

Jordyn Proctor, Entomology, Status: In Process. (August 2022 - Present).

Rebecca Robertson, Entomology, Status: In Process. (August 2022 - Present).

Laura Rosenwald, Entomology, Status: Degree Awarded. (August 2017 - December 2020).

Thorsten Hansen, Entomology, Status: Degree Awarded. (August 2015 - January 12, 2018).

#### **Master's Thesis Committee Member**

Julie Collins-Russo, Entomology MS-B, Status: In Process (August 2021 - Present).

Katie Grubb, Entomology, Status: Degree Awarded. (January 2020 – April 2022).

Grayson Grume, Entomology, Status: Degree Awarded. (September 2016 - March 2020).

Mahtaab Bagherzadeh, Plant and Soil Sciences, "Can Increasing Grass-Fungal Endophyte Symbiotic Diversity Enhance Grassland Ecosystem Functioning?," Status: Degree Awarded. (August 2016 - July 2018).

Wil Licht, "What cues female kicking in *Callosobruchus maculatus*? Disentangling the effects of male traits on female mating decisions," Status: Degree Awarded. (September 2014 - June 2017).

#### **Outside examiner**

Thomas Maignet, Biology, Status: Degree Awarded. (April 2020).

Michelle Giedt, Biology, "Jak/Stat Signaling Regulates Gametogenesis and Age-Related Reproductive Maintenance," Status: Degree Awarded. (November 2017 - December 2017).

## **Directed Student Learning (excluding theses, dissertations)**

Kaitlin Butler. Directed Individual/Independent Study (January 2022-Present). Description:  
Supervised ENT 395 independent research project

Chris Rice. Directed Individual/Independent Study (January 2022-May 2022). Description:  
Supervised ENT 395 independent research project

Leah Carpenter. Directed Individual/Independent Study (May 2021-August 2021). Description:  
Supervised ENT 395 independent research project

Erica Knorpp. Directed Individual/Independent Study (January 2021-May 2021). Description:  
Supervised ENT 395 independent research project

Grace Moses. Directed Individual/Independent Study. *Will the co-infection of Rickettsia in Mermessus fradeorum Lessen the Strength of CI (Cytoplasmic Incompatibility) Caused by Rickettsiella?*. Completed (January 2020 - December 2020).

Description: Supervised ABT 395 independent research project

Kristen Bruce. Directed Individual/Independent Study. *The Cowpea Aphid is a Suitable food Source for the Green Lacewing*. Completed (January 2020 - May 2020).

Description: Supervised ABT 395 independent research project

## **Academic Advising**

30 Spring 2021-2022, 5 undergraduate students advised.

50 Summer 2021-2022, 4 undergraduate students advised.

10 Fall 2021-2022, 4 undergraduate students advised.

30 Spring 2020-2021, 4 undergraduate students advised.

10 Fall 2020-2021, 7 undergraduate students advised, 1 graduate student advised.

30 Spring 2019-2020, 5 undergraduate students advised, 1 graduate student advised, I am DUS for Entomology, and serve as advisor or coadvisor for all students who major or co-major in Entomology.

10 Fall 2019-2020, 3 undergraduate students advised, 1 graduate student advised.

50 Summer 2017-2018, Student Award:

Thor Hansen, 2nd place MS presentation award, North Central Branch of the Entomological Society of America.

## **Other Credit and Non-Credit Instructional Activities**

### **Club Advisor, Emerging Entomologists**

Participants: Undergraduate Students, 8 (2020-Present)

Description: Ongoing advisor for undergraduate student entomology organization. Attend meetings, provide resources as necessary

### **Club Advisor, H. Garman Entomology Club**

Participants: Graduate Students, 30, (2019-2020)

Description: Ongoing advisor for graduate student entomology organization. Attend

meetings, act as liaison between students and faculty, provide resources as necessary

### **Club Advisor, Linnean Team**

Description: The Linnean team is a quiz bowl team that competes at regional and national meetings. Act as liaison between club and national organization, provide questions for use in competitions.

### **Guest Lecture**

Introduction to grad school and professional development, Participants: Graduate Students, 10, (October 5, 2021) Description: I led one discussion session on grant writing/funding research

Introduction to grad school and professional development, Participants: Graduate Students, 10, (October 2, 2020)

Description: I led one discussion session on grant writing/funding research

Introduction to grad school and professional development, Participants: Graduate Students, 8, (October 11, 2019)

Description: I led one discussion session on grant writing/funding research

Scientific Method in BioTechnology, Participants: Undergraduate Students, 75, (October 18, 2018)

Description: Introduction to research in my area

Introduction to grad school and professional development, Participants: Graduate Students, 8, (October 12, 2018)

Description: I led one discussion session on grant writing/funding research

Integrated Organismal Entomology, Participants: Graduate Students, 6, (September 26, 2018)

Description: Graduate survey course for organismal aspects of entomology. I conducted 2 lectures on symbionts, and participated in one review session.

Greenhouse Floral Crop Management, Participants: Undergraduate Students, 20, (January 31, 2018)

Description: Integrated Pest Management

Introduction to graduate school and professional development, Participants: Graduate Students, 8, (October 13, 2017)

Description: One lecture on grant writing and funding research

## **Service**

### **Department Service**

Insect Safari at the Arboretum, (August 31, 2018).

Insect Safari at the Arboretum, (September 1, 2017).

### **Committee Chair**

Integrated Pest Management Search Committee Chair (2021-2022).

Departmental Steering Committee, Co-Chair, (2018 – 2021).

Greenhouse Committee, (September 2014 - 2022).

### **Committee Member**

Departmental Curriculum Committee (2022-Present)

OneHealth Entomologist Search Committee, (2019 - 2020).

Arthropod Systematist Search Committee, (October 2017 - August 2018).

Curriculum Committee, (2016 - 2017).

Arthropod Ecologist Search Committee, (2016 - February 2017).

## **College Service**

### **Committee Member**

CAFE Undergraduate Curriculum Committee, (August 2019 - Present).

CAFE Continuing Student Scholarship Review Panel, (March 2021)

Barnhart Committee, (January 2017 - 2020).

CAFE New Faculty Welcome panelist, (August 10, 2020).

CAFE continuing student scholarship review panel, (January 2020).

CAFE Incoming Freshman scholarship review panel, (December 2019).

## **University Service**

### **Committee Member**

University Senator, (August 1, 2020 - Present).

Arboretum Review Committee, (February 26, 2018 - July 2018).

### **Faculty Advisor**

NSF GRFP Resource Person, (2010 - Present).

## **Professional Service**

### **Committee Member**

Entomological Society of America, National Awards and Honors committee, (November 2018 - Present).

### **At Large Committee Member**

North Central Branch Entomological Society of America, (2014 - 2017).

### **Awards Coordinator**

North Central Branch Entomological Society of America, (2016 - March 2018).

North Central Branch Entomological Society of America, (March 12, 2018).

Entomological Society of America, (November 6, 2017).

North Central Branch Entomological Society of America, (June 5, 2017).

### **Program Organizer**

North Central Branch Entomological Society of America, Symposium Organization, (May 5, 2020).

North Central Branch Entomological Society of America, Symposium Organization, (March 13, 2018).

#### **Judge, Student Awards Competition**

American Arachnological Society National Meeting, 2022.

Entomological Society of America National Meeting, 2021

Entomological Society of America National Meeting, 2019

Entomological Society of America National Meeting, 2017

Entomological Society of America North Central Branch Meeting, 2019

Entomological Society of America North Central Branch Meeting, 2018

Entomological Society of America North Central Branch Meeting, 2017

#### **Moderator, Meeting Session**

Entomological Society of America National Meeting, 2021

#### **Reviewer, Grant Proposal**

NSF-DEB, panel (January-March 2021).

Austrian Science Foundation, ad hoc (May 2020).

NSF-IOS, panel (August 9, 2018 - September 17, 2018).

German Science Foundation, ad hoc (June 2018 - July 2018).

Netherlands Organization for Scientific Research, (June 2017).

#### **Reviewer, Journal Article**

Ecological Entomology (July 2022)

Journal of Animal Ecology (May 2022)

Entomologia Experimentalis et Applicata (Dec 2021)

Microbial Ecology (July 2021)

Microbial Ecology (April 2021)

Frontiers in Microbiology (April 2021)

Microbial Ecology (Dec 2020)

BMC Ecology, (November 23, 2020 - November 27, 2020).



Journal of Evolutionary Biology, (August 21, 2020 - August 22, 2020).

Microbial Ecology, (July 21, 2020 - July 22, 2020).

Molecular Ecology, (July 21, 2020 - July 22, 2020).

Microbiology Open, (June 11, 2020 - June 15, 2020).

Scientific Reports, (May 14, 2020 - May 18, 2020).

Microbiology Open, (May 1, 2020 - May 4, 2020).

Microbial Ecology, (March 17, 2020 - March 20, 2020).

European Journal of Entomology, (March 14, 2020 - March 17, 2020).

Journal of Animal Ecology, (March 2, 2020 - March 4, 2020).

Insects, (February 20, 2020 - February 24, 2020).

Insects, (January 1, 2020 - January 3, 2020).

Molecular Ecology, (December 17, 2019 - December 27, 2019).

FEMS Microbiology Ecology, (December 17, 2019 - December 26, 2019).

European Journal of Entomology, (December 17, 2019 - December 23, 2019).

Journal of Animal Ecology, (November 27, 2019 - December 3, 2019).

Molecular Ecology, (October 23, 2019 - October 27, 2019).

Journal of Pest Science, (September 10, 2019 - September 13, 2019).

Microbial Ecology, (August 20, 2019 - August 21, 2019).

Symbiosis, (July 9, 2019 - July 16, 2019).

Microbial Ecology, (May 18, 2019 - May 20, 2019).

Journal of Insect Physiology, (May 15, 2019 - May 17, 2019).

Environmental Microbiology Reports, (May 10, 2019 - May 12, 2019).

Journal of Insect Physiology, (April 29, 2019 - April 30, 2019).

Microbial Ecology, (April 20, 2019 - April 22, 2019).

Microbial Ecology, (February 20, 2019 - February 22, 2019).

Journal of Insect Physiology, (January 10, 2019 - January 20, 2019).

Journal of Insect Physiology, (August 9, 2018 - August 10, 2018).

Journal of Insect Pathology, (August 1, 2018 - August 10, 2018).

PLOS Genetics, (June 1, 2018 - June 24, 2018).

Economic Entomology, (May 15, 2018 - June 7, 2018).

Environmental Microbiology, (March 20, 2018 - April 10, 2018).

PLOS One, (February 7, 2018 - February 28, 2018).

PeerJ, (January 19, 2018 - January 28, 2018).

Journal of Insect Pathology, (December 15, 2017 - December 18, 2017).

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Environmental Entomology, (February 10, 2017 - February 13, 2017).

Biological Control, (January 1, 2017 - January 31, 2017).

## **Public Service**

### **Guest Speaker**

University of Kentucky Everything is Science!, (March 5, 2019).

## **Professional Development**

### **Professional Memberships**

Ohio Valley Entomological Association. Regional. (2011 - 2020).

International Organization of Biological Control. International. (2009 - Present).

Entomological Society of America. National. (2000 - Present).

### **Awards and Honors**

*George E. Mitchell, Jr. Award for Outstanding Service to Graduate Students*, University of Kentucky, College of Arts and Sciences. Advising, Recognition Award, College. (December 2017).

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### Education

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### Work History

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2006-2008 Senior Biological Scientist, Department of Entomology and Nematology, University of Florida, Gainesville, FL  
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### Research and Scholarship

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Undergraduate    WOS = Web of Science    JIF = Journal Impact Factor    TC = Journal Total Cites  
SNIP = Source Normalize Impact per Paper    SJR = Scimago Journal Rank

#### Published

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## Sponsored Projects

### Awarded

Austin Merchant, USDA NIFA Predoc Fellowship: Managing Stress in Termites: Perspectives from the Brain, Sponsored by National Institute of Food and Agriculture Submitted: September 27, 2021. Funding Dates: June 1, 2021 - May 31, 2024. | Awarded: \$180,000.00  
OSPA ID: 202109271407

### Closed

Zhou X., Developing a framework for assessing the risks of in planta RNAi on non-target arthropods, Sponsored by National Institute of Food and Agriculture Submitted: March 1, 2011. Funding Dates: September 1, 2011 - June 30, 2016. | Awarded: \$500,000.00

OSPA ID: 201103011349

Zhou X., Haynes K., F., Talk to the dead: Chemical communications in corpse management in termites, Sponsored by KY Science and Technology Co Inc Submitted: January 20, 2013. Funding Dates: July 1, 2013 - June 30, 2015. | Awarded: \$30,000.00

OSPA ID: 201301201012

Connolly J., W., Brill J., Cao G., DeLong L., Guiton B., S., Hinds B., J., Jaromczyk J., W., Kaul R., McNear D., H., Ng K.-W., Patwardhan A., A., Puleo D., A., Saunders M., M., Schardl C., L., Seo

S. S., Shin H., Y., Strachan D., R., Stromberg A., Voss S., R., Webb B., A., Weisrock D.,

W., Zhou X., State EPSCoR: Transforming Kentucky's New Economy, Sponsored by KY Council on Postsecondary Education Submitted: June 20, 2008. Funding Dates: June 1, 2008 - June 30, 2013. | Awarded: \$3,092,197.00

OSPA ID: 200806200938

Zhou X., Potter M., F., KSEF KCF: Integration of Double Stranded RNA into Baiting System: A Novel Genetic Control Strategy for Termites, Sponsored by KY Science and Technology Co Inc Submitted: October 13, 2008. Funding Dates: January 1, 2009 - December 31, 2011. | Awarded: \$102,500.00

OSPA ID: 200810131405

## **Non-Sponsored Projects**

### **Federal**

#### **Hatch**

##### **Closed**

Zhou, X., COLONY COLLAPSE IN TERMITES - RNA INTERFERENCE-MEDIATED GENETIC MANIPULATION, National Institute of Food and Agriculture, (November 19, 2014 - September 30, 2019).

##### **On-going**

From "Scared to Death" to "Peace of Mind": the neuroscience governing social buffering in termites, (March 26, 2021 - January 31, 2026).

### **Other Government**

#### **Closed**

Zhou, X. (Principal), Zhou, C. (Collaborator), Neuroanatomy of a eusocial termite brain, Enrichment grant, Institute of Zoology, Chinese Academy of Science, (March 1, 2018 - March 25, 2020). Awarded: ¥ 80,000 (equivalent to \$11,887).

Description: This fund was used to support the 2018 summer research of Austin Merchant, a PhD student, at Dr. Chuan Zhou's laboratory in Beijing, China. Dr. C. Zhou has strong research background in insect neuroscience.

Zhou, X. (Principal), Zhou, C. (Collaborator), Visual and auditory behavior of *Aedes aegypti*, Enrichment grant, Institute of Zoology, Chinese Academy of Science, (March 1, 2019- February 29, 2021). Awarded: \$¥ 80,000 (equivalent to \$11,887).

Description: This fund was used to support the 2019 summer research of Austin Merchant, a PhD student, at Dr. Chuan Zhou's laboratory in Beijing, China. Dr. C. Zhou has strong research background in insect neuroscience.

Zhou, X. (Co-Investigator), Zhang, Y. (Principal), Integrative genomic analysis of insecticide resistance, the driving force for the competitive displacement of sweetpotato whitefly, *Bemisia tabaci*, in China, Major International (Regional) Collaborative Research Project, The National Natural Science Foundation of China, (January 1, 2015 - December 31, 2019).

Awarded: \$500000.

Description: Besides collaborative research, I have used this funding source primarily to support the exchange visits of faculty members and students from University of Kentucky to China.

## University

### Closed

Zhou, X. (Principal), Visualizing the termite brain, Research Activity Award, (October 17, 2019 - June 30, 2020). Awarded: \$3000.

Zhou, X. (Principal), Insect pest performance on low nicotine and regular burley tobacco lines, Enrichment Grant, KTRDC, (November 1, 2018 - December 31, 2019). Awarded: \$80000.

Zhou, X. (Principal), Transcriptomic dissection of worker-soldier caste transition in the Eastern subterranean termite, *Reticulitermes flavipes* (Kollar) (Isoptera: Rhinotermitidae)., The Research Support Grant Program sponsored by the University of Kentucky Office of the Vice President for Research, (January 2015 - December 31, 2016). Awarded: \$20000.

Mihaylova-Kroumova, A. (Principal), Zhou, X. (Co-Principal), Wagner, G. (Co-Principal), Comparative study of aphid infestation in low- and moderate-nicotine tobacco in the presence / absence of CBT diols, Summit Grant, KTRDC, (July 1, 2020 - June 30, 2022). Awarded: \$30000.

Description: A total of \$10,000 goes to Co-PI Zhou for aphid feeding bioassays.

Zhou, X. (Principal), Behavioral adaptations in the green peach aphid, *Myzus persicae* (Sulzer) (Insecta: Hemiptera: Aphididae), to tobacco plants with ultralow, low, and standard nicotine contents. Enrichment Grant, KTRDC, (July 1, 2020 - June 30, 2022). Awarded: \$80000.

Zhou, X. (Principal), Equipment grant: behavioral observation and recording platform. Equipment Grant, KTRDC, (July 1, 2020 - June 30, 2021). Awarded: \$30000.

Zhou, X. (Principal), Mihaylova-Kroumova, A. (Co-Principal), Investigation of the effect of tobacco-produced cembratrien-diols on attracting aphids by conducting laboratory preference experiments., Pilot Grant, KTRDC, (July 1, 2019 - June 30, 2020). Awarded: \$6000.

Description: A total of \$5,000 goes to PI Zhou for aphid feeding preference testing.

Zhou, X. (Principal), Tritrophic interactions among host plant-plant pathogen-insect vector dictate the host selection of tobacco whitefly, *Bemisia tabaci* (Hemiptera: Aleyrodidae), Philip Morris Internationals (PMI) Leaf Agricultural Programs - Research & Innovation program, KTRDC, (2015 - 2016). Awarded: \$15000.

### On-going

Zhou, X. (Principal), Behavioral adaptations in the green peach aphid, *Myzus persicae* (Sulzer) (Insecta: Hemiptera: Aphididae), to tobacco plants with ultralow, low, and standard nicotine contents, Enrichment Grant, KTRDC, (July 1, 2022-June 30, 2023). Award: \$60,000.

Zhou, X. (Principal), Dissecting “Timebomb”, a chemical defense mechanism in vinca plants against chewing herbivores, Enrichment Grant, KTRDC, (August 1, 2021-July 31, 2024). Awarded: \$350,000.

Zhou, X. (Principal), Mihaylova-Kroumova, A., Perry, P. (Co- Principal), Field survey of aphid infestation in low- and moderate-nicotine tobaccos in the presence/absence of CBT diols, Summit Grant, KTRDC, (January 1, 2021-December 31, 2022). Awarded: \$20,000 (\$9,000 to Zhou).

### **Presentation Given**

#### **Invited Speaker**

Departmental (Entomology) Seminar Series at University of Arizona (2022), Purdue University (2020), University of Kentucky (2019), and Texas A & M University (2017).

Departmental (Pathology) Seminar Series at University of Kentucky (2016).

Seminars invited by universities and research institutions in China: 3 (remote, 2022), 2 (remote, 2021), 2 (remote, 2020), 9 (on-site, 2019), 9 (on-site, 2018), 8 (on-site, 2017), and 6 (on-site, 2016). Talks covering different research interests, including, but not limit to 1) overview of Insect Integrative Genomics lab at the University of Kentucky; 2) sociality and termite behaviors, 3) wood-feeding Dictyoptera, 4) insect-plant-pathogen tritrophic interactions, 5) ecological risk assessment of RNA-based control alternatives, 6) biomimicry, 7) cultural entomology, 8) science behind scientific writing, and 8) the art of science: lessons learned from an independent researcher.

KTRDC Seminar Series, University of Kentucky, 2017 – *pres.*

### **Keynote or plenary address**

Zhou X., (November 21, 2018). Managing Termites in a Social Way International Symposium on Green Prevention and Control of Crop Pests, Tianjin Academy of Agricultural Science, Tianjin, China.  
Invited, International.

### **Podium Session**

Zhou X., (November 13-16, 2022). Cricket fighting: a game for royals. Symposium entitled “The Cultural Significance of Insects Through Historical and Diverse Lenses”. Entomology 2022, Entomological Society of America, Vancouver, British Columbia, Canada. International.

Zhou X., (October 27, 2018). *Cryptocercus digestome* shed light on the lignocellulose degradation machinery within the termite-woodroach lineage World Life Science Conference, Organized by the Chinese Union of Life Science Societies. Sponsored by China Association of Science and Technology, Beijing, China. Invited, International.

- Zhou X., (September 6, 2017). Lessons and Perspectives from the Early-tier ERA of Transgenic RNAi Plants on NTAs 8th Meeting of the IOBC/WPRS Working Group, GMO in Integrated Plant Production, Joint Programme with the COST Action IPLANTA: Biosafety issues associated with plants using RNAi technology to provide pathogen or insect resistance, Ghent, Belgium. Invited, International.
- Zhou X., (July 21, 2017). Ecological Risk Assessment of Transgenic RNAi Crops: Current Knowledge and Future Directions The 1st International Conference on Integrated Pest Management, Entomological Society of China, Changsha, Hunan, China. Invited, International.
- Zhou X., (June 6, 2017). Assessing the Impact of Transgenic RNAi Plants on Non-target Organisms: Current Knowledge and Future Directions ISBGMO14, ISBR (International Society for Biosafety Research), Guadalajara, Mexico. Invited, International.
- Zhou X., (September 29, 2016). Collaboration and integration: an old model with new implications. XXV International Congress of Entomology, Entomological Society of America, Orlando, FL, United States. International.

## Extension

### Extension Education & Training Programs Demonstration

**Workshop leader.** "Cultural Entomology" at the Stonewall Interactive Science Night. (April 2016 - April 2019). Scope: State. Participants: 200 General public.

Description: Stonewall Elementary School. Actively involved in outreach activities hosted by the Department of Entomology to promote insect science within the State of Kentucky. I use fighting crickets as a vehicle to reach out to the general public about the animal behavior as well as the cultural influence of insects. Since 2014, I have led a group of graduate students from the department to participate and present at the Stonewall Elementary School for Stonewall Interactive Science Night, and at the Amphitheater of Beaumont Centre Circle for the Kentucky Chinese American Association (KYCAA) Moon Festival Celebration. In each event, we had the opportunity to interact with hundreds of kids about the insects and how these little creatures impact our life and culture.

**Workshop leader.** "Chinese fighting Crickets" at the Moon Festival Celebration.

(September 2016 - September 2018). Scope: State. Participants: 600 General public. Description: Actively involved in outreach activities hosted by the Department of Entomology to promote insect science within the State of Kentucky. I use fighting crickets as a vehicle to reach out to the general public about the animal behavior as well as the cultural influence of insects. Since 2014, I have led a group of graduate students from the department to participate and present at the Stonewall Elementary School for Stonewall Interactive Science Night, and at the Amphitheater of Beaumont Centre Circle for the Kentucky Chinese American Association (KYCAA) Moon Festival Celebration. In each event, we had the opportunity to interact with hundreds of kids about the insects and how these little creatures impact our life and culture.

# Teaching

## Teaching

| Prefix Number - Section | Credit Hours      | # Enrolled | Code Term Year      |
|-------------------------|-------------------|------------|---------------------|
| ENT 770 - 004/203       | 1.00000 - 1.00000 | 6          | 10 Fall 2021-2022   |
| ABT 301 - 001           | 1.00000 - 1.00000 | 8          | 10 Fall 2021-2022   |
| ENT 767 - 007           | 2.00000 - 2.00000 | 3          | 10 Fall 2021-2022   |
| ENT 768 - 007           | 1.00000 - 6.00000 | 1          | 10 Fall 2021-2022   |
| ENT 790 - 007           | 1.00000 - 6.00000 | 1          | 10 Fall 2021-2022   |
| ABT 201 - 001           | 1.00000 - 1.00000 | 15         | 30 Spring 2021-2022 |
| ENT 767 - 013           | 2.00000 - 2.00000 | 3          | 30 Spring 2021-2022 |
| ENT 780 - 013           | 2.00000 - 3.00000 | 1          | 30 Spring 2021-2022 |
| ABT 301 - 003           | 2.00000 - 2.00000 | 4          | 10 Fall 2021-2022   |
| ENT 767 - 007           | 2.00000 - 2.00000 | 3          | 10 Fall 2021-2022   |
| ENT 768 - 007           | 1.00000 - 6.00000 | 1          | 10 Fall 2021-2022   |
| ABT 460 - 201           | 3.00000 - 3.00000 | 36         | 30 Spring 2020-2021 |
| ENT 460 - 201           | 3.00000 - 3.00000 | 1          | 30 Spring 2020-2021 |
| ENT 767 - 013           | 2.00000 - 2.00000 | 2          | 30 Spring 2020-2021 |
| ENT 768 - 015           | 1.00000 - 6.00000 | 1          | 30 Spring 2020-2021 |
| ENT 780 - 013           | 2.00000 - 3.00000 | 1          | 30 Spring 2020-2021 |
| ENT 790 - 013           | 1.00000 - 6.00000 | 1          | 30 Spring 2020-2021 |
| ABT 301 - 003           | 2.00000 - 2.00000 | 8          | 10 Fall 2020-2021   |
| ENT 767 - 007           | 2.00000 - 2.00000 | 2          | 10 Fall 2020-2021   |
| ENT 790 - 007           | 1.00000 - 6.00000 | 1          | 10 Fall 2020-2021   |
| ENT 395 - 001           | 1.00000 - 3.00000 | 1          | 30 Spring 2019-2020 |
| ENT 767 - 013           | 2.00000 - 2.00000 | 2          | 30 Spring 2019-2020 |
| ENT 790 - 013           | 1.00000 - 6.00000 | 1          | 30 Spring 2019-2020 |
| ABT 301 - 003           | 2.00000 - 2.00000 | 9          | 10 Fall 2019-2020   |
| ENT 767 - 007           | 2.00000 - 2.00000 | 2          | 10 Fall 2019-2020   |
| ABT 460 - 001           | 3.00000 - 3.00000 | 31         | 30 Spring 2018-2019 |
| ENT 767 - 013           | 2.00000 - 2.00000 | 1          | 30 Spring 2018-2019 |
| ENT 790 - 013           | 1.00000 - 6.00000 | 1          | 30 Spring 2018-2019 |
| ENT 767 - 007           | 2.00000 - 2.00000 | 1          | 10 Fall 2018-2019   |
| ENT 790 - 007           | 1.00000 - 6.00000 | 1          | 10 Fall 2018-2019   |
| ENT 780 - 013           | 2.00000 - 3.00000 | 1          | 30 Spring 2017-2018 |
| ENT 790 - 013           | 1.00000 - 6.00000 | 1          | 30 Spring 2017-2018 |
| ENT 790 - 007           | 1.00000 - 6.00000 | 1          | 10 Fall 2017-2018   |
| ABT 460 - 001           | 3.00000 - 3.00000 | 25         | 30 Spring 2016-2017 |
| ENT 748 - 013           | 0.00000 - 0.00000 | 1          | 30 Spring 2016-2017 |
| ENT 790 - 013           | 1.00000 - 6.00000 | 1          | 30 Spring 2016-2017 |
| ENT 790 - 007           | 1.00000 - 6.00000 | 1          | 10 Fall 2016-2017   |
| BIO 199 - 045           | 0.00000 - 1.00000 | 9          | 30 Spring 2015-2016 |

|               |                   |    |                     |
|---------------|-------------------|----|---------------------|
| ENT 767 - 013 | 2.00000 - 2.00000 | 1  | 30 Spring 2015-2016 |
| ENT 790 - 013 | 1.00000 - 6.00000 | 1  | 30 Spring 2015-2016 |
| ENT 767 - 007 | 2.00000 - 2.00000 | 2  | 10 Fall 2015-2016   |
| ENT 780 - 002 | 2.00000 - 3.00000 | 1  | 10 Fall 2015-2016   |
| ABT 495 - 001 | 4.00000 - 4.00000 | 10 | 30 Spring 2014-2015 |



|               |                   |    |                     |
|---------------|-------------------|----|---------------------|
| ENT 767 - 013 | 2.00000 - 2.00000 | 2  | 30 Spring 2014-2015 |
| ENT 780 - 013 | 2.00000 - 3.00000 | 1  | 30 Spring 2014-2015 |
| ENT 790 - 013 | 1.00000 - 6.00000 | 1  | 30 Spring 2014-2015 |
| ENT 767 - 007 | 2.00000 - 2.00000 | 2  | 10 Fall 2014-2015   |
| ENT 767 - 013 | 2.00000 - 2.00000 | 2  | 30 Spring 2013-2014 |
| ENT 770 - 001 | 1.00000 - 1.00000 | 7  | 30 Spring 2013-2014 |
| ABT 360 - 001 | 3.00000 - 3.00000 | 18 | 10 Fall 2013-2014   |
| ENT 767 - 007 | 2.00000 - 2.00000 | 2  | 10 Fall 2013-2014   |
| ENT 767 - 007 | 2.00000 - 2.00000 | 2  | 30 Spring 2012-2013 |
| ENT 790 - 007 | 1.00000 - 6.00000 | 1  | 30 Spring 2012-2013 |
| ABT 360 - 001 | 3 - 3             | 23 | 10 Fall 2012-2013   |
| ENT 360 - 001 | 3 - 3             | 3  | 10 Fall 2012-2013   |
| ENT 767 - 007 | 2.00000 - 2.00000 | 1  | 10 Fall 2012-2013   |
| ENT 790 - 007 | 1.00000 - 6.00000 | 2  | 10 Fall 2012-2013   |
| ENT 790 - 007 | 01 - 06           | 3  | 30 Spring 2011-2012 |
| ABT 360 - 001 | 03 - 03           | 13 | 10 Fall 2011-2012   |
| ENT 360 - 001 | 03 - 03           | 1  | 10 Fall 2011-2012   |
| ENT 770 - 001 | 01 - 01           | 17 | 10 Fall 2011-2012   |
| ENT 790 - 007 | 01 - 06           | 3  | 10 Fall 2011-2012   |
| ABT 360 - 001 | 03 - 03           | 19 | 10 Fall 2010-2011   |
| ENT 360 - 001 | 03 - 03           | 1  | 10 Fall 2010-2011   |
| ENT 770 - 002 | 01 - 01           | 3  | 30 Spring 2009-2010 |

### Teacher Course Evaluations

| Prefix Number - Section | Responses | TCE Course Quality Mean | TCE Teaching Quality Mean | Code Term Year      |
|-------------------------|-----------|-------------------------|---------------------------|---------------------|
| ABT 201 - 001           | 6         | 4.33                    | 4.67                      | 30 Spring 2021-2022 |
| ABT 301 - 003           | 5         | 4.80                    | 5.00                      | 10 Fall 2019-2020   |
| ABT 360 - 001           | 13        | 3.00                    | 3.15                      | 10 Fall 2013-2014   |
| ABT 360 - 001           | 14        | 3.21                    | 3.14                      | 10 Fall 2010-2011   |
| ABT 460 - 001           | 12        | 4.50                    | 4.42                      | 30 Spring 2018-2019 |
| ABT 460 - 001           | 14        | 4.00                    | 3.93                      | 30 Spring 2016-2017 |
| ABT 495 - 001           | 7         | 3.29                    | 3.14                      | 30 Spring 2014-2015 |
| BIO 199 - 045           | 7         | 2.71                    | 3.14                      | 30 Spring 2015-2016 |
| ENT 360 - 001           | 6         | 3.50                    | 3.67                      | 10 Fall 2011-2012   |
| ENT 460 - 201           | 18        | 3.83                    | 3.82                      | 30 Spring 2020-2021 |
| ENT 770 - 001           | 6         | 2.50                    | 2.50                      | 30 Spring           |

|               |    |      |      |                   |
|---------------|----|------|------|-------------------|
|               |    |      |      | 2013-2014         |
| ENT 770 - 001 | 15 | 3.67 | 3.73 | 10 Fall 2011-2012 |

Note: With regards to 2020 TCEs please consider the following from page 121 of the UK Playbook for Fall 2020, "It is essential that performance evaluation take into account the extenuating circumstances brought about by the disruption for faculty in all title series and the extraordinary work accomplished by faculty in response to the disruption. Academic leaders shall reiterate that TCEs should be but one indicator of effective teaching in both periodic merit reviews and tenure/promotion decisions. Evaluation of teaching must go beyond student evaluations alone."

## Theses and Dissertations

### Dissertation Committee Chair

Quanquan Liu, Ph.D. in Entomology, "Evolution of sociality in termites," Status: In-Process. (January 2020 - Present).

Austin Merchant, Ph.D. in Entomology, Status: In-Process. (August 2017 - Present).

Jizhe Shi, Ph.D. Entomology, Status: In-Process. (August 2015 - Present).

Li Tian, Entomology, Status: PhD Degree Awarded, John Obrycki, Reddy Palli, Kenneth Haynes, Catherine Linnen. (August 2011 - December 2015).

Qian Sun, Entomology, Status: PhD Degree Awarded, Kenneth Haynes (co-chair), Michael Sharkey, Christopher Schardl, Ruriko Yoshida. (August 2011 - December 2015).

### Dissertation Committee Member

Yan Zhou, Plant and Soil Sciences, Status: In-Process, Ling Yuan, Chair, Tomo Kawashima, Jan Smalle. (January 2022 - Present).

Joshua Singleton, Plant and Soil Sciences, "The interaction between MED25 and MYC2 in the jasmonate signaling pathway in *Catharanthus roseus*," Status: In-Process, Ling Yuan, Chair, Tomo Kawashima, Sharyn Perry. (May 2020 - Present).

Najla Albishi, Entomology, Status: Degree Award, Reddy Palli (Chair), Douglas Harrison, Zainulabeuddin Syed (August 2014 - May 2022).

Jinmo Koo, Entomology, Status: In-Process, Subba Reddy Palli, Chair, Nicholas Teets, Douglas Harrison. (March 2019 - Present).

Emily Nadeau, Entomology, Status: Degree Award, Chuck Fox, Jeramiah Smith, Nicholas Teets, Chair. (August 2017 - Present).

Fernan Gálvez, Entomology, Status: In-Process, Rittschof, Clare; Linnen, Catherine; Teets, Nicholas, Chair. (August 2017 - Present).

Yaoyu Jiao, Entomology, Status: In-Process, Subba Reddy Palli, Chair, Stefan Stamm, Clare Rittschof. (August 2017 - Present).

Smitha George, Entomology, Status: Degree Award, Reddy Palli (Chair), John Obrycki, Haining Zhu. (August 2014 – May 2022).

John William Terbot, II, Biology, Status: Degree Awarded, Catherine Linnen, Chair, David Weisrock, Co-Chair, David Westneat. (August 2013 – May 2022).

June-Sun Yoon, Entomology, Status: Degree Awarded, Reddy Palli (Chair), Daniel Potter, Michael Goodin. (August 2013 - June 2018).

Priyanka Paul, Plant and soil sciences, Status: Degree Awarded, Ling Yuan, Chair, Arthur Hunt, Sharyn Perry. (August 2012 - December 2017).

Hemant Gujar, Entomology, "HORMONAL AND NUTRITIONAL REGULATION OF MOLTING, METAMORPHOSIS, AND REPRODUCTION IN BED BUGS, *Cimex lectularius*," Status: Degree Awarded, Douglas Harrison, Kenneth Haynes, Reddy Palli, Chair. (August 2011 - June 2016).

### **Master's Thesis Committee Chair**

Anugerah Fajar, Msc in Entomology, Status: In-Process. (January 2021 - Present).

Jeffrey Noland, Entomology, Status: Degree Awarded, Reddy Palli, John Obrycki, Ling Yuan. (January 28, 2015 - December 2017).

### **Directed Student Learning (excluding theses, dissertations)**

Jason Wu. Advisor. *Task allocation in termite workers*. In-Process (January 2018 - December 2020).

Description: ABT 395, independent research project

Luke Landis. Advisor. *Overloading soldier termites*. In-Process (January 2018 - December 2020).

Description: ABT 395, independent research project

Jordyn Proctor. Advisor. *Termite undertaking behavior*. In-Process (January 2020 - May 2020).

Description: Special problems for individual students who are capable of pursuing independent investigations in the various areas of entomology. May be repeated to a maximum of six credits.

Chi Zhang. Advisor. *Termite undertaking behavior*. In-Process (August 2018 - December 2019).

Description: ABT 395, independent research project

Sirui Huang. Advisor. *Termite undertaking behavior*. Completed (August 2018 - December 2019).

Description: Special problems for individual students who can pursue independent investigations in the various areas of entomology. May be repeated to a maximum of six credits.

Yating Zhang. Advisor. *Termite behavior*. Completed (January 2018 - December 2019).

Description: ABT 395, independent research project

Jay Philips. Advisor. *Termite undertaking behavior*. Completed (May 2018 - September 2019).

Description: ABT 395, independent research project

Joseph Moore. Advisor. *Termite soldier behavior*. Completed (August 2018 - May 2019).

Description: ABT 395, independent research project

### **Academic Advising**

50 Summer 2021-2022, 3 undergraduate students advised.

10 Fall 2021-2022, 5 undergraduate students advised.

99 Academic year 2020-2021, 19 undergraduate students advised, 11 graduate students advised, 2 professional students advised, 1 interns and residents advised, I have been advising ABT students on the pharmacy track for the past six years. I mentored 3 PhD students in my research

program and served on committees for 8 other graduate students. I also co-advised graduate students with my collaborators in China, hosted and mentored 2 visiting professors during the 2020-2021 academic year.

30 Spring 2020-2021, 6 undergraduate students advised.

99 Academic year 2019-2020, 11 undergraduate students advised, 8 graduate students advised, 3 professional students advised, I have been advising ABT students on the pharmacy track for the past six years. I mentored 2 PhD students in my research program and served on committees for 6 other graduate students. I also co-advised graduate students with my collaborators in China, hosted and mentored 3 visiting professors during the 2019-2020 academic year.

99 Academic year 2018-2019, 11 undergraduate students advised, 8 graduate students advised, 3 professional students advised, I have been advising ABT students on the pharmacy track for the past six years. I co-advised graduate students with my collaborators in China. I also mentored 1 temporary technician (a Master student graduated from the Agricultural and Medical Biotechnology program) during the summer of 2018, as well as 1 postdoctoral researcher and 3 visiting professors through the 2018-2019 academic year.

99 Academic year 2017-2018, 10 undergraduate students advised, 8 graduate students advised, 4 professional students advised, I have been advising ABT students on the pharmacy track for the past six years. I co-advised graduate students with my collaborators in China. I also mentored 1 temporary technician (a Master student graduated from the Agricultural and Medical Biotechnology program), 1 postdoctoral researcher and 2 visiting professor.

99 Academic year 2016-2017, 10 undergraduate students advised, 9 graduate students advised, 5 professional students advised, I have been advising ABT students on the pharmacy track for the past six years. I co-advised graduate students with my collaborators in China. I also mentored 1 temporary technician (a Master student graduated from the Agricultural and Medical Biotechnology program), 1 postdoctoral researcher, 1 visiting PhD student, and 2 visiting professor.

## **Program and Curriculum Development**

### **2016 -2018**

Program/Curriculum Name - International exchange program with China

Description: Within my DOE, I have committed 10% of my time (service component) to this exchange efforts. I initiated the program since I joined the department in 2008. During the process, I have secured the funding from USDA and National Natural Science Foundation of China. Institutional supports at the department, college, and university allows me to establish an academic and cultural bridge between UKy and China. The reciprocal exchange channel has supported the visits of UKy students (2) and faculty members (12 times) to China, and I have hosted more than 15 visiting students and scholars from China.

## **Other Credit and Non-Credit Instructional Activities**

## **Guest Lecture**

Introduction to Genetically Engineered Crops, Risks and Benefits II, (2016)

Description: Prof. Paul Vincelli from Department of Plant Pathology invited me to present a guest lecture on the potential ecological risks associated with RNAi transgenic crops.

## **Seminar**

**2016 - 2018**

Scientific writing-the gateway to a successful professional career, Participants:

Graduate Students, undergraduate students, post-doctoral scholar/fellow, professionals,

Description: Each year I give a series of talks focusing on scientific writing and visual presentation to universities and research institutions in China during my recruitment and collaborative research trip(s). Such seminar typically lasts 2-3 hours, and I use about 45 min to talk about the state of Kentucky, Lexington, and the University of Kentucky. My audience group primarily includes students both under and graduate students, early to mid-career researchers, and few senior-level researchers. Between 2016 and 2018, I delivered 9, 8, and 10 talks, respectively.

## **Workshop**

Making the Transition: Advice from an International Faculty Member, Participants: Graduate Students, 100, (January 5, 2019)

Description: At the start of a semester, I will give this talk "Making the Transition: Advice from an International Faculty Member" as a part of the orientation event for the incoming international graduate teaching assistants. The event lasts for 1 day.

Making the Transition: Advice from an International Faculty Member, Participants: Graduate Students, 100, (January 2018)

Description: At the start of a semester, I will give this talk "Making the Transition: Advice from an International Faculty Member" as a part of the orientation event for the incoming international graduate teaching assistants. The event lasts for 1 day.

Making the Transition: Advice from an International Faculty Member, Participants: Graduate Students, 100, (August 2017)

Description: At the start of a semester, I will give this talk "Making the Transition: Advice from an International Faculty Member" as a part of the orientation event for the incoming international graduate teaching assistants. The event lasts for 1 day.

Making the Transition: Advice from an International Faculty Member, Participants: Graduate Students, 100, (January 2017)

Description: At the start of a semester, I will give this talk "Making the Transition: Advice from an International Faculty Member" as a part of the orientation event for incoming international graduate teaching assistants. The event lasts for 1 day.

Making the Transition: Advice from an International Faculty Member, Participants: Graduate

Students, 100, (August 2016)

Description: At the start of a semester, I will give this talk "Making the Transition: Advice from an International Faculty Member" as a part of the orientation event for the incoming international graduate teaching assistants. The event lasts for 1 day.

Making the Transition: Advice from an International Faculty Member, Participants: Graduate Students, 100, (January 2016)

Description: At the start of a semester, I will give this talk "Making the Transition: Advice from an International Faculty Member" as a part of the orientation event for incoming international graduate teaching assistants. The event lasts for 1 day.

## **Service**



## **Department Service**

### **Committee Member**

Award Coordinator (2022 - Present).

Advisory Committee, (2020 - 2022).

Diversity and Inclusion Committee, (2020 - 2022).

Planning Committee, (2018 - 2022).

Faculty Search Committee, (2015 -

Present). Curriculum Committee, (2018 - 2020).

Graduate Admissions Committee, (2008 - 2018).

Committee to update Entomology department rules, (December 2015 - February 2016). Long-range Planning Committee, (2011 - 2014).

## **College Service**

Coordinator of International Partnerships and Programs, (2017 - Present). Director of Life Science Outreach, (2014 - Present).

### **Committee Chair**

CAFE APR Appeals Committee, (2021 - Present).

### **Committee Member**

CAFE APR Appeals Committee, (2019 - 2020).

Agricultural Medical Biotechnology Program Steering Committee, (2012 - 2018).

## **University Service**

Office of the Provost, Coordinator of Chinese Student & Scholar Networks, (2014 - Present).

### **Committee Member**

International Advisory Council, the International Partnerships and Research committee, (2018 - Present).

International Advisory Council, (2017 - Present).

International Advisory Council, International Recruitment Committee, (2017 - Present).

International Advisory Council, Regional Strategic Planning Committee, China Committee,  
(2013 - 2016).

## **Professional Service**

### **Chairperson**

President (2020-2021), Vice President (2019), Treasurer (2018) and the Board Member (2017-pres.), the Overseas Chinese Entomologists Association.

International Symposium on Green Prevention & Control of Crop Pests, Academic committee, (November 22, 2018 - November 24, 2018).

The 1st International Conference on Integrated Pest Management, Organizing committee, (July 21, 2017 - July 24, 2017).

### **Committee Chair**

Journal of Economic Entomology, Search Committee for Editor-in-Chief, Search Committee for Editor-in-Chief, (April 9, 2018 - July 2018).

Entomological Society of America/Membership, Membership, (January 1, 2014 - December 31, 2014).

### **Committee Member**

Entomological Society of America/Diversity and Inclusion Committee, ESA Diversity and Inclusion Committee, (December 18, 2020 - Present)

- Awards Subcommittee (2022)
- Program Subcommittee (2022)
- Internship and Fellowship Task Force (2022)

Entomological Society of America/Journal Transparency Committee, Publication Council, (December 15, 2020 - Present).

Entomological Society of America/Publication Council, Publication Council, (November 15, 2019 - Present).

- Editor Evaluation Task Force (2022)
- Appeals Subcommittee (2022)
- Annals Editor-in-Chief Search subcommittee (2022)

EntoMentors (2021-pres.), Mentor, a mentorship program hosted by ESA to provide mentorship for members from historically underrepresented groups. In 2021, I have had the privilege to mentor Lilly Elliott, a first-year graduate student in the Agricultural, Environmental, and Sustainability Sciences Program at the University of Texas Rio Grande Valley. Along with Hongmei Li-Byarlay, a colleague from Department of Agricultural and Life Science at Central State University, we hold monthly Zoom meetings with Lilly, one of the three Alate Awardees, to discuss challenges in her research, scientific writing, graduate school applications, and career goals and trajectories. In 2022, Lilly has been admitted to a PhD program at Cornell University with a research assistantship. In 2022, I have been paired up with Shorooq Abdulraheem Alharbi, a lecturer from Public Health College at the Umm Al-Qura University, the Kingdom of Saudi Arabia. Shorooq is intended to pursue her PhD degree in the U.S. in 2023,

and I am currently working with her for the graduate school application.  
EntoMentos (2022-pres.), facilitator, host Thursday group meetings, 1)  
Getting into graduate school and paying for it (July 14, 2022)

American Entomologist/Search Committee for Editor-in-Chief, Search  
Committee for Editor-in-Chief, (March 2020 - January 2021).

Journal of Economic Entomology/Search Committee for Co-Editor-in-Chiefs, Search  
Committee for Co-Editor-in-Chief, (March 6, 2019 - June 2019).

Insect Systematics and Diversity/Search Committee for Editor-in-Chief, 1. Search  
committee for Co-EICs for Insect Systematics and Diversity (2016)

2. Reappointment of Co-EICs for Insect Systematics and Diversity (2018), (2016 - 2018).

#### **Editor, Journal Editor**

Insects (2021-pres.)  
Scientific Reports, (2014 - Present).

#### **Editor, Senior Editor**

Horticultural Plant Journal, Associate Editors-in-chief, (July 1, 2018 - Present).

#### **Editorial Board Member**

Insects (2021-pres.)  
Scientific Reports (2013-pres.)  
Journal of Plant Protection (2015-pres.)  
Chinese Journal of Pesticide Science (2019-pres.)  
Horticultural Plant Journal (Associate Editors-in-chief, 2019-pres.)  
Frontiers in Physiology (2021-2022)  
Journal of Economic Entomology (2014-2019; Chair, 2018)  
Insect Systematics and Diversity (2016-2019)

#### **Guest Editorship for Special Issues**

- Scientific Reports (2021-pres.): "Insect Decline and Extinction" (Co-edited with Xiang-Dong Liu, Nanjing Agricultural University; Mariusz Kanturski, University of Silesia in Katowice; Renee Borges, Indian Institute of Science; and Kenneth Haynes, university of Kentucky).
- Insects (2021-pres.): "Mechanisms, Applications, and Challenges of Insect Functional Genomics".
- Frontiers in Physiology (2021-2022): "Mechanisms and Strategies of Arthropod Adaptation to the Chemical Environment" (Co-edited with Chaoyang Zhao, University of California, Riverside; Qian Sun, Louisiana State University; and Fang Zhu, Pennsylvania State University).

#### **Professional Society Affiliations**

- American Association for the Advancement of Science (2018-pres.)
- International Union for the Study of Social Insects (2006-pres.)

- Entomological Society of America (1998-pres.)
- Overseas Chinese Entomologists Association (1998-pres.; President, 2020-pres.)

#### **Leadership Positions in Professional Societies and Meetings**

- Co-organized a program symposium, Significance of insects: from patent and diverse cultural lenses, at the 2022 joint annual meeting between ESA and the Entomological Society of British Columbia (ESBA), Vancouver, Canada, 2022.
- President (2020-2021), Vice President (2019), Treasurer (2018) and the Board Member (2017-pres.), The Overseas Chinese Entomologists Association.
- Chair (2018), Editorial Board, Journal of Economic Entomology, the most-cited entomological journal, publishes articles on the economic significance of insects.
- Chair and a keynote speaker, Academic Committee, International Symposium on Green Prevention and Control of Crop Pests. Tianjin, China. November 22-24, 2018.
- Chair and a keynote speaker, Organizing Committee, 1st International Conference on Integrated Pest Management. Changsha, Hunan, China. July 21-24, 2017.

#### **Member**

ILSI Research Foundation, Workshop on Sublethal Endpoints in NTO Testing for Non-Bt GE Crops, Workshop on Sublethal Endpoints in NTO Testing for Non-Bt GE Crops, (March 5, 2019 - March 6, 2019).

#### **Panelist, National and International Panels**

- USDA NIFA Pest and Beneficial Species in Agricultural Production Systems panel (2021)
- USDA NIFA Predoctoral Fellowship Program (2020)
- International Assessment of Degree Authorization at CAU (2018)
- National Natural Science Foundation of China (2017-2018)
- Scientific Advisory Panel for the Environmental Protection Agency (EPA-SAP, 2016)

#### **Reviewer, National and International Granting Agencies**

- National Fund for Scientific Research, Belgium (2015, 2019, 2020, 2021)
- Qiu Shi Outstanding Young Scholar Award (2018)
- National Natural Science Foundation of China (2014-2018)
- EOS, the Excellence of Science, Belgium (2017)
- Czech Science Foundation (2016)

#### **Reviewer, Tenure and Promotion**

- Evaluated a promotion dossier (for full professorship) for Department of Entomology & Nematology, University of Florida (2021)
- Evaluated a promotion dossier (for full professorship) for Department of Molecular & Cellular Biochemistry, College of Medicine, University of Kentucky (2020)
- Evaluated a promotion & tenure dossier for the Institute of Organic Chemistry and Biochemistry of the Czech Academy of Sciences, Prague, Czech Republic (2019)

#### **Outside Examiner**

- Final Doctoral Examination (Sanjay Joshi), Department of Plant and Soil Sciences, College of Arts and Sciences, University of Kentucky (2022)
- MSc thesis (Laura Bishop), Department of Genetics, Biochemistry and Microbiology,

- University of Pretoria, South Africa (2021)
- Final Doctoral Examination (Clifford Harpole), Biology Department, College of Arts and Sciences, University of Kentucky (2020)

### **Judging Panel, Awards and Fellowships**

- Judging Panel, ESA Early Career Professional (ECP) Outreach and Public Engagement Award (2022)
- Judging Panel, Entomological Society of America (ESA), Public Health Entomology For All (PHEFA) Internships and Fellowships (2022)
- Judging Panel, ESA Overseas Chinese Entomologist Association (OCEA), Graduate Student Award (2019 - pres.)
- Judging Panel, The Glenn B. Collins Undergraduate Research Achievement Award, Agricultural and Medical Biotechnology Program, University of Kentucky (2019-pres.)
- Judging Panel, International Ambassador Scholarship, International Center, University of Kentucky (2017- pres.)
- Judging Panel, ESA Early Career Professional (ECP) Research Award (2021- pres.)
- Judging Panel, ESA Alate Award, which will honor students currently enrolled at Historically Black Colleges and Universities (HBCUs) and other Minority-Serving Institutions (MSI) (2021- pres.)
- JSPS (Japan) Postdoctoral Fellowship-FY2019, National Fund for Scientific Research, Belgium (2019)
- National Fellowship Program of Sigma Delta Epsilon, Graduate Women in Science (2016)

### **Reviewer, Scientific Journals**

Invited to provide anonymous peer reviews for scientific journals (>50), including Annals of the Entomological Society of America, Animal Behaviour, Apidologie, Archive of Insect Biochemistry and Physiology, Biology Letters, Biotechnology and Biofuels, BMC Genomics, Chemosphere, Communication Biology, Comparative Biochemistry and Physiology, Current Biology, Ecology and Evolution, Frontiers in Plant Sciences, Frontiers in Physiology, Frontiers in Genetics, Gates Open Research, Gene, Genome Biology and Evolution, GigaScience, Insect Science, Insectes Sociaux, Insect Molecular Biology, Insect Biochemistry and Molecular Biology, International Journal of Biological Science, International Journal of Agricultural and Food Chemistry, Journal of Economic Entomology, Journal of Experimental Biology, Journal of Pest Science, Molecular Ecology & Evolution, Mycologia, Open Biology, Pest Management Science, Pesticide Biochemistry and Physiology, Philosophical Transactions of the Royal Society B, , PLoS One, Proceedings of the Royal Society B: Biological Sciences, Scientific Report, Trends in Ecology and Evolution, Zoology, and Zoological Letters.

### **Reviewer, Book Proposal**

- Nancy Maragioglio, the acquiring editor responsible for the Agricultural Sciences book program at Elsevier, to review a book proposal titled “Pepper Virome: Molecular Evolution and Management” by Akhtar Ali and R. K. Gaur (2022).
- Invited by Alice Oven, a Senior Editor for Life Science Books, CRC Press, Taylor & Francis Publishing to review the latest edition of Insect Physiology and Biochemistry by James L. Nation (2020).

**Site Visit, Accreditation**

China Agricultural University, Served on the review panel for “Double First Class University Plan” at the China Agricultural University (2018)., (July 7, 2018 - July 14, 2018).

**Task Force Member**

ILSI Research Foundation, Workshop on Sublethal Endpoints in NTO Testing for Non-Bt GE Crops, (March 5, 2019 - March 6, 2019).

**Public Service****Board Member**

Kentucky Chinese American Association, (2014 - 2017).

**Officer, Vice President**

Kentucky Chinese American Association, Chinese School, (2013 - Present).

**Media Contributions****Radio**

"British Broadcasting Corporation (BBC) Radio 4 and the Natural History Museum produced a weekly series called Natural Histories." (November 2016). This 25-episode series explored nature's influence on culture and society, and it was presented by wildlife expert Brett Westwood. I was interviewed by Sarah Blunt, a senior radio producer at BBC, on May 11, 2016. From that, we developed a 30-minute program entitled "NATURAL HISTORIES- CRICKET". The cricket episode was first broadcasted on BBC Radio 4 on November 1 and 8, 2016, United Kingdom.

## Professional Development

**Professional Memberships**

International Union for the Study of Social Insects. International. (January 1, 2017 - Present). American Association for the Advancement of Science. International. (January 1, 2016 - Present). Entomological Society of America. National. (January 1, 1998 - Present). Overseas Chinese Entomologists Association. International. (January 1, 1998 - Present).

**Development Activities Attended****Workshop**

UK CAFE Grant Writing Workshop. (December 14, 2020 - December 15, 2020). UK College of Agriculture, Food and Environment, Office of the Associate Dean for Research. University.

Lexington, United States.

This widely acclaimed seminar comprehensively addresses both practical and conceptual aspects that are important to the proposal-writing process. Emphasis is given to such things as idea development, identification of the most appropriate granting agency, how to write for reviewers, and tips and strategies that are of proven value in presenting an applicant's case to reviewers. The content includes material for applications to the NSF and to the USDA, although much of the program is applicable to other funding agencies.

**Film Screening and Panel Discussion: Picture a Scientist**

Title IX in the U.S. academic research enterprise. (December 2, 2020 - December 9, 2020). American Association for the Advancement of Science. International. Lexington, KY, United States.

Previewed a groundbreaking documentary film entitled "*Picture a Scientist*", and participated in a panel discussion on the history, present-day challenges, and future opportunities surrounding Title IX in the U.S. academic research enterprise.

**Awards and Honors**

Thomas Poe Cooper Research Award, College of Agriculture, Food and Environment, University of Kentucky (2022)



University of Kentucky

## Proposal Summary, Academic FY 2022

Hover over the "College or Unit" column and click the expand icon [+] to show department-level data.

| College or Unit                               | Pending    | Awarded or Established* | Rejected or Withdrawn | Total Proposals |
|-----------------------------------------------|------------|-------------------------|-----------------------|-----------------|
| College of Agriculture, Food, and Environment | 149        | 133                     | 18                    | 300             |
| <b>University Total</b>                       | <b>149</b> | <b>133</b>              | <b>18</b>             | <b>300</b>      |

Source: University of Kentucky, Office of Sponsored Projects Administration (OSPA) Database

Compiled by: University of Kentucky, Office of the Vice President for Research

Data Updated: Every day at 6:00 AM

Report includes the following variable selections:

Year: Academic FY 2022; Source of Funding: All; College or Unit: College of Agriculture, Food, and Environment; Proposal Type: None; Status:

Pending, Awarded or Established\*, Rejected or Withdrawn

**Report Notes:**

- Proposal numbers may occasionally change due to changes in the proposal submission deadlines, improvements to data quality, etc.
- Data is based on the college, department, and/or unit that is administering the grant project.

\* Established accounts are pre-award accounts that are pending approval.

University of Kentucky

## Proposals by Sponsor Type, Academic FY 2022

Hover over the "College or Unit" column and click the expand icon [+] to see department-level data.

| College or Unit                               | Federal Government | State Government | Industry | Nonprofit | Other    | Total Proposals |
|-----------------------------------------------|--------------------|------------------|----------|-----------|----------|-----------------|
| College of Agriculture, Food, and Environment | 21                 | 3                | 2        | 7         | 9        | 42              |
| <b>University Total</b>                       | <b>21</b>          | <b>3</b>         | <b>2</b> | <b>7</b>  | <b>9</b> | <b>42</b>       |

Source: University of Kentucky, Office of Sponsored Projects Administration (OSPA) Database

Compiled by: University of Kentucky, Office of the Vice President for Research

Data Updated: Every day at 6:00 AM

Report includes the following variable selections:

Year: Academic FY 2022; College or Unit: College of Agriculture, Food, and Environment; College or Unit Department: Entomology; Proposal Type: None; Status: Pending, Awarded or Established\*, Rejected or Withdrawn

### Report Notes:

- Proposal numbers may occasionally change due to changes in the proposal submission deadlines, improvements to data quality, etc.
- Data is based on the college, department, and/or unit that is administering the grant project.

\* Established accounts are pre-award accounts that are pending approval.

University of Kentucky

## Proposal Trend, Academic FY 2018, FY 2019, FY 2020 and 2 more

Hover over the "College or Unit" column and click the expand icon [+] to see department-level data.

| College or Unit                               | FY 2018         |                            | FY 2019         |                            | FY 2020         |                            | FY 2021 |
|-----------------------------------------------|-----------------|----------------------------|-----------------|----------------------------|-----------------|----------------------------|---------|
|                                               | Total Proposals | % +/- from the Previous FY | Total Proposals | % +/- from the Previous FY | Total Proposals | % +/- from the Previous FY |         |
| College of Agriculture, Food, and Environment | 16              |                            | 14              | -12.50%                    | 23              | +64.29%                    |         |
| <b>University Total</b>                       | <b>16</b>       |                            | <b>14</b>       | <b>-12.50%</b>             | <b>23</b>       | <b>+64.29%</b>             |         |

Source: University of Kentucky, Office of Sponsored Projects Administration (OSPA) Database

Compiled by: University of Kentucky, Office of the Vice President for Research

Data Updated: Every day at 6:00 AM

**Report includes the following variable selections:**

Year(s): Academic FY 2018, FY 2019, FY 2020 and 2 more; Source of Funding: All; College or Unit: College of Agriculture, Food, and Environment; College or Unit Department: Entomology; Proposal Type: None; Status: Pending, Awarded or Established\*, Rejected or Withdrawn

**Report Notes:**

- Proposal numbers may occasionally change due to changes in the proposal submission deadlines, improvements to data quality, etc.
- Data is based on the college, department, and/or unit that is administering the grant project.

\* Established accounts are pre-award accounts that are pending approval.

University of Kentucky

## Proposal Trend, Academic FY 2018, FY 2019, FY 2020 and 2 more

Hover over the "College or Unit" column and click the expand icon [+] to see department-level data.

| College or Unit                               | FY 2021   |                            | FY 2022         |                            |
|-----------------------------------------------|-----------|----------------------------|-----------------|----------------------------|
|                                               | Proposals | % +/- from the Previous FY | Total Proposals | % +/- from the Previous FY |
| College of Agriculture, Food, and Environment | 43        | +86.96%                    | 42              | -2.33%                     |
| <b>University Total</b>                       | <b>43</b> | <b>+86.96%</b>             | <b>42</b>       | <b>-2.33%</b>              |

Source: University of Kentucky, Office of Sponsored Projects Administration (OSPA) Database

Compiled by: University of Kentucky, Office of the Vice President for Research

Data Updated: Every day at 6:00 AM

**Report includes the following variable selections:**

Year(s): Academic FY 2018, FY 2019, FY 2020 and 2 more; Source of Funding: All; College or Unit: College of Agriculture, Food, and Environment; College or Unit Department: Entomology; Proposal Type: None; Status: Pending, Awarded or Established\*, Rejected or Withdrawn

**Report Notes:**

- Proposal numbers may occasionally change due to changes in the proposal submission deadlines, improvements to data quality, etc.
- Data is based on the college, department, and/or unit that is administering the grant project.

\* Established accounts are pre-award accounts that are pending approval.

University of Kentucky

## Proposal Yield Trend, Academic FY 2018, FY 2019, FY 2020 and 2 more

Hover over the "College or Unit" column and click the expand icon [+] to see department-level data.

| College or Unit                               | Proposal Cohort Year |               |               |               |               |
|-----------------------------------------------|----------------------|---------------|---------------|---------------|---------------|
|                                               | FY 2018              | FY 2019       | FY 2020       | FY 2021       | FY 2022       |
| College of Agriculture, Food, and Environment | 68.89%               | 84.78%        | 68.09%        | 55.00%        | 72.09%        |
| <b>University Total</b>                       | <b>68.89%</b>        | <b>84.78%</b> | <b>68.09%</b> | <b>55.00%</b> | <b>72.09%</b> |

Source: University of Kentucky, Office of Sponsored Projects Administration (OSPA) Database

Compiled by: University of Kentucky, Office of the Vice President for Research

Data Updated: Every day at 6:00 AM

**Report includes the following variable selections:**

Year(s): Academic FY 2018, FY 2019, FY 2020 and 2 more; Source of Funding: All; College or Unit: College of Agriculture, Food, and Environment;

College or Unit Department: Entomology; Proposal Type: None

**Report Notes:**

- Proposal numbers may occasionally change due to changes in the proposal submission deadlines, improvements to data quality, etc.
- Proposal numbers for recent years may appear lower due to pending proposals that have not yet been awarded.
- Data is based on the college, department, and/or unit that is administering the grant project.
- The proposal yield rate is the total number of **awarded** proposals divided by the **total** number of proposals (**including those that may be pending**).

Grants awarded to Entomology Faculty, staff and students during the review period

| Principal Investigator | Grant Type         | Sponsor                                    | Sponsor | Project Title                                                                           | Project Begin | Project End | Total    |
|------------------------|--------------------|--------------------------------------------|---------|-----------------------------------------------------------------------------------------|---------------|-------------|----------|
| Bessin, Ricardo        | Federal Government | National Institute of Food and Agriculture | USDA    | Kentucky IPM Extension and Implementation Program:2014 - 2017                           | 9/1/2014      | 8/31/2017   | \$65,000 |
|                        | Other University   | North Carolina State University            |         | Management of Brown Marmorated Stink Bug in US Specialty Crops                          | 9/1/2016      | 8/31/2022   | \$46,025 |
|                        | Industry           | Syngenta Crop Protection                   |         | Evaluating A21065B Efficacy on Wireworm, White Grubs and Seedcorn Maggot in US Corn     | 8/1/2016      | 7/1/2017    | \$22,000 |
| Brown, Grayson         | State Government   | KY Department for Public Health            | KYSG    | FY 17 UK Mosquito Surveillance                                                          | 7/1/2016      | 6/30/2017   | \$20,000 |
| Dobson, Stephen        | Nonprofit          | Bill and Melinda Gates Foundation          |         | Development of Artificial Blood for Mosquitoes                                          | 5/1/2015      | 4/28/2017   | \$61     |
| Fox, Charles           | Other University   | Iowa State University                      |         | Integrating IPM into IRM theory for improved resistance management and pest suppression | 4/1/2016      | 3/31/2018   | \$60,000 |
| Haynes, Kenneth        | Other University   | Iowa State University                      |         | Sublethal effects of neurotoxic insecticides on insect behavior                         | 1/1/2017      | 12/31/2018  | \$70,000 |
| Lensing, Janet         | Federal Government | Animal and Plant Health Inspection Service | USDA    | Invasive Pest Outreach in Kentucky                                                      | 9/1/2016      | 8/31/2017   | \$54,491 |
|                        | Federal Government | Animal and Plant Health Inspection Service | USDA    | Cooperative Agricultural Pest Surveys (CAPS) in Kentucky                                | 1/1/2017      | 12/31/2017  | \$58,370 |
|                        | Federal Government | Animal and Plant Health Inspection Service | USDA    | Grape Commodity Survey                                                                  | 4/1/2017      | 3/31/2018   | \$21,000 |
|                        | Federal Government | Animal and Plant Health Inspection Service | USDA    | Phytophthora Ramorum Survey                                                             | 4/1/2017      | 3/31/2018   | \$20,000 |
|                        | Federal Government | Animal and Plant Health Inspection Service | USDA    | Forest Pest Outreach and Education                                                      | 4/1/2017      | 3/31/2018   | \$8,768  |

Grants awarded to Entomology Faculty, staff and students during the review period

|                |                    |                                                       |      |                                                                                                                                         |           |            |           |
|----------------|--------------------|-------------------------------------------------------|------|-----------------------------------------------------------------------------------------------------------------------------------------|-----------|------------|-----------|
|                | Federal Government | Animal and Plant Health Inspection Service            | USDA | Thousand Cankers Disease/Walnut Twig Beetle Survey                                                                                      | 6/1/2017  | 5/31/2018  | \$25,000  |
|                | Federal Government | Animal and Plant Health Inspection Service            | USDA | KY FY17 Apple Survey Farm Bill Project 1                                                                                                | 5/1/2017  | 4/30/2018  | \$17,000  |
|                | Federal Government | Animal and Plant Health Inspection Service            | USDA | Imported Fire Ant Survey                                                                                                                | 6/1/2017  | 5/31/2018  | \$3,783   |
|                | Federal Government | Animal and Plant Health Inspection Service            | USDA | KY FY17 Gypsy Moth                                                                                                                      | 5/1/2017  | 4/30/2018  | \$144,683 |
| Palli, Subba   | Federal Government | Agricultural Research Service                         | USDA | Development of Novel Insecticide Synergistic for Resistance Management                                                                  | 9/1/2014  | 9/30/2018  | \$120,000 |
|                | Federal Government | National Institute of General Medical Sciences        | DHHS | Epigenetic and posttranslational modifier regulation of Juvenile hormone action                                                         | 2/1/2005  | 6/2/2021   | \$252,000 |
|                | Federal Government | Animal and Plant Health Inspection Service            | USDA | Development of New RNAi-Based Control Technologies for Use in Plant Health Emergencies                                                  | 9/30/2016 | 9/29/2017  | \$82,500  |
|                | Federal Government | National Institute of Allergy and Infectious Diseases | DHHS | RNAi Methods for Zika Virus Vector Control                                                                                              | 2/14/2017 | 1/31/2020  | \$210,000 |
| Potter, Daniel | Nonprofit          | United States Golf Association                        |      | Operation Monarch for Golf Courses: Developing Protocols for Monarch Butterfly Conservation Plantings in Golf Course Naturalized Roughs | 8/11/2016 | 8/10/2018  | \$48,720  |
|                | Other University   | Rutgers University                                    |      | Assessing Bee Attractiveness of Woody Landscape Plants and Mitigating Potential Bee Hazard from Neonicotinoid Insecticides              | 9/1/2016  | 8/31/2018  | \$187,669 |
|                | Nonprofit          | Horticultural Research Institute                      |      | Assessing Bee Attractiveness of Woody Landscape Plants and                                                                              | 6/1/2016  | 12/31/2018 | \$26,000  |

Grants awarded to Entomology Faculty, staff and students during the review period

|                      |                    |                                            |      |                                                                                                               |           |            |           |
|----------------------|--------------------|--------------------------------------------|------|---------------------------------------------------------------------------------------------------------------|-----------|------------|-----------|
|                      |                    |                                            |      | Mitigating Potential Bee Hazard from Neonicotinoid Insecticides                                               |           |            |           |
| Rieske-Kinney, Lynne | Federal Government | Forest Service                             | USDA | Development of RNAi in Woody Plants for Broad Scale Management of Tree Pests                                  | 8/18/2015 | 7/31/2018  | \$45,000  |
|                      | State Government   | KY Division of Forestry                    | KYSG | Urban Forestry Initiative with KY Communities                                                                 | 7/1/2016  | 6/30/2017  | \$18,520  |
|                      | Federal Government | Animal and Plant Health Inspection Service | USDA | Healthy Trees - Healthy People                                                                                | 4/1/2017  | 3/31/2018  | \$34,396  |
| Rittschof, Clare     | Nonprofit          | KY Science and Technology Co Inc           |      | KSEF RDE: Identifying Mechanisms of Resilience to Health Stressors in the Honey Bee ( <i>Apis mellifera</i> ) | 7/1/2016  | 6/30/2017  | \$29,863  |
| Teets, Nicholas      | Nonprofit          | KY Science and Technology Co Inc           |      | KSEF RDE: Calcium-Dependent Signaling Mechanisms Governing Rapid Cold Hardening in Insects                    | 7/1/2016  | 12/31/2018 | \$30,000  |
| Townsend, Lee        | State Government   | KY Department of Agriculture               | KYSG | FY 2017-2018 UK Private Pesticide Applicator                                                                  | 7/1/2016  | 6/30/2018  | \$27,500  |
| Villanueva, Raul     | Nonprofit          | Kentucky Small Grain Growers Association   |      | Looking for Old and New Foes to Prevent BYDV Transmission on Wheat                                            | 9/1/2016  | 12/31/2017 | \$13,022  |
| White, Jennifer      | Nonprofit          | KY Science and Technology Co Inc           |      | KSEF RDE: Developing a spider model system for understanding interactions among endosymbionts                 | 7/1/2016  | 6/30/2018  | \$30,000  |
|                      | Other University   | Iowa State University                      |      | Do bacterial symbionts play a role in insecticide resistance in a polyphagous aphid pest?                     | 1/1/2017  | 12/31/2018 | \$75,000  |
| Lucas, Patricia      | Other University   | North Carolina State University            |      | Kentucky Contact for the Southern Region Regulatory Information Network                                       | 7/1/2016  | 12/31/2016 | \$5,000   |
| Bessin, Ricardo      | Other University   | North Carolina State University            |      | Management of Brown Marmorated Stink Bug in US Specialty Crops                                                | 9/1/2016  | 8/31/2022  | \$57,969  |
|                      | Federal Government | National Institute of Food and Agriculture | USDA | Kentucky Extension IPM Implementation Program: 2017-2020                                                      | 9/1/2014  | 8/31/2021  | \$128,889 |



Grants awarded to Entomology Faculty, staff and students during the review period

|                 |                    |                                            |      |                                                                                                                                |            |            |           |
|-----------------|--------------------|--------------------------------------------|------|--------------------------------------------------------------------------------------------------------------------------------|------------|------------|-----------|
|                 | Other University   | University of Florida                      |      | Wire Evaluation In Sweet Potato And IR-4 State Liason                                                                          | 9/1/2017   | 1/31/2019  | \$13,750  |
|                 | Industry           | Syngenta Crop Protection                   |      | Managing wireworm and white grubs in corn                                                                                      | 3/8/2018   | 3/31/2019  | \$19,000  |
| Dobson, Stephen | Industry           | MosquitoMate Incorporated                  |      | SBIR Phase 2: Developing Mosquito Vector Suppression Methods                                                                   | 12/13/2017 | 2/28/2019  | \$27,732  |
| Garcia, Mark    | Federal Government | National Institute of Food and Agriculture | USDA | Drosophila Suzukii Population Collection: A Tool For Integrating Evolutionary Principles Into Pest Management                  | 4/1/2018   | 7/31/2020  | \$165,000 |
| Gonthier, David | Other University   | University of California Davis             |      | Managing wild birds for improved strawberry production, pest control, and food safety outcomes in the California Central Coast | 1/1/2017   | 12/31/2019 | \$32,386  |
| Harper, Carl    | Nonprofit          | Slow the Spread Foundation                 |      | Monitor Gypsy Moth Populations for Slow the Spread Program                                                                     | 1/1/2017   | 6/1/2018   | \$44,000  |
|                 | Nonprofit          | Slow the Spread Foundation                 |      | Monitor Gypsy Moth Populations for Gypsy Moth Slow the Spread Program                                                          | 1/1/2018   | 6/1/2019   | \$44,000  |
| Haynes, Kenneth | Other University   | Iowa State University                      |      | Sublethal effects of neurotoxic insecticides on insect behavior                                                                | 1/1/2017   | 12/31/2018 | \$70,000  |
|                 | Industry           | Clorox Company                             |      | ELECTROSTATIC SPRAYER ERADICATION OF BED BUGS STUDY                                                                            | 6/22/2018  | 6/21/2019  | \$21,750  |
| Lensing, Janet  | Federal Government | Animal and Plant Health Inspection Service | USDA | Pine Shoot Beetle Survey                                                                                                       | 9/1/2017   | 8/31/2018  | \$11,290  |
|                 | Federal Government | Animal and Plant Health Inspection Service | USDA | KY FY17 Gypsy Moth                                                                                                             | 5/1/2017   | 4/30/2018  | \$107,917 |
|                 | Federal Government | Animal and Plant Health Inspection Service | USDA | Cooperative Agricultural Pest Surveys                                                                                          | 1/1/2018   | 12/31/2018 | \$38,480  |

Grants awarded to Entomology Faculty, staff and students during the review period

|              |                    |                                                       |      |                                                                                    |           |            |           |
|--------------|--------------------|-------------------------------------------------------|------|------------------------------------------------------------------------------------|-----------|------------|-----------|
|              | Federal Government | Animal and Plant Health Inspection Service            | USDA | Cooperative Agricultural Pest Surveys                                              | 1/1/2018  | 12/31/2018 | \$62,980  |
|              | Federal Government | Animal and Plant Health Inspection Service            | USDA | Gypsy Moth Survey                                                                  | 5/1/2018  | 4/30/2019  | \$200,000 |
|              | Federal Government | Animal and Plant Health Inspection Service            | USDA | Orchard Commodity Survey                                                           | 5/1/2018  | 4/30/2019  | \$17,000  |
|              | Federal Government | Animal and Plant Health Inspection Service            | USDA | Grape Commodity Survey                                                             | 5/1/2018  | 4/30/2019  | \$21,000  |
|              | Federal Government | Animal and Plant Health Inspection Service            | USDA | KY FY18 P.ramorum survey FG Goal 1S.0061                                           | 5/1/2018  | 4/30/2019  | \$25,000  |
|              | Federal Government | Animal and Plant Health Inspection Service            | USDA | Invasive Pest Outreach in Kentucky                                                 | 6/1/2018  | 5/31/2019  | \$57,931  |
|              | Federal Government | Animal and Plant Health Inspection Service            | USDA | Invasive Pest Outreach: Focus Firewood                                             | 6/1/2018  | 5/31/2019  | \$9,138   |
| Palli, Subba | Other University   | Iowa State University                                 |      | Mechanisms of RNA interference                                                     | 1/1/2014  | 12/31/2018 | \$75,000  |
|              | Federal Government | Agricultural Research Service                         | USDA | Development of Novel Insecticide Synergistic for Resistance Management             | 9/1/2014  | 9/30/2018  | \$92,000  |
|              | Federal Government | National Institute of General Medical Sciences        | DHHS | Epigenetic and posttranslational modifier regulation of Juvenile hormone action    | 2/1/2005  | 6/2/2021   | \$280,000 |
|              | Federal Government | National Institute of Allergy and Infectious Diseases | DHHS | RNAi Methods for Zika Virus Vector Control                                         | 2/14/2017 | 1/31/2020  | \$175,000 |
|              | Federal Government | Animal and Plant Health Inspection Service            | USDA | Development Of RNAi-based Control Technologies For Use In Plant Health Emergencies | 9/30/2017 | 9/29/2018  | \$91,999  |

Grants awarded to Entomology Faculty, staff and students during the review period

|                      |                    |                                              |      |                                                                                                                            |           |            |           |
|----------------------|--------------------|----------------------------------------------|------|----------------------------------------------------------------------------------------------------------------------------|-----------|------------|-----------|
|                      | Other University   | Iowa State University                        |      | RNAi Methods For Controlling Stored Product Pests                                                                          | 1/1/2018  | 12/31/2018 | \$58,000  |
| Potter, Daniel       | Other University   | Rutgers University                           |      | Assessing Bee Attractiveness of Woody Landscape Plants and Mitigating Potential Bee Hazard from Neonicotinoid Insecticides | 9/1/2016  | 8/31/2018  | \$25,000  |
| Rieske-Kinney, Lynne | Federal Government | Animal and Plant Health Inspection Service   | USDA | Healthy Trees - Healthy People                                                                                             | 6/1/2018  | 12/31/2019 | \$37,539  |
| Rittschof, Clare     | Nonprofit          | Foundation for Food and Agriculture Research |      | Can Commodity Crop Weed Management Practices Enhance Bee Abundance Diversity And Health On Agricultural Land?              | 1/15/2018 | 1/14/2022  | \$45,352  |
| Teets, Nicholas      | Federal Government | National Institute of Food and Agriculture   | USDA | Impact of Genotype and Environmental Variables on Transgene Effectiveness for Conditional Lethality Systems in Insects     | 9/1/2017  | 8/31/2022  | \$500,000 |
|                      | Federal Government | National Institute of Food and Agriculture   | USDA | Fellowship for Leslie Potts: Winter Warming Effects On Spiders As Biological Control Agents                                | 3/15/2018 | 3/14/2021  | \$95,000  |
|                      | Other University   | Iowa State University                        |      | Molecular Mechanisms of Diapause In The Corn Rootworm Complex                                                              | 1/1/2018  | 12/31/2018 | \$75,000  |
| Townsend, Lee        | State Government   | KY Department of Agriculture                 | KYSG | FY 2017-2018 UK Private Pesticide Applicator                                                                               | 7/1/2017  | 6/30/2018  | \$27,500  |
| Villanueva, Raul     | Nonprofit          | Kentucky Soybean Promotion Board             |      | Management of Stink Bugs in Soybeans: Does One Strategy Fit All Species?                                                   | 8/1/2017  | 7/31/2019  | \$41,693  |
|                      | Nonprofit          | Kentucky Small Grain Growers Association     |      | Evaluating Aphis Resistance To Pyrethroids In Western Kentucky's Wheat                                                     | 9/1/2017  | 12/31/2018 | \$4,738   |
|                      | Nonprofit          | Kentucky Small Grain Growers Association     |      | Times Insecticide Spray To Control Aphids And Reduce BYDV Infections                                                       | 9/1/2017  | 6/30/2019  | \$15,149  |
|                      | Nonprofit          | Kentucky Soybean Promotion Board             |      | Causes and Developing Solutions on Outbreaks of Slugs in Soybeans                                                          | 4/1/2018  | 3/31/2019  | \$12,813  |

Grants awarded to Entomology Faculty, staff and students during the review period

|                 |                    |                                            |      |                                                                                           |           |            |           |
|-----------------|--------------------|--------------------------------------------|------|-------------------------------------------------------------------------------------------|-----------|------------|-----------|
|                 | State Government   | KY Department of Agriculture               | KYSG | Studies on Ambrosia Beetles Affecting Nursery Crops and Fruit Trees in Kentucky           | 11/1/2017 | 9/29/2020  | \$29,954  |
| White, Jennifer | Other University   | Iowa State University                      |      | Do bacterial symbionts play a role in insecticide resistance in a polyphagous aphid pest? | 1/1/2017  | 12/31/2018 | \$75,000  |
| Bessin, Ricardo | Other University   | North Carolina State University            |      | Management of Brown Marmorated Stink Bug in US Specialty Crops                            | 9/1/2016  | 8/31/2022  | \$179,064 |
|                 | Federal Government | National Institute of Food and Agriculture | USDA | Kentucky Extension IPM Implementation Program: 2017-2020                                  | 9/1/2014  | 8/31/2021  | \$145,055 |
|                 | Other University   | University of Florida                      |      | Wire Evaluation In Sweet Potato And IR-4 State Liason                                     | 9/1/2017  | 1/31/2019  | \$1,750   |
|                 | State Government   | KY Department of Agriculture               | KYSG | Private Pesticide Applicator Training Program                                             | 7/1/2018  | 6/30/2020  | \$27,500  |
|                 | Nonprofit          | eXtension Foundation                       |      | 2019 Enhancing the Pesticide Safety Education Program for Kentucky                        | 1/1/2019  | 12/31/2019 | \$20,525  |
|                 | Industry           | Syngenta Crop Protection                   |      | Managing Wireworms and White Grubs on Corn                                                | 3/18/2019 | 3/31/2020  | \$20,000  |
| Harper, Carl    | Nonprofit          | Slow the Spread Foundation                 |      | Monitor Gypsy Moth Populations for Gypsy Moth Slow the Spread Program                     | 1/1/2019  | 6/1/2020   | \$44,000  |
| Lensing, Janet  | Federal Government | Animal and Plant Health Inspection Service | USDA | Imported Fire Ant Survey                                                                  | 7/1/2018  | 6/30/2019  | \$4,783   |
|                 | Federal Government | Animal and Plant Health Inspection Service | USDA | Pine Shoot Beetle Survey                                                                  | 9/1/2018  | 8/31/2019  | \$11,290  |
|                 | Federal Government | Animal and Plant Health Inspection Service | USDA | CAPS Surveys                                                                              | 1/1/2019  | 12/31/2019 | \$62,980  |
|                 | Federal Government | Animal and Plant Health Inspection Service | USDA | CAPS Infrastructure                                                                       | 1/1/2019  | 12/31/2019 | \$38,480  |

Grants awarded to Entomology Faculty, staff and students during the review period

|               |                    |                                                |      |                                                                                                                          |           |            |           |
|---------------|--------------------|------------------------------------------------|------|--------------------------------------------------------------------------------------------------------------------------|-----------|------------|-----------|
|               | Federal Government | Animal and Plant Health Inspection Service     | USDA | Gypsy Moth Survey                                                                                                        | 5/1/2019  | 12/31/2020 | \$170,000 |
|               | Federal Government | Animal and Plant Health Inspection Service     | USDA | Orchard Commodity Survey                                                                                                 | 5/1/2019  | 4/30/2020  | \$17,500  |
|               | Federal Government | Animal and Plant Health Inspection Service     | USDA | Phytophthora Ramorum Nursery and/or Environs Survey                                                                      | 5/1/2019  | 4/30/2020  | \$20,000  |
|               | Federal Government | Animal and Plant Health Inspection Service     | USDA | Grape Commodity Survey                                                                                                   | 4/17/2019 | 3/31/2020  | \$21,000  |
|               | Federal Government | Animal and Plant Health Inspection Service     | USDA | Solanaceous Commodity Survey                                                                                             | 5/1/2019  | 4/30/2020  | \$29,000  |
|               | Federal Government | Animal and Plant Health Inspection Service     | USDA | Invasive Pest Outreach: Focus Firewood                                                                                   | 6/1/2019  | 5/31/2020  | \$10,132  |
|               | Federal Government | Animal and Plant Health Inspection Service     | USDA | Asian Defoliator Survey                                                                                                  | 4/17/2019 | 3/31/2020  | \$16,776  |
|               | Federal Government | Animal and Plant Health Inspection Service     | USDA | Invasive Pest Outreach in Kentucky                                                                                       | 6/1/2019  | 5/31/2020  | \$58,611  |
| Obrycki, John | State Government   | KY Department of Agriculture                   | KYSG | Enhancing the adoption of biological control for arthropod pest management in high tunnel production systems in Kentucky | 12/1/2018 | 9/29/2021  | \$19,798  |
| Palli, Subba  | Federal Government | National Institute of General Medical Sciences | DHHS | Epigenetic and posttranslational modifier regulation of Juvenile hormone action                                          | 2/1/2005  | 6/2/2021   | \$308,000 |
|               | Federal Government | National Science Foundation                    | NSF  | I/UCRC: Center For Arthropod Management Technologies Phase II Site: University Of Kentucky                               | 8/1/2013  | 6/30/2023  | \$119,999 |
|               | Other University   | University of Florida                          |      | Transport of dsRNA in lepidopteran and hemipteran insects                                                                | 1/1/2019  | 12/31/2019 | \$82,500  |

Grants awarded to Entomology Faculty, staff and students during the review period

|                      |                    |                                              |      |                                                                                                                                      |           |           |           |
|----------------------|--------------------|----------------------------------------------|------|--------------------------------------------------------------------------------------------------------------------------------------|-----------|-----------|-----------|
|                      | Federal Government | National Institute of Food and Agriculture   | USDA | The Fall Armyworm Functional Genomics: Genome Editing and RNAi                                                                       | 3/15/2019 | 3/14/2023 | \$453,997 |
|                      | Federal Government | Animal and Plant Health Inspection Service   | USDA | Development of RNAi-based Control Technologies for Use in Plant Health Emergencies                                                   | 9/30/2018 | 9/29/2019 | \$114,770 |
|                      | Other University   | University of Florida                        |      | Tissue-Specific Promoters                                                                                                            | 1/1/2019  | 6/30/2021 | \$82,000  |
|                      | State Government   | KY Department for Public Health              | KYSG | Tick Surveillance                                                                                                                    | 6/17/2019 | 6/30/2020 | \$20,000  |
| Potter, Daniel       | Other University   | Rutgers University                           |      | Protecting Pollinators with Economically Feasible and Environmentally Friendly Ornamental Horticulture                               | 9/1/2018  | 8/31/2020 | \$94,471  |
| Rieske-Kinney, Lynne | Federal Government | Forest Service                               | USDA | Development of RNAi in Woody Plants for Broad Scale Management of Tree Pests                                                         | 8/18/2015 | 7/31/2018 | \$25,000  |
|                      | Federal Government | Animal and Plant Health Inspection Service   | USDA | Regional Difference in Plant and Pest Phenology May Affect Biological Control Efforts Targeting Emerald Ash Borer                    | 8/1/2018  | 1/31/2020 | \$57,692  |
|                      | Federal Government | Animal and Plant Health Inspection Service   | USDA | Developing RNAi for Suppression of Exotic Wood-Boring Buprestids                                                                     | 8/1/2018  | 7/31/2020 | \$96,312  |
| Rittschof, Clare     | Nonprofit          | Foundation for Food and Agriculture Research |      | Can Commodity Crop Weed Management Practices Enhance Bee Abundance Diversity And Health On Agricultural Land?                        | 1/15/2018 | 1/14/2022 | \$37,152  |
|                      | Nonprofit          | Animal Behavior Society                      |      | Aggression in Honey Bees (Apis mellifera) May Be Socially Transmitted Through Familial Care That is Mediated by Multiple Pheromones. | 5/20/2019 | 5/19/2021 | \$1,301   |
|                      | Other University   | North Carolina State University              |      | Developing Sustainable Strategies to Manage Spotted Wing                                                                             | 9/1/2018  | 2/28/2021 | \$195,382 |

Grants awarded to Entomology Faculty, staff and students during the review period

|                             |                    |                                   |      |                                                                                                                                                                 |          |           |           |
|-----------------------------|--------------------|-----------------------------------|------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------|----------|-----------|-----------|
| Syed,<br>Zainulabeu<br>ddin |                    |                                   |      | Drosophila in United States Fruit Crops                                                                                                                         |          |           |           |
|                             | Nonprofit          | California Cherry Board           |      | Evaluation of attractive blends, lures and field deployable baits against Drosophila suzukii based on the identified volatiles                                  | 8/1/2018 | 7/31/2019 | \$14,853  |
|                             | Federal Government | Agricultural Research Service     | USDA | Enhancing pollination by attracting and retaining leaf cutting bees, Megachile rotundata, in alfalfa seed production fields                                     | 7/1/2018 | 6/15/2021 | \$14,098  |
|                             | Other University   | University of Notre Dame          |      | Developing an Attractant for Lygus hesperus Derived from Post Plant Volatile Compounds                                                                          | 9/1/2018 | 7/22/2022 | \$236,375 |
|                             | Federal Government | Agricultural Research Service     | USDA | Identifying the signatures of cuticular hydrocarbon profiles of screwworm and related flies towards developing taxonomic identification keys and enhanced baits | 9/1/2018 | 6/30/2022 | \$35,000  |
| Teets,<br>Nicholas          | Other University   | University of Vermont             |      | RII Track-2 FEC: From Genome to Phenome in a Stressful World: Epigenetic regulatory mechanisms mediating thermal plasticity in Drosophila                       | 9/1/2018 | 7/31/2023 | \$409,544 |
|                             | Other University   | University of Florida             |      | Molecular Mechanisms of Diapause in the Corn Rootworm Complex                                                                                                   | 1/1/2019 | 3/1/2020  | \$82,500  |
| Villanueva,<br>Raul         | Nonprofit          | Kentucky Soybean Promotion Board  |      | Management of Stink Bugs in Soybean: Does One Strategy Fit All Species? - Year 2                                                                                | 4/1/2019 | 9/30/2020 | \$24,873  |
|                             | Nonprofit          | Kentucky Soybean Promotion Board  |      | Evaluating the Presence of Dectes Stem Borer in Soybean Fields, Weeds and Assessing the Tolerance of Cultivars in Kentucky                                      | 4/1/2019 | 9/30/2020 | \$15,712  |
|                             | Nonprofit          | Kentucky Corn Growers Association |      | Management of Caterpillars on Non-GMO Corn                                                                                                                      | 2/1/2019 | 6/1/2020  | \$15,000  |

Grants awarded to Entomology Faculty, staff and students during the review period

|                     |                    |                                              |      |                                                                                                                                                                                |           |            |           |
|---------------------|--------------------|----------------------------------------------|------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|------------|-----------|
| Bessin,<br>Ricardo  | Federal Government | National Institute of Food and Agriculture   | USDA | Kentucky Extension IPM Implementation Program: 2017-2020                                                                                                                       | 9/1/2014  | 8/31/2021  | \$158,210 |
|                     | State Government   | KY Department of Agriculture                 | KYSG | Private Pesticide Applicator Training Program                                                                                                                                  | 7/1/2018  | 6/30/2020  | \$27,500  |
|                     | Nonprofit          | eXtension Foundation                         |      | 2020 eXtension PSEP Enhancement Grant                                                                                                                                          | 1/1/2020  | 12/31/2020 | \$18,850  |
|                     | Other University   | University of Florida                        |      | IR-4 Liaison funds                                                                                                                                                             | 9/1/2019  | 8/31/2021  | \$16,750  |
| DeVries,<br>Zachary | Federal Government | Office of the Director                       | DHHS | Histamine in Homes: Exposure Risks and Health Effects                                                                                                                          | 9/16/2019 | 8/31/2024  | \$330,455 |
| Dobson,<br>Stephen  | Nonprofit          | Civilian Research and Development Foundation |      | Wolbachia as a New Tool to Control Aedes Aegypti and Aedes Albopictus in Cuba                                                                                                  | 8/1/2019  | 12/31/2021 | \$20,055  |
| Fox,<br>Charles     | Federal Government | National Institute of Food and Agriculture   | USDA | Fellowship for Allyssa Kilanowski: Assessing Density in the Dark: Juvenile Insect Feeding Vibrations as a Cue for Dispersal and Consequences for Landscape Population Dynamics | 6/15/2020 | 6/14/2023  | \$179,181 |
| Gonthier,<br>David  | Other University   | Iowa State University                        |      | Integrating Vegetable, Poultry, and Cover Cropping to Enhance Resiliency in Organic Production Systems                                                                         | 1/1/2020  | 8/31/2023  | \$37,729  |
|                     | Other University   | Iowa State University                        |      | Resilient Systems for Sustainable Management of Cucurbit Crops                                                                                                                 | 1/1/2020  | 8/31/2023  | \$383,142 |
| Harper,<br>Carl     | Nonprofit          | Slow the Spread Foundation                   |      | Monitor Gypsy Moth Populations for Gypsy Moth Slow the Spread Program                                                                                                          | 1/1/2020  | 6/1/2021   | \$44,000  |
| Larson,<br>Jonathan | Other University   | University of Georgia                        |      | Integration of Predator Releases with Insecticidal Soap Sprays for Management of the Sugarcane Aphid                                                                           | 3/15/2019 | 3/14/2021  | \$14,913  |
| Lensing,<br>Janet   | Federal Government | Animal and Plant Health Inspection Service   | USDA | Pine Shoot Beetle Survey                                                                                                                                                       | 9/1/2019  | 8/31/2020  | \$11,290  |



Grants awarded to Entomology Faculty, staff and students during the review period

|              |                    |                                            |      |                                                                                            |          |            |           |
|--------------|--------------------|--------------------------------------------|------|--------------------------------------------------------------------------------------------|----------|------------|-----------|
|              | Federal Government | Animal and Plant Health Inspection Service | USDA | Imported Fire Ant Survey                                                                   | 7/1/2019 | 12/31/2020 | \$5,783   |
|              | Federal Government | Animal and Plant Health Inspection Service | USDA | CAPS (Cooperative Agricultural Pest Surveys) Survey Project                                | 1/1/2020 | 12/31/2020 | \$62,980  |
|              | Federal Government | Animal and Plant Health Inspection Service | USDA | CAPS (Cooperative Agricultural Pest Surveys) Infrastructure                                | 1/1/2020 | 12/31/2020 | \$38,480  |
|              | Federal Government | Animal and Plant Health Inspection Service | USDA | Gypsy Moth Survey                                                                          | 5/1/2020 | 4/30/2021  | \$170,000 |
|              | Federal Government | Animal and Plant Health Inspection Service | USDA | Grape Commodity Survey                                                                     | 5/1/2020 | 4/30/2021  | \$21,000  |
|              | Federal Government | Animal and Plant Health Inspection Service | USDA | Orchard Commodity Survey                                                                   | 5/1/2020 | 4/30/2021  | \$19,630  |
|              | Federal Government | Animal and Plant Health Inspection Service | USDA | Phytophthora Ramorum Nursery Survey                                                        | 5/1/2020 | 4/30/2021  | \$20,000  |
|              | Federal Government | Animal and Plant Health Inspection Service | USDA | Solanaceous Commodity Survey                                                               | 5/1/2020 | 4/30/2021  | \$29,000  |
|              | Federal Government | Animal and Plant Health Inspection Service | USDA | Asian Defoliator Survey                                                                    | 5/1/2020 | 4/30/2021  | \$16,000  |
|              | Federal Government | Animal and Plant Health Inspection Service | USDA | Invasive Pest Outreach: Focus Firewood                                                     | 6/1/2020 | 5/31/2021  | \$11,639  |
|              | Federal Government | Animal and Plant Health Inspection Service | USDA | Invasive Pest Outreach in Kentucky                                                         | 6/1/2020 | 12/31/2021 | \$58,820  |
| Palli, Subba | Federal Government | National Science Foundation                | NSF  | I/UCRC: Center For Arthropod Management Technologies Phase II Site: University Of Kentucky | 8/1/2013 | 6/30/2023  | \$240,000 |

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|                      |                    |                                              |      |                                                                                                                                                                                  |           |            |           |
|----------------------|--------------------|----------------------------------------------|------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|------------|-----------|
|                      | Other University   | University of Florida                        |      | Tissue-Specific Promoters                                                                                                                                                        | 1/1/2019  | 6/30/2021  | \$82,000  |
|                      | Federal Government | Animal and Plant Health Inspection Service   | USDA | Development of RNAi-based Control Technologies for Use in Plant Health Emergencies                                                                                               | 6/30/2019 | 12/29/2020 | \$114,770 |
|                      | Other University   | University of Florida                        |      | PhaseII IUCRC at the University of Florida: Center for Arthropod Management Technologies                                                                                         | 1/1/2020  | 2/28/2022  | \$77,400  |
|                      | State Government   | KY Department for Public Health              | KYSG | Tick Surveillance                                                                                                                                                                | 6/17/2019 | 6/30/2020  | \$20,000  |
| Potter, Daniel       | Other University   | University of Florida                        |      | 2019 IR-4 Envir Hort Trials                                                                                                                                                      | 9/1/2019  | 8/31/2021  | \$11,250  |
|                      | Nonprofit          | Horticultural Research Institute             |      | In Defense of Nativars: Comparing the Conservation Value of Native Milkweed Cultivars and Straight Species for Monarch Butterflies, Bees, and Other Pollinators in Small Gardens | 3/1/2020  | 12/31/2021 | \$35,000  |
| Rieske-Kinney, Lynne | Federal Government | Animal and Plant Health Inspection Service   | USDA | Development of RNAi for Suppression of Exotic Wood-boring Buprestids                                                                                                             | 6/1/2019  | 5/31/2021  | \$94,348  |
|                      | Federal Government | Animal and Plant Health Inspection Service   | USDA | Phenology of EAB and Parasitoids in Kentucky                                                                                                                                     | 8/1/2019  | 1/31/2021  | \$66,692  |
| Rittschof, Clare     | Nonprofit          | Foundation for Food and Agriculture Research |      | Can Commodity Crop Weed Management Practices Enhance Bee Abundance Diversity And Health On Agricultural Land?                                                                    | 1/15/2018 | 1/14/2022  | \$38,396  |
|                      | State Government   | KY Governor's Office of Agricultural Policy  | KYSG | Virus Testing for Kentucky Honey Bees                                                                                                                                            | 5/8/2020  | 12/31/2023 | \$44,364  |
| Syed, Zainulabeuddin | Federal Government | Agricultural Research Service                | USDA | Identifying the signatures of cuticular hydrocarbon profiles of screwworm and related flies towards developing taxonomic                                                         | 9/1/2018  | 6/30/2022  | \$60,000  |

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|                  |                    |                                             |      |                                                                                                                                       |           |            |           |
|------------------|--------------------|---------------------------------------------|------|---------------------------------------------------------------------------------------------------------------------------------------|-----------|------------|-----------|
|                  |                    |                                             |      | identification keys and enhanced baits                                                                                                |           |            |           |
| Teets, Nicholas  | Federal Government | National Science Foundation                 | NSF  | Mechanisms of Adaptation to Terrestrial Antarctica through Comparative Physiology and Genomics of Antarctic and sub-Antarctic Insects | 8/1/2019  | 7/31/2023  | \$726,070 |
| Villanueva, Raul | State Government   | KY Department of Agriculture                | KYSG | Developing Management Strategies Against Invasive Ambrosia Beetles Affecting Apples and Nurseries in Kentucky                         | 9/30/2019 | 9/29/2022  | \$21,786  |
|                  | Other University   | Ohio State University                       |      | Soybean Entomology Research and Extension in the North Central Region                                                                 | 10/1/2019 | 6/30/2021  | \$15,140  |
|                  | Nonprofit          | Kentucky Soybean Promotion Board            |      | Assessing the Management of Bean Leaf Beetles and Pod Mottle Virus Infections in Soybeans                                             | 4/1/2020  | 3/31/2021  | \$8,144   |
|                  | Industry           | BASF Corporation                            |      | BASF Service Order                                                                                                                    | 2/1/2020  | 3/31/2021  | \$26,100  |
| Bessin, Ricardo  | Federal Government | National Institute of Food and Agriculture  | USDA | Kentucky Extension IPM Implementation Program: 2017-2020                                                                              | 9/1/2014  | 8/31/2021  | \$144,051 |
|                  | State Government   | KY Department of Agriculture                | KYSG | FY 21 Private Applicator Training Program                                                                                             | 7/1/2020  | 6/30/2022  | \$55,000  |
|                  | Nonprofit          | eXtension Foundation                        |      | 2021 eXtension PSEP Enhancement Grant                                                                                                 | 1/1/2021  | 12/31/2021 | \$17,900  |
|                  | Other University   | University of Florida                       |      | IR-4 Liaison and Wireworm Study in Sweet Potatoes                                                                                     | 9/1/2019  | 8/31/2022  | \$13,500  |
| DeVries, Zachary | Federal Government | Office of the Director                      | DHHS | Histamine in Homes: Exposure Risks and Health Effects                                                                                 | 9/16/2019 | 8/31/2024  | \$356,200 |
|                  | Federal Government | Department of Housing and Urban Development | HUD  | Cockroach Eradication through Community Engagement: Empowering Residents to Improve their Health                                      | 1/4/2021  | 1/3/2024   | \$400,000 |

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|                 |                    |                                            |      |                                                                                                                                   |           |            |           |
|-----------------|--------------------|--------------------------------------------|------|-----------------------------------------------------------------------------------------------------------------------------------|-----------|------------|-----------|
|                 | Nonprofit          | Pest Management Foundation                 |      | The Perfect Meal: Determining How Age and Humidity Effect Cockroach Gel Bait Performance                                          | 11/1/2020 | 10/31/2022 | \$21,309  |
|                 | Industry           | BASF Corporation                           |      | Testing of Velifer Fungal Contact Insecticide (registered), and PT Vedira® Pressurized Insecticide (unregistered)                 | 8/13/2020 | 6/30/2021  | \$12,060  |
| Dupuis, Julian  | Federal Government | National Institute of Food and Agriculture | USDA | Developing Phylogenomic-Based Diagnostic Tools for Species Identification Across Diptera                                          | 7/1/2020  | 6/30/2024  | \$500,000 |
|                 | Federal Government | Animal and Plant Health Inspection Service | USDA | Population Genomics, Diagnostic Strain Determination, and SIT Characterization for the Mexican Fruit Fly <i>Anastrepha ludens</i> | 9/30/2020 | 9/29/2022  | \$146,505 |
| Gonthier, David | Other University   | Iowa State University                      |      | Integrating Vegetable, Poultry, and Cover Cropping to Enhance Resiliency in Organic Production Systems                            | 1/1/2020  | 8/31/2023  | \$247,271 |
|                 | State Government   | KY Department of Agriculture               | KYSG | A Remedy For Insect And Bird Pests: Fine-Mesh Netting Canopies For Use In Direct To Market And You-Pick Berries                   | 12/1/2020 | 9/29/2023  | \$49,972  |
| Harper, Carl    | Nonprofit          | Slow the Spread Foundation                 |      | Monitor Gypsy Moth Populations for Gypsy Moth Slow the Spread Program                                                             | 1/1/2021  | 6/1/2022   | \$44,000  |
| Lensing, Janet  | Federal Government | Animal and Plant Health Inspection Service | USDA | Imported Fire Ant Survey                                                                                                          | 7/1/2020  | 12/31/2021 | \$5,783   |
|                 | Federal Government | Animal and Plant Health Inspection Service | USDA | CAPS (Cooperative Agricultural Pest Surveys) Infrastructure                                                                       | 1/1/2021  | 12/31/2021 | \$38,480  |
|                 | Federal Government | Animal and Plant Health Inspection Service | USDA | CAPS (Cooperative Agricultural Pest Surveys ) Surveys                                                                             | 1/1/2021  | 12/31/2021 | \$62,980  |

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|              |                    |                                                       |      |                                                                                            |           |           |           |
|--------------|--------------------|-------------------------------------------------------|------|--------------------------------------------------------------------------------------------|-----------|-----------|-----------|
|              | Federal Government | Animal and Plant Health Inspection Service            | USDA | Phytophthora Ramorum Nursery and/or Environs Survey                                        | 5/1/2021  | 4/30/2022 | \$20,000  |
|              | Federal Government | Animal and Plant Health Inspection Service            | USDA | Gypsy Moth Survey                                                                          | 5/1/2021  | 4/30/2022 | \$170,000 |
|              | Federal Government | Animal and Plant Health Inspection Service            | USDA | Asian Defoliator Survey                                                                    | 5/1/2021  | 4/30/2022 | \$15,000  |
|              | Federal Government | Animal and Plant Health Inspection Service            | USDA | Grape Commodity Survey                                                                     | 5/1/2021  | 4/30/2022 | \$21,000  |
|              | Federal Government | Animal and Plant Health Inspection Service            | USDA | Orchard Commodity Survey                                                                   | 5/1/2021  | 4/30/2022 | \$20,000  |
|              | Federal Government | Animal and Plant Health Inspection Service            | USDA | Solanaceous Commodity Survey                                                               | 5/1/2021  | 4/30/2022 | \$29,000  |
|              | Federal Government | Animal and Plant Health Inspection Service            | USDA | Invasive Pest Outreach: Focus Firewood                                                     | 6/1/2021  | 5/31/2022 | \$12,152  |
| Palli, Subba | Federal Government | National Science Foundation                           | NSF  | I/UCRC: Center For Arthropod Management Technologies Phase II Site: University Of Kentucky | 8/1/2013  | 6/30/2023 | \$7,200   |
|              | Other University   | University of Florida                                 |      | PhaseII IUCRC at the University of Florida: Center for Arthropod Management Technologies   | 1/1/2020  | 2/28/2022 | \$77,400  |
|              | State Government   | KY Department for Public Health                       | KYSG | Tick Surveillance                                                                          | 7/1/2020  | 6/30/2022 | \$20,000  |
|              | Federal Government | Animal and Plant Health Inspection Service            | USDA | Development of RNAi Methods to Control Exotic Woodboring Beetles                           | 9/30/2020 | 9/29/2022 | \$116,783 |
|              | Federal Government | National Institute of Allergy and Infectious Diseases | DHHS | Molecular Mode of Action of Juvenile Hormone Analogs                                       | 6/1/2021  | 5/31/2023 | \$217,500 |

Grants awarded to Entomology Faculty, staff and students during the review period

|                      |                    |                                                       |      |                                                                                                                                                  |           |            |           |
|----------------------|--------------------|-------------------------------------------------------|------|--------------------------------------------------------------------------------------------------------------------------------------------------|-----------|------------|-----------|
|                      | State Government   | KY Department for Public Health                       | KYSG | Tick Surveillance                                                                                                                                | 7/1/2020  | 6/30/2022  | \$20,000  |
| Potter, Daniel       | Other University   | University of Florida                                 |      | 2019 IR-4 Envir Hort Trials                                                                                                                      | 9/1/2019  | 8/31/2021  | \$15,000  |
| Rieske-Kinney, Lynne | Federal Government | Animal and Plant Health Inspection Service            | USDA | Gene Silencing Using RNAi for Bark Beetle Management                                                                                             | 7/1/2020  | 6/30/2022  | \$153,173 |
|                      | Federal Government | Animal and Plant Health Inspection Service            | USDA | Regional Difference in Phenology May Affect Biological Control Efforts Targeting EAB                                                             | 8/1/2020  | 7/31/2022  | \$76,019  |
|                      | State Government   | KY Division of Forestry                               | KYSG | Conservation, Protection, and Enhancement of Forest Canopies in Rural Communities and Small Municipalities                                       | 2/1/2021  | 6/30/2023  | \$406,337 |
| Rittschof, Clare     | State Government   | KY Governor's Office of Agricultural Policy           | KYSG | Virus Testing for Kentucky Honey Bees                                                                                                            | 5/8/2020  | 12/31/2023 | \$50,564  |
|                      | Nonprofit          | Sigma XI Scientific Research Society Inc              |      | Allogrooming May Induce Immune Gene Expression as a Component of Social Immunity in the Western Honey Bee ( <i>Apis mellifera</i> )              | 6/15/2020 | 6/30/2021  | \$967     |
| Syed, Zainulabeuddin | Federal Government | Agricultural Research Service                         | USDA | Functional Characterization of Sex-Biased Odorant Receptors in Screwworm to Develop Sex Specific Baits                                           | 9/1/2020  | 8/31/2023  | \$60,000  |
|                      | Federal Government | National Institute of Allergy and Infectious Diseases | DHHS | Identifying Novel Tick Attractants and Repellents by Exploiting Their Olfactory and Eco-Physiology                                               | 6/7/2021  | 5/31/2023  | \$197,250 |
| Teets, Nicholas      | Other University   | University of Vermont                                 |      | RII Track-2 FEC: From Genome to Phenome in a Stressful World: Epigenetic regulatory mechanisms mediating thermal plasticity in <i>Drosophila</i> | 9/1/2018  | 7/31/2023  | \$469,574 |
|                      | Federal Government | National Science Foundation                           | NSF  | Mechanisms of Adaptation to Terrestrial Antarctica through Comparative Physiology and                                                            | 8/1/2019  | 7/31/2023  | \$53,963  |

Grants awarded to Entomology Faculty, staff and students during the review period

|                  |                    |                                                        |      |                                                                                                                                     |           |            |            |
|------------------|--------------------|--------------------------------------------------------|------|-------------------------------------------------------------------------------------------------------------------------------------|-----------|------------|------------|
|                  |                    |                                                        |      | Genomics of Antarctic and sub-Antarctic Insects                                                                                     |           |            |            |
| Villanueva, Raul | Nonprofit          | Kentucky Soybean Promotion Board                       |      | Evaluating the Presence of Dectes Stem Borer in Soybean Fields, Weeds, and Assessing the Tolerance of Cultivars in Kentucky: Year 2 | 4/15/2021 | 4/14/2022  | \$16,668   |
|                  | Nonprofit          | Kentucky Soybean Promotion Board                       |      | Assessing the Management of Bean Leaf Beetles, Grape Colaspis Beetle, and the Three-Cornered Alfalfa Hopper in Soybeans             | 5/15/2021 | 5/14/2022  | \$14,294   |
|                  | Other University   | Ohio State University                                  |      | Soybean Entomology Research and Extension in the North Central Region                                                               | 10/1/2020 | 12/31/2021 | \$14,860   |
| White, Jennifer  | Federal Government | National Science Foundation                            | NSF  | NSFDEB-BSF: Uneasy Alliances: Emergent Properties and Feedback Mechanisms among Manipulative Endosymbiotic Communities              | 8/1/2020  | 7/31/2024  | \$674,744  |
| Zhou, Xuguo      | Federal Government | National Institute of Food and Agriculture             | USDA | Managing Stress in Termites: Perspectives from the Brain                                                                            | 6/1/2021  | 5/31/2024  | \$180,000  |
| Bessin, Ricardo  | State Government   | KY Department of Agriculture                           | KYSG | FY 21 Private Applicator Training Program                                                                                           | 7/1/2020  | 6/30/2022  | (\$27,500) |
|                  | Federal Government | National Institute of Food and Agriculture             | USDA | Kentucky Extension IPM Implementation Program: 2021-2024                                                                            | 9/1/2021  | 8/31/2023  | \$380,438  |
|                  | Nonprofit          | eXtension Foundation                                   |      | 2022 Kentucky Pesticide Safety Education Enhancement                                                                                | 1/1/2022  | 12/31/2022 | \$20,350   |
|                  | State Government   | KY Department of Agriculture                           | KYSG | FY 22 Private Applicator Training Program                                                                                           | 7/1/2020  | 6/30/2022  | \$27,500   |
| DeVries, Zachary | Federal Government | Office of the Director                                 | DHHS | Histamine in Homes: Exposure Risks and Health Effects                                                                               | 9/16/2019 | 8/31/2024  | \$348,575  |
|                  | Other Government   | Washington State Commission on Pesticide Registrations |      | Evaluation of Beauveria bassiana (Apprehend) as an Alternative to the Organophosphate dichlorvos                                    | 5/1/2022  | 12/16/2023 | \$47,000   |

Grants awarded to Entomology Faculty, staff and students during the review period

|                  |                    |                                            |      |                                                                                                                            |           |            |           |
|------------------|--------------------|--------------------------------------------|------|----------------------------------------------------------------------------------------------------------------------------|-----------|------------|-----------|
|                  |                    |                                            |      | (Nuvan ProStrips) for Bed Bug (Cimex lectularius) Control                                                                  |           |            |           |
| Dupuis, Julian   | Federal Government | Animal and Plant Health Inspection Service | USDA | Population Genomics, Diagnostic Strain Determination, and SIT Characterization for the Mexican Fruit Fly Anastrepha Ludens | 9/30/2021 | 9/29/2023  | \$130,009 |
| Harper, Carl     | Nonprofit          | Slow the Spread Foundation                 |      | Slow the Spread Trapping & Treatment Program: Spongy Moth                                                                  | 1/1/2022  | 5/31/2023  | \$44,000  |
| Larson, Jonathan | Other University   | University of Florida                      |      | 2021 IR-4 Envir Hort Trials: Phytotoxicity Rating Trial of Novel Greenhouse Insecticide and Miticides                      | 8/1/2021  | 7/31/2023  | \$5,000   |
| Lensing, Janet   | Federal Government | Animal and Plant Health Inspection Service | USDA | KY FY22 Asian Defoliator Survey 1S.0118                                                                                    | 5/1/2022  | 4/30/2023  | \$15,000  |
|                  | Federal Government | Animal and Plant Health Inspection Service | USDA | KY FY22 Grape Survey 1S.0127.01                                                                                            | 5/1/2022  | 4/30/2023  | \$23,678  |
|                  | Federal Government | Animal and Plant Health Inspection Service | USDA | KY FY22 Solanaceous Survey 1S.0160.01                                                                                      | 5/1/2022  | 4/30/2023  | \$29,606  |
|                  | Federal Government | Animal and Plant Health Inspection Service | USDA | KY FY22 P.ramorum Survey 1S.0115.01                                                                                        | 5/1/2022  | 4/30/2023  | \$20,000  |
|                  | Federal Government | Animal and Plant Health Inspection Service | USDA | KY FY22 IPO: Focus Firewood 5.0166.01                                                                                      | 6/1/2022  | 5/31/2023  | \$12,927  |
|                  | Federal Government | Animal and Plant Health Inspection Service | USDA | KY FY22 CAPS Combined Survey                                                                                               | 1/1/2022  | 12/31/2022 | \$62,980  |
|                  | Federal Government | Animal and Plant Health Inspection Service | USDA | KY FY22 Spotted Lanternfly Survey 1S.0410.01                                                                               | 6/1/2022  | 5/31/2023  | \$42,720  |



Grants awarded to Entomology Faculty, staff and students during the review period

|              |                    |                                                       |      |                                                                                                                             |          |            |           |
|--------------|--------------------|-------------------------------------------------------|------|-----------------------------------------------------------------------------------------------------------------------------|----------|------------|-----------|
|              | Federal Government | Animal and Plant Health Inspection Service            | USDA | KY FY22CAPS Infrastructure                                                                                                  | 1/1/2022 | 12/31/2022 | \$38,480  |
|              | Federal Government | Animal and Plant Health Inspection Service            | USDA | KY FY22 Invasive Pest Outreach 5.0389.01                                                                                    | 6/1/2022 | 5/31/2023  | \$30,985  |
|              | Federal Government | Animal and Plant Health Inspection Service            | USDA | Imported Fire Ant Survey                                                                                                    | 6/1/2022 | 5/31/2023  | \$5,783   |
|              | Federal Government | Animal and Plant Health Inspection Service            | USDA | KY FY22 Spongy Moth Survey                                                                                                  | 5/1/2022 | 4/30/2023  | \$170,000 |
|              | Federal Government | Animal and Plant Health Inspection Service            | USDA | KY FY22 Spotted Lanternfly Outreach 5.03                                                                                    | 6/1/2022 | 5/31/2023  | \$45,974  |
| Palli, Subba | Federal Government | National Science Foundation                           | NSF  | I/UCRC: Center For Arthropod Management Technologies Phase II Site: University Of Kentucky                                  | 8/1/2013 | 6/30/2023  | \$240,000 |
|              | Federal Government | National Institute of Allergy and Infectious Diseases | DHHS | Molecular Mode of Action of Juvenile Hormone Analogs                                                                        | 6/1/2021 | 5/31/2023  | \$181,250 |
|              | Federal Government | National Institute of Allergy and Infectious Diseases | DHHS | Epigenetic Regulation of Hormone Action in Tribolium and Aedes                                                              | 6/3/2021 | 3/31/2025  | \$298,700 |
|              | Federal Government | Animal and Plant Health Inspection Service            | USDA | The Japanese Beetle Control Near Airports and Cargo Transportation Facilities                                               | 6/1/2021 | 5/31/2023  | \$99,769  |
|              | Industry           | GreenLight BioSciences Incorporated                   |      | Determine the Cellular Route of Uptake and Trafficking of Naked and Nanoformulated dsRNA in Spodoptera frugiperda Sf9 Cells | 8/2/2021 | 6/30/2023  | \$308,000 |
|              | Other University   | University of Florida                                 |      | IUCRC at the University of Florida: Improving Genome Editing in Hemipteran Pests                                            | 1/1/2022 | 5/31/2023  | \$80,000  |

Grants awarded to Entomology Faculty, staff and students during the review period

|                      |                    |                                                       |      |                                                                                                                          |           |            |           |
|----------------------|--------------------|-------------------------------------------------------|------|--------------------------------------------------------------------------------------------------------------------------|-----------|------------|-----------|
|                      | Other University   | University of Florida                                 |      | Phase II IUCRC at UF: Center for Arthropod Management Technologies - Single Cell Sequencing of Midguts from Pest Insects | 3/1/2022  | 5/31/2023  | \$85,000  |
|                      | Federal Government | National Institute of General Medical Sciences        | DHHS | Epigenetic Regulation of Hormone Action in Tribolium and Aedes                                                           | 6/3/2021  | 3/31/2025  | \$461,787 |
|                      | Federal Government | Animal and Plant Health Inspection Service            | USDA | The Japanese Beetle Control Near Airports and Cargo Transportation Facilities: Testing Field Efficacy of the Product     | 6/1/2022  | 5/31/2023  | \$107,210 |
| Potter, Daniel       | Other University   | University of Florida                                 |      | 2020 IR-4 Evir Hort Trials                                                                                               | 9/1/2019  | 8/31/2022  | \$15,000  |
|                      | Industry           | Novozymes North America Incorporated                  |      | Novozymes White Grub Trial NZ21NATURF03                                                                                  | 7/20/2021 | 12/31/2021 | \$43,500  |
|                      | Other University   | University of Florida                                 |      | 2021 IR-4 Evir Hort Trials: Foliar Feeding Beetle Efficacy – Japanese Beetle                                             | 8/1/2021  | 1/31/2022  | \$13,750  |
| Rieske-Kinney, Lynne | Federal Government | Animal and Plant Health Inspection Service            | USDA | Developing RNAi for Suppression of Exotic Wood-Boring Buprestids                                                         | 7/1/2020  | 6/30/2021  | \$76,217  |
| Rittschof, Clare     | Federal Government | National Science Foundation                           | NSF  | CAREER: Signal to Noise: How Complex Social Information Regulates Brain Genomics and Behavior                            | 8/1/2021  | 7/31/2026  | \$799,439 |
| Syed, Zainulabuddin  | Federal Government | National Institute of Allergy and Infectious Diseases | DHHS | Identifying Novel Tick Attractants and Repellents by Exploiting Their Olfactory and Eco-Physiology                       | 6/7/2021  | 5/31/2023  | \$181,250 |
|                      | Other University   | University of Florida                                 |      | Finding Tick Repellents: Development of neurophysiological and behavioral paradigms                                      | 7/1/2021  | 5/31/2023  | \$80,000  |
|                      | Other University   | University of Florida                                 |      | Phase II IUCRC at the University of Florida: Center for Arthropod Management Technologies                                | 1/1/2022  | 5/23/2023  | \$80,000  |

Grants awarded to Entomology Faculty, staff and students during the review period

|                  |                    |                                            |      |                                                                                                                        |           |            |              |
|------------------|--------------------|--------------------------------------------|------|------------------------------------------------------------------------------------------------------------------------|-----------|------------|--------------|
| Teets, Nicholas  | Federal Government | Office of the Director                     | DHHS | Development of Long-Term Preservation and Revival Protocols for <i>Drosophila</i>                                      | 8/15/2021 | 7/31/2023  | \$231,573    |
| Villanueva, Raul | Other University   | Ohio State University                      |      | Research and Extension on Emerging Soybean Pests in the North Central Region                                           | 10/1/2021 | 12/31/2022 | \$10,000     |
|                  | Other University   | University of Florida                      |      | Control of Mites in Industrial Hemp Open Field Study                                                                   | 9/1/2019  | 8/31/2022  | \$12,500     |
|                  | Nonprofit          | Kentucky Soybean Promotion Board           |      | Studying the Management and Impact of BMSB                                                                             | 5/2/2022  | 6/30/2023  | \$28,674     |
|                  | Nonprofit          | Kentucky Soybean Promotion Board           |      | Studies on Molluscicides, Potash, Slug Management                                                                      | 5/15/2022 | 6/30/2023  | \$18,140     |
|                  | Other University   | North Carolina State University            |      | Evaluation of a Leatherjacket, A New Pest of Alfalfa                                                                   | 4/1/2022  | 3/31/2023  | \$10,000     |
| White, Jennifer  | Federal Government | National Science Foundation                | NSF  | NSFDEB-BSF: Uneasy Alliances: Emergent Properties and Feedback Mechanisms among Manipulative Endosymbiotic Communities | 8/1/2020  | 7/31/2024  | \$39,600     |
| Zhou, Xuguo      | Federal Government | National Institute of Food and Agriculture | USDA | Fellowship for Austin Merchant: Managing Stress in Termites: Perspectives from the Brain                               | 6/1/2021  | 5/31/2024  | \$180,000    |
| Total            |                    |                                            |      |                                                                                                                        |           |            | \$22,034,285 |

## Publications 2016 – 2022

### Bessin:

#### **Intellectual Contributions**

\* = Senior Author ~ = Corresponding Author + = Grad/Prof Student # = Post Doc ^ = Undergraduate WOS = Web of Science JIF = Journal Impact Factor TC = Journal Total Cites  
SNIP = Source Normalize Impact per Paper SJR = Scimago Journal Rank

#### **Published**

##### **Journal Article**

+ ~ Brockman, R., + Kuesel, R., ^ Archer, K., ^ Kyla, O., Wilson, N., Scott Hicks, D., Mark, W., Bessin, R. T., \* Gonthier, D. J. (2020). The Impact of Plant Essential Oils and Fine Mesh Row Covers on Flea Beetle (Chrysomelidae) Management in Brassicaceous Greens Production, *Insects*, 11, 714.

##### **Journal Article, Academic Journal**

Mercer, N. H., Bessin, R. T., Obrycki, J. J. (2021). Parasitization of the sugarcane aphid, *Melanaphis sacchari*, by commercially available aphid parasitoids, *BioControl*, 66(2), 181-191. doi: 10.1007/s10526-020-10051-w

Mercer, N. H., Obrycki, J. J., Bessin, R. T. (2021). Altering Planting Date to Manage *Melanaphis sacchari* (Hemiptera: Aphididae) Populations in Sweet Sorghum, *Journal of economic entomology*, 114(1), 197-200. doi: 10.1093/jee/toaa306

\* + ~ Mercer, N. H., Bessin, R. T., Obrycki, J. J. (2021). Altering planting date to manage *Melanaphis sacchari* (Hemiptera: Aphididae) populations in sweet sorghum. Lanham, MD, *J. Econ. Entomol.* doi: <https://doi.org/10.1093/jee/toaa306>

Author Role: Mercer: Was part of his dissertation.

Bessin: Co-Advised student, assisted with experimental design, statistical analysis, interpretation of data and writing of manuscript.

Obrycki: Co-Advisor

Viloria, Z., Villanueva, R. T., Bessin, R., O'Neal, P., Ranger, C. M., Dunwell, W. C. (2021). Scolytinae in Nursery and Fruit Crops of Western Kentucky and Seasonal Population Patterns of Four Invasive Ambrosia Beetles, *Journal of Entomological Science*, 56(3), 374-386. doi: 10.18474/JES20-50

Acebes-Doria, A. L., Agnello, A. M., Alston, D. G., Andrews, H., Beers, E. H., Bergh, J. C., Bessin, R., Blaauw, B. R., Buntin, G. D., Burkness, E. C., Chen, S., Cottrell, T. E., Daane, K. M., Fann, L. E., Fleischer, S. J., Guédot, C., Gut, L. J., Hamilton, G. C., Hilton, R., Hoelmer, K. A., Hutchison, W. D., Jentsch, P., Krawczyk, G., Kuhar, T. P., Lee, J. C., Milnes, J. M., Nielsen, A. L., Patel, D. K., Short, B. D., Sial, A. A., Spears, L. R., Tatman, K., Toews, M. D., Walgenbach, J. D., Welty, C., Wiman, N. G., Van Zoeren, J., Leskey, T. C. (2020). Season-long monitoring of the brown marmorated stink bug (Hemiptera: Pentatomidae) throughout the United States using commercially available traps and lures, *Journal of Economic Entomology*, 113(1), 159-171. doi: 10.1093/jee/toz240

Brockman, R., Kuesel, R., Archer, K., O'Hearn, K., Wilson, N., Scott, D., Williams, M. A., Bessin, R. T., Gonthier, D. J. (2020). The impact of plant essential oils and fine mesh row covers on flea beetle

(Chrysomelidae) management in brassicaceous greens production, *Insects*, 11(10), 1-16. doi: 10.3390/insects11100714

Mercer, N. H., Bessin, R. T., Obyrcki, J. J. (2020). Impact of buckwheat and methyl salicylate lures on natural enemy abundance for early season management of *Melanaphis sacchari* (Hemiptera: Aphididae) in sweet sorghum, *Crop Protection*, 137. doi: 10.1016/j.cropro.2020.105279

Author Role:

Bessin: Co-Advised student, assisted with experimental design, statistical analysis, interpretation of data and writing of manuscript.

\* ~ Mercer, N. H., Bessin, R. T., Obyrcki, J. J. (2020). Parasitization of the sugarcane aphid, *Melanaphis sacchari*, by commercially available aphid parasitoids., *BioControl*. doi:

<https://doi.org/10.1007/s10526-020-10051-w>

Author Role: Mercer: Was graduate student, this was part of his dissertation. Bessin: Co-advisor, assisted with design, analysis and interpretation.

Obyrcki: Co-advisor, assisted with design, analysis and interpretation.

+ ~ Mercer, N. H., Teets, N. M., Bessin, R. T., \* Obyrcki, J. J. (2020). Supplemental Foods Affect Energetic Reserves, Survival, and Spring Reproduction in Overwintering Adult *Hippodamia convergens* (Coleoptera: Coccinellidae), *Environmental Entomology*, 49(1), 1-9. doi: 10.1093/ee/nvz137

Author Role:

Teets: trained student on laboratory methods for nutrient analyses; assisted with manuscript preparation

Bessin: Co-Advised student, assisted with experimental design, statistical analysis, interpretation of data and writing of manuscript.

Kuesel, R., Scott Hicks, D., Archer, K., Sciligo, A., Bessin, R. T., Gonthier, D. J. (2019). Effects of fine-mesh exclusion netting on pests of blackberry, *Insects*, 10(8). doi: 10.3390/insects10080249

\* + ~ Skidmore, A. N., Wilson, N., Williams, M. A., Bessin, R. T. (2019). Integrating Row Covers and Strip Tillage for Pest Management in Summer Squash and Muskmelon Production., *HortSci*, 29(6), 923-932.

Author Role: Skidmore: Conducted the research, analyzed the data, developed the publication.

Wilson: Assisted with data collection and field maintenance. Williams: Co-

advisor, Co-PI Bessin: Co-Advised student, assisted with experimental design, statistical analysis, interpretation of data and writing of manuscript.

Skidmore, A., Wilson, N., Williams, M. A., Bessin, R. T. (2019). The impact of tillage regime and row cover use on insect pests and yield in organic cucurbit production, *Renewable Agriculture and Food Systems*, 34(4), 338-348. doi: 10.1017/S1742170517000503

Author Role: Bessin: Co-Advised student, assisted with experimental design, statistical analysis, interpretation of data and writing of manuscript.

Skidmore, A. R., Short, C. A., Dills, C., Goodell, K., Bessin, R. T. (2019). Preference of *Peponapis pruinosa* (Hymenoptera: Apoidea) for Tilled Soils Regardless of Soil Management System, *Environmental Entomology*, 48(4), 961-967. doi: 10.1093/ee/nvz052

Author Role:

Bessin: Co-Advised student, assisted with experimental design, statistical analysis, interpretation of data and writing of manuscript.

Abram, P., Hoelmer, K., Acebes-Doria, A., Andrews, H., Beers, E., Bessin, R. T., Bergh, J. C., Bessin, R., Biddinger, D., Botch, P., Buffington, M., Cornelius, M., Costi, E., Delfosse, E., Dieckhoff, C., Dobson, R., Donais, Z., Grieshop, M., Hamilton, G., Haye, T., Hedstrom, C., Herlihy, M., Hoddle, M., Hooks, C., Jentsch, P., Joshi, N., Kuhar, T., Lara, J., Legrand, A., Lee, J., Leskey, T., Lowenstein, D., Milnes, J., Maistrello, L., Morrison, W., Nielsen, A., Ogburn, E., Pickett, C., Poley, K., Pote, J., James, R., Shrewsbury, P., Talamas, E., Tavella, L., Walgenbach, J., Waterworth, R., Weber, D., Welty, C., Wiman, N. (2017). Indigenous arthropod natural enemies of the invasive brown marmorated stink bug in North America and Europe, *J. Pest Sci.*, 90(4), 12. doi: DOI: 10.1007/s10340-017-0891-7

Skidmore, A., Wilson, N., Williams, M. A., Bessin, R. T. (2017). The Impact of Tillage Regime and Row Cover Use on Insect Pests and Yield in Organic Cucurbit Production., *Renewable Food and Agriculture Systems*. doi: doi.org/10.1017/S1742170517000503

Dobson, R. C., Rogers, M., Moore, Jennifer L. C., Bessin, R. T. (2016). Exclusion of the Brown Marmorated Stink Bug from Organically Grown Peppers Using Barrier Screens, *HORTTECHNOLOGY*, 26(2), 191-198.

Ogburn, E. C., Bessin, R. T., Dieckhoff, C., Dobson, R., Grieshop, M., Hoelmer, K. A., Mathews, C., Moore, J., Nielsen, A. L., Poley, K., Pote, J. M., Rogers, M., Welty, C., Walgenbach, J. F. (2016). Natural enemy impact on eggs of the invasive brown marmorated stink bug, *Halyomorpha halys* (Stal) (Hemiptera: Pentatomidae), in organic agroecosystems: A regional assessment, *BIOLOGICAL CONTROL*, 101, 39-51. doi: 10.1016/j.biocontrol.2016.06.002

### **Journal Article, Public or Trade Journal**

Potter, M. F., Bessin, R. T. (2017). Alien invasion: managing the brown marmorated stink bug, *Pest Control Technol*, 56(6), 29-36.

### **DeVries:**

### **Intellectual Contributions**

\* = Senior Author ~ = Corresponding Author + = Grad/Prof Student # = Post Doc ^ = Undergraduate

WOS = Web of Science JIF = Journal Impact Factor TC = Journal Total Cites

SNIP = Source Normalize Impact per Paper SJR = Scimago Journal Rank

### **Published**

### **Book, Chapter in Scholarly Book-New**

Schal, C., DeVries, Z. C. (2021). Public health and veterinary importance of the German cockroach Biology and Management of the German Cockroach Melbourne, Victoria, CSIRO Publishing, 304. Author Role: Dr. DeVries wrote half of this chapter and reviewed the entire chapter.

### **Journal Article, Academic Journal**

# Gaire, S., \* ~ DeVries, Z. C., Mick, R., Santangelo, R., Bottillo, G., Camera, E., Schal, C. (2021).

Human skin triglycerides prevent bed bug (*Cimex lectularius* L.) arrestment, *Scientific Reports*, 11, 22906. doi: 10.1038/s41598-021-01981-1 Author Role: Dr. DeVries designed the study, conducted the experiments, and co-wrote the paper. Dr. DeVries serves as a co-first authors (both he and Dr. Gaire contributed equally to this work).

Gonzalez-Morales, M., DeVries, Z. C., Sierras, A., Santangelo, R., Kakumanu, M., Schal, C. (2021). Resistance to Fipronil in the Common Bed Bug, *Cimex lectularius* (Hemiptera: Cimicidae) Annapolis, MD, *Journal of Medical Entomology*, 58(4), 1798-1807. doi: 10.1093/jme/tjab040 Author Role: Dr. DeVries designed the study, assisted Maria González-Morales with experiments and data analysis, and reviewed the manuscript.

Saveer, A. M., DeVries, Z. C., Santangelo, R. G., Schal, C. (2021). Mating and starvation modulate feeding and host-seeking responses in female bed bugs, *Cimex lectularius*, *Scientific Reports*, 11(1). doi: 10.1038/s41598-021-81271-y Author Role: Dr. DeVries designed the study and co-wrote the manuscript.

~ DeVries, Z. C., Santangelo, R. G., Booth, W., Lawrence, C. G., Balvin, O., Bartonicka, T., Schal, C. (2020). Reproductive compatibility among populations and host-associated lineages of the common bed bug (*Cimex lectularius* L.) Hoboken, NJ, *ECOLOGY AND EVOLUTION*, 10(20), 11090-11099. doi: 10.1002/ece3.6738 Author Role: Dr. DeVries designed the study, conducted the experiments, analyzed the data, and wrote the manuscript.

# ~ Gaire, S., Mick, R., Schal, C., \* DeVries, Z. C. (2020). The role of antennae in heat detection and feeding behavior in the bed bug (*Cimex lectularius* L.). Annapolis, MD, *JOURNAL OF ECONOMIC ENTOMOLOGY*, 113(6), 2858-2863. doi: 10.1093/jee/toaa250 Author Role: Dr. DeVries designed the study, conducted the experiments, analyzed the data, and co-wrote the manuscript with Dr. Gaire

Kakumanu, M. L., DeVries, Z. C., Barbarin, A. M., Santangelo, R. G., Schal, C. (2020). Bed bugs shape the indoor microbial community composition of infested homes Amsterdam, *SCIENCE OF THE TOTAL ENVIRONMENT*, 743, 140704. doi: 10.1016/j.scitotenv.2020.140704 Author Role: Dr. DeVries designed the study, conducted the field work, assisted in writing the manuscript, and reviewed the manuscript.

### **Journal Article, Professional Journal**

Coyle, D., Brosius, T., DeVries, Z. C., Schmidt-Jeffris, R., Gott, R. C., Loudon, C., Saguez, J., Simonsen, T., Van Den Berg, J., McDonnell, R., Ronai, I., Zhu, L., Siebert, M., Wessels, F., Hamm, R., Higgins, L., Thompson, S., Serikawa, R., Spomer, N., Spencer, J. (2020). COVID-19: Reflections from an entomologist who rose to the occasion Annapolis, MD, *AMERICAN ENTOMOLOGIST*, 66(3), 34-51.

### **Dobson:**

### **Intellectual Contributions**

\* = Senior Author ~ = Corresponding Author + = Grad/Prof Student # = Post Doc ^ = Undergraduate WOS = Web of Science JIF = Journal Impact Factor TC = Journal Total Cites  
SNIP = Source Normalize Impact per Paper SJR = Scimago Journal Rank

### **Published**

### **Journal Article, Academic Journal**

Aryaprema, V. S., Qualls, W. A., Dobson, K. L., Dobson, S. L., Xue, R. D. (2022). The effects of boric acid sugar bait on wolbachia trans-infected male aedes albopictus (Zap males®) in laboratory conditions, *Insects*, 13(1). doi: 10.3390/insects13010001

Crawford, J. E., Clarke, D. W., Criswell, V., Desnoyer, M., Cornel, D., Deegan, B., Gong, K., Hopkins, K. C., Howell, P., Hyde, J. S., Livni, J., Behling, C., Benza, R., Chen, W., Dobson, K. L., Eldershaw, C., Greeley, D., Han, Y., Hughes, B., Kakani, E., Karbowski, J., Kitchell, A., Lee, E., Lin, T., Liu, J., Lozano, M., MacDonald, W., Mains, J. W., Metlitz, M., Mitchell, S. N., Moore, D. J., Ohm, J. R., Parkes, K., Porshnikoff, A., Robuck, C., Sheridan, M., Sobecki, R., Smith, P., Stevenson, J., Sullivan, J., Wasson, B., Weakley, A. M., Wilhelm, M., Won, J., Yasunaga, A., Chan, W. C., Holeman, J., Snoad, N., Upson, L., Zha, T., Dobson, S. L., Mulligan, F. S., Massaro, P., White, B. J. (2020). Efficient production of male Wolbachia-infected Aedes aegypti mosquitoes enables large-scale suppression of wild populations, *Nature Biotechnology*, 38(4), 482-492. doi: 10.1038/s41587-020-0471-x

Brelsfoard, C. L., Mains, J. W., Mulligan, S., Cornel, A., Holeman, J., Klueh, S., Leal, A., Hribar, L. J., Morales, H., Posey, T., Dobson, S. L. (2019). Aedes aegypti males as vehicles for insecticide delivery, *Insects*, 10(8). doi: 10.3390/insects10080230

Mains, J. W., Kelly, P. H., Dobson, K. L., Petrie, W. D., Dobson, S. L. (2019). Localized Control of Aedes aegypti (Diptera: Culicidae) in Miami, FL, via Inundative Releases of Wolbachia-Infected Male Mosquitoes, *Journal of Medical Entomology*, 56(5), 1296-1303. doi: 10.1093/jme/tjz051

Suh, E., Mercer, D. R., Dobson, S. L. (2017). Life-shortening Wolbachia infection reduces population growth of Aedes aegypti, *ACTA TROPICA*, 172, 232-239. doi: 10.1016/j.actatropica.2017.05.015

Telschow, A., Grziwotz, F., Crain, P., Miki, T., Mains, J. W., Sugihara, G., Dobson, S. L., Hsieh, C.-h. (2017). Infections of Wolbachia may destabilize mosquito population dynamics, *JOURNAL OF THEORETICAL BIOLOGY*, 428, 98-105. doi: 10.1016/j.jtbi.2017.05.016

Mains, J. W., Brelsfoard, C. L., Rose, R. I., Dobson, S. L. (2016). Female Adult Aedes albopictus Suppression by Wolbachia-Infected Male Mosquitoes, *SCIENTIFIC REPORTS*, 6. doi: 10.1038/srep33846

Suh, E., Fu, Y., Mercer, D. R., Dobson, S. L. (2016). Interaction of Wolbachia and Bloodmeal Type in Artificially Infected Aedes albopictus (Diptera: Culicidae), *JOURNAL OF MEDICAL ENTOMOLOGY*, 53(5), 1156-1162. doi: 10.1093/jme/tjw084

### **Letter, Journal**

Crawford, J. E., Hopkins, K. C., Buchman, A., Zha, T., Howell, P., Kakani, E., Ohm, J. R., Snoad, N., Upson, L., Holeman, J., Massaro, P., Dobson, S. L., Mulligan, F. S., White, B. J. (2022). Reply to: Assessing the efficiency of Verily's automated process for production and release of male Wolbachia-infected mosquitoes, *Nature Biotechnology*. doi: 10.1038/s41587-022-01325-y

Dobson, S. L. (2021). When More is Less: Mosquito Population Suppression Using Sterile, Incompatible and Genetically Modified Male Mosquitoes, *Journal of Medical Entomology*, 58(5), 1980-1986. doi: 10.1093/jme/tjab025



Crawford, J. E., Clarke, D. W., Criswell, V., Desnoyer, M., Cornel, D., Deegan, B., Gong, K., Hopkins, K. C., Howell, P., Hyde, J. S., Livni, J., Behling, C., Benza, R., Chen, W., Dobson, K. L., Eldershaw, C., Greeley, D., Han, Y., Hughes, B., Kakani, E., Karbowski, J., Kitchell, A., Lee, E., Lin, T., Liu, J., Lozano, M., MacDonald, W., Mains, J. W., Metlitz, M., Mitchell, S. N., Moore, D. J., Ohm, J. R., Parkes, K., Porshnikoff, A., Robuck, C., Sheridan, M., Sobecki, R., Smith, P., Stevenson, J., Sullivan, J., Wasson, B., Weakley, A. M., Wilhelm, M., Won, J., Yasunaga, A., Chan, W. C., Holeman, J., Snoad, N., Upson, L., Zha, T., Dobson, S. L., Mulligan, F. S., Massaro, P., White, B. J. (2020). Author Correction: Efficient production of male Wolbachia-infected *Aedes aegypti* mosquitoes enables large-scale suppression of wild populations (*Nature Biotechnology*, (2020), 38, 4, (482-492), 10.1038/s41587-020-0471-x), *Nature Biotechnology*, 38(8), 1000. doi: 10.1038/s41587-020-0649-2

Dobson, S. L., Bordenstein, S. R., Rose, R. I. (2016). Wolbachia mosquito control: Regulated, *SCIENCE*, 352(6285), 526+.

### **Dupuis:**

### **Intellectual Contributions**

\* = Senior Author ~ = Corresponding Author + = Grad/Prof Student # = Post Doc ^ = Undergraduate

WOS = Web of Science JIF = Journal Impact Factor TC = Journal Total Cites SNIP = Source Normalize Impact per Paper SJR = Scimago Journal Rank

### ***Published***

#### **Journal Article, Academic Journal**

Doorenweerd, C., San Jose, M., Geib, S., Dupuis, J. R., Leblanc, L., Barr, N., Fiegalan, E., Morris, K. Y., Rubinoff, D. (2022). A phylogenomic approach to species delimitation in the mango fruit fly (*Bactrocera frauenfeldi*) complex: A new synonym of an important pest species with variable morphotypes (Diptera: Tephritidae). *Systematic Entomology* early view. doi: 10.1111/syen.12559

Author Role: Julian Dupuis assisted with analyses.

+ Devlin, J., Thomas, R.J., Long, S.E., Boardman, P., Dupuis, J. R. (2022). Impact of climate change on the elevational and latitudinal distributions of populations of Tipulidae (Diptera) in Wales, United Kingdom. *Biological Journal of the Linnaen Society*, 137, 30-46. doi: 10.1093/biolinnean/blac079

Author Role: Julian Dupuis supervised lead author, Jack Devlin, as a student in ENT564 Insect Taxonomy; Jack's term project became this paper.

# ~ Vernygora, O. V., Campbell, E. O., Grishin, N. V., Sperling, F. A. H., \* Dupuis, J. R. (2022). Gauging ages of tiger swallowtail butterflies using alternative SNP analyses. *Molecular Phylogenetics and Evolution*, 171, 107465. doi: 10.1016/j.ympev.2022.107465

Author Role: Julian Dupuis supervised the lead author, Oksana Vernygora, as a postdoctoral researcher.

Rubinoff, D., Longcore, T., Dupuis, J. R., \* Osborne, K. H. (2021). Genomic data support the elevation of the federally listed El Segundo blue (*Euphilotes bernardino/battoides allyni*) to species status, *Journal of the Lepidopterist Society*, 75(2), 161-164. doi: 10.18473/lepi.75i2.a10 Author Role: Julian Dupuis conducted analyses and assisted with the manuscript.

Mori, B. A., Coutu, C., Chen, Y. H., Campbell, E. O., Dupuis, J. R., Erlandson, M. A., \* Hegedus, D. D. (2021). De Novo Whole-Genome Assembly of the Swede Midge (*Contarinia nasturtii*), a Specialist of Brassicaceae, Using Linked-Read Sequencing, *Genome Biology and Evolution*, 13(3), evab036. doi: 10.1093/gbe/evab036 Author Role: Julian Dupuis conducted bioinformatic analyses.

# ~ Campbell, E. O., Dupuis, J. R., Holowachuk, J., Hladun, S., Vankosky, M. A., \* Mori, B. A. (2020). Disjunction between canola distribution and the genetic structure of its recently described pest, the canola flower midge (*Contarinia brassicola*), *Ecology and Evolution*, 10(23), 13284-13296. doi: 10.1002/ece3.6927 Author Role: Julian Dupuis conducted preliminary analyses and assisted with final analyses.

~ Dupuis, J. R., Geib, S. M., Schmidt, C., \* Rubinoff, D. (2020). Genomic-wide sequencing reveals remarkable connection between widely disjunct populations of the internationally threatened bog buck moth, *Insect Conservation and Diversity*, 13(5), 495-500. doi: 10.1111/icad.12432 Author Role: Julian Dupuis conducted analyses and wrote the manuscript.

~ Dupuis, J. R., Judge, K. A., Brunet, B. M., Ohlmann Chan, S., \* Sperling, F. A. (2020). Does hunger lead to hybridization in a genus of sexually cannibalistic insects (Orthoptera: Prophalangopsidae)?, *Biological Journal of the Linnean Society*, 131(2), 434-448. doi: 10.1093/biolinnean/blaa094 Author Role: Julian Dupuis conducted genetic data analyses and wrote this manuscript.

~ Dupuis, J. R., \* Sperling, F. A. (2020). Phylogenomic test of mitochondrial clues to archaic ancestors in a group of hybridizing swallowtail butterflies, *Molecular Phylogenetics and Evolution*, 152, 106921. doi: 10.1016/j.ympev.2020.106921 Author Role: Julian Dupuis conducted all analysis and wrote the manuscript.

+ ~ MacDonald, Z. G., Dupuis, J. R., Davis, C. S., Acorn, J. H., Nielsen, S. E., Sperling, F. A.H. (2020). Gene flow and climate-associated genetic variation in a vagile habitat specialist, *Molecular Ecology*. doi: 10.1111/mec.15604 Author Role: Julian Dupuis mentored the first author and assisted with data analysis and writing.

~ Rubinoff, D., + Reil, J. B., Osborne, K. H., Gregory, C. J., Geib, S. M., \* Dupuis, J. R. (2020). Phylogenomics reveals conservation challenges and opportunities for cryptic endangered species in a rapidly disappearing desert ecosystem, *Biodiversity and Conservation*, 29(7), 2185-2200. doi: 10.1007/s10531-020-01968-w Author Role: Julian Dupuis mentored Bradley Reil on data analysis and helped write the manuscript.

- ~ Dupuis, J. R., Geib, S. M., Osborne, K. H., \* Rubinoff, D. (2020). Genomics confirms surprising ecological divergence and isolation in an endangered butterfly, *Biodiversity and Conservation*, 29(6), 1897-1921. doi: 10.1007/s10531-020-01950-6 Author Role: Julian Dupuis conducted analyses and wrote the manuscript.
- ~ Koch, J. B., Dupuis, J. R., ^ Jardeleza, M. K., ^ Ouedraogo, N., Geib, S. M., Follett, P. A., \* Price, D. K. (2020). Population genomic and phenotype diversity of invasive *Drosophila suzukii* in Hawai'i, *Biological Invasions*, 22(5), 1753-1770. doi: 10.1007/s10530-020-02217-5 Author Role: Julian Dupuis conducted analyses and helped to write the manuscript.
- ~ Cullingham, C. I., Miller, J. M., Peery, R. M., Dupuis, J. R., Malenfant, R. M., Gorrell, J. C., \* Janes, J. K. (2020). Confidently identifying the correct K value using the ?K method: When does K = 2?, *Molecular Ecology*, 29(5), 862-869. doi: 10.1111/mec.15374 Author Role: Julian Dupuis helped with data collection (meta-analysis), analysis, and manuscript editing.
- ~ Dupuis, J. R., Pillon, Y., + Sakishima, T., Gemmill, C. E.C., Chamala, S., Barbazuk, W. Brad, Geib, S. M., \* Stacy, E. A. (2019). Targeted amplicon sequencing of 40 nuclear genes supports a single introduction and rapid radiation of Hawaiian *Metrosideros* (Myrtaceae), *Plant Systematics and Evolution*. doi: <https://doi.org/10.1007/s00606-019-01615-0> Author Role: Julian Dupuis conducted analyses and wrote the manuscript.
- ~ Dupuis, J. R., Ruiz-Arce, R., Barr, N. B., Thomas, D. B., \* Geib, S. M. (2019). Range-wide population genomics of the Mexican fruit fly: towards development of pathway analysis tools. *Evolutionary Applications*, 12, 1641-1660. doi:10.1111/eva.12824 Author Role: Julian Dupuis conducted analyses and wrote the manuscript.
- ~ Dupuis, J. R., Cullingham, C. I., Nielsen, S. E., \* Sperling, F. A. H. (2019). Environmental effects on gene flow in a species complex of vagile, hilltopping butterflies. *Biological Journal of the Linnean Society* 127, 417-428. doi:10.1093/biolinnean/blz043 Author Role: Julian Dupuis conducted analyses and wrote the manuscript.
- Mori, B. A., Andreassen, L., Heal, J. D., Dupuis, J. R., Soroka, J., \* Sinclair, B. J. (2019). A new species of *Contarinia Rondani* (Diptera: Cecidomyiidae) that induces flower galls on canola in the Canadian Prairies. *The Canadian Entomologist*, 151, 131-148. doi:10.4039/tce.2018.63 Author Role: Julian Dupuis assisted with analyses.
- ~ Dupuis, J. R., Peigler, R. S., Geib, S. M., \* Rubinoff, D. (2018). Phylogenomics supports incongruence between ecological specialization and taxonomy in a charismatic clade of buck moths. *Molecular Ecology*, 27, 4417-4429. doi:10.1111/mec.14883 Author Role: Julian Dupuis conducted analyses and wrote the manuscript. ~ Dupuis, J. R. and Oliver, J. C., Brunet, B. M. T., Longcore, T., Johnson, J., \* Sperling, F. A. H. (2018). Genomic data indicate ubiquitous evolutionary distinctiveness among populations of California metalmark butterflies. *Conservation Genetics*, 19, 1097-1108. doi:10.1007/s10592-018-1081-8 Author Role: Julian Dupuis conducted analyses and wrote the manuscript.
- Campbell, E. O., Brunet, B. M. T., Dupuis, J. R., \* Sperling, F. A. H. (2018). Would an RRS by any other name sound as RAD? *Methods in Ecology and Evolution*, 9, 1920-1927. doi:10.1111/2041-210X.13038 Author Role: Julian Dupuis assisted with analyses.

~ Dupuis, J. R., Guerrero, F. D., Skoda, S. R., Phillips, P. L., Welch, J. B., Schlater, J. L., Azeredo-Espin, A. M., Pérez de León, A. A., \* Geib, S. M. (2018). Molecular characterization of the 2016 New World screwworm fly outbreak in the Florida Keys. *Journal of Medical Entomology*, 55, 938-946. doi:10.1093/jme/tjy078 Author Role: Julian Dupuis conducted analyses and wrote the manuscript.

~ Dupuis, J. R., Bremer, F. T., Kauwe, A., San Jose, M., Leblanc, L., Rubinoff, D., \* Geib, S. M. (2018). HiMAP: robust phylogenomics from highly multiplexed amplicon sequencing. *Molecular Ecology Resources*, 18, 1000-1019. doi:10.1111/1755-0998.12783 Author Role: Julian Dupuis conducted analyses and wrote the manuscript.

Condamine, F. L., Nabholz, B., Clamens, A. L., Dupuis, J. R., \* Sperling, F. A. H. (2018). Mitochondrial phylogenomics, the origin of swallowtail butterflies, and the impact of the number of clocks in Bayesian molecular dating. *Systematic Entomology*, 43, 460-480. doi:10.1111/syen.12284 Author Role: Julian Dupuis assisted with analyses.

~ Dupuis, J. R., McDonald, C. M., \* Sperling, F. A. H. (2018). Genomics-informed species delimitation to support morphological identification of anglewing butterflies (Lepidoptera: Nymphalidae). *Zoological Journal of the Linnean Society*, 183, 372-389. doi:10.1093/zoolinnean/zlx081 Author Role: Julian Dupuis conducted analyses and wrote the manuscript.

~ Dupuis, J. R., Sim, S. B., San Jose, M., Leblanc, L., Hoassain, M. A., Rubinoff, D., \* Geib, S. M. (2018). Population genomics and comparisons of selective signatures in two invasions of melon fly, *Bactrocera cucurbitae* (Diptera: Tephritidae). *Biological Invasions*, 20, 1211-1228. doi:10.1007/s10530-017-1621-z Author Role: Julian Dupuis conducted analyses and wrote the manuscript.

~ Dupuis, J. R., Bremer, F. T., Jombart, T., Sim, S. B., \* Geib, S. M. (2018). mvMapper: statistical and geographical data exploration and visualization of multivariate analyses of population structure. *Molecular Ecology Resources*, 18, 362-367. doi:10.1111/1755-0998.12724 Author Role: Julian Dupuis conducted analyses and wrote the manuscript.

Owens, H. L., Lewis, D. S., Dupuis, J. R., Clamens, A. L., Sperling, F. A. H., Kawahara, A. Y., Guralnick, R., \* Condamine, F. L. (2017). The latitudinal diversity gradient in New World swallowtail butterflies is caused by contrasting patterns of out-of- and into-the-tropics dispersal. *Global Ecology and Biogeography*, 26, 1447-1458. doi:10.1111/geb.12672

Author Role: Julian Dupuis generated data and assisted with analyses.

Campbell, E. O., Davis, C. S., Dupuis, J. R., Muirhead, K., \* Sperling, F. A. H. (2017). Cross-platform compatibility of de novo SNPs in a non-model butterfly genus. *Molecular Ecology Resources*, 17, e84-e93. doi:10.1111/1755-0998.12695 Author Role: Julian Dupuis assisted with analyses.

Janes, J. K., Miller, J. M., Dupuis, J. R., Malenfant, R. M., Gorrell, J. C., Cullingham, C. I., \* Andrew, R. L. (2017). The K=2 conundrum. *Molecular Ecology*, 26, 3594-3602. doi: 10.1111/mec.14187 Author Role: Julian Dupuis generated data and assisted with analyses.

Roe, A. D. R., Dupuis, J. R., \* Sperling, F. A. H. (2017). Molecular dimensions of insect taxonomy in the genomics era. In Footitt RG, Adler PH eds. *Insect Biodiversity: Science and Society* 2nd Edition. Wiley Blackwell Publishing. doi:10.1002/9781118945568.ch16 Author Role: Julian Dupuis co-wrote the manuscript.

~ Dupuis, J. R., Brunet, B. M., Bird, H. M., Lumley, L. M., Fagua, G., Boyle, B., Levesque, R., Cusson, M., Powell, J. A., \* Sperling, F. A. H. (2017). Genome-wide SNPs resolve phylogenetic relationships in the North American spruce budworm (*Choristoneura fumiferana*) species complex. *Molecular Phylogenetics and Evolution*, 111, 158-168. doi:10.1016/j.ympev.2017.04.001

Author Role: Julian Dupuis conducted analyses and wrote the manuscript.

~ Dupuis, J. R., \* Sperling, F. A. H. (2016). Speciation, hybridization, and conservation quandaries: what are we protecting anyway? *News of the Lepidopterists Society*, 58, 202-204. Author Role: Julian Dupuis conducted analyses and wrote the manuscript.

~ Dupuis, J. R., \* Sperling, F. A. H. (2016). Hybrid dynamics in a species group of swallowtail butterflies. *Journal of Evolutionary Biology*, 29, 1932-1951. doi:10.1111/jeb.12931 Author Role: Julian Dupuis conducted analyses and wrote the manuscript.

~ Dupuis, J. R., Mori, B. A., \* Sperling, F. A. H. (2016). Trogus parasitoids of *Papilio* butterflies undergo extended diapause in western Canada (Hymenoptera, Ichneumonidae). *Journal of Hymenoptera Research*, 50, 179-190. doi:10.3897/JHR.50.9158 Author Role: Julian Dupuis conducted analyses and wrote the manuscript.

## **Fox:**

### **Intellectual Contributions**

\* = Senior Author ~ = Corresponding Author + = Grad/Prof Student # = Post Doc ^ = Undergraduate WOS = Web of Science JIF = Journal Impact Factor TC = Journal Total Cites  
SNIP = Source Normalize Impact per Paper SJR = Scimago Journal Rank

### ***Published***

### **Blog**

Fox, C. W. (2020). The representation of women as authors of submissions to ecology journals during the COVID-19 pandemic, *Functional Ecologist (Official Blog of Functional Ecology)*  
<https://functionalecologists.com/2020/05/29/the-representation-of-women-as-authors-of-submissions-to-ecology-journals-during-the-covid-19-pandemic/>.

Lowenberg, D., Fox, C. W. (2019). Building on our successes: Past and present., *Dryad News and Views* (<https://blog.data-dryad.org/2019/09/26/building-on-our-successes/>).

Fox, C. W. (2019). Single vs double-blind peer review: An experiment, *Functional Ecologist (Official Blog of Functional Ecology)* ([functionalecologists.com/2019/09/02/2295/](https://functionalecologists.com/2019/09/02/2295/)).

### **Book, Chapter in Scholarly Book-New**

Carroll, S. P., Dingle, H., Famula, T. R., Fox, C. W. (2001). Genetic architecture of adaptive differentiation in evolving host races of the soapberry bug, *Jadera haematoloma* *Microevolution Rate, Pattern, Process, Springer, Dordrecht*, 257--272.

### Invited Editorial

~ Fox, C. W., Knapp, A., Ferry, L. A., Rezende, E. L., Aime, E., Meyer, J. (2019). Double-blind peer review – an experiment, *Functional Ecology*, 33(1), 4-6. doi: 10.1111/1365-2435.13269

Fox, C. W. (2018). Towards a mechanistic understanding of global change ecology, *Functional Ecology*, 32, 1648-1651. doi: 10.1111/1365-2435.13182

Fox, C. W., Thompson, K., Irschick, D. J., Knapp, A. K., White, C. R., Aime, E., Meyer, J. A. (2017). 30 Years of Functional Ecology, *Functional Ecology*, 31, 4-6. doi: 10.1111/1365-2435.12811

### Journal Article, Academic Journal

~ Fox, C. W., Duffy, M. A., Fairbairn, D. J., Meyer, J. A. (2019). Gender diversity of editorial boards and gender differences in the peer review process at six journals of ecology and evolution, *Ecology and Evolution*, 9(24), 13636-13649. doi: 10.1002/ece3.5794

Author Role: CWF and JAM collected the data, CWF analyzed the data, CWF and MAD wrote the manuscript, and JAM and DJF commented on the manuscript.

~ Fox, C. W., Paine, C.E. Timothy (2019). Gender differences in peer review outcomes and manuscript impact at six journals of ecology and evolution, *Ecology and Evolution*, 9(6), 3599-3619. doi: 10.1002/ece3.4993 Author Role: CWF collected and analyzed the data for the sections of the manuscript examining papers submitted to *Evolution* and the five journals of *British Ecological Society*. CETP collected and analyzed the data for the author survey and manuscript citations. Both CWF and CETP wrote the manuscript.

O'Neill, E. M., Beard, K. H., Fox, C. W. (2018). Body size and life history traits in native and introduced populations of coqui frogs, *Copeia*, 106, 161-170. doi: 10.1643/CE-17-642

Fox, C. W., Messina, F. J. (2018). Evolution of larval competitiveness and associated life-history traits in response to host shifts in a seed beetle, *Journal of Evolutionary Biology*, 31, 302-313.

Schafer, M. A., Berger, D., Rohner, P. T., Kjaersgaard, A., Bauerfeind, S. S., Guillaume, F., Fox, C. W., Blanckenhorn, W. U. (2018). Geographic clines in wing morphology relate to colonization history in New World but not Old World populations of yellow dung flies, *Evolution*, 72, 1629–1644. doi: 10.1111/evo.13517

Blanckenhorn, W. U., Bauerfeind, S. S., Berger, D., Davidowitz, G., Fox, C. W., Guillaume, Frederic, Nakamura, S., Nishimura, K., Sasaki, H., Stillwell, R. C., others (2018). Life history traits, but not body size, vary systematically along latitudinal gradients on three continents in the widespread yellow dung fly, *Ecography*.

Fox, C. W., + Ritchey, J., Paine, T. (2018). Patterns of authorship in ecology and evolution: First, last and corresponding authorship vary with gender and geography, *Ecology and Evolution*. doi:10.1002/ece3.4584

Bauerfeind, S. S., Schafer, Martin A, Berger, D., Blanckenhorn, W. U., \* Fox, C. W. (2018). Replicated latitudinal clines in reproductive traits of European and North American yellow dung flies, *Oikos*,127(11), 1619-1632.

Fox, C. W., Paine, T. (2018). The effectiveness of journals as arbiters of scientific impact, *Ecology and Evolution*, 8, 9566-9585. doi: 10.1002/ece3.4467

Fox, C. W., Zitomer, R., Deas, J. B., Messina, F. J. (2017). Asymmetric evolution of egg laying behavior following reciprocal host shifts by a seed-feeding beetle, *Evolutionary Ecology*, 31, 753-767. doi: 10.1007/s10682-017-9910-7

Fox, C. W. (2017). Difficulty of recruiting reviewers predicts review scores and editorial decisions at six journals of ecology and evolution, *Scientometrics*, 113, 465-477. doi: 10.1007/s11192-017-2489-5

Kebe, K., Alvarez, N., Tuda, M., Arnqvist, G., Fox, C. W., Sembene, M., Espindola, A. (2017). Global phylogeography of the insect pest *Callosobruchus maculatus* (Coleoptera: Bruchinae) relates to the history of its main host, *Vigna unguiculata*, *Journal of Biogeography*, 44, 2515-2526. doi: 10.1111/jbi.13052

Fox, C. W., Albert, A. Y., Vines, T. H. (2017). Recruitment of reviewers is becoming harder at some journals: a test of the influence of reviewer fatigue at six journals in ecology and evolution, *Research Integrity and Peer Review*, 2, 3 (1-6).

Fox, C. W., Burns, C., Muncy, A., Meyer, J. (2017). Author-suggested reviewers: Gender differences and influences on the peer review process at an ecology journal, *Functional Ecology*, 31, 270-280. doi: 10.1111/1365-2435.12665

Burns, C., Fox, C. W. (2017). Language and socioeconomics predict geographic variation in peer review outcomes at an ecology journal, *Scientometrics*, 113, 1113-1127. doi: 10.1007/s11192-017-2517-5

Fox, C. W., Paine, C. E. Timothy, Sauterey, B. (2016). Citations increase with manuscript length, author number, and references cited in ecology journals, *Ecology and Evolution*, 6, 7717-7726. doi: 10.1002/ece3.2505

\* Fox, C. W., Burns, C., Muncy, A. D., Meyer, J. A. (2016). Gender differences in patterns of authorship do not affect peer review outcomes at an ecology journal, *Functional Ecology*, 30, 126-139. doi: 10.1111/1365-2435.12587

Fox, C. W., Burns, C., Meyer, J. A. (2016). Editor and reviewer gender influence the peer review process at an ecology journal, *Functional Ecology*, 30, 140-153. doi: 10.1111/1365-2435.12529

### **Magazine/Trade Publication**

Fox, C. W. (2019). BES-sponsored research - understanding peer review to make it better., *The Niche*, December 2019, 36-37.

Aime, E., Fox, C. W. (2019). Functional Ecology double-blind peer review trial, *The Niche*, September 2019, 9.

Fox, C. W. (2018). Is it getting harder to find reviewers?, *The Niche*, 49(4), 16.

### **Editorial, Journal**

Fox, C. W., Meyer, J. (2021). The influence of the global COVID-19 pandemic on manuscript submissions and editor and reviewer performance at six ecology journals, *Functional Ecology*, 35(1), 4-10. doi: 10.1111/1365-2435.13734

Fox, C. W., Mousseau, T. A. (2020). The Year in Evolutionary Biology 2020, *Annals of the New York Academy of Sciences*, 1476, 1-92.

Fox, C. W., Mousseau, T. A. (2018). The Year in Evolutionary Biology 2018, *Annals of the New York Academy of Sciences*, 1422, 1-103.

Fox, C. W., Mousseau, T. A. (2017). The Year in Evolutionary Biology 2017, *Annals of the New York Academy of Sciences*, 1389, 1-212.

### **Published Comment**

Whitlock, M. C., Bronstein, J. L., Bruna, E. M., Ellison, A. M., Fox, C. W., McPeck, M. A., Moore, A. J., Noor, Mohamed A. F., Rausher, M. D., Rieseberg, L. H., Ritchie, M. G., Shaw, R. G. (2016). A Balanced Data Archiving Policy for Long-Term Studies, *Trends in Ecology and Evolution*, 31, 84-85. doi: 10.1016/j.tree.2015.12.001

### **Web Based Publication**

Fox, C. W. (2020). The representation of women as authors of submissions to ecology journals during the COVID-19 pandemic, *bioRxiv*. doi: 10.1101/2020.05.29.123455

### **Haan:**

### **Intellectual Contributions**

#### ***Published***

#### **Journal Article, Academic Journal**

~ = Haan as corresponding author

~Haan, N.L., Iuliano, B., Gratton, C., Landis, D.A. (2021). Designing agricultural landscapes for biodiversity services in North America. *Advances in Ecological Research* 64, 191-250. Author Role: Equal author contributions. Dr. Haan wrote ~1/3 of manuscript and led review/editing.



Bloom, E.H., Graham, K., Haan, N.L., Heck, A., Gut, L., Landis, D.A., Wilson, J., Zhang, Y., Milbrath, M., Szendrei, Z., Isaacs, R. (2021). Responding to the US National Pollinator Plan: a case study in Michigan. *Frontiers in Ecology and the Environment*. Doi: 10.1002/fee.2430 Author Role: Dr. Haan wrote a section of the article and contributed to edits.

Alred, B., Landis, D.A., Haan, N.L., Szűcs, M. (2021). Does the presence of the biological control agent, *Hypena opulenta* (Lepidoptera: Erebididae) on swallow-worts deter monarch oviposition? *Environmental Entomology*. Doi:10.1093/ee/nvab121  
Author Role: Dr. Haan contributed to study design, advised lead author on analysis, and edited the manuscript.

~Haan, N.L., Bowers, M.D., Bakker, J.D., (2021). Preference, performance, and chemical defense in an endangered butterfly using novel and ancestral host plants. *Scientific Reports* 11. doi: 10.1038/s41598-020-80413-y  
Author Role: Dr. Haan designed study, collected data, performed analyses, and wrote the manuscript.

Zhang, Y., Haan, N.L., Landis, D.A. (2020). Landscape composition and configuration have scaledependent effects on pest suppression services in agricultural landscapes. *Agriculture, Ecosystems and Environment* 302, 107085.  
Author Role: Dr. Haan contributed to design of study, statistical analysis, and assisted with writing/editing.

Myers, A.T., Haan, N.L., Landis, D.A. (2020). Video surveillance reveals a diverse and largely nocturnal community of *Danaus plexippus* (L.) egg predators. *Journal of Insect Conservation* 24, 731-737. Author Role: Dr. Haan assisted with analysis, writing, and editing.

~Haan, N.L., Landis, D.A. (2020). Effects of grassland disturbance on first-instar monarch butterfly survival, floral resources, and flower-visiting insects. *Biological Conservation* 243, 108492.  
Author Role: Dr. Haan designed study, collected data, conducted analyses, and wrote the manuscript.

~Haan, N.L., Zhang, Y. Landis, D.A. (2020). Predicting landscape configuration effects on agricultural pest suppression. *Trends in Ecology and Evolution*. doi: 10.1016/j.tree.2019.10.003  
Author Role: Dr. Haan conducted review of literature and wrote the manuscript.

Hermann, S.L., Blackledge, C., Haan, N.L., Myers, A.T., Landis, D.A. (2019). Predators of monarch butterfly eggs and neonate larvae are more diverse than previously recognized. *Scientific Reports* 9, 14304. doi: 10.1038/s41598-019-50737-5. Author Role: Dr. Haan performed ~1/3 of data collection and contributed to writing.

~Haan, N.L., Landis, D.A. (2019). The importance of shifting disturbance regimes in monarch butterfly decline and recovery. *Frontiers in Ecology and Evolution*. doi: 10.3389/fevo.2019.00191. Author Role: Dr. Haan wrote the manuscript.

~Haan, N.L., Landis, D.A. (2019). Grassland disturbance increases monarch butterfly oviposition and decreases arthropod predator abundance. *Biological Conservation* 233: 185-192. Author Role: Dr. Haan collected data, conducted analyses, and wrote the manuscript.

~Haan, N.L., Bakker, J.D., Dunwiddie, P.W., Linders, M.J. (2018). Instar-specific effects of host plants on larvae of an endangered butterfly. *Ecological Entomology* 43: 724-753. Author Role: Dr. Haan designed study, collected data, conducted analyses, and wrote the manuscript.

~Haan, N.L., Bakker, J.D., Bowers, M.D. (2017). Hemiparasites can transmit indirect effects from their host plants to herbivores. *Ecology* 99: 399-410. Author Role: Dr. Haan designed study, collected data, conducted analyses, and wrote the manuscript.

Dunwiddie, P.W., Haan, N.L., Linders, M.J., Bakker, J.D., Fimbel, C., Thomas, T.J. (2016). Intertwined fates: opportunities and challenges in the linked recovery of two rare species. *Natural Areas Journal* 36: 207-215. Author Role: Dr. Haan wrote sections of the manuscript.

## **Gonthier:**

### **Peer-reviewed publications**

#### Legend for peer-reviewed publications at the University of Kentucky:

+ Graduate or undergraduate student mentored by D.G.

\$ Research technician directed by D.G.

\* Corresponding author

‡ This work is supported by National Institute of Food and Agriculture, U.S. Department of Agriculture, Hatch Program, titled: "The impact of local and landscape farmland diversification on the services and dis-services of biodiversity" under UK008079.

#### D.G. contributions as co-author:

1 = technical expertise/methodology developed/oversaw research conducted

2 = provided experimental concept and design

3 = topical expertise provided, manuscript edited

4 = provided datasets for meta-analysis

5 = provided funding for study

6 = member of the first author's graduate committee

Journal rankings, **IF** = Journal Impact factor, **JCI** = Journal Citation Indicator, **TC** = Journal total citations, article citation number are all based on Web of Science

### **Peer-reviewed book chapters 2021**

**+Kuesel, R.\*, Gonthier, D.J.<sup>1,3,5</sup>** On the efficacy of protection netting for control of spotted-winged Drosophila. Edited by Garcia, Flavio Roberto Mello. **2021**. In *Drosophila suzukii* Management. Springer International Publishing, Cham., doi 10.1007/978-3-030-62692-1. Book chapter has no citations to date.  
Peer-reviewed journal article 2022

Olimpi, E.M.\*, Daly, H., +Garcia, K., Glynn, V.M., Gonthier, D.J.<sup>1,2,3</sup>, Kremen, C., M'Gonigle, L.K. and Karp, D.S., 2022. Interactive effects of multiscale diversification practices on farmland bird stress. *Conservation Biology*: In Press. Rank among Biodiversity Conservation journals 3/60, IF = 6.6, JCI = 1.6, TC = 25,286, Article has no citations to date.

Olimpi, E.M.\* , +Garcia, K., Gonthier, D.J.<sup>1,2,3</sup>, Kremen, C., Snyder, W.E., Wilson-Rankin, E.E. and Karp, D.S. 2022. Semi-natural habitat surrounding farms promotes multifunctionality in avian ecosystem services. *Journal of Applied Ecology*, 59(4), pp.898-908. Rank among Biodiversity Conservation Journals 4/60, Rank among Ecology Journals 14/166, IF = 6.5, JCI = 1.7, TC = 25,441, Article has no citations to date. ‡

Smith, O.M.\* , Olimpi, E.M., Navarro-Gonzalez, N., Cornell, K.A., Frishkoff, L.O., Northfield, T.D., Bowles, T.M., Edworthy, M., Eilers, J., Fu, Z., +Garcia, K., Gonthier, D.J.<sup>3,4</sup>, Jones, S., Kennedy, C.M., Latimer, C.E., Owen, J.P., Sato, C., Taylor, J.M., Wilson-Rankin, E.E., Snyder, W.E., and Karp, D.S. 2022. A trait-based framework for predicting foodborne pathogen risk from wild birds. **Ecological Applications**, 32(2), p.e2523. Rank among Ecology journals 31/166, IF = 4.7, JCI = 1.2, TC = 24,246, Article citations to date =3.

Lu, A.\* , Gonthier, D.J.<sup>1,2,3</sup>, Sciligo, A.R., +Garcia, K., Chiba, T., Juárez, G. and Kremen, C. 2022. Changes in arthropod communities mediate the effects of landscape composition and farm management on pest control ecosystem services in organically managed strawberry crops. **Journal of Applied Ecology**, 59(2), pp.585-597. Rank among Biodiversity Conservation Journals 4/60, Rank among Ecology Journals 14/166, IF = 6.5, JCI = 1.7, TC = 25,441, Article has no citations to date.

## 2021

Morales, H.\* , Armbrecht, I., Gonthier, D.<sup>1,3</sup>, and Wyckhuys, K.A. 2021. Editorial: Moving from a curative to preventative pest management paradigm. **Frontiers in Sustainable Food Systems** 3, 102. Rank among Food Science & technology Journals = 53/163, IF = NA (New journal cannot be calculated), JCI = 0.8, TC = 1,013, Article has no citations to date.

## 2020

+Brockman, R.\* , +Kuesel, R., +Archer, K., +O'Hearn, K., Wilson, N., \$Scott, D., Williams, M., Bessin, R., Gonthier, D.J.<sup>1,2,3,5</sup>. 2020. The impact of plant essential oils and fine mesh row covers on flea beetle (Chrysomelidae) management in Brassicaceous greens production. **Insects** 11:714. Rank among Entomology journals 18/102, IF = 2.8, JCI = 1.1, TC = 3,936, Article has no citations to date. ‡

Potts, L.J.\* , Gantz, J.D., Kawarasaki, Y., Philip, B.N., Gonthier, D.J.<sup>3,6</sup>, Law, A.D., Moe, L., Unrine, J.M., McCulley, R.L., Lee, R.L., Denlinger, D.L., Teets, N.M. 2020. Environmental factors influencing fine-scale distribution of Antarctica's only endemic insect. **Oecologia** 194(4): 529-539. Rank among Ecology journals 59/166, IF = 3.2, JCI = 0.9, TC = 37,835, Article citations to date = 4.

+Garcia, K.\* , Olimpi, E., Karp, D., Gonthier, D.J.<sup>1,3</sup>. 2020. The good, the bad, and the risky: Can birds be incorporated as biological control agents into integrated pest management programs? **Journal of Integrated Pest Management** 11(1):11. 529-539. Rank among Entomology journals 17/102, IF = 2.9, JCI = 1.2, TC = 837, Article citations to date = 11.

‡

Olimpi, E.M.\* , +Garcia, K., Gonthier, D.J.<sup>1,2,3</sup>, De Master, K., Echeverri, A., Kremen, C., Sciligo, A., Snyder, W., Wilson-Rankin, E., Karp, D.S. 2020. Shifts in species interactions and farming contexts mediate net effects of birds in California strawberry systems. **Ecological Applications** 30(5):e02115. Rank among Ecology journals 31/166, IF = 4.7, JCI = 1.2, TC = 24,246, Article citations to date = 16. ‡

## 2019

+Kuesel, R.\* , \$Scott Hicks, D., +Archer, K., Sciligo, A., Bessin, R., \* Gonthier, D. J<sup>1,2,3,5</sup>. 2019. Effects of fine-mesh exclusion netting on pests of blackberry. **Insects** 10(8):249. Rank among Entomology journals 18/102, IF = 2.8, JCI = 1.1, TC = 3,936, Article citations to date = 7. ‡

Olimpi, E.M.\* , Baur, P., Echeverri, A., Gonthier, D.J.<sup>1,2,3</sup>, Karp, D., Kremen, C., Sciligo, A., De Master, K.

**2019.** Evolving food safety pressures in California's Central Coast region. **Frontiers in Sustainable Food Systems** 3, 102. Rank among Food Science & technology Journals = 53/163, IF = NA (New journal cannot be calculated), JCI = 0.8, TC = 1,013, Article citations to date = 15. ‡

Vandermeer, J.\* , Armbrecht, I., de la Mora, A., Ennis, K., **Gonthier, D.J.**<sup>3</sup>, Hajian-Forooshani, Z., Hsieh, H.-Y., Iverson, A., Jackson, D., Jha, S., Jimenez-Soto, E., Lopez-Bautista, G., Larsen, A., Li, K., Liere, H., MacDonald, A., Marin, L., Mathis, K., Monagan, I., Morris, J., Ong, T., Pardee, G., Saraeny Rivera, I., Williams-Guillen, K., Yitbarek, S., Uno, S., Zemenick, A., Philpott, S., Perfecto, I. **2019.** The community ecology of herbivore regulation in an agroecosystem: lessons from complex systems, **Bioscience** 69:974-996. Rank among Biology Journals 4/93, IF = 8.6, JCI = 2.3, TC = 22,562, Article citations to date = 11.

Iverson, A.\* , **Gonthier, D.J.**<sup>1,2,3</sup>, Pak, D., Ennis, K., Burnham, R., Perfecto, I., Ramos Rodriguez, M. **2019.** A multifunctional approach for achieving simultaneous biodiversity conservation and farmer livelihood in coffee agroecosystems, **Biological Conservation** 238:108179. Rank among Biodiversity Conservation Journals = 6/60, Rank among Ecology Journals 19/166, IF = 6.0, JCI = 1.4, TC = 39,676, Article citations to date = 10.

**Gonthier, D.J.**<sup>\*1,2,3</sup>, Sciligo, A., Karp, D., Lu, A., + Garcia, K., Chiba, T., Juarez, G., Gennet, S., Kremen, C. **2019.** Bird services and disservices to strawberry farming in Californian agricultural landscapes. **Journal of Applied Ecology** 56: 1948-1959. Rank among Ecology Journals 14/166, IF = 6.5, JCI = 1.7, TC = 25,441, Article citations to date = 14. ‡

## 2018

Karp, D. S\* ,...**Gonthier, D.J.**<sup>3,4</sup> (Author 58)...(of 153 authors) **2018.** Crop pests and predators exhibit inconsistent responses to surrounding landscape composition. **Proceedings of the National Academy of Sciences** 115 (33): E7863-E7870. Rank among multidisciplinary sciences Journals 3/48, IF = 10.7, JCI = NA, TC = 315,820, Article citations to date = 247.

Hajian-Forooshani, Z., +**Kuesel, R., Gonthier, D. J.**<sup>\*1,2,3</sup> **2018.** Explaining the distribution of *Rhabdopterus jansonii* in coffee plantations: insights from diet breadth and preference. **Agroforestry Systems** 92(3):731-739. Rank among agronomy journals 27/91, IF = 2.6, JCI = 1.0, TC = 5,409, Article citations to date = 1.

## 2017

Ward, R.\* , **Gonthier, D.J.**<sup>1,3</sup>, Nicholls, C. **2017.** Ecological resilience to coffee rust: Varietal adaptations of coffee farmers in Copán, Honduras, (9-10 ed., vol. 41, pp. 1081-1098) **Agroecology and Sustainable Food Systems** 41: 1081-1098. Rank among Multidisciplinary Agriculture Journals 10/57, IF = 3.0, JCI = 0.7, TC = 1,149, Article citations to date = 11.

## Publications prior to U.K

Summary: 20 total publications, with 617 total citations, mean IF = 4.0, mean JCI = 1.1.

+**Fisher, K.\* , Gonthier, D.J.**<sup>1,2,3</sup>, Ennis, K.K., Perfecto, I. **2017.** Floral resource availability from groundcover promotes bee abundance in coffee agroecosystems. **Ecological Applications** 27: 1715-1826. Rank among Ecology journals 31/166, IF = 4.7, JCI = 1.2, TC = 24,246, Article citations to date = 12.

+**Vaidya, C.\* , +Cruz, M., +Kuesel, R., Gonthier, D.J.**<sup>1,2,3,5</sup>, Iverson, A., Ennis, K.K., Perfecto, I. **2017.** Local and landscape constraints on coffee leafhopper (Hemiptera: cicadellidae) diversity. **Journal of Insect Science** 17(2), 38. Rank among Entomology journals 40/102, IF = 1.9, JCI = 0.8, TC = 3,808, Article citations to date = 3.

+**Hajian-Forooshani, Z.\* , +Kuesel, R.\*\* , Gonthier, D.J.**<sup>1,2,3,5</sup> **2016.** Explaining the distribution of

*Rhabdopterus jansoni* in coffee plantations: insights from diet breadth and preference. **Agroforestry Systems**, 1-8. Rank among Agronomy journals 27/91, IF = 2.6, JCI = 1.0, TC = 5,409, Article citations to date = 1.

Maas, B\*, Karp, D, Bumrungsri, S., Darras, K., **Gonthier, D.**<sup>1,3</sup>, Huang, C., Lindell, C., Maine, J., Mestre, L., Michel, N., Morrison, E., Perfecto, I., Philpott, S., Sekercioglu, C., Silva, R.M., Taylor, P., Tscharrntke, T., Van Bael, S., Whelan, C.J., Williams-Guillén, K. **2016**. Bird and bat predation services in tropical forests and agroforestry landscapes. **Biological Reviews** 91: 1081-1101. Rank among Biology journals 1/93, IF = 12.8, JCI = 2.9, TC = 17,047, Article citations to date = 112.

Pak, D.\*, Iverson, A., Ennis, K.K., **Gonthier, D.**<sup>1,2,3,5</sup>, Vandermeer, J.H. **2015**. Parasitoid wasps benefit from shade tree structure and landscape complexity in Mexican coffee agroecosystems. **Agriculture, Ecosystems & Environment** 206: 21-32. Rank among Multidisciplinary Agriculture journals 1/57, IF = 5.6, JCI = 1.6, TC = 30.607, Article citations to date = 14.

**+Hajian-Forooshani, Z.\***, **Gonthier, D.J.**<sup>1,2,3,5</sup>, Marin, L., Iverson, A., Perfecto, I. **2014**. Local and landscape factors explain the biodiversity of arboreal spiders in coffee agroecosystems. **PeerJ** 2:e623. Rank among Multidisciplinary Sciences journals 27/72, IF = 3.0, JCI = 0.5, TC = 29,907, Article citations to date = 7.

Iverson, A.\*, Marin, L., Ennis, K., **Gonthier, D.**<sup>1,2,3</sup>, Remfert, J., Conner-Barrie, B., Cardinale, B.J., Perfecto, I. **2014**. Do polycultures promote win-wins or tradeoffs in agricultural ecosystem services? A meta-analysis. **Journal of Applied Ecology** 51:1593-1602. Rank among Ecology Journals 14/166, IF = 6.5, JCI = 1.7, TC = 25,441, Article citations to date = 108.

**Gonthier, D.J.**<sup>1,2,3,5\*</sup>, Ennis, K.K., Iverson, A., Hsieh, H., Farinas, S., Batary, P., Rudolphi, J., Tscharrntke, T., Cardinale, B.J., Perfecto, I. **2014**. Biodiversity conservation in agriculture requires a multi-scale approach: a quantitative review. **Proceedings of the Royal Society B** 281: 20141358. Rank among Biology journals 13/93, IF = 5.4, JCI = 1.3, TC = 64,655, Article citations to date = 168.

**+Kuesel, R.\***, **Gonthier, D.J.**<sup>1,2,3,5</sup>, **+Cruz, L.**, **+Vaidya, C.**, Iverson, A., Perfecto, I. **2014**. Local management and landscape use intensity associated with a coffee leaf-chewing beetle. **Agroecology and Sustainable Food Systems** 38: 552-540. Rank among Multidisciplinary Agriculture Journals 10/57, IF = 3.0, JCI = 0.7, TC = 1,149, Article citations to date = 1.

**Gonthier, D.J.**<sup>\*1,2,3</sup>, Castañeda, F.E. **2013**. Large- and medium-sized mammal survey using camera traps in the Sikre River in the Río Plátano Biosphere Reserve, Honduras. **Tropical Conservation Science** 6:584-591. Rank among Biodiversity Conservation journals 34/60, IF = 2.0, JCI = 0.4, TC = 1,395, Article citations to date = 10.

**Gonthier, D.J.**<sup>\*1,2,3,5</sup>, Ennis, K.K., Philpott, S.M., Vandermeer, J., Perfecto, I. **2013**. Ants defend coffee from berry borer colonization. **BioControl** 58:815-820. Rank among Entomology journals 12/102, IF = 3.6, JCI = 1.4, TC = 3,646, Article citations to date = 45.

**Gonthier, D.J.**<sup>\*1,2,3</sup>, Dominguez, G.M., Witter, J., Spongberg, A.L., Philpott, S.M. **2013**. Bottom up effects of soil quality on a coffee arthropod interaction web. **Ecosphere** 4: Article 107. (DOI)10.1890/ES13-00072.1. Rank among Ecology journals 62/166, IF = 3.2, JCI = 0.9, TC = 10,223, Article citations to date = 8.

Murnen, C.\* **Gonthier, D.J.**<sup>1,2</sup>, Philpott, S.M. **2013**. Food webs in the litter: Effects of food and nest addition on ant communities in coffee agroecosystems and forest. **Environmental Entomology** 42: 668-676. Rank among Entomology journals 27/102, IF = 2.4, JCI = 1.0, TC = 10,392, Article citations to date = 6.

Philpott, S.M.\* **+Pardee, G.L.**, **Gonthier, D.J.**<sup>1,2</sup> **2012**. Cryptic biodiversity effects: Importance of functional redundancy revealed through addition of food web complexity. **Ecology** 93:992-1001. Rank among Ecology journals 22/166, IF = 5.5, JCI = 1.4, TC = 74,376, Article citations to date = 30.

**Gonthier, D.J.**<sup>\*1,2,3,5</sup> **2012**. Do herbivores eavesdrop on ant chemical communication to avoid predation? **PLoS ONE** 7: e28703. Rank among Multidisciplinary Sciences journals 27/72, IF = 3.2, JCI = 0.6, TC = 857,751, Article citations to date = 10.

**Gonthier, D.J.**<sup>\*1,2,3</sup>, Witter, J., Spongberg, A.L., Philpott, S.M. **2011**. Effect of nitrogen fertilization on caffeine production in coffee (*Coffea arabica* L.). **Chemoecology** 21:123-130. Rank among Ecology journals 120/166, IF = 1.7, JCI = 0.5, TC = 1,194, Article citations to date = 12.

**Gonthier, D.J.**<sup>\*1,2,3</sup>, **+Pardee, G.L.**, and Philpott, S.M. **2010**. *Azteca instabilis* ants and the defence of a coffee shade tree: an ant-plant association without mutual rewards in Chiapas, Mexico. **Journal of Tropical Ecology** 26: 343-346. Rank among Ecology journals 133/166, IF = 1.4, JCI = 0.4, TC = 3,635, Article citations to date = 2.

**Gonthier, D.J.**<sup>\*1,2,3</sup> **2009**. Notes on seeds deposited in elephant dung at Tarangire National Park, Tanzania. **African Journal of Ecology** 47:252-256. Rank among Ecology journals 131/166, IF = 1.4, JCI = 0.3, TC = 2,798, Article citations to date = 7.

Swarthout, D.\*, Harper, E., Judd, S., **Gonthier, D.**<sup>1,2,3</sup>, Shyne, R., Stowe, T., Bultman, T. **2009**. Measures of leaf-level water-use efficiency in drought stressed endophyte infected tall fescue grasses. **Environmental and Experimental Botany** 66:88-93. Rank among Plant Sciences journals 20/235, IF = 5.6, JCI = 1.4, TC = 16,198, Article citations to date = 40.

**Gonthier, D.J.**<sup>1,2,3</sup>, Sullivan, T.J., Brown, K.L., Wurtzel, B., Lawal, R., VandenOever, K., Buchan, Z., Bultman, T.L.\* **2008**. Stroma-forming endophyte *Epichloë glyceriae* provides wound- inducible herbivore resistance to its grass host. **Oikos** 117:629-633. Rank among Ecology journals 41/166, IF = 3.9, JCI = 1.1, TC = 25,815, Article citations to date = 22.

#### Larson:

#### Intellectual Contributions

\* = Senior Author      ~ = Corresponding Author      + = Grad/Prof Student      # = Post Doc      ^ = Undergraduate

WOS = Web of Science    JIF = Journal Impact Factor    TC = Journal Total Cites

SNIP = Source Normalize Impact per Paper    SJR = Scimago Journal Rank

#### **Published**

#### **Journal Article, Academic Journal**

Skvarla, M., Larson, J., Dowling, A. (2020). A Review of Terrestrial and Canopy Malaise Traps, *Annals of the Entomological Society of America*.

#### Palli:

## **Published Journal Article, Academic Journal**

Gao Y, Alyokhin A, Nauen R, Guedes RNC, Palli SR. Challenges and opportunities in managing pests of potato. *Pest Manag Sci*. 2022 Sep;78(9):3729-3730. doi: 10.1002/ps.7081. PubMed PMID: 35932235.

Arya SK, Goodman CL, Stanley D, Palli SR. A database of crop pest cell lines. *In Vitro Cell Dev Biol Anim.* 2022 Aug 22;. doi: 10.1007/s11626-022-00710-w. [Epub ahead of print] PubMed PMID: 35994130.

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K. A., Jentzsch, Iris M. Vargas, Vargo, E. L., Booth, W., Friedrich, M., Weirauch, M. T., Anderson, Michelle A. E., Jones, J. W., Mittapalli, O., Zhao, C., Zhou, J.-J., Evans, J. D., Attardo, G. M., Robertson, H. M., Zdobnov, E. M., Ribeiro, Jose M. C., Gibbs, R. A., Werren, J. H., Palli, S. R., Schal, C., Richards, S. (2016). Unique features of a global human ectoparasite identified through sequencing of the bed bug genome, *NATURE COMMUNICATIONS*, 7. doi: 10.1038/ncomms10165

### **Review, Journal**

Palli, S. R. (2021). Epigenetic regulation of post-embryonic development, *Current Opinion in Insect Science*, 43, 63-69. doi: 10.1016/j.cois.2020.09.011

Zhu, K. Y., Palli, S. R. (2020). Mechanisms, applications, and challenges of insect RNA interference *Annual Review of Entomology*, 65, 293-311. doi: 10.1146/annurev-ento-011019-025224

Palli, S. R. (2017). Annual Review of Entomology Volume 62, 2017 Introduction *Annual Review of Entomology*, ANNUAL REVIEW OF ENTOMOLOGY, VOL 62, 62, V-VII.

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### **Rieske-Kinney:**

#### **Intellectual Contributions**

\* = Senior Author ~ = Corresponding Author + = Grad/Prof Student # = Post Doc ^ = Undergraduate  
WOS = Web of Science JIF = Journal Impact Factor TC = Journal Total Cites  
SNIP = Source Normalize Impact per Paper SJR = Scimago Journal Rank

### ***Published***

#### **Journal Article, Academic Journal**

+ Bragg Z.B., L.K. Rieske (2022). Spatial distribution and retention in loblolly pine seedlings of exogenous dsRNAs applied through roots. *International Journal of Molecular Science – RNA Interference-based tools for plant improvement and protection* 23(16), 9167; <https://doi.org/10.3390/ijms23169167>.

+ Kyre, B. R., Rieske, L. K. (2022). Using RNAi to silence heat shock protein has congeneric effects in North America's Dendroctonus bark beetles, *Forest Ecology and Management*, 520. doi: 10.1016/j.foreco.2022.120367

+ Hollowell, H., Rieske, L. K. (2022). Southern pine beetle-specific RNA interference exhibits no effect on model nontarget insects, *Journal of Pest Science*, 95(3), 1429-1441. doi: 10.1007/s10340-021-01473-1

Tull, A. R., Gladfelter, H., + Pampolini, F., Rieske, L., Nelson, C. D., Merkle, S. (2022). Development of a New Genetic Transformation System for White and Green Ash Using Embryogenic Cultures, *Forests*, 13(5). doi: 10.3390/f13050671



+ Bragg, Z., Rieske, L. K. (2022). Feasibility of Systemically Applied dsRNAs for Pest-Specific RNAi-Induced Gene Silencing in White Oak, *Frontiers in Plant Science*, 13. doi: 10.3389/fpls.2022.830226

+ Wallace, M., Rieske, L. K. (2021). Validation of reference genes for quantitative PCR in the forest pest, *Ips calligraphus*, *Scientific Reports*, 11(1). doi: 10.1038/s41598-021-02890-z

Norman-Burgdolf, H., Rieske, L. K. (2021). Healthy trees – Healthy people: A model for engaging citizen scientists in exotic pest detection in urban parks, *Urban Forestry and Urban Greening*, 60. doi: 10.1016/j.ufug.2021.127067

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+ Olson, D. G., Townsend, L. H., Roemmele, E., \* Rieske, L. K. (2020). Another look at systemic neonicotinoid applications for emerald ash borer suppression, *Arboriculture and Urban Forestry*(46(5)), 347-357.

# Leelesh, R., ~ Rieske-Kinney, L. K. (2020). Oral ingestion of bacterially expressed dsRNA can silence genes and cause mortality in a highly invasive, tree-killing pest, the emerald ash borer, *Insects*, 11(7), 1-10. doi: 10.3390/insects11070440

+ Pampolini, F., # Rodrigues, T. B., # Leelesh, R. S., Kawashima, T., \* ~ Rieske-Kinney, L. K. (2020). Confocal microscopy provides visual evidence and confirms the feasibility of dsRNA delivery to emerald ash borer through plant tissues, *Journal of Pest Science*. doi: 10.1007/s10340-020-01230-w

+ Kyre, B. R., # Rodrigues, T. B., \* ~ Rieske-Kinney, L. K. (2019). RNA interference and validation of reference genes for gene expression analyses using qPCR in southern pine beetle, *Dendroctonus frontalis*, *Scientific Reports*, 9(1). doi: 10.1038/s41598-019-42072-6

+ Savage, M. B., \* Rieske, L. K. (2018). Coleopteran communities associated with forests invaded by emerald ash borer, *Forests*, 9(2). doi: 10.3390/f9020069

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+ Olson, D. G., \* Rieske, L. K. (2018). Host range expansion may provide enemy free space for the highly invasive emerald ash borer, *Biological Invasions*. doi: <https://doi.org/10.1007/s10530-018-1853-6>

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\* Lacki, M. J., Dodd, L. E., Skowronski, N. S., Dickinson, M. B., Rieske, L. K. (2017). Relationships among burn severity, forest canopy structure and bat activity from spring burns in oak-hickory forests, *International Journal of Wildland Fire*, 26(11), 963-972. doi: 10.1071/WF16159

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### **Journal Article, Professional Journal**

\* ~ Rieske-Kinney, L. K., Borden, S., Damron, B., Williamson, N., Arthur, M. A., Kinney, A. (2019). College Campus as a Living Laboratory: Scrubbing Scales, Saving Trees, Engaging Students, *American Entomologist*, 65(1), 43-49. doi: 10.1093/ae/tmz010

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# Graziosi, I., Townsend, L. H., \* Rieske, L. K. (2018). The EAB discovery trail: A novel approach to engage the public in emerald ash borer research, *American Entomologist*, 64(3), 190-193.

Graziosi, I., Davidson, W., \* Rieske, L. K. (2017). The Battle Plan: Defining a strategy to manage the emerald ash borer in Kentucky forests, *Kentucky Woodlands*, 11(1), 20-21.

### **Editorial, Journal**

Rodrigues, T. B., Rieske, L. K., Narva, K. E., Roberts, A., Vélez, A. M. (2022). Editorial: New Applications of Insecticidal RNAi, *Frontiers in Agronomy*, 4. doi: 10.3389/fagro.2022.903841

### **Report, Technical**

\* ~ Dodd, L. E., Dickinson, M. B., Lacki, M. J., Rieske-Kinney, L. K., Skowronski, N. K., Thomas, S. C., Toomey III, R. S. (2019). A long-term evaluation of the interacting effects of fire and white-nose syndrome on endangered bats., *USFS Joint Fire Science Program*.(Project #14-1-05-22.), 34.

### **Rittschof:**

### **Intellectual Contributions**

\* = Senior Author      ~ = Corresponding Author      + = Grad/Prof Student      # = Post Doc      ^ = Undergraduate

WOS = Web of Science    JIF = Journal Impact Factor    TC = Journal Total Cites  
SNIP = Source Normalize Impact per Paper    SJR = Scimago Journal Rank

### **Published**

## Book, Chapter in Scholarly Book-New

\* Rittschof, C. C., \* Grozinger, C. M. (2020). The fundamental role of aggression and conflict in the evolution and organization of social groups *Social Cooperation and Conflict: Biological Mechanisms at the Interface*, Cambridge University Press.

## Journal Article, Academic Journal

^Foose, A.M., +Westwick, R.R., Vengarai, M., \*Rittschof, C.C. (2022). The survival consequences of grooming in the honey bee *Apis mellifera*, *Insectes Sociaux*, 69, 279-287.

Martin, M.J., Diem, S.J., Karwat, D.M.A., Krieger, E.M., Rittschof, C.C., Banyon, B., Aghazadeh, M., Asensio, O., Zeilkova, T.J., Garcia-Cazarin, M., Alvelo Maurosa, J.G., Mahmoud, H. (Accepted). The climate is changing. Engineering education needs to change as well. *Journal of Engineering Education*.

Lee, M. J., Rittschof, C. C., Greenlee, A. J., Turi, K. N., Rodriguez-Zas, S. L., Robinson, G. E., Cole, S. W., Mendenhall, R. (2021). Transcriptomic analyses of black women in neighborhoods with high levels of violence, *Psychoneuroendocrinology*, 127. doi: 10.1016/j.psyneuen.2021.105174

Grume, G. J., Biedenbender, S. P., Rittschof, C. C. (2021). Honey robbing causes coordinated changes in foraging and nest defence in the honey bee, *Apis mellifera*, *Animal Behaviour*, 173, 53-65. doi: 10.1016/j.anbehav.2020.12.019

Carr, H. M., Palmer, J. H., ~ Rittschof, C. C. (2020). Honey bee aggression: Evaluating causal links to disease-resistance traits and infection, *Behavioral Ecology and Sociobiology*, 74(9). doi: 10.1007/s00265-020-02887-0

Rittschof, C. C., Rubin, B. E.R., Palmer, J. H. (2019). The transcriptomic signature of low aggression in honey bees resembles a response to infection, *BMC Genomics*, 20(1). doi: 10.1186/s12864-019-6417-3 Author Role:CCR designed the study, collected specimens, conducted bioinformatics analyses associated with differential gene expression and enrichment analyses, and wrote the manuscript. BER conducted the informatics assessment of pathogen presence as well as the gene ontology analysis, and participated in manuscript writing. JHP conducted molecular sample preparation. All authors read and approved the final manuscript.

^ Harrison, J. W., Palmer, J. H., \* ~ Rittschof, C. C. (2019). Altering social cue perception impacts honey bee aggression with minimal impacts on aggression-related brain gene expression., *Scientific Reports*, 9, 14642. doi: 10.1038/s41598-019-51223-8 Author Role: C.C.R. designed all steps of the project, analyzed the data, and wrote the manuscript. J.W.H. collected data and wrote the manuscript. J.H.P. collected data. All authors reviewed the manuscript.

\* ~ Rittschof, C. C., Vekaria, H. J., Palmer, J. H., Sullivan, P. G. (2019). Biogenic amines and activity levels alter the neural energetic response to aggressive social cues in the honey bee *Apis mellifera*., *Journal of Neuroscience Research*, 97(8), 991-1003. doi: 10.1002/jnr.24443  
Author Role:Conceptualization, C.C.R. and P.G.S.; Methodology, C.C.R. and P.G.S.; Formal

Analyses, C.C.R.; Investigation, C.C.R., J.H.P. and H.J.V.; Resources, C.C.R.; Writing – Original Draft, C.C.R.; Visualization, C.C.R.; Project Administration, C.C.R., P.G.S.; Funding Acquisition, C.C.R., P.G.S.

+ Preston, S. R., Palmer, J. H., ^ Harrison, J. W., ^ Carr, H. M., \* ~ Rittschof, C. C. (2019). The impacts of maternal stress on worker phenotypes in the honey bee, *Apidologie*. doi: 10.1007/s13592-019-00680-1 Author Role:

S.R.P. carried out data collection, analysis, and manuscript writing. J.W.H. assisted in experimental setup and data collection. J.H.P. and H.M.C. conducted molecular analyses C.C.R. designed study, performed data analysis, and wrote manuscript.

\*Rittschof, C. C., Hughes, K.A. (2018). Advancing behavioural genomics by considering timescale, *Nature Communications*, 9(1), 489-491. doi: 10.1038/s41467-018-02971-0

\*Rittschof, C. C., Vekaria, H.J., Palmer, J., Sullivan, P.G. (2018). Brain mitochondrial bioenergetics change with rapid and prolonged shifts in aggression in the honey bee, *Apis mellifera*, *Journal of Experimental Biology*, 221(8), 1-10. doi: 10.1242/jeb.176917

Rittschof, C. C., Schimeier, S. (2017). Insect models of central nervous system energy metabolism and its links to behavior, *GLIA*, 66(6), 1160-1175. doi: 10.1002/glia.23235

Rittschof, C. C. (2017). Sequential social experiences interact to modulate aggression but not brain gene expression in the honey bee (*Apis mellifera*), *Frontiers in Zoology*, 14. doi:

10.1186/s12983-017-0199-8

Rittschof, C. C., Robinson, G. E. (2016). Behavioral Genetic Toolkits: Toward the Evolutionary Origins of Complex Phenotypes, *Curr Top Dev Biol*, 119, 157-204. doi: 10.1016/bs.ctdb.2016.04.001

**Journal Article, Professional Journal**

\* Rittschof, C. C., \* Esther, N. (2019). Entomological Society of America position statement on climate change, *Annals of the Entomological Society of America*, 112, 288-291. doi: 10.1093/aesa/saz013

**Editorial, Journal**

Fernandez, M. P., Rittschof, C. C., Sierralta, J. A. (2021). Editorial: Invertebrate Neuroscience: Contributions From Model and Non-model Species, *Frontiers in Behavioral Neuroscience*, 15. doi: 10.3389/fnbeh.2021.726295

Rittschof, C. C., Sheehan, M. J. (2021). Editorial overview: Behavioral ecology of insects in a changing world, *Current Opinion in Insect Science*, 45, vi-viii. doi: 10.1016/j.cois.2021.07.001

Rittschof, C. C., Nieh, J. C. (2021). Honey robbing: could human changes to the environment transform a rare foraging tactic into a maladaptive behavior?, *Current Opinion in Insect Science*, 45, 84-90. doi: 10.1016/j.cois.2021.02.005

Westwick, R. R., Rittschof, C. C. (2021). Insects Provide Unique Systems to Investigate How Early-Life Experience Alters the Brain and Behavior, *Frontiers in Behavioral Neuroscience*, 15. doi: 10.3389/fnbeh.2021.660464

Rittschof, C. C. (2017). To bee or not to bee aggressive.

### Web Based Publication

Elsenhon, J., Alleyne, M., Anderson, T., Dreyer, J., Gandhi, K., Huseeth, A., Rivers, A., Rittschof, C. C., Spafford, H., Krell, R. (2016). A Post-Election Washington D.C.: The ESA Science Policy Fellows' Perspective *Entomology Today, Entomological Society of America*.

### Syed:

### Intellectual Contributions

### **Published**

Underline indicates member(s) of Syed laboratory, and categories are further broken down as follows: <sup>+</sup> Indicates graduate student under my supervision; <sup>#</sup> Indicates post-doc under my supervision; <sup>§</sup> Indicates undergraduate or high school student under my supervision; <sup>^</sup> indicates lab technician; \* indicates the corresponding author. Journal rankings are based on CiteScore obtained from Scopus and are provided for either the year of publication or the most recent ranking if rankings are unavailable for that year). (SNIP = Source Normalize Impact per Paper SJR = Scimago Journal Rank)

1. <sup>+</sup>Littler, A., <sup>+</sup>Pandey, P., <sup>+</sup>O'Dell Jr. K. \* and **Syed, Z.** (2022). Chemical ecology of oviposition dynamics in *Drosophila suzukii* (Diptera: Drosophilidae). *Journal of Economic Entomology*. 115 (4) 1029-1035. Author Role: Conception and design of the study: L.A. and Z.S.; Acquisition of data: L.A., P.P. and Z.S.; Analysis and/or interpretation of data: L.A., P.P., OK. and Z.S; Writing and editing of the m/s: LA, PP, OK and ZS.

1. Josek, T., Sperrazza, J., Alleyne, M. and **Syed, Z.** (2021) Neurophysiological and behavioral responses of blacklegged ticks to host odors. *J Insect Physiol*.128:104175. <https://doi.org/10.1016/j.jinsphys.2020.104175>. Author Role: Conception and design of the study: JT, AM and Z.S.; Acquisition of data: JT and Z.S.; Analysis and/or interpretation of data: JT, SJ and Z.S. Writing and editing of the m/s: JT, SJ, AM and ZS.

1. Chauhan, K. R., McPhatter, L. P., <sup>+</sup> O'Dell, K., **Syed, Z.**, Wheeler, A., Debboun, M. (2021). Evaluation of a novel user-friendly arthropod repellent gel, Verdegen. *Journal of Medical Entomology*. doi: 10.1093/jme/tjab065 (*in press*)

Scopus Metric Year: 2019 | Category: Veterinary: General Veterinary | CiteScore: 3.4 | Highest Percentile: 90 | Rank: #/N: 18/178 | SNIP: 0.87 | SJR: 0.896

Author Role: K.O. and Z.S. analyzed the data, contributed a figure, and contributed to writing the manuscript.

1. [#Hickner, P. V.](#), Timoshevskaya, N., [+Nowling, R. J.](#), Labbe, F., [§Nguyen, A. D.](#), McDowell, M. A., [#Spiegel, C. N.](#), [\\*Syed, Z.](#) (2020). Molecular signatures of sexual communication in the phlebotomine sand flies. *PLoS Neglected Tropical Diseases*, 14(12). doi: 10.1371/journal.pntd.0008967

Scopus Metric Year: 2019 | Category: Public Health, Environmental and Occupational Health | CiteScore: 7.6 | Highest Percentile: 95 | Rank: #/N: 23/516 | SNIP: 1.494 | SJR: 2.148 Author Role: P.V.H. and Z.S. designed research; P.V.H., R.J.N., A.D.N., C.N.S., Z.S. conducted the research; P.V.H., R.J.N., A.D.N., C.N.S., Z.S. analyzed the data; P.V.H., R.J.N. and Z.S. wrote the paper.

1. [#Hickner, P. V.](#), [#Mittapalli, O.](#), [+Subramoniam, A.](#), Sagel, A., Watson, W., Scott, M., Arp, A. P., de León, A. A., [\\*Syed, Z.](#) (2020). Physiological and molecular correlates of the screwworm fly attraction to wound and animal odors. *Scientific Reports*. 10(1), 20771. doi: 10.1038/s41598-020-77541-w

Scopus Metric Year: 2019 | Category: Multidisciplinary | CiteScore: 7.2 | Highest Percentile: 93 | Rank: #/N: 8/111 | SNIP: 1.365 | SJR: 1.341

Author Role: P.V.H., O.M., A.P.A., A.P.L., W.W., M.J.S. and Z.S. designed research; P.V.H., O.M., A.S. (Panama), A.S. (University of Kentucky), A.P.L. and Z.S. conducted the research; P.V.H., O.M. and Z.S. analyzed the data; P.V.H., O.M., A.P.A. and Z.S. wrote the paper.

1. [\\*Scott, M. J.](#), Benoit, J. B., Davis, R. J., Bailey, S. T., Varga, V., Martinson, E. O., [+ Hickner, P. V.](#), [Syed, Z.](#), Cardoso, G. A., Torres, T. T., Weirauch, M. T., Scholl, E. H., Phillippy, A. M., Sagel, A., Vasquez, M., Quintero, G., Skoda, S. R. (2020). Genomic analyses of a livestock pest, the New World screwworm, find potential targets for genetic control programs. *Communications Biology*, 3(1), 424. doi: 10.1038/s42003-020-011524

Scopus Metric Year: 2019 | Category: General Agricultural and Biological Sciences | CiteScore: 2 | Highest Percentile: 67 | Rank: #/N: 66/203 | SNIP: 1.233 | SJR: 2.15

Author Role: Chemosensory genome analyses, interpretation and write-up was performed by P.V.H. and Z.S.

1. Zhu, G. H., Zheng, M. Y., Sun, J. B., Khuhro, S. A., Yan, Q., Huang, Y., [Syed, Z.](#), Dong, S. L. (2019). CRISPR/Cas9 mediated gene knockout reveals a more important role of PBP1 than PBP2 in the perception of female sex pheromone components in *Spodoptera litura*. *Insect Biochemistry and Molecular Biology*, 115. doi: 10.1016/j.ibmb.2019.103244

Scopus Metric Year: 2019 | Category: Insect Science | CiteScore: 6.7 | Highest Percentile: 97 | Rank: #/N: 4/142 | SNIP: 1.381 | SJR: 1.341

Author Role: Z.S. contributed to data analysis, data validation and manuscript editing.

1. Cloonan, K.R., Abraham, J., Angeli, S., **Syed, Z.** and Rodriguez-Saona, C., 2018. Advances in the chemical ecology of the spotted wing drosophila (*Drosophila suzukii*) and its applications. *Journal of Chemical Ecology*, 44(10), 922-939.

Scopus Metric Year: 2018 | Category: Agricultural and Biological Sciences: Ecology, Evolution, Behavior and Systematics | CiteScore: 4.1 | Highest Percentile: 77 | Rank: #/N: 134/603 | SNIP: 1.15 | SJR: 1.028

Author Role: Z.S. contributed data, interpretation and manuscript writing.

1. Cloonan, K. R., Hernández-Cumplido, J., De Sousa, A. L. V., Ramalho, D. G., Burrack, H. J., Della Rosa, L., Diepenbrock, L. M., Ballman, E., Drummond, F. A., Gut, L. J., Hesler, S., Isaacs, R., Leach, H., Loeb, G. M., Nielsen, A. L., Nitzsche, P., Park, K. R., **Syed, Z.**, Van Timmeren, S., Wallingford, A. K., Walton, V. M., Rodriguez-Saona, C. (2019). Laboratory and field evaluation of host-related foraging odor-cue combinations to attract *Drosophila suzukii* (Diptera: Drosophilidae). *Journal of Economic Entomology*, 112(6), 2850-2860. doi: 10.1093/jee/toz224

Scopus Metric Year: 2018 | Category: Agricultural and Biological Sciences: Insect Science | CiteScore: 3.1 | Highest Percentile: 75 | Rank: #/N: 35/140 | SNIP: 1.055 | SJR: 0.826

Author Role: Z.S. contributed data, interpretation and manuscript writing

### Teets:

### **Book, Chapter in Scholarly Book - New**

Syed, Z., O'Dell, K. (2022). Finding a Repellent Against Ticks: Neurophysiological and Behavioral Approaches Advances in Arthropod Repellents, 131-140. Academic Press.

### Teets:

### **Intellectual Contributions**

\* = Senior Author ~ = Corresponding Author + = Grad/Prof Student # = Post Doc ^ = Undergraduate

WOS = Web of Science JIF = Journal Impact Factor TC = Journal Total Cites

SNIP = Source Normalize Impact per Paper SJR = Scimago Journal Rank

### **Published**

#### Journal Article, Academic Journal

+ ~ Devlin, J.J., +Unfried, K., #Lecheta, M.C., +McCabe, E.A., Gantz, J.D., Kawarasaki, Y., Elnitsky, M.A., Hotaling, S., Michel, A.P., Convey, P., Hayward, S.A.L., \*Teets, N.M. (2022). Simulated winter warming

negatively impacts survival of Antarctica's only endemic insect. *Functional Ecology* 36, 1949-1960. doi.org/10.1111/1365-2435.14089

Nadeau, E.A.W., Lecheta, M.C., Obrycki, J.J., \*Teets, N.M. (2022). Transcriptional regulation of diapause in the convergent lady beetle, *Hippodamia convergens*. *Insects* 13, 343. doi.org/10.3390/insects13040343

+ ~Dias, V. S., Cáceres, C., Parker, A. G., Pereira, R., Demirbas-Uzel, G., Abd-Alla, A. M.M., Teets, N. M., Schetelig, M. F., Handler, A. M., \*Hahn, D. A. (2021). Mitochondrial superoxide dismutase overexpression and low oxygen conditioning hormesis improve the performance of irradiated sterile males, *Scientific Reports*, 11, 1-15. doi: 10.1038/s41598-021-99594-1

+ ~ Spacht, D. E., Gantz, J. D., +Devlin, J. J., +McCabe, E. A., Lee, R. E., Denlinger, D. L., Teets, N. M. (2021). Fine-scale variation in microhabitat conditions influences physiology and metabolism in an Antarctic insect, *Oecologia*, 197(2), 373-385. doi: 10.1007/s00442-02105035-1

^Littler, A. S., #Garcia, M. J., \*~Teets, N. M. (2021). Laboratory diet influences cold tolerance in a genotype-dependent manner in *Drosophila melanogaster*, *Comparative Biochemistry and Physiology -Part A : Molecular and Integrative Physiology*, 257. doi: 10.1016/j.cbpa.2021.110948

\*~Teets, N. M., Meuti, M. E. (2021). Hello Darkness, My Old Friend: A Tutorial of NandaHammer Protocols, *Journal of Biological Rhythms*, 36(3), 221-225. doi: 10.1177/0748730421998469

+ ~ Potts, L. J., Kostal, V., Simek, P., \* Teets, N. M. (2020). Energy balance and metabolic changes in an overwintering wolf spider, *Schizocosa stridulans*, *Journal of Insect Physiology*, 126, 104112.

Author Role:

+ ~Potts, L. J., Košťál, V., Simek, P., \*~Teets, N. M. (2020). Energy balance and metabolic changes in an overwintering wolf spider, *Schizocosa stridulans*, *Journal of Insect Physiology*, 126. doi: 10.1016/j.jinsphys.2020.104112

+ ~ Potts, L. J., # Garcia, M. J., \* Teets, N. M. (2020). Chilling in the cold: Using thermal acclimation to demonstrate phenotypic plasticity in animals., *CourseSource*. doi: doi.org/10.24918/cs.2020.21

# ~ Garcia, M. J., ^ Littler, A. S., ^ Sriram, A., \* Teets, N. M. (2020). Distinct cold tolerance traits independently vary across genotypes in *Drosophila melanogaster*, *Evolution*, 74(7), 1437-1450. doi: 10.1111/evo.14025

# ~ Lecheta, M. C., # Awde, D. N., + O'Leary, T. S., + Unfried, L. N., ^ Jacobs, N. A., ^ Whitlock, M. H., + McCabe, E., Powers, B., Bora, K., Waters, J. S., Axen, H. J., Frieze, S., Lockwood, B. L., Teets, N. M., \* Cahan, S. H. (2020). Integrating GWAS and transcriptomics to identify the molecular underpinnings of



thermal stress responses in *Drosophila melanogaster*, *Frontiers in Genetics*, 11. doi: 10.3389/fgene.2020.00658

# ~ Awde, D. N., ^ Fowler, T. E., + Pérez-Gálvez, F., # Garcia, M. J., \* Teets, N. M. (2020). High-Throughput Assays of Critical Thermal Limits in Insects, *Journal of visualized experiments : JoVE*(160). doi: 10.3791/61186

+ ~ Mercer, N. H., Teets, N. M., Bessin, R. T., \* Obrycki, J. J. (2020). Supplemental Foods Affect Energetic Reserves, Survival, and Spring Reproduction in Overwintering Adult *Hippodamia convergens* (Coleoptera: Coccinellidae), *Environmental Entomology*, 49(1), 1-9. doi: 10.1093/ee/nvz137

~ Gantz, J. D., Philip, B. N., Teets, N. M., Kawarasaki, Y., + Potts, L. J., + Spacht, D. E., Benoit, J. B., \* Denlinger, D. L., \* Lee, E. (2020). Brief exposure to a diverse range of environmental stress enhances stress tolerance in the polyextremophilic Antarctic midge, *Belgica antarctica*, *bioRxiv*. doi: <https://doi.org/10.1101/2020.01.01.887414>

\*~ Teets, N. M., ^ Dalrymple, E. G., ^ Hillis, M. H., Gantz, J. D., + Spacht, D. E., Lee, R. E., Denlinger, D. L. (2020). Changes in energy reserves and gene expression elicited by freezing and supercooling in the antarctic midge, *Belgica antarctica*, *Insects*, 11(1). doi: 10.3390/insects11010018

+ ~ Potts, L. J., Gantz, J. D., Kawarasaki, Y., Philip, B. N., Gonthier, D. J., Law, A. D., Moe, L. A., Unrine, J. M., McCulley, R. L., Lee, R. E., Denlinger, D. L., \* Teets, N. M. (2020). Environmental factors influencing fine-scale distribution of Antarctica's only endemic insect, *Oecologia*. doi: 10.1007/s00442-020-04714-9

# Nadeau, E. A.W., \* ~ Teets, N. M. (2020). Evidence for a rapid cold hardening response in cultured *Drosophila* S2 cells, *Journal of Experimental Biology*, 223(2). doi: 10.1242/jeb.212613

\*~ Teets, N. M., Gantz, J. D., Kawarasaki, Y. (2020). Rapid cold hardening: ecological relevance, physiological mechanisms and new perspectives, *The Journal of Experimental Biology*, 223. doi: 10.1242/jeb.203448

# ~ AL-Amery, M., Downie, B., DeBolt, S., Crocker, M., Urschel, K. L., Goff, B. M., Teets, N. M., Gollihue, J., \* Hildebrand, D. F. (2019). Proximate composition of enhanced DGAT high oil, high protein soybeans, *Biocatalysis and Agricultural Biotechnology*, 21. doi: 10.1016/j.bcab.2019.101303

\*~ Teets, N. M., Kawarasaki, Y., + Potts, L. J., Philip, B. N., + Gantz, J. D., Denlinger, D. L., Lee, R. E. (2019). Rapid cold hardening protects against sublethal freezing injury in an Antarctic insect, *Journal of Experimental Biology*, 222(15), jeb206011. doi: 10.1242/jeb.206011

~ Kawarasaki, Y., Teets, N. M., Philip, B. N., + Potts, L. J., + Gantz, J. D., \* Denlinger, D. L., \* Lee, R. E. (2019). Characterization of drought-induced rapid cold-hardening in the Antarctic midge, *Belgica antarctica*, *Polar Biology*, 42(6), 1147-1156. doi: 10.1007/s00300-019-02503-6 Teets, N. M., + Dias, V. S., ^ Pierce, B. K., Schetelig, M. F., Handler, A. M., \* Hahn, D. A. (2019). Overexpression of an antioxidant enzyme improves male mating performance after stress in a lek-mating fruit fly, *Proceedings of the Royal Society B-Biological Sciences*, 286(1904), 20190531. doi: 10.1098/rspb.2019.0531

# Garcia, M. J., \* ~ Teets, N. M. (2019). Cold stress results in sustained locomotor and behavioral deficits in *Drosophila melanogaster*, *Journal of Experimental Zoology Part a-Ecological and Integrative Physiology*, 331(3), 192-200. doi: 10.1002/jez.2253

\*+ Spacht, D. E., Teets, N. M., Denlinger, D. L. (2018). Two isoforms of Pepck in *Sarcophaga bullata* and their distinct expression profiles through development, diapause, and in response to stresses of cold and starvation, *Journal of Insect Physiology*, 111, 41-46. doi: 10.1016/j.jinsphys.2018.10.008

\*+ Halbritter, D., Teets, N. M., Williams, C. M., Daniels, J. C. (2018). Differences in winter cold hardiness support the geographic range disjunction of *Neophasia menapia* and *Neophasia terlooii* (Lepidoptera: Pieridae), *Journal of Insect Physiology*, 107, 204-211. doi: 10.1016/j.jinsphys.2018.03.005

\*Teets, N. M., Hahn, D. A. (2018). Genetic variation in the shape of cold survival curves in a single fly population suggests potential for selection from climate variability, *Journal of Evolutionary Biology*, 31(4), 543-555. doi: 10.1111/jeb.13244

\*Teets, N. M., Denlinger, D. L. (2016). Quantitative Phosphoproteomics Reveals Signaling Mechanisms Associated with Rapid Cold Hardening in a Chill-Tolerant Fly, *JOURNAL OF PROTEOME RESEARCH*, 15(8), 2855-2862. doi: 10.1021/acs.jproteome.6b00427

\*^ Dean, C. A. E., Teets, N. M., Kostal, V., Simek, P., Denlinger, D. L. (2016). Enhanced stress responses and metabolic adjustments linked to diapause and onset of migration in the large milkweed bug *Oncopeltus fasciatus*, *PHYSIOLOGICAL ENTOMOLOGY*, 41(2), 152-161. doi: 10.1111/phen.12140

#### **Villanueva:**

### **New extension publications peer-reviewed**

1. ENTfact 162: Hemp Russet mite a key pest of Hemp in Kentucky. **R. T. Villanueva**, Zenaida Vilorio, Ronald Ochoa, and Andrew Ulsamer.
2. ENTfact 161: Management of Fall Armyworms in Double Crop Soybeans in Kentucky. **R. T. Villanueva**.

3. ENTfact 160: What do wasps do in hemp? A survey in Western Kentucky. Armando Falcon-Brindis, and **R. T. Villanueva**.
4. ENTfact 159: Red Cocklebur Weevil. **R. T. Villanueva**, and Armando FalconBrindis.  
<https://entomology.ca.uky.edu/ef159>
5. ENTfact 158: Threecornered Alfalfa Hopper in Soybeans. **R. T. Villanueva**.
6. ENTfact 459: Non-Native ambrosia beetles: damage and management. 2020. Z. Viloría, **R. T. Villanueva**, W. Dunwell, and R. Bessin.  
<https://entomology.ca.uky.edu/ef459>.
7. ID-268: Kentucky Grain Crop Production at a Glance. C. Knott, C. Bradley, C. Lee, T. Legleiter, S. McNeill, E. Ritchey, **R. T. Villanueva**, and K. Wise.  
<http://www2.ca.uky.edu/agcomm/pubs/ID/ID268/ID268.pdf>
8. ID-268P: Kentucky Grain Crop Production at a Glance-Poster. C. Knott, C. Bradley, C. Lee, T. Legleiter, S. McNeill, E. Ritchey, **R. T. Villanueva**, and K. Wise.  
<http://www2.ca.uky.edu/agc/pubs/ID/ID268P/ID268P.pdf>
9. ID-249: A comprehensive guide to soybean management in Kentucky. Insect Pests (pages 57-66). **R. T. Villanueva**, and R. Bessin. 2018. 80 pp.
10. Approaches to conduct balanced studies using hemp russet mites. 2021. **R. T. Villanueva**, A. Falcon-Brindis, Z. Viloría, and C. Bradley. In Proceedings of the 2nd Annual Scientific Conference the Science of Hemp: Production and Pest Management. P. 59, 2022.
11. Observations of insect and disease pests on field grown hemp in Kentucky. 2021. Ricciardi, M., **R. T. Villanueva**, N. Gauthier, R. Pearce. In Proceedings of the 2nd Annual Scientific Conference the Science of Hemp: Production and Pest Management, p. 45, 2022.
12. Parasitism of corn earworm by tachinid flies in industrial hemp. 2021. FalconBrindis, A., **R. T. Villanueva**, Z. Viloría, and C. Bradley. In Proceedings of the 2nd Annual Scientific Conference the Science of Hemp: Production and Pest Management, p 29, 2022.
13. Evaluation of biopesticides for the management of *Helicoverpa zea* in hemp. 2021. Viloría, Z., A. Falcon-Brindis, C. Bradley, and **R. T. Villanueva**. In Proceedings of the 2nd Annual Scientific Conference the Science of Hemp: Production and Pest Management. p. 60, 2022.
14. Arthropods Collected in Industrial Hemp Fields in Kentucky in 2019. 2019. **R. T. Villanueva**, Samantha Anderson, Colby Guffey, and Susan Fox. Proceedings of the 1st Annual Scientific Conference the Science of Hemp-2019.
15. Hemp Russet Mite: A Threat to Hemp in Kentucky. 2019. **R. T. Villanueva** Proceedings of The Science of Hemp Conference-2019.

### **Previous Work at other institutions.**

1. EAG -0511/18: Economic impact of the sugarcane aphid outbreak in south Texas. Zapata, S; R. Dudensing, **R. T. Villanueva**, D. Sekula and G. Esparza-Diaz. 2016. Texas AgriLife Extension Publication.

## Revisions

1. ENT-13 Insecticide recommendations for field corn. **R. T. Villanueva.**
2. ENT-16 Insecticide recommendations for soybeans. **R. T. Villanueva.**
3. ENT-24 Insecticide recommendations for grain sorghum. **R. T. Villanueva.**
4. ENT-47 Insecticide recommendations for small grains. **R. T. Villanueva.**
5. ENT-2 Insecticide recommendations for popcorn. **R. T. Villanueva.**

## Wheat: Newsletters and Science Reports

Wheat Science Newsletter (<https://wheatscience.ca.uky.edu/newsletters>).

Wheat reports (<https://wheatscience.ca.uky.edu/research>).

1. April 8, 2020. Scouting for aphids in Winter Wheat and Their Control During Spring in Kentucky **R. T. Villanueva.** Vol. 243, Issue 14.
2. August 28, 2019. Effects of rainfall or drought in the abundance of aphids in winter wheat. **R. T. Villanueva.** Vol. 23, Issue 4.
3. March 8, 2019. Do frequent rainfalls during winter reduce insect populations in the spring in field crops? **R. T. Villanueva.** <https://wheatscience.ca.uky.edu/newsletters>).
4. February 5, 2019. Hold on to your insecticide sprays to manage aphids in wheat in the harsh winter of 2019. **R. T. Villanueva.** Vol. 23, Issue 1.
5. April 10, 2018. Unnecessary use of pyrethroids in wheat can lead to aphid resistance and barley yellow dwarf virus outbreaks. **R. T. Villanueva.** Vol. 22, Issue 1.
6. April 11, 2017. Entomopathogenic fungus may cause high mortality on aphids. **R. T. Villanueva** and Y. Gonzalez Vol. 21, Issue 3.
7. March 21, 2017. Freeze effects on aphids and their parasitoids under the mild winter conditions of 2017. **R. T. Villanueva.** Vol. 21, Issue 2.
8. February 23, 2017. Wheat: earlier aphid occurrences may be a consequence of 2017's warm winter. **R. T. Villanueva.** Vol. 21, Issue 1.
9. 2018-2019. Scouting for aphids in wheat fields with or without insecticide seed treatment in March and April is critical to reduce BYDV in winter wheat. **R. T. Villanueva.**
10. 2017-2018. Comparing pyrethroids to manage aphids in insecticide treated and untreated wheat seed. **R. T. Villanueva.**, Carl Bradley, Yaziri Gonzalez, and Rocio Davila.
11. 2017-2018. Changes of BYDV and CYDV infection in commercial wheat of western Kentucky. **R. T. Villanueva.**, and C. Bradley. (<https://wheatscience.ca.uky.edu/research/2017-2018>).
12. 2016-2017. Insecticides are not the only option: natural enemies can cause high mortality on large aphid population outbreaks in small grains **R. T. Villanueva,** and Yaziri Gonzalez. (<https://wheatscience.ca.uky.edu/research/2016-2017>).
13. 2016-2017. Insecticide efficacy test and evaluation of damage by rice stink bug on barley. **R. T. Villanueva,** and Y. Gonzalez.

## **Corn and Soybean Newsletters and Science Research Reports**

### **2021**

1. Seedcorn maggot seen in abundant numbers in corn and soybeans. **R. T. Villanueva.**
2. Increased mollusk activity in corn and soybeans observed in the spring of 2021. **R. T. Villanueva.**
3. Abundance of sugarcane aphid was reduced in Sorghum in 2021. **R. T. Villanueva,** Chris Teutsch, and Susan Fox.
4. Fall armyworms affected double-crop soybeans in many counties of Kentucky in 2021. **R. T. Villanueva.**
5. Soybean gall midge, the “new pest” of soybeans in the Midwest, still not detected in Kentucky. **R. T. Villanueva.**
6. Outbreaks of fall armyworm soybeans in western Kentucky. **R. T. Villanueva.**
7. Speculations on the Causes of Fall Armyworm Outbreaks in 2021 and its Management in Soybeans in Kentucky. **R. T. Villanueva.**
8. Effects of various rates of potash and molluscicides in the management of slugs: laboratory and field studies. Josey Tolley, and **R. T. Villanueva,** Entomology Extension Specialist, and Edwin Ritchey.
9. Blister beetles in soybeans in Kentucky. **R. T. Villanueva.**
10. Description of the rapid colonization of western Kentucky by the brown marmorated stink bug 2020-2021. A. Falcon-Brindis, Z. Viloría, and **R. T. Villanueva.**
11. The ragweed weevil, a harmless visitor of soybean fields in Kentucky. **R. T. Villanueva.**
12. Evaluating sunflower as a trap crop for *Dectes* stem borer in western Kentucky. **R. T. Villanueva.**
13. Farmers Notice the sudden presence of fall armyworms in western Kentucky. **R. T. Villanueva.**
14. Evaluating molluscicides and carabid predation of slugs in soybeans. J. Tolley and **R. T. Villanueva.**
15. Brown marmorated stink bug increases its numbers in western KY soybeans in 2021. **R. T. Villanueva,** and A. Falcon-Brindis.

### **2020**

16. Response of the Japanese beetle to pyrethroids in soybeans. **R. T. Villanueva** and Z. Viloría.
17. Soybeans and corn might be injured by stink bugs in 2020. **R. T. Villanueva** and Z. Viloría.
18. High population occurrences of threecornered alfalfa hopper in soybeans in 2020. **R. T. Villanueva.**
19. Stink bug populations surpassing economic thresholds in soybeans in 2020. **R. T. Villanueva.**
20. Sporadic beetles that may affect earlier stages of corn: Corn flea beetles, Sugarcane beetles, and White Grubs. **R. T. Villanueva.**

### **2019**

21. Management of caterpillars in non-GMO corn in western and eastern Kentucky. **R. T. Villanueva,** and Ric Bessin.

22. Evaluating the effects of *Dectes texanus* in soybeans yields using exclusion cages in Kentucky. **R. T. Villanueva**, and I. Gomes.
23. Two-season study to compare preventive insecticide sprays for the management of stink bugs in soybean. **R. T. Villanueva**, and Y. Gonzalez.

### **Kentucky Pest News:**

A total of 83 original articles based on personal field observations, and my applied research and entomological expertise have been published. Some articles were coauthored with other specialists, students, or County Extension Agents. Kentucky Pest News is a freely accessed blog in the WWW, the URL is: <https://kentuckypestnews.wordpress.com/>.

#### **2022**

1. Concrete mites make their annual spring return to paved surfaces. May 17. **R. T. Villanueva**.
2. Wild bees contribute to the pollination of apple orchards in western Kentucky. May 10. A. Falcon-Brindis, and **R. T. Villanueva**.
3. Stink bugs in wheat may have an early awakening and affect corn and soybean seedlings. May 10. **R. T. Villanueva**.
4. Small, creepy, and beautiful predacious tigers of the soil. May 10. A. Falcon-Brindis and **R. T. Villanueva**.
5. Conducive weather for seedcorn maggot & slug outbreaks in field crops. April 12. **R. T. Villanueva**.
6. EPA mandates the phase-out of chlorpyrifos after February 28, 2022. February 22. **R. T. Villanueva**.

#### **2021**

1. Overwintering Asian lady beetles might extend their fly period in 2021. November **R. T. Villanueva**.
2. The ragweed weevil, a harmless visitor of soybean fields in Kentucky. November 9. **R. T. Villanueva**.
3. Twice stabbed stink bug observed in maturing hemp. October 26. **R. T. Villanueva**.
4. Blister beetle: predatory behavior outweighs their feeding in Soybeans in Kentucky. October 19. **R. T. Villanueva**.
5. Spreading of the brown marmorated stink bug across west and central Kentucky: Distribution and trends. October 19. A. Falcon-Brindis and **R. T. Villanueva**.
6. What are the tiny mud pots on hemp petioles? October 5. A. Falcon-Brindis and **R. T. Villanueva**.
7. Overview of insect pests in maturing soybean fields in central Kentucky. September 14. A. Falcon-Brindis and **R. T. Villanueva**.
8. Status of stink bugs in full season and double crop soybeans in August 2021. September 7. **R. T. Villanueva**, and A. Falcon-Brindis.
9. Outbreak of fall armyworm did not affect hemp, but corn earworm and tobacco budworm

- might make their move soon. August 31. **R. T. Villanueva**, and A. FalconBrindis.
10. Status of several aphid species in grain, forage, and sweet sorghum in 2021. August 24. **R. T. Villanueva**.
  11. Fall armyworm may have a persistent presence as oviposition lingers in August. August 17. **R. T. Villanueva**, and Z. Viloría.
  12. The white marginated burrower bug in soybeans is a harmless insect. August 17. **R. T. Villanueva**.
  13. Controlling slugs through the application of potash and molluscicides. August 10. J. Tolley, and **R. T. Villanueva**.
  14. Abrupt presence of fall armyworms in double-crop soybeans in Kentucky. August 3. **R. T. Villanueva**.
  15. The Kudzu bug and the search for its parasitoids. August 3. A. Ritchey and **R. T. Villanueva**.
  16. Spider mites damage observed in soybeans in western Kentucky. July 20. **R. T. Villanueva**.
  17. Soybean gall midge is spreading in the Midwest – A 2021 update. May 24. **R. T. Villanueva**.
  18. Seedcorn maggot seen in abundant numbers in corn and soybeans. May 18. **R. T. Villanueva**.
  19. Current weather conditions are suitable for increase mollusk activity in corn and soybeans. May 4. **R. T. Villanueva**.

## **2020**

1. Eurasian hemp borer making its way in Kentucky. November 3. **R. T. Villanueva**, and C. Whitney.
2. Brown marmorated stink bug expected to invade man-made structures in Western Kentucky this fall. October 12. **R. T. Villanueva**.
3. Colonization of western Kentucky by brown marmorated stink bug. September 22. **R. T. Villanueva** and Z. Viloría.
4. Predatory stink bug detected in western Kentucky. September 22. **R. T. Villanueva**.
5. Stink bug populations surpassing economic thresholds in soybeans in 2020. September 15. **R. T. Villanueva**, and Z. Viloría.
6. Threecornered alfalfa hopper found cutting soybeans. July 28. **R. T. Villanueva**.
7. Damage by corn flea beetles in seedling. June 23. **R. T. Villanueva**.
8. As rains stopped, thrips started to move into late-planted corn. June 20. **R. T. Villanueva**.
9. Periodical cicada: guardians of time. June 2. R. Bessin, and **R. T. Villanueva**,
10. Warrior II with Zeon Technology® approved for control of crane flies in alfalfa. March 24. **R. T. Villanueva**, and R. Bessin.
11. 2020: List of products for the management of insects and mites in commercial hemp. February 11. **R. T. Villanueva**, R. Bessin and Z. Viloría.
12. Two additional insecticides are registered under section 24(c) to manage insect pests on hemp in Kentucky. January 14. R. Bessin and **R. T. Villanueva**.

## **2019**

1. Heligen® is registered under section 24(c) to manage corn earworm in industrial hemp in Kentucky. October 1. **R. T. Villanueva**, and R. Bessin.
2. Tachinid flies might have been actively working this season in Kentucky. October 1. **R. T. Villanueva**.

3. Corn earworm outbreaks in industrial hemp in Kentucky: September –2019. September 17. **R. T. Villanueva**, S. Anderson, and Colby Guffey.
4. Soybean gall midge: an emergent pest in the Midwest. August 13. **R. T. Villanueva**.
5. Insecticides registered in Kentucky for insects affecting commercial hemp. August 13. **R. T. Villanueva**.
6. Hemp russet mite detected in several areas across Kentucky. August 6. **R. T. Villanueva** and B. Kennedy.
7. Pecan trees damaged by the hickory shoot curculio. June 4. **R. T. Villanueva**.
8. Sugarcane beetle reported feeding on seedling corn. June 4. **R. T. Villanueva**.
9. Fly species that thrive on decomposing organic matter and moist environments stand out in the 2019 planting season in different crop systems. May 14. **R. T. Villanueva**.
10. Damage by stink bugs observed in seedling corn. May 14. **R. T. Villanueva**.
11. Aphids not detected in wheat fields in western Kentucky yet. April 2. **R. T. Villanueva**.
12. Crane fly larvae might be on the rise in soggy alfalfa fields. April 2. **R. T. Villanueva**, and B. Kennedy.
13. Cannabis aphid found in hemp grown in greenhouses in western Kentucky. February 20. **R. T. Villanueva**, and B. Kennedy.
14. The Asiatic Garden beetle is a potential pest for Kentucky’s field corn; it might cause field corn losses in Southwest Michigan. February 12. **R. T. Villanueva**.
15. Hold on to your insecticide sprays to manage aphids in wheat in the harsh winter of 2019. February 5. **R. T. Villanueva**.

## **2018**

1. Causes for green stem syndrome in soybeans are still a conundrum. November 6. **R. T. Villanueva** and C. Bradley.
2. Soybean stem borer infestations are being noticed by Kentucky growers: yield might be reduced. October 23. **R. T. Villanueva**.
3. Scout for armyworms. June 5. **R. T. Villanueva**, and R. Bessin.
4. Slugs in wheat fields: a management challenge for farmers and researchers. May 1. **R. T. Villanueva**.
5. Unnecessary use of pyrethroids in wheat can lead to aphid resistance and Barley Yellow Dwarf Virus outbreaks. April 3. **R. T. Villanueva**.

## **2017**

1. Soybean stem borer: an unnoticed bug that may cause problems during harvest and reduce yields in soybeans. September 19. **R. T. Villanueva**, and Y. Gonzalez.
2. Copious amounts of honeydew produced by sugarcane aphids attracts bees and other insects: do we need to be worried? September 12. **R. T. Villanueva**.
3. True and fall armyworms and black cutworms may be causing some damages in corn and pastures in Kentucky. August 15. **R. T. Villanueva**.
4. Sugarcane aphid: occurrence in August 2017, misidentification, and insecticides registered for grain, forage, and sweet sorghum. August 8. **R. T. Villanueva**, and R. Bessin.
5. Spike of Southwestern corn borer might need attention in corn fields in western Kentucky. August 8. **R. T. Villanueva**.



6. Sugarcane aphid detected on sweet sorghum. July 11. **R. T. Villanueva**, and R. Bessin.
7. Kudzu bug found in the Land Between the Lakes for first time. July 11. **R. T. Villanueva**, and Susan Fox (CEA-Lyon).
8. Replanted and double crop soybeans can be affected by mollusk outbreaks in Kentucky in 2017. June 28. **R. T. Villanueva**.
9. Scouting for true armyworms is highly recommended in small grains and early corn.
10. April 25. **R. T. Villanueva**.
11. Ticks may be on the rise this year. April 11. **R. T. Villanueva**. Ambrosia beetles are out looking for new hosts. April 11. **R. T. Villanueva**. Entomopathogenic fungus may cause high mortality on aphids. April 4. **R. T. Villanueva**, and Y. Gonzalez.
12. Beware of true armyworms—mild winter provides conditions for potential injuries in small grains. March 28. **R. T. Villanueva**.
13. Freeze effects on aphids and their parasitoids under the mild winter conditions of 2017. March 21. **R. T. Villanueva**.
14. Earlier aphid occurrences on wheat may be a consequence of the 2017's warm winter. February 28. **R. T. Villanueva**.

## **2016**

1. Ambrosia beetles are out looking for new hosts. November 4. **R. T. Villanueva**.
2. Bio-solids, poultry & swine manure amendments affect population densities of soil mites on corn & wheat fields in western Kentucky. August 30. **R. T. Villanueva**.
3. Tips for good grain storage management. August 30. **R. T. Villanueva**.
4. Surge of fall armyworms may affect pastures and cover crops in Kentucky. August 23. **R. T. Villanueva**.
5. Moist soils may cause outbreaks of slugs in late soybean planting August 9. **R. T. Villanueva**.
6. Insecticides registered against the sugarcane aphid on grain & sweet sorghum in Kentucky for 2016. August 2. **R. T. Villanueva** and R. Bessin.
7. Caterpillars may affect late corn planting in different areas of Kentucky in 2016. July 21. **R. T. Villanueva**, P. Lucas, and R. Bessin.
8. July 19, 2016. Fall-colored damage in bald cypress (*Taxodium distichum*) caused by rust mites in late spring. Z. Vilorio, **R. T. Villanueva**, and W. Dunwell.
9. Sugarcane aphid arrived at Kentucky a month earlier in 2016 than in 2015. July 19. **R. T. Villanueva**.
10. How to monitor and when to control the early abundance of thrips on soybean fields. June 28. **R. T. Villanueva**.
11. New aphid pest on grain sorghum – sugarcane aphid. June 2. **R. T. Villanueva**.
12. New cereal aphid (*Sipha maydis*) expands range of distribution. May 6. **R. T. Villanueva**.

## **Publications in printed and digital press:**

Articles from Kentucky Pest News were published by different agricultural magazines.

Digital and printed media such as the *Ag-fax*, *Agnews*, *Mid-American Farmer Grower*, *Morning AgClips*, *Non-Till Farmer Magazine*, and *Progressive farmer*, reprinted and posted some of these articles. Examples are listed below.

### ***Ag-fax***

#### **2022**

1. Kentucky corn, soybeans: stink bugs in wheat may have an early awakening and affect seedlings. May 11. **R. T. Villanueva.**

#### **2021**

1. Kentucky corn, soybeans: conditions suitable for increased mollusk activity. May 6. **R. T. Villanueva.**

#### **2020**

1. Kentucky: 2020 Fall crop protection webinar series. October 20. University of
2. Kentucky. K. Wise, C. Bradley, **R. T. Villanueva**, J.D. Green, and T. Legleiter.
3. Kentucky soybeans: stink bugs reaching dangerous levels. September 16. **R. T. Villanueva**, and Z. Vilorio.

#### **2019**

1. Hemp: corn earworm outbreaks. September 18. **R. T. Villanueva**, S. Anderson, and C. Guffey.
2. How does rainfall, drought affect aphid populations? August 30. **R. T. Villanueva.**
3. Hemp russet mite management. August 7. **R. T. Villanueva**, and B. Kennedy.
4. Sugarcane beetles feeding on seedlings. June 6. **R. T. Villanueva.**
5. Stink bugs damaging seedlings. May 15. **R. T. Villanueva.**
6. Cannabis aphid found in greenhouses. February 20. **R. T. Villanueva**, and B. Kennedy.
7. Kentucky: IPM training school, Hopkinsville, March 6. University of Kentucky. February 6. **R. T. Villanueva.**
8. Spraying for aphids? don't just rely on the calendar. February 6. **R. T. Villanueva.**
9. Illinois: 4 upcoming crop management conferences in Jan. and Feb. J. Soule. January 15.

#### **2018**

1. Green stem syndrome – what causes it? November 7. **R. T. Villanueva**, and C. Bradley.
2. Kentucky Wheat: Slugs – A management challenge for farmers and researchers. May **R. T. Villanueva.**

#### **2017**

1. Kentucky sorghum: sugarcane aphids – identification and management. August 9. **R. T. Villanueva**, and R. Bessin.
2. Kentucky Corn: spike of southwestern corn borer might need attention. August 9. **R. T. Villanueva**, and R. Bessin.
3. Kentucky soybeans: heavy outbreak of slugs, snails. July 5. **R. T. Villanueva.**
4. Kentucky: UK wheat field day, Princeton, May 9. May 4. C. Laurent.
5. Kentucky: wheat production field school, March 8, April 26. February 6. E. Ritchey.

#### **2016**

1. Kentucky soybeans: moist soils may cause slug outbreaks in late fields. August 10. **R. T.**

## **Villanueva.**

2. Kentucky: wheat field day, Princeton, May 10. July 21. C. Laurent.
3. Sorghum: sugarcane aphid started in Texas and now: Hello, Kansas! April 25. E. Unglesbee.
4. Texas: Sugarcane aphid meeting, Weslaco, April 12. April Rod Santana.

## **Agrinews**

1. Slugging it out: Pests, weeds, and disease outlook for coming season. February 6, 2019. K. Binder.

## **Mid-American Farmer Grower (Claims 36,000 weekly views)**

### **2021**

1. UK Scientists to host interactive virtual wheat meeting. Katie Pratt.
2. Current weather conditions are suitable for increase mollusk activity in corn and soybeans. **R. T. Villanueva.**
3. Seedcorn maggot seen in abundant numbers in corn and soybeans. **R. T. Villanueva.**
4. Soybean gall midge is spreading in the Midwest—a 2021 update. **R. T. Villanueva.**
5. Pest management field day to focus on grain crops. **R. T. Villanueva.**
6. Spider mites damage observed in soybeans in western Kentucky. **R. T. Villanueva.**
7. Kentucky grain farmers adapt to new climate normal. **R. T. Villanueva.**
8. Status of several aphid species in grain, forage, and sweet sorghum in 2021. **R. T. Villanueva.**  
Status of stink bugs in full season and double crop soybeans in August 2021. **R. T. Villanueva.**
9. Blister beetles, predatory behavior outweigh their feeding in soybeans in Kentucky. **R. T. Villanueva.**
10. The ragweed weevil, a harmless visitor of soybean fields in Kentucky. **R. T. Villanueva.**
11. Overwintering Asian lady beetles might extend their fly period in 2021. **R. T. Villanueva.**

### **2020**

1. Warrior II with Zeon Technology® approved for control of crane flies in alfalfa. **R. T. Villanueva,** and R. Bessin.
2. Periodical cicada: guardians of time. R. Bessin, **R. T. Villanueva,** and D. Becker.
3. As rains stopped, thrips started to move into late-planted corn. **R. T. Villanueva.**
4. Damage by corn flea beetles in seedling. **R. T. Villanueva.**
5. Threecornered alfalfa hopper found cutting soybeans. **R. T. Villanueva,** and G. K. Drake.
6. Stink bug populations surpassing economic thresholds in soybeans in 2020. **R. T. Villanueva,** and Z. Viloría.
7. Colonization of western Kentucky by brown marmorated stink bug. **R. T. Villanueva,** and Z. Viloría.
8. Predatory stink bug detected in Western Kentucky. **R. T. Villanueva.**

### **2019**

1. Hold on to your insecticide sprays to manage aphids in wheat in the harsh winter of 2019. **R. T. Villanueva.**
2. Aphids not detected in wheat fields in western Kentucky yet. **R. T. Villanueva.**
3. Damage by stink bugs observed in seedling corn. **R. T. Villanueva**
4. Tachinid flies might have been actively working this season in Kentucky. **R. T. Villanueva,**

and Y. Gonzalez.

## **2018**

1. Unnecessary use of pyrethroids in wheat can lead to aphid resistance and Barley Yellow Dwarf Virus outbreaks. **R. T. Villanueva.**
2. Soybean stem borer infestations are being noticed by Kentucky growers: yield might be reduced. **R. T. Villanueva.**
3. Causes for green stem syndrome in soybeans are still a conundrum. **R. T. Villanueva,** and C. Bradley.

## **2017**

1. Freeze effects on aphids and their parasitoids under the mild winter conditions of 2017. **R. T. Villanueva.**
2. Beware of true armyworms – mild winter provides conditions for potential injuries in small grains. **R. T. Villanueva.**
3. Scouting for true armyworms is highly recommended in small grains and early corn. **R. T. Villanueva.**
4. Entomopathogenic fungus may cause high mortality on aphids. Y. Gonzalez, and **R. T. Villanueva.**
5. Replanted and double crop soybeans can be affected by mollusk outbreaks in Kentucky in 2017. **R. T. Villanueva.**
6. Kudzu Bug found in the land between the lakes for first time. **R. T. Villanueva,** and S. Fox.
7. True and fall armyworms and black cutworms may be causing some damages in corn and pastures in Kentucky. **R. T. Villanueva.**
8. Soybean stem borer: an unnoticed bug that may cause problems during harvest and reduce yields in soybeans. **R. T. Villanueva.**

## **2016**

1. True and fall armyworms and black cutworms may be causing some damages in corn and pastures In Kentucky. **R. T. Villanueva.**
2. How to monitor and when to control the early abundance of thrips on soybean fields. **R. T. Villanueva.**
3. Caterpillars may affect late corn planting in different areas of Kentucky in 2016. **R. T. Villanueva,** P. Lucas, R. Bessin.
4. Moist soils may cause outbreaks of slugs in late-season soybean planting. **R. T. Villanueva.**
5. Surge of fall armyworms may affect pastures and cover crops In Kentucky. **R. T. Villanueva.**

## ***Morning AgClips***

### **2021**

1. Overwintering Asian lady beetles might extend their fly period in 2021. November
2. 29. **R. T. Villanueva.** Schedule for the University of Kentucky 2021 fall crop protection webinar series. November 15. K. Wise, C. Bradley, J. D. Green, and T. Legleiter.
3. Status of stink bugs in full season and double crop soybeans in August 2021. September 13. **R. T. Villanueva,** and A. Falcon-Brindis.
4. Status of several aphid species in grain, forage, and sweet sorghum in 2021. August 26. **R. T. Villanueva.**

5. Controlling slugs through the application of potash and molluscicides. August 15. J. Tolley, **R. T. Villanueva**, and E. Ritchey.
6. The kudzu bug and the search for its parasitoids. August 9. A. Ritchey, and **R. T. Villanueva**. Abrupt presence of fall armyworms in double-crop soybeans in Kentucky. August 8. **R. T. Villanueva**.
7. Spider mite damage observed in soybeans in Western Kentucky. July 22. **R. T. Villanueva**.
8. Kentucky grain farmers adapt to new climate normals. July 21. K. Pratt. Pest Management Field Day to focus on grain crops. June 8. K. Pratt.
9. Soybean gall midge spreading in Midwest. May 25. **R. T. Villanueva**.
10. Weather conditions suitable for mollusk activity. May 11. **R. T. Villanueva**.
11. UK scientists to host interactive virtual wheat meeting. May 3. K. Pratt.

#### **2020**

1. Additional pesticides registered for hemp. January 22. R. Bessin, and **R. T. Villanueva**.

#### **2019**

1. Soybean gall midge, an emergent pest in the Midwest. August 19. **R. T. Villanueva**.

#### **2018**

1. Slugs in wheat fields. May 3. **R. T. Villanueva**.
2. Pyrethroids use in wheat. April 16. **R. T. Villanueva**.
3. Look for ambrosia beetles as spring begins. March 4. K. Pratt.

#### **2017**

1. Spike of SWCB might need attention. August 13. **R. T. Villanueva**, and R. Bessin.
2. Sugarcane aphid occurrence in Kentucky. August 14. **R. T. Villanueva**, and R. Bessin.
3. Soybean stem borer. September 21. **R. T. Villanueva**, and Y. Gonzalez.
4. Mollusk outbreaks in soybeans. July 5. **R. T. Villanueva**.
5. Scout for true armyworms. April 27. **R. T. Villanueva**.
6. Beware of true armyworms. April 9. **R. T. Villanueva**.
7. Mild winter and aphids. March 30. **R. T. Villanueva**.
8. Earlier aphid occurrences. March 13. **R. T. Villanueva**.

#### ***Non-Till Farmer Magazine***

1. Monitoring and controlling early abundance of thrips on soybean fields. July 7, 2016. **R. T. Villanueva**.

#### ***Progressive Farmer Magazine***

1. Large populations of true armyworm moths heading north early. April 18, 2017. **R. T. Villanueva**.
2. Sugarcane aphid spreading quickly northward. July 21, 2016. **R. T. Villanueva**.

#### ***Times Tribune***

1. Kentucky grain farmers adapt to new climate normals. July 24, 2021. Katie Pratt.
2. UK Scientists to host interactive virtual wheat meeting. May 9, 2021. Katie Pratt.

#### ***The Ledger***

1. 2021 Fall Armyworm Outbreak Affects Lyon County and State. **R. T. Villanueva**.

## White:

### Intellectual Contributions

\* = Senior Author ~ = Corresponding Author + = Grad/Prof Student # = Post Doc ^ = Undergraduate  
WOS = Web of Science JIF = Journal Impact Factor TC = Journal Total Cites  
SNIP = Source Normalize Impact per Paper SJR = Scimago Journal Rank

### Published

#### Journal Article, Academic Journal

# Lenhart, P. A., White, J. A. (2020). Endosymbionts facilitate rapid evolution in a polyphagous herbivore, *Journal of Evolutionary Biology*, 33(10), 1507-1511. doi: 10.1111/jeb.13697

Holt, J. R., Styer, A., White, J. A., Scott Armstrong, J., Nibouche, S., Costet, L., Malacrinò, A., Antwi, J. B., Wulff, J., Peterson, G., McLaren, N., Medina, R. F. (2020). Differences in microbiota between two multilocus lineages of the sugarcane aphid (*Melanaphis sacchari*) in the continental United States, *Annals of the Entomological Society of America*, 113(4), 257-265. doi: 10.1093/aesa/saaa003

+ Rosenwald, L. C., # Sitvarin, M. I., \* ~ White, J. A. (2020). Endosymbiotic *Rickettsiella* causes cytoplasmic incompatibility in a spider host, *Proceedings of the Royal Society B: Biological Sciences*, 287(1930). doi: 10.1098/rspb.2020.1107rspb20201107

\* ~ White, J. A., Styer, A., + Rosenwald, L. C., + Curry, M. M., + Welch, K. D., + Athey, K. J., # Chapman, E. G. (2020). Endosymbiotic bacteria are prevalent and diverse in agricultural spiders, *Microbial Ecology*, 79(2), 472-481. doi: 10.1007/s00248-019-01411-w

Angelella, G., Nalam, V., Nachappa, P., White, J. A., \* Kaplan, I. (2018). Endosymbionts differentially alter exploratory probing behavior of a nonpersistent plant virus vector, *Microbial Ecology*, 76(2), 453-458. doi: 10.1007/s00248-017-1133-5

Desneux, N., Asplen, M. K., + Brady, C. M., Heimpel, G. E., Hopper, K. R., Luo, C., Monticelli, L., Oliver, K. M., \* White, J. A. (2018). Intraspecific variation in facultative symbiont infection among native and exotic pest populations: Potential implications for biological control, *Biological Control*, 116, 27-35. doi: 10.1016/j.biocontrol.2017.06.007

Hopper, K. R., Kuhn, K. L., Lanier, K., Rhoades, J. H., Oliver, K. M., White, J. A., Asplen, M. K., Heimpel, G. E. (2018). The defensive aphid symbiont *Hamiltonella defensa* affects host quality differently for *Aphelinus glycinis* versus *Aphelinus atriplicis*, *Biological Control*, 116, 3-9. doi: 10.1016/j.biocontrol.2017.05.008

\* Obrycki, J. J., + McCord, J., + Mercer, N., White, J. A. (2018). Photoperiodic induction of adult diapause in North American populations of the convergent lady beetle (Coleoptera: Coccinellidae), *Environmental Entomology*, 47(6), 1596-1600. doi: <https://doi.org/10.1093/ee/nvy128>

# Lenhart, P. A., + Jackson, K. A., \* White, J. A. (2018). Heritable variation in prey defence provides refuge for subdominant predators, *Proceedings of the Royal Society, B*, 285(1879), 20180523. doi: 10.1098/rspb.2018.0523

# Lenhart, P. A., \* White, J. A. (2017). A defensive endosymbiont fails to protect aphids against the parasitoid community present in the field, *Ecological Entomology*, 42(5), 680-684. doi: 10.1111/een.1241

+ Jackson, K. A., + McCord, J. S., \* White, J. A. (2017). A window of opportunity: Subdominant predators can use suboptimal prey, *Ecology and Evolution*, 7(14), 5269-5275. doi: 10.1002/ece3.3139

White, J. A., + McCord, J. S., + Jackson, K. A., Dehnel, A. C., # Lenhart, P. A. (2017). Differential aphid toxicity to ladybeetles is not a function of host plant or facultative bacterial symbionts, *Functional Ecology*, 31(2), 334-339. doi: 10.1111/1365-2435.12736

Gebiola, M., White, J. A., Cass, B. N., Kozuch, A., Harris, L. R., Kelly, S. E., Karimi, J., Giorgini, M., Perlman, S. J., Hunter, M. S. (2016). Cryptic diversity, reproductive isolation and cytoplasmic incompatibility in a classic biological

control success story, *Biological Journal of the Linnean Society*, 117(2), 217-230. doi: 10.1111/bij.12648

## **Zhou:**

### **Intellectual Contributions**

\* = Senior Author ~ = Corresponding Author + = Grad/Prof Student # = Post Doc

^ = Undergraduate WOS = Web of Science JIF = Journal Impact Factor TC = Journal Total Cites

SNIP = Source Normalized Impact per Paper SJR = Scimago Journal Rank

### **Published**

#### **Journal Article, Academic Journal**

Li, J, Merchant, A., Zhou, SY, Wang, T., Zhou, X., Zhou, C. (2022). Neuroanatomical basis of sexually dimorphic behaviors in the mosquito brain. *iScience*. In press

Guo, M. J., Nanda, S., Yang, CX, Li, ZY, Liu, JN, Gao, R., Zhang, Y., Zhou, X., Pan, HP. (2022). Oral RNAi assays in *Henosepilachna vigintioctopunctata* suggest HvSec23 and HvSar1. *Entomologia Generalis*. In press.

Tao, M, Wan, YR, Zheng, XB, Qian, KH, Merchant, A., Xu, BY, Zhang, YJ, Zhou, X., Wu QJ. (2022). TSWV shifts sex ratio toward males in the western flower thrips, *Frankliniella occidentalis*, by down-regulating a FSCB-like gene. *Pest Management Science*. In press.

Guo, M. J., Lin, M. J., Pan, G., Yu, J. Q., Lü, J., Guo, W., Zhang, Y. J., Yang, C. X., Qiu, B. L., Zhou, X., Pan, H. P. (2022). Rapid identification of *Henosepilachna vigintioctopunctata* and *Henosepilachna vigintioctomaculata* based on species-specific mitochondrial cytochrome oxidase I primers. *Journal of South China Agricultural University*, 43(1), 59-66. doi: 10.7671/j.issn.1001-411X.202101008.

Fan, X. F.; Liu, Y., Zhang, Z., Zhang, Z. H., Peng, J., Gao, Y., Zheng, L. M., Chen, J. B., Du, J., Yan, S., Zhou, X., Shi, X. B., Zhang, D. Y. (2022). Bta06987, encoding a peptide of the AKH/RPCH family: a role of energy mobilization in *Bemisia tabaci*. *Insects*. 13, 834. doi.org/10.3390/insects13090834.

Su, Q. Z., Tang, M., Hu, J. H., Tang, J. B., Zhang, X., Li, X. A., Niu, Q. S., Zhou, X., Luo, S. Q., Zhou, X. (2022). Significant compositional and functional variation reveals patterns of gut microbiota evolution among wide-spread Asian honeybee populations. *Frontiers in Microbiology*. 13, 934459. doi: 10.3389/fmicb.2022.934459.

Chen, S. M., Nanda, S., Guo, M. J., Kong, L., Yang, C. X., Liu, Z. Q., Gao, R., Qiu, B. L., Zhang, Y. J., Zhou, X., Pan H. P. (2022). Tyrosine hydroxylase is involved in cuticle tanning and reproduction in the 28-spotted potato ladybeetle, *Henosepilachna vigintioctopunctata*. *Pest Management Science*. 78, 3859-3870. doi: 10.1002/ps.6980

Zong, T., Li, J., Zhou, X., Liu, X. Y. (2022). Field resistance of *Digitaria sanguinalis* (L.) Scop. to haloxypop-P-methyl in China's cotton fields. *Agronomy*. 12(5), 1071. doi: 10.3390/agronomy12051071.

Bi, H. L., Merchant, A., Gu, J. W., Li, X. W., Zhou, X., Zhang, Q. (2022). CRISPR/Cas9-mediated mutagenesis of abdominal-A and ultrabithorax in the Asian corn borer, *Ostrinia furnacalis*. *Insects*. 13(4), 384. doi: 10.3390/insects13040384.

Zhang, Y. Y., Zhang, Z. H., Ren, M. F., Liu, X. Y., Zhou, X., Yang, J. (2022). Selection of reference genes for RT-qPCR analysis in the hawthorn spider mite, *Amphitetranychus viennensis* (Acarina: Tetranychidae), under acaricide treatments. *Journal of Economic Entomology*. 115(2), 662-670. doi: 10.1093/jee/toac019.

Shi, J. Z., Merchant, A., Wang, Q. H., Zhou, X. (2022). Signals and cues in death recognition: a quantitative review. *Journal of Plant Protection*. 49(1), 240-249. DOI : 10.13802/j.cnki.zwbhxb.2022.2022833.

Zhang, H. J., Tao, L. M., Liu, X., Zhou, X., Huang X. Z. (2022). Current status and challenges of pesticide management in China. *Journal of Plant Protection*. 49(1), 398-406. doi : 10.13802/j.cnki.zwbhxb.2022.2022830.

Zhao, C. Y., Zhu, F., Sun, Q., Zhou, X. (2022). Editorial: Recent progress in understanding the mechanisms of

arthropod adaptation to the chemical environment. *Frontiers in Physiology*. doi: 10.3389/fphys.2022.889757.  
Ding, C. X., Deng, Y. C., Merchan, A., Su, J. Y., Zeng, G. Y., Long, X. Y., Zhong, M. E., Yang, L. H., Gong, D. X., Bai, L.

Y., Zhou, X., Liu, X. Y. (2022). Insights into surface ionimprinted materials for heavy metal ion treatment: challenges and opportunities. *Separation & Purification Reviews*, doi: 10.1080/15422119.2022.2044352.

Li, H. R., Shu, X. H., Zhou, J. C., Meng, L., Zhou, X., Obrycki, J., Li, B. P. (2022). A comparison of microbiota in the ladybird *Harmonia axyridis* between native and invaded ranges. *Entomologia Experimentalis et Applicata*. doi: 10.1111/eea.13230.

Xu, L. Z., Qin, J. Y., Fu, W., Wang, S. L., Wu, Q. J., Zhou, X., Crickmore, N., Guo, Z. J., Zhang, Y. J. (2022). MAP4K4 controlled transcription factor POUM1 regulates PxABCG1 expression influencing Cry1Ac resistance in *Plutella xylostella* (L.). *Pesticide Biochemistry and Physiology*. 182, 105053. doi: 10.1016/j.pestbp.2022.105053.

Sun, D., Zhu, L., Guo, L., Wang, S. L., Wu, Q. J., Crickmore, N., Zhou, X., Bravo, A., Soberón, M., Guo, Z. J., Zhang, Y. J. (2022). A versatile contribution of both aminopeptidases N and ABC transporters to Bt Cry1Ac toxicity in the diamondback moth. *BMC Biology*. 20, 33. doi: 10.1186/s12915-022-01226-1.

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## **Service to the Department**

### **Advisory Committee**

Ric Bessin, Chuck Fox, Lynne Rieske-Kinney and Jen White

### **Curriculum Committee**

Nick Teets (Chair), Julian Dupuis, Dave Gonthier, Jen White, and a student

### **Graduate Program Committee**

Steve Dobson (Chair), Zain Syed, Zach DeVries, and a student

### **Planning Committee (Ad-hoc)**

Clare Rittschof (Chair), Nathan Haan, Zach DeVries, Julian Dupuis, Tonja Fisher, Dave Gonthier, Jonathan Larson, Zain Syed, Nick Teets, and Raul Villanueva

### **Diversity and Inclusion Committee (Ad-hoc)**

Tonja Fisher (Chair), Jonathan Larson, Clare Rittschof, Zain Syed, Raul Villanueva, staff and student reps

**Director of Graduate Studies:** Chuck Fox

**Director of Undergraduate Studies:** Jen White

**Director of online MS program:** Tonja Fisher



**Extension Coordinator:** Ric Bessin

**Farm operations coordinator:** Ric Bessin

**Seminar Coordinator:** Chuck Fox

**Greenhouse Coordinator:** Lynne Rieske-Kinney

**Awards Nominations coordinator:** Joe Zhou

**Safety Officer:** Eric Chapman

|        |                  |
|--------|------------------|
| Date:  | January 16, 2023 |
| Day 1: | Monday           |

|                 |                                                                                                                                                                                                                                                                                                                                                                                                                                         |
|-----------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 6:00am – 5:00pm | <p>Reviewers external to UK or from off-campus facilities travel to Lexington<br/>Flight schedules:</p> <p style="padding-left: 40px;">Dr. Michael Strand arrives at Bluegrass Airport at 10:28 am<br/>Dr. Amit Sethi arrives at Bluegrass Airport at 1:10 pm<br/>Dr. John Ruberson arrives at Bluegrass Airport at 2:27 pm</p> <p>Designated local committee member transports guests from Bluegrass Airport to Campbell House Inn</p> |
| 5:00 pm         | Designated local committee member transports Hotel guests to Sedona Tap House on Harrodsburg Road.                                                                                                                                                                                                                                                                                                                                      |
| 5:30 – 7:30 pm  | <p>Review Committee has dinner and working session at Sedona Tap House at 3600 Palomar Centre Dr, Lexington, KY 40513.<br/>Group is joined by Department Chair Dr. Reddy Palli.<br/>A local committee member returns hotel guests to Campbell House Inn.</p>                                                                                                                                                                            |

|        |                  |
|--------|------------------|
| Date:  | January 17, 2023 |
| Day 2: | Tuesday          |

|                   |                                                                                                                                                                                                                                                                                                               |
|-------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 7:30 – 8:30 am    | Breakfast on own (hotel guests dine at Campbell House Inn)                                                                                                                                                                                                                                                    |
| 8:30 – 9:00 am    | Local committee member transports hotel guests to E.S. Good Barn                                                                                                                                                                                                                                              |
| 9:00 – 9:45 am    | <p>Meet with College of Agriculture, Food and Environment Senior Associate Dean Carmen Agouridis and Associate Dean for Faculty Resources, Planning and Assessment Brian Lee.<br/>Committee receives their charge from Dr. Agouridis and Dr. Lee reviews rules and procedures. ES Good Barn, Culton Suite</p> |
| 9:45 – 10:15 am   | Break and walk to departmental location TBD                                                                                                                                                                                                                                                                   |
| 10:15 – 11:30 am  | Meet department chair Dr. Reddy Palli, for departmental facility tour and discussion at departmental location TBD                                                                                                                                                                                             |
| 11:30am – 12:00pm | Break and walk to ES Good Barn                                                                                                                                                                                                                                                                                |
| 12:00 – 1:30 pm   | Lunch with external stakeholders and industry partners, ES Good Barn, Culton Suite<br>Zoom link provided for remote attendees                                                                                                                                                                                 |

|                |                                                                                                                                              |
|----------------|----------------------------------------------------------------------------------------------------------------------------------------------|
| 1:30 – 2:30 pm | Video conference with Extension agents, ES Good Barn, Culton Suite                                                                           |
| 2:30 – 2:45 pm | Break                                                                                                                                        |
| 2:45 – 3:30 pm | Meet with departmental Extension faculty, ES Good Barn, Culton Suite.                                                                        |
| 3:30 – 4:15 pm | Meet with departmental teaching faculty, ES Good Barn, Culton Suite                                                                          |
| 4:15 – 5:00 pm | Meet with departmental research faculty, ES Good Barn, Culton Suite                                                                          |
| 5:00 – 5:45 pm | Break and travel to Fiddletree Kitchen and Bar, 444 Parkway Dr., Lexington, KY 40504                                                         |
| 5:45 – 7:30 pm | Working dinner at Fiddletree Kitchen and Bar for all committee members. A local committee member returns hotel guests to Campbell House Inn. |

|        |                  |
|--------|------------------|
| Date:  | January 18, 2023 |
| Day 3: | Wednesday        |

|                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
|-------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 7:45 – 8:00 pm    | Local committee member transports hotel guests to Agricultural Science North                                                                                                                                                                                                                                                                                                                                                                                                                  |
| 8:00 – 9:30 am    | Working breakfast with departmental staff, Ag North N24B1.                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| 9:30 – 10:15 am   | Meet with State Entomologist staff, Ag North N24B1.                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| 10:15 – 10:45 am  | Break                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| 10:45am – 11:45am | Meet with Entomology and AMBT undergraduate students, Ag North N24B1, departmental faculty committee members recused. Snacks provided                                                                                                                                                                                                                                                                                                                                                         |
| 11:45am – 12:45pm | Meet with departmental graduate students and post-docs, Ag North N24B1, Snacks provided                                                                                                                                                                                                                                                                                                                                                                                                       |
| 12:45 – 2:30 pm   | Break and committee working lunch, Ag North N24B1                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| 2:30 – 3:30 pm    | Meet with college leadership in Ag North N24B1<br>Dr. James Matthews, Research<br>Dr. Carmen Agouridis, Instruction<br>Dr. Laura Stephenson, Extension<br>Dr. Orlando Chambers, Administration (facilities)<br>Dr. Brian Lee, Faculty Resources, Planning and Assessment<br>Dr. Mia Farrell, Diversity, Equity, and Inclusion<br>Ms. Danielle Jostes, Philanthropy and Alumni<br>Note- additional college administrators may be invited to attend if available at the committee's discretion. |
| 3:30 – 4:30 pm    | Committee reflection session, Ag North N24B1                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| 4:30 – 5:00 pm    | Break and travel to Campbell House Inn (designated local committee member transports hotel guests)                                                                                                                                                                                                                                                                                                                                                                                            |
| 5:00 – 7:00 pm    | Working dinner at Campbell House Inn for all committee members                                                                                                                                                                                                                                                                                                                                                                                                                                |

|        |                  |
|--------|------------------|
| Date:  | January 19, 2023 |
| Day 3: | Thursday         |

|                  |                                                                                                                                                                                                                                                              |
|------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 8:30 – 9:00 am   | Local committee member transports hotel guests to ES Good Barn                                                                                                                                                                                               |
| 9:00am – 12:00pm | Breakfast and working session for all committee members, ES Good Barn, Weldon Suite                                                                                                                                                                          |
| 12:00 – 1:00 pm  | Lunch with College Leadership and committee presentation of preliminary recommendations, ES Good Barn, Weldon Suite                                                                                                                                          |
| 1:00 – 3:00 pm   | Designated local committee member transports guests to Bluegrass Airport<br><br>Flight schedules:     Dr. Ruberson departs Bluegrass Airport at 2:57 pm<br>Dr. Strand departs Bluegrass Airport at 3:07 pm<br>Dr. Sethi departs Bluegrass Airport at 5:32 pm |

### Review Committee

|                    |                                                                                                          |
|--------------------|----------------------------------------------------------------------------------------------------------|
| Dr. Wes Harrison   | Committee Chair and Chair of UK Community and Leadership Development Department                          |
| Dr. John Ruberson  | Entomology Department Head at University of Nebraska-Lincoln                                             |
| Dr. Michael Strand | Entomology Department Professor at University of Georgia                                                 |
| Dr. Amit Sethi     | Technical Director of Durability and Resistance Management at Corteva Agriscience in Johnston, Iowa      |
| Dr. Tonja Fisher   | UK Entomology Department Lecturer (Internal committee member)                                            |
| Dr. Doug Harrison  | UK Biology Department Associate Professor                                                                |
| Brandon Sears      | Kentucky Cooperative Extension Service, Madison County Agriculture and Natural Resources Extension Agent |
| Dr. Eric Chapman   | UK Entomology Department Staff Research Analyst (Internal committee member)                              |
| Isabelle Lucero    | UK Entomology Department Graduate Student (Internal committee member)                                    |

Support for Review Committee  
 Dr. Brian Lee  
 Tricia Coakley

Office Phone #  
 859-218-7991  
 859-257-7041 (forwarding to cell when away from office)



## **UK Department of Entomology**

### **2023 Periodic Program Review**

Review Committee site visit January 16-19, 2023

### **Review Report Submitted on March 15, 2023**

#### Review Committee

|                    |                                                                                                          |
|--------------------|----------------------------------------------------------------------------------------------------------|
| Dr. Wes Harrison   | Committee Chair and Chair of UK Community and Leadership Development Department                          |
| Dr. John Ruberson  | Entomology Department Head at University of Nebraska-Lincoln                                             |
| Dr. Michael Strand | Entomology Department Professor at University of Georgia                                                 |
| Dr. Amit Sethi     | Technical Director of Durability and Resistance Management at Corteva Agriscience in Johnston, Iowa      |
| Dr. Tonja Fisher   | UK Entomology Department Lecturer (Internal committee member)                                            |
| Dr. Doug Harrison  | UK Biology Department Associate Professor                                                                |
| Brandon Sears      | Kentucky Cooperative Extension Service, Madison County Agriculture and Natural Resources Extension Agent |
| Dr. Eric Chapman   | UK Entomology Department Staff Research Analyst (Internal committee member)                              |
| Isabelle Lucero    | UK Entomology Department Graduate Student (Internal committee member)                                    |

## - EXECUTIVE SUMMARY -

In January of 2023, the external review committee completed its site-visit for the mandated six-year Periodic Review for the Department of Entomology in the College of Agriculture, Food and Environment. The report that follows is organized as a SWOT analysis of the research, instructional and UK Cooperative Extension Service missions of the unit, and concludes with a set of recommendations for the department faculty and staff, and college administration to consider. The process followed in conducting the review is summarized below:

- Prior to the review, all committee members received and studied the Self-study Report submitted by faculty and staff of the Entomology Department.
- The committee received its charge from Senior Associate Dean Agouridis, and Dr. Lee, Associate Dean for Faculty Resources, Planning and Assessment, toured departmental facilities, and conducted listening sessions with departmental faculty, staff, students, and stakeholders on Tuesday and Wednesday, January 17-18.
- On Thursday, January 19, the committee held working sessions and drafted talking points about the program's strengths, challenges, opportunities, and preliminary committee recommendations, and then presented the recommendations to college leadership.
- Committee Chair Wes Harrison worked with the committee to prepare this report, which all members of the committee have approved.

### *SWOT Summary*

The department has many strengths across all three mission areas including productive and well-funded research programs, an overall strong graduate education program and excellence in several areas of UK Cooperative Extension Service programming. Faculty, staff, and graduate students shared a sense of unity and camaraderie, which creates a culture of collaborative synergies resulting in a productive department in both external grant funding, and the educational experience for its students. Grant funding has become essential for the department to achieve its mission, and the faculty and staff have delivered.

The increased emphasis by college and university administration on competitive extramural funding that generates overhead support also creates challenges for state-mandated programs, such as UK Cooperative Extension Service (UK CES) programs. Budget cuts have led to insufficient funds to deliver UK CES programs without the support from grants. The heavy reliance on grants to operate labs and fund programs, has disproportionately affected the department's UK CES programs.

The Extension Title Series faculty have developed an excellent and valued relationship with county agents. Reasons cited by agents during our listening sessions include excellent written communication materials, quick and timely responses to stakeholder questions, high quality programming, and a top-of-mind UK CES program. All said, there is a risk these outstanding

programs may be diminished, or lost, if several key challenges are not addressed. The overarching challenge is not enough personnel to support the UK CES mission, an inadequate operating budget to meet state programs, and extension faculty and staff that are stretched too thin. Unclear evaluation criteria and performance expectations for Extension Title Series are also noted as a concern.

Regarding research, the department has several strong, internationally recognized programs and is overall well-above average within the College in terms of securing extramural support from competitive granting agencies. The department though has also undergone considerable recent turnover due to retirement of several senior faculty members. The department has been able to fill a number of these positions with new, tenure track faculty, which are in the early stage of their career and in many cases show great promise of developing strong future research programs. However, expected additional retirements over the next several years will also create major voids in key basic and applied research areas that will have to be addressed.

Regarding instruction, the department exhibits a high degree of student satisfaction, particularly among graduate students, who seem highly engaged and interactive with faculty and staff. However, listening sessions indicated that course offerings are limited or inconsistent, despite having many courses listed in the course catalog, making program planning difficult for students. Also, the timing of course offerings is uneven, with disproportionately more courses offered in one semester relative to another. Further, there is limited classroom space on the agriculture side of campus.

Regarding facilities, the department has sufficient lab space in terms of square footage, but it is spread across multiple buildings and varies in quality. The department has done a good job of utilizing available lab space and renovating selected lab space given limited resources. However, some of that space is too antiquated, and there is inconsistency across labs regarding the quality and functionality of space. Basic and essential infrastructure, such as ventilation and climate control are unreliable and compromise research activities—particularly for labs located in Agricultural Science North. During the review site-visit, much of one floor was drying out due to ruptured pipes caused by inadequate heating during cold weather. Ventilation and climate control issues in this building are serious and should be a major priority for renovation.

Regarding administration, the department Chair is well respected by faculty, staff, and students, and viewed as engaged, inclusive, and passionate about the department. The faculty and staff feel the department culture is conducive to equality and mutual respect between faculty and staff. The staff are committed and motivated, with a seasoned and experienced staff within the department. The faculty and staff support each other and feel included and encouraged by the administration. However, there appears to be a need to review short- and long-term departmental plans more often, and better communication between Chair and faculty regarding matters of the budget.

### *Recommendation Summary*

The committee provides seven recommendations, which are presented in the main body of the report. The recommendations address the following: development of a hiring plan for critical needs and succession planning; a review of budget priorities to address the lack of an adequate operating budget – particularly, in support of UK CES programs; review and clarify promotion and tenure expectations for Extension Title Series faculty; review curriculum and course offerings, including growing the undergraduate program and online offerings; develop a plan for philanthropy; and assessment and annual reporting to college administration regarding new and/or renovated facilities for the department.

The remainder of the report includes greater detail regarding the SWOT analysis and recommendations.

### **- RESEARCH -**

#### *Strengths*

- Faculty and staff have done an excellent job securing extramural support, and the department has an overall strong record of publication.
- Research programs in several areas are internationally recognized. The most internationally recognized research programs are primarily headed by the more senior faculty members in the department.
- The department has many junior faculty with emerging, diverse, and innovative programs that are beginning to demonstrate productivity, collaboration, and funding potential.
- Intra- and inter-departmental collaboration are conducive to a culture of inclusion and collegiality among researchers.
- There is sufficient space for research functions (although facilities are aging and in need of renovation), and labs have adequate research staff, through intentional prioritization, to support research programs.

#### *Challenges*

- The department's labs and office space are dispersed across multiple buildings, which inhibits greater interaction across labs, and the quality of research space is not ideal. Facilities are badly outdated, especially concerning climate control, and the quality of lab facilities can vary greatly across researchers. Reliable facilities, especially for rearing animals, are lacking.



- There are current gaps in applied research, such as integrated pest management (IPM) and livestock entomology. There are no specialists for core commodity groups to support pest/problems related to relevant agricultural interests/needs, such as a “Field-Crop Entomologist”. There is also a disconnect between ecology hires and applied science for commodities and agriculture.
- Pre- and post-award support for faculty in entomology and other units in the college is currently limited due to staff constraints. There is also a lack of clarity regarding the grant processes from the university’s central grant office. The department’s use of PI salary savings is unclear (there is a need for greater transparency regarding salary savings).
- There is a need for improved faculty mentoring and professional development support, and limited (or non-existent) opportunities for research staff to advance within the unit.
- There is too much variability among PIs regarding their financial and professional development support for research assistants to present research and travel to annual meetings, which leads to inequities and uncertainty for graduate students assigned to different labs.
- There is no mention of “Agriculture” in departmental mission statement, despite the importance of agriculture to the department and UK.
- There is great potential for training in curation of the insect collection and systematics for undergraduates, but these are currently underutilized in the department’s research and teaching activities, especially with respect to student training.

#### - INSTRUCTION -

##### *Strengths*

- The department exhibits a high degree of student satisfaction, particularly among graduate students, who seem highly engaged and interactive with faculty and staff.
- Ph.D. students expressed a high level of satisfaction with the flexibility of the qualifying exam format and felt supported and incentivized to present and publish research. The professional development course is seen as a positive.
- Although a small number of students, the undergraduate students seemed satisfied with the instruction and the program, particularly those students recruited through lab work.
- There is a sense that teaching loads are fairly distributed across faculty. Student evaluations (TCE scores) are above university averages, and teaching faculty seem passionate and committed to quality teaching.

- The department is a strong contributor to the Agricultural and Medical Biotechnology (AMBT) program.

### *Challenges*

- Course offerings are limited in variety, despite having many courses listed in the course catalog. This is misleading, as many courses on the books are not regularly offered. The timing of course offerings is uneven, with disproportionately more courses offered in one semester relative to another. Also, there is limited classroom space on the agriculture side of campus.
- Concerns were raised by several students regarding advising in the graduate program. Some students felt there was insufficient programmatic guidance as they progressed through their program. As such, the department may need to assess and clarify advising responsibilities of the DGS, PI's and related support staff.
- The opportunities for graduate students to engage with the teaching mission is limited, with too few TA lines available.
- Opportunities for internships and other means to engage with industry are limited.
- Distance learning courses are largely offered in a synchronous format, limiting nontraditional student enrollment.
- The undergraduate program is small in numbers.
- Regarding faculty perspectives, there is little incentive for faculty to teach large undergraduate courses, and a departmental process to introduce/develop new classes is unclear.

### **- EXTENSION -**

### *Strengths*

- The Extension Title Series faculty, although few, have developed an excellent and valued relationship with county agents. Reasons cited by agents during our listening sessions include excellent written communication materials, quick and timely responses to stakeholder questions, high quality, and top-of-mind UK CES programs.
- The pesticide applicator program is highly regarded statewide and nationally.
- New Extension Title Series hires have strong potential for significant and long-lasting impacts on UK CES programs.
- The inclusion of the State Entomology office as part of the department, and the strong reputation office staff have with nurseries, with a focus on education rather than just

regulation. Collaboration between State Entomologist staff and Extension Title Series faculty is unique and a positive.

- In general, all stakeholders expressed a high level of satisfaction with Extension Title Series faculty efforts.
- World class programming in Integrated Pest Management, Urban Entomology, and Turfgrass Entomology.

### *Challenges*

- There is a risk that outstanding UK CES programs identified above under strengths may become diminished, or lost, if several key challenges are not addressed. The overarching challenge is not enough personnel to support the UK CES mission, and that Extension Title Series faculty and associated staff are stretched too thin. Also, there appears to be no succession planning for key Extension Title Series faculty positions.
- An unclear evaluation criteria/expectation for Extension Title Series faculty was noted as a concern, as well as the usefulness of the Faculty Success system for reporting extension work.
- UK CES programs currently have no expert/specialist for commodity groups, and no support staff for the pest applicator professional certification.
- Departmental extension-related operating budget is currently supported only from grants obtained by Extension Title Series faculty- most particularly, in-state extension-related travel.
- Perception that there is a disconnect, or a lack of understanding, between the research and extension mission, and a need for a stronger relationship between Department Chair and UK CES agents.
- The departmental mission statement does not indicate the value of extensive departmental engagement with the community.
- There is limited interaction between State Entomologist staff and Department Chair, and a lack of student involvement in State Entomologist office. Concerns that State Entomologist office's funding model is not sustainable.
- There is no formal education for students in Extension Education, lack of graduate students at the Princeton campus, and a need to encourage more student internships with the agricultural industry.
- There are risks associated with a faculty member isolated in Princeton dealing with tornado damage.
- Community partners expressed they could benefit from more UK CES outreach regarding bees/pollinators. There is very limited apportionment allocated to extension in this area,

while an outsized amount of work is being done on the low apportionment, making this unsustainable.

## **- FACILITIES -**

### *Strengths*

- The department seems to have sufficient space, but the space is spread across multiple buildings. All said, the department has done a good job of utilizing available lab space and renovating selected lab space given limited resources.

### *Challenges*

- Lab space is spread across multiple buildings, and some of that space is antiquated. There is also inconsistency across labs regarding the quality and functionality of the space. Ventilation and climate control issues are many – particularly in Ag North. This latter issue is a serious concern for existing faculty, the overall mission of the department and future recruitment. As such, this long-standing problem should be elevated as a major renovation priority for the college and university.
- Storm damage repairs to the Princeton station need to be completed.

## **- ADMINISTRATION -**

### *Strengths*

- The Chair is well respected by faculty, staff, and students, and viewed as engaged, inclusive, and passionate about the department.
- Faculty and staff feel the department culture is conducive to equality and mutual respect.
- The staff appear committed and motivated, with good experience inside department. Staff networking outside the department allows for enhanced problem-solving. Staff support each other and feel included and encouraged to engage with the department overall.
- The faculty are engaged (including junior faculty) in departmental planning.
- There is good diversity within the department and good engagement with Minorities in Agriculture, Natural Resources, and Related Sciences (MANNRs).
- Staff remote work allows for enhanced efficiency.

## *Challenges*

- There appears to be no regular discussion of short- or long-term vision for the department (vision 2030 or 2040). The department may wish to revisit its mission statement.
- The lines of communication and decision-making within the college are in a state of flux with the appointment of Vice President for Land Grant Engagement and appointment of CAFE Senior Associate Dean. The department will benefit from impending clarification as lines of communication solidify in the coming months.
- Communication by Chair and department regarding budget matters especially among faculty funds could be improved.
- Lack of streamlined process for developing new courses, and for reviewing existing course offerings periodically.
- Faculty mentoring seems quite informal and perhaps inconsistent - faculty mentoring could be improved.
- There is a need for succession planning for departmental and program leadership.
- Communication/coordination between the Director of Graduate Studies (DGS) and key staff supporting the graduate program could be improved. Office staff covering many DGS areas fall outside their normal responsibilities.
- Early planning of labs' IT requirements is needed to relieve burden of IT staff. Central campus IT does not understand departmental IT and central IT regulations create limitations.

## **Opportunities**

- Development of online entomology certificate, especially targeting agricultural and UK CES professionals; Soft-skills training for students; Look for opportunities to improve visibility and training breadth of post-docs.
- There are opportunities to fill current and future gaps within the UK CES program.
- There is a need for an extension associate position dedicated to pesticide applicator certification program, a livestock entomologist, and a plan for succession in key UK CES program areas.
- There are opportunities for greater engagement between the state entomologist staff with UK CES, and with the instruction mission, particularly in educational programs regarding the role of regulations related to the departmental mission.
- Quality digitization of collection specimens and data to broaden access and provide long-term security and safety of the collection's irreplaceable data and materials.
- Develop practices to grow leadership in the department, such as rotating individuals leading faculty and staff meetings.

## Threats

- Departmental extension specialists feel undervalued; low morale of extension specialists could lead to departures and vacancies
- Communication with college administration in a state of flux, and departmental funding faces uncertainty and the department budget is already stretched very thinly.
- There is a disconnect in communication between unit-level IT staff and central IT.
- There are limited opportunities for staff to be promoted in departments.
- There is a potential loss of senior faculty through retirements.

## - RECOMMENDATIONS -

1) Develop a hiring plan for faculty and administrative appointments to include applied research programs and succession planning, with attention to improving diversity, equity, inclusion, and accessibility among faculty ranks.

- New lines needed immediately to meet major challenges in applied research and extension (i.e., livestock entomologist, field crop entomologist, pesticide coordinator).
- Prioritization of developing a plan that anticipates future losses of senior faculty to retirement that have essential roles in departmental leadership, research productivity, and UK Cooperative Extension Service programming.

2) Review budget priorities and work with college administration to identify funding to adequately support UK Cooperative Extension Service programs. Critical needs include funding for a staff associate position to support the Pesticide Applicator Certification Program, and the operating budget for extension-related in-state travel and other program expenses.

3) Related to recommendation (2), review budget priorities and work with college administration to identify funding to adequately restore operating budgets for departmental flexibility. For example, programs such as the insect collection and State Entomologist office would benefit from a consistent operating budget.

4) Review and clarify the promotion and tenure expectations for the Extension Title Series and update the departmental Statement of Evidences accordingly.

5) Review curriculum offerings regarding timing and sequencing. Update the course catalog to more accurately reflect courses that are currently or soon-to-be offered. Consider ways to improve soft-skills training and experiential learning/internships. Assess investment level

needed to grow the undergraduate major. Explore the value of online certificate for master's program, possibly as a stackable credential. Review annual performance evaluations for graduate students to incorporate beneficial feedback and progression assessment to the students.

6) Work with CAFE Office of Philanthropy and Alumni to develop a philanthropy plan and enhanced alumni engagement processes.

7) Conduct an annual assessment of facilities and initiate annual meetings with administration to keep them apprised of critical needs to update and expand outdated lab space. Renovation to correct woefully inadequate heating and cooling issues in Ag North should be a College/University priority as the current situation is unhealthy for faculty, staff and students and endangers the research mission of the department. This would allow the department to remain competitive in attracting grant funds, and to recruit and retain the most talented faculty and staff.

**Opportunities for college leadership consideration outside the purview of a single academic program.**

- More pre- and post-grant support from CAFE grants office.
- New and updated facilities in general.
- Increase support for communication between departmental and campus IT.

# Periodic Review Implementation Plan

Unit Name: Entomology Department

Date: April 7, 2023

| Recommendation/<br>Suggestion                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | Source<br>I/E/H* | Accept/<br>Reject** | Unit Response/Rationale<br>(include goal or objective alignment)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | Actions<br>(including needed resources &<br>Approximate Costs)                                                                                                                                                                                                                                                                                                                                                                                                                       | Time Line                                                                                                    |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------|---------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------|
| <p>1) Develop a hiring plan for faculty and administrative appointments to include applied research programs and succession planning, with attention to improving diversity, equity, inclusion, and accessibility among faculty ranks.</p> <ul style="list-style-type: none"> <li>○ New lines needed immediately to meet major challenges in applied research and extension (i.e., livestock entomologist, field crop entomologist, pesticide coordinator).</li> <li>○ Prioritization of developing a plan that anticipates future losses of senior faculty to retirement that have essential roles in departmental leadership, research productivity, and UK Cooperative Extension Service programming.</li> </ul> | E                | Accept              | <ul style="list-style-type: none"> <li>• Engage Chair advisory committee, planning committee and faculty to develop hiring plan.</li> <li>• Continue discussion on future faculty hires. The Livestock Entomologist position has been recently approved by the college.</li> <li>• Need discussion among faculty and with the college administration on extension support for farmers.</li> <li>• Associate Dean for Extension recently provided funding for 1.5 years for a pesticide applicator training coordinator.</li> <li>• It is expected that several faculty members will be able to take on Chair, DGS and DUS roles as they become available.</li> <li>• Since all but one Extension</li> </ul> | <ul style="list-style-type: none"> <li>• Chair advisory committee and planning committee will develop hiring plan that will be discussed at faculty meetings and departmental retreats.</li> <li>• Develop proposals for new faculty lines and submit them to the college for approval.</li> <li>• Facilitate development and training of faculty with leadership aspirations</li> <li>• Seek approval from the College administration to hire the next Extension Faculty</li> </ul> | <p>Complete by end of year 3</p> <p>Ongoing all 6 years</p> <p>Ongoing all 6 years</p> <p>Next 2-3 years</p> |



## ***Periodic Review Implementation Plan***

|                                                                                                                                                                                                                                                                                                                                                                           |   |        |                                                                                                                                                                                                                                           |                                                                                                                                                                                                   |               |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---|--------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------|
|                                                                                                                                                                                                                                                                                                                                                                           |   |        | faculty are Assistant Professors, filling departmental Extension coordinator, director of IPM programs and director of Pesticide applicator training programs may be challenging.                                                         | member at an Associate or Full professor level.                                                                                                                                                   |               |
| 2) Review budget priorities and work with college administration to identify funding to adequately support UK Cooperative Extension Service programs. Critical needs include funding for a staff associate position to support the Pesticide Applicator Certification Program, and the operating budget for extension-related in-state travel and other program expenses. | E | Accept | <ul style="list-style-type: none"> <li>After 14% cut in 2021, the department currently has no operating budget. Department's share of salary savings and incentive funds are used to support the operations of the department.</li> </ul> | <ul style="list-style-type: none"> <li>Work with college administration to restore operating funds.</li> </ul>                                                                                    | 1-2 years     |
| 3) Related to recommendation (2), review budget priorities and work with college administration to identify funding to adequately restore operating budgets for departmental flexibility. For example, programs such as the insect collection and State Entomologist office would benefit from a consistent operating budget.                                             | E | Accept | <ul style="list-style-type: none"> <li>Recurring funding for the Insect Collection and the State Entomologist office is needed.</li> </ul>                                                                                                | <ul style="list-style-type: none"> <li>Work with college and University administrators to obtain mandated program funding for the Insect Collection and the State Entomologist office.</li> </ul> | All six years |
| 4) Review and clarify the promotion and tenure expectations for the                                                                                                                                                                                                                                                                                                       | E | Accept | <ul style="list-style-type: none"> <li>The departmental Statement of Evidences needs updates</li> </ul>                                                                                                                                   | <ul style="list-style-type: none"> <li>Work with faculty to revise the departmental Statement of</li> </ul>                                                                                       | End of year 1 |

## ***Periodic Review Implementation Plan***

| Extension Title Series and update the departmental Statement of Evidences accordingly.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |   |        |                                                                                                                                                                                                                                                                                                                                     | Evidences                                                                                                                                                                                                                                                                                                                                        |                                    |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---|--------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------|
| <p>5) Review curriculum offerings regarding timing and sequencing. Update the course catalog to more accurately reflect courses that are currently or soon-to-be offered. Consider ways to improve soft-skills training and experiential learning/internships. Assess investment level needed to grow the undergraduate major. Explore the value of online certificate for master's program, possibly as a stackable credential. Review annual performance evaluations for graduate students to incorporate beneficial feedback and progression assessment to the students.</p> | E | Accept | <ul style="list-style-type: none"> <li>• The curriculum committee will discuss various components of this recommendation and brings recommendations to the faculty.</li> <li>• The practice of giving feedback on evaluations of graduate student proposals and exit seminars was discontinued during Covid-19 outbreak.</li> </ul> | <ul style="list-style-type: none"> <li>• The faculty will discuss the recommendations of the curriculum committee at future faculty retreats and formulate action plans.</li> <li>• Restore the practice of giving feedback on evaluations of graduate student proposals and exit seminars was discontinued during Covid-19 outbreak.</li> </ul> | <p>Years 3 and 4</p> <p>Year 1</p> |
| <p>6) Work with CAFE Office of Philanthropy and Alumni to develop a philanthropy plan and enhanced alumni engagement processes.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                             | E | Accept | <ul style="list-style-type: none"> <li>• Philanthropy plan and enhanced alumni engagement are needed to raise funds for scholarships and endowments</li> </ul>                                                                                                                                                                      | <ul style="list-style-type: none"> <li>• The chair will work with CAFE Office of Philanthropy and Alumni Development to enhance departmental philanthropy and alumni engagement activity.</li> </ul>                                                                                                                                             | All six years                      |
| <p>7) Conduct an annual assessment of facilities and initiate annual meetings with administration to keep them apprised of critical needs to update and expand outdated lab space. Renovation to correct woefully</p>                                                                                                                                                                                                                                                                                                                                                           | E | Accept | <ul style="list-style-type: none"> <li>• Improvement of facilities and equipment are recurring issues.</li> <li>• Dr. Beryl Jones will start as an Insect Genomics Assistant professor in July 2023. Labs in</li> </ul>                                                                                                             | <ul style="list-style-type: none"> <li>• The chair will work with the college administration to find ways to improve facilities and equipment.</li> <li>• The chair will work with</li> </ul>                                                                                                                                                    | Ongoing all 6 years                |

## ***Periodic Review Implementation Plan***

|                                                                                                                                                                                                                                                                                                                                                                              |  |  |                                                                           |                                                                                              |                  |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|--|---------------------------------------------------------------------------|----------------------------------------------------------------------------------------------|------------------|
| <p>inadequate heating and cooling issues in Ag North should be a College/University priority as the current situation is unhealthy for faculty, staff and students and endangers the research mission of the department. This would allow the department to remain competitive in attracting grant funds, and to recruit and retain the most talented faculty and staff.</p> |  |  | <p>Ag. North are not suitable for conducting Insect Genomics research</p> | <p>college administrators to find lab space for Dr. Jones in the Plant Science building.</p> | <p>1-2 years</p> |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|--|---------------------------------------------------------------------------|----------------------------------------------------------------------------------------------|------------------|

**\*Source of Recommendation (I = Internal/Self-study recommendation; E = External Review Committee recommendation; H = Unit Head [Dean] recommendation)**

**\*\*Accept/Reject Recommendation (A=Accept; R=Reject) as negotiated between self-study stakeholders and Unit Head.**

|                                                                          |                                |
|--------------------------------------------------------------------------|--------------------------------|
|                                                                          |                                |
| <p><b>Unit Head Signature:</b> <i>Subba Reddy Palli</i></p>              | <p><b>Date:</b> 04/26/2023</p> |
| <p><b>Unit Head Supervisor Signature:</b> <i>Carmen T. Agouridis</i></p> | <p><b>Date:</b> 05.01.23</p>   |