



Postharvest Institute for Perishables

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Annual Report

Postharvest Institute for Perishables
University of Idaho
Moscow, Idaho 83843

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Project Title: Storage and Processing of Fruits and Vegetables

Dr. Robert L. Skiles, Director

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A. Introduction

This is the second annual report from the Postharvest Institute for Perishables (PIP) and presents a review of activities for the year October 1, 1981 to September 30, 1982. The cooperative agreement between the U.S. Agency for International Development and the University of Idaho specified certain categories of activities that should be undertaken by PIP. Those categories are discussed individually in the report. In addition, certain other activities are discussed that arose peripherally to the principal categories of action during the year.

In general the year was a successful one, with most of the interim objectives having been attained, as defined in the cooperative agreement. There were some exceptions, but they were to be expected and were relatively easy to accommodate by periodic internal reassessment and realignment of priorities. The basis for such realignments was largely determined by requests made upon PIP by developing-country interests and USAID Missions in those countries. Every effort was made to accommodate those requests.

Two phases of PIP capabilities that attracted the most interest in developing countries during the past year were General Technical Service Teams (or Technical Assistance Teams) and the PIP Information Center. PIP's services in these areas surpassed the interim expectations according to the cooperative agreement and it clearly appears that both will continue to be in greater demand in the coming months.

The core staff of PIP was notably increased during the year when Dr. Robert E. Julian assumed the position of Field Director. He brings several years' experience in AID project planning and implementation, and his presence has materially strengthened PIP's potential.

The PIP core staff is now composed of:

- Dr. Robert Skiles - Director
- Dr. Robert Julian - Field Director
- Ms. Paulette George - Information Specialist
- Ms. Gleanne Wray - Administrative Secretary
- Ms. Doris Kayser - Senior Clerk-Typist
- Mr. Joseph Dvorak - Micrographics Technician
- Mr. Kevin Proctor - Clerk
- Ms. Shannon Proctor - Clerk

The supporting staff is composed of the hundreds of experts and specialists in all aspects of postharvest technology of perishable crops whose names appear as consultants in the PIP computerized XPRF roster. Those people are located at the University of Idaho and many other institutions, both public and private, around the world.

B. Goals and Objectives of the Cooperative Agreement

The Cooperative Agreement between the U.S. Agency for International Development (AID) and the University of Idaho was negotiated on September 30, 1980, for the purpose of establishing the Postharvest Institute for Perishables (PIP) at the University. The goals and objectives are:

1. To increase the availability of fruits, vegetables, roots, tubers, spices and oilseeds, and to enhance the basic diet of people in developing countries by reducing postharvest losses.
2. To reduce the costs of these perishable commodities by improving marketing efficiency.
3. To encourage the development of fruit, vegetable, root, tuber, spice and oilseed industries and processing.

C. Scope of Activities and Responsibilities

The means for attaining the defined goals and objectives of PIP are twofold:

1. PIP will function as an international base to organize General Technical Service teams that will identify, assess and reduce the problems associated with the storage, marketing and processing of perishable crops.

2. PIP, in conjunction with AID, will design projects or activities which will reduce food losses, reduce costs and improve market efficiency, and/or encourage and enhance economic growth through agri-business development in the labor intensive perishable crops industries and through foreign exchange earnings from the export of these commodities.

These two broad categories have been subdivided into the following ten specific areas of activity:

1. Organize General Technical Service teams
2. Adapt research to developing countries
3. Develop a documentation system for dissemination of information
4. Develop and distribute manuals on postharvest loss reduction
5. Conduct short courses and training in postharvest loss reduction
6. Organize international meetings related to loss prevention in developing countries
7. Develop an international voluntary network of groups associated with food loss reduction in perishable crops
8. Coordinate placement of developing country graduate students in the U.S.
9. Develop cooperation with the Peace Corps in developing countries
10. Cooperate with other financial institutions interested in promoting postharvest loss control in perishable crops

The activities in PIP during the past year that related to the above ten categories will be discussed in detail in the sections that follow.

D. General Technical Service Teams

AID Missions and other agencies commonly refer to General Technical Services teams as Technical Assistance (TA) teams and there were eleven of them assembled or in various stages of being assembled by PIP during the year for developing country projects.

1. Barbados - AID/Bridgetown. October 5 to 20, 1981. The AID Regional Development Office/Caribbean (RDO/C) requested TA in the Eastern Caribbean region to identify perishable commodities where significant postharvest losses occur during handling, packing, transport, storage and distribution. Also it was requested that a determination be made of the economical and technical feasibilities of interventions for loss reductions. The island-countries of concern were Barbados, Antigua, Dominica, St. Lucia and St. Vincent.

The team members were Dr. Richard Schenmerhorn and Dr. Donald Jackson, agricultural economists, and Mr. Donald Leeper, marketing specialist. It was agreed that they limit their studies to Barbados, St. Vincent, St. Lucia and Dominica. After completion of the study, a report was prepared which included

- a) a general assessment of the marketing system and of the amount and value of losses attributable to postharvest losses of various perishable crops, e.g. breadfruit, citrus, banana, plantain, papaya, guava, sweet potato, eddoes, dasheen, mangoes and others,
- b) for each commodity identified where significant economic losses occur, an analysis of the problems, causes and potential solutions, and
- c) recommendations as to where AID assistance may be best focused to reduce postharvest losses in perishables, including detailed scopes of work for any further analysis required.

2. Dominican Republic - AID/Santo Domingo. November 1 to 12, 1981. The AID Mission responded to a request from the National Marketing Institute (INESPRE) for recommendations as to methods for reducing losses of onions and potatoes. The needs that were specified were to

- a) review the entire marketing system for onions and potatoes and to determine major causes of losses,

- b) evaluate existing storage facilities and recommend modifications to improve efficiencies,
- c) recommend economically feasible additional storage installations,
- d) assess the possibility of alternative storage methods,
- e) recommend operational measures to improve the perishables division of INESPRES, and
- f) prepare a scope of work for additional, more intensive studies.

The team was composed of Dr. Neil Meyer, agricultural economist, and Mr. William Simpson, onion and potato specialist. Upon completion of their studies they submitted a report that contained a survey of the causes of potato and onion losses, an analysis of the marketing subsystems, and their influence on the potato and onion postharvest loss problems. Recommendations were made for improvements in the following areas:

- a) Storage refrigeration operation for maximum efficiency
- b) Preparation of crops in the field for storage after harvest
- c) Commodity management in storage
- d) Training of INESPRES employees for crop management in the field before harvest and in storage
- e) Restructure of management responsibilities in INESPRES to improve crop management in storage
- f) Conduct experiments or feasibility studies on alternative storage methods and processing of surplus crops, and to identify new profitable crops
- g) Conduct an educational program on farm and storage planning to avoid oversupply and concomitant storage problems.

3. Thailand - AID/Bangkok. March 2 to 21, 1982. The AID Mission requested assistance for the Thailand Institute for Scientific and Technological Research (TISTR) to identify project needs that might be supported by AID. The points specified for investigation in the scope of work were

- a) the formulation of a project proposal for subsequent AID funding in needed areas of the food industry,

- b) the establishment of essential facilities for postharvest work in the food handling and distribution system, and laboratory and research designs, and
- c. the feasibility, preparation and recommended assistance for organizing a postharvest workshop or seminar in Thailand on food losses.

Mr. Harvey Neese, a food marketing specialist with considerable experience in Thailand, went to Bangkok in response to the request. Upon completion of the project he submitted a report that included

- a) an analysis of the fruit and vegetable distribution system in Thailand,
- b) the determination that postharvest losses in Thai fruits and vegetables result from or are exacerbated by
 - 1) lack of incentives for farmers to produce quality crops,
 - 2) poor transportation and lack of refrigeration in transit, and/or
 - 3) lack of proper storage facilities.

In addition, the report covered problem areas in the export market where poor quality caused rejections of some produce by exporters. The problems were primarily concerned with inadequate packaging, excessive handling, lack of standards and inspections, lack of cold storage and misunderstanding of western market quarantine and pesticide regulations.

Recommendations that were made for improvements in Thailand cover the following topics:

- a) A workshop should be held in TISTR where experts could present U.S. and European quarantine regulations, and explain and demonstrate grading standards.
- b) A consultant should be contracted who could make recommendations for and teach proper storage of onions, garlic, shallots and potatoes.
- c) Equipment should be provided to TISTR in order to expand that organization's ability to assist in food handling and distribution processes.
- d) An advisory board should be formed that would concern itself with applied research projects for perishable crops.
- e) The government Cold Storage Organization (CSO) vehicles should expand their activities to include more perishable crops in transit and at the Bangkok Airport.

4. Philippines - Funded by the Asian Development Bank. March 19 to April 18, 1982. The Asian Development Bank (ADB), in collaboration with the National Food Authority of the Philippine Government, requested that a technical assistance team study fruit, vegetable and rice postharvest losses in that country. The purpose of the study was to determine the feasibility of developing region-specific complexes for the collection, grading, processing and storage of the crops. The complexes would be designed to link the Manila consumer market with accessible production centers in a manner that would minimize the high postharvest losses that are now occurring.

The team that responded to the request was composed of Dr. Robert Enochian and Dr. Richard Schermerhorn, agricultural economists; Mr. Harvey Neese and Mr. Donald Leeper, marketing specialists; Mr. Felipe Luna, food processing equipment specialist. Upon completion of their study the team members prepared a report for submission to ADB. The project was funded by ADB and will become part of a larger, subsequent project. Therefore, its contents are not available for distribution at present.

5. Bangladesh - AID/Dacca. March 12 to April 4, 1982. The AID Mission in Bangladesh responded to a request from the Bangladesh Agricultural Research Institute (BARI) for technical assistance in the identification and reduction of potato storage and processing losses.

The following studies were specified by the Potato Research Center in BARI for the initiation of activities:

- a) Development of low-cost methods for processing potatoes into a variety of long shelf-life commodities
- b) Design, testing and evaluation of a nonrefrigerated storage center for holding potatoes for 3 to 5 months after harvest to stabilize market prices
- c) The effects of storage conditions on local and improved varieties of potatoes.

Mr. Roy Shaw was contracted jointly by PIP and the International Potato Center (CIP) in Lima, Perú to work on the project. Upon completion of it he prepared a report that contained recommendations to

- a) build sufficient cold-storage units to store the new, higher-yielding varieties that do not store well,

- b) plan storage and marketing management in order to spread the available crop over a longer period of time, and
- c) process the new, higher-yielding varieties that do not store well.

In addition, it was learned that a simple, inexpensive and effective solar dehydration technology was being practiced by some farm families for potato processing. The dehydrated product could be stored for long periods and transported easily, as well as be prepared for consumption by frying or boiling. It was recommended that small cottage industries at the farm family levels be expanded in order to

- a) develop home industries,
- b) absorb seasonal high productions,
- c) take advantage of lower prices,
- d) spread the availability of potatoes over a longer period, and
- e) obviate the need for so many additional cold storage units.

6. Pakistan - AID/Islamabad. April 11 to May 5, 1982. The AID Mission requested assistance in determining the feasibility of supporting a major marketing, storage and distribution project being undertaken in the Northwest Frontier and Baluchistan Provinces by the Pakistan Government. Specifically, it was planned to create a fruit and vegetable marketing board, and the requested assistance was to cover all related functions of research, extension, training, credit, marketing and institutional development. Within the marketing system the functions to be studied were storage, processing, handling, packaging and transportation of a variety of fruits and vegetables, with special emphasis on apples and potatoes. In addition, it was requested that a strategic plan be prepared for the development of the marketing board with recommendations for implementing efficient postharvest systems that would minimize crop losses.

The team that was assembled for the project included Mr. E.N. Tony Bato, agricultural project specialist, Mr. Charles W. Peters, agricultural economist and market board specialist, Mr. James K. Ballard, pomologist, and Dr. Ronald D. Morse, olericulturist.

Upon completion of the project the team submitted a report that examined the current agricultural system in the Northwest Frontier Province, and analyzed its constraints. Then potentials for development were presented with proposed implementation projects for the Northwest Frontier and Baluchistan Provinces. Finally, a scope of work for a design team was included which encompassed technology development, marketing, cooperatives, food processing and private sector.

7. Thailand - AID/PRE. April 10 to 22, 1982. The Bureau of Private Enterprise in AID requested technical assistance to analyze and assess agro-industry investment opportunities for U.S. companies in Thailand. The terms of reference were to 1) analyze agro-industry investment opportunities, 2) verify the existence, feasibility and attractiveness of the identified opportunities, and 3) make a comparative assessment of the opportunities and draft specific investment opportunity proposals.

Upon completion of the assignment a report was submitted to PRE that analyzed a) the climate for U.S. agro-industry investment and business in Thailand, b) specific agro-industry investment opportunities, fruits, vegetables and seeds, c) areas of potential agro-industry investment opportunities, and d) other agro-industries for consideration.

8. India - AID/New Delhi. September 20 to October 22, 1982. The AID Mission was requested to provide assistance related to the design and development of a postharvest technology subproject on fruits and vegetables. It was to focus on the reduction of those perishable crop losses through all phases of the postharvest channels and recommend research and other measures to accomplish the reduction.

The assignment was successfully completed and a report was submitted to the Mission in India. It is not now available for publication.

9. Pakistan - AID/Islamabad. Starting November 15, 1982. This technical assistance project is now being developed at the request of the AID Mission and will be the second phase of the Pakistan project described under 6, above. There will be eight specialists who will comprise a design team that will include the team leader, an anthropologist, a horticulturist, a

management expert, a market and processing expert, an organizational management expert, an extension horticulturist, and a potato seed production expert. The project will extend into 1983.

10. Jamaica - AID/Kingston. Starting October 4, 1982. This technical assistance project will respond to an AID Mission request for short-term services of a specialist in food processing equipment for fruits and vegetables. The processing concerns assembling and grading stations, precooling, washing, drying, dipping, waxing and storing fruits and vegetables.

One food processing technologist will work on this project in October and again in December, 1982.

11. Thailand - AID/Washington. Starting October 26, 1982. This will be a Private Sector in Development Project to assist the Royal Thai Government promote processing and marketing of Thai fruits and vegetables. The study will cover potential market areas in Singapore, Hong Kong, Japan and the U.S. for a variety of Thai commodities. The project will extend into 1983 and will involve the services of two international marketing specialists.

E. Adaptive Research

There were inadequate funds in the PIP budget to initiate any adaptive research during the year. Nevertheless, plans were made for some low-cost crop cooling or refrigeration research for developing countries, pending the availability of funds.

The research would be under the direction of the Department of Chemical Engineering at the University of Idaho and a developing-country student would do the research. Considering that AID funds may not become available for the project, a proposal for funding was submitted to a private donor agency. No decision has been received.

F. Information Center

The Postharvest Institute for Perishables Information Center (PIPIC) finished its second year fully operational, as a comparison with its first year will show. There are two sides to the operation: 1) the acquisition and processing of materials and 2) the services rendered to users. Gains in both areas will be discussed below.

Acquisitions and Processing: There are now nearly 5,000 documents in the collection which is 2.5 times as many as a year ago. These are mostly journal articles, technical reports, and extension publications. A few segments from books are included (but full books are excluded due to copyright restrictions). Most materials are donated by the authors or through exchanges with other institutions and libraries around the world. Formal exchanges have been established with the following institutions:

Tropical Products Institute /TPI (London, United Kingdom)

International Development and Research Centre /IDRC (Ottawa, Canada)

United Nations Industrial Development Organization /UNIDO (Vienna, Austria)

International Trade Centre of UNCTAD/GATT (Geneva, Switzerland)

International Center for Tropical Agriculture /CIAT (Cali, Colombia)

International Potato Center /CIP (Lima, Perú)

Institute of Development Studies (Brighton, United Kingdom)

Volcani Institute (Bet Dagan, Israel)

Thai Institute for Science and Technical Research /TISTR (Bangkok, Thailand)

ASEAN Postharvest Training and Research Center (Los Baños, Philippines)

A consortia of Thai Agricultural Colleges (Chiang Mai, Thailand)

College of Tropical Agriculture, University of Hawaii (Honolulu, Hawaii)

Philippine Root Crop Research and Training Center (Visayas, Philippines)

Tanzanian Documentation Center /TANDOC (Dar Es Salaam, Tanzania)

Philippine Ministry of Agriculture (Quezon City, Philippines)

Rwandan Ministry of Agriculture (Kigali, Rwanda)

Equatorial Guinean Ministry of Agriculture (Malabo, Equatorial Guinea)

Services to Clients: The services available to clients are:

- Copies of documents in the collection (photocopies or microfiche)
- Copies of any document related to postharvest perishables, even if not in the collection (obtainable by interlibrary loan)
- Bibliographies on topics within our subject area
- Bi-monthly acquisitions lists called New Titles (see Appendix VI)
- Answers to reference questions
- Referrals to experts working on certain topics
- Automatically generated bibliographies on topics of continuing interest (Selective Dissemination of Information or SDI's)

These services are apparently valuable to our primary clientele as the number of users continues to increase steadily. There was a ten-fold increase during this fiscal year in the number of clients. A total of 289 are now being served. Many of these were reached through the mailing of the PIPIC brochure entitled "Need Postharvest Information?" (see Appendix V).

Over 700 letters introducing the service were sent to international agricultural agencies, attendees at conferences related to our field, and most productively, libraries in governmental agencies and universities throughout the developing world.

A summary of the numbers of items received for each of the service follows.

	<u>1981-82</u>	<u>1980-81</u>	<u>Total</u>
Photocopies of articles:	3529	151	3680
Microfiche of articles:	973	1	974
Bibliographies	250	21	271

The materials sent as requests for documents not included in the collection and those sent as a result of the SDI's are included in the above totals.

The bibliographies are generated when a specific request is received. It is searched in the PIPIC files. Whenever it is seen that the local files do not cover the topic adequately, commercially available databases are searched. During this year PIPIC gained access to the French-based vendor QUBSTEL which has databases focusing on agriculture in Europe and also on

francophone Africa. We have also established a working agreement with Denver Research Institute which is the coordinator of the DEVELOP non-bibliographic database from Control Data Corporation. These resources are added to those of Bibliographic Retrieval Services, Lockheed's Dialog and SDC's Orbit databases previously accessed. Some sample bibliographies created include:

- "Gloeosporium and anthracnose diseases of tropical fruits"
- "Manufacturers of small-scale potato processing equipment"
- "Fermentation as a preservation method"
- "Aflatoxins: detection and prevention during storage of groundnuts"
- "Methods of cooking beans: considerations of nutrition and energy-consumption"
- "Appropriate materials for banana crates"
- "Economic analysis of ginger as a cash crop in Central America"

Clients are asked systematically and continuously for feedback on the quality of service. With each packet of materials shipped a postcard survey is sent (see Appendix VII) checking on the shipping time and condition of the package. It is also meant as a quick way to verify whether the people received what they requested. A survey of the responses was done during July, after approximately one operational year. On the whole, satisfaction was very high, a conclusion also apparent from the numbers of repeat customers. In addition an annual survey of all users was initiated. The questions asked users to evaluate the importance of all the current services and to comment on the factors which are of importance to any information center (Appendix VIII). A summary of the user recommendations follows:

1. 75% of the bibliographies sent were general surveys of the topics, not specific aspects. For example, there were many requests of the type "storage of commodity x" and only a few of the type "effect of humidity on disease x for crop y in storage".
2. Commodity foci cut across all the categories covered by the Institute rather than the expected focus on roots, tubers, and tropical fruits.

3. Some of the users are content to receive an acquisitions-listing consisting solely of titles and order numbers. Probably 10% of the users (mostly information centers) prefer to receive complete abstracts as well as a bibliographic information for all cited materials. Yet others would like bibliographic information and can live without abstracts.

4. Delivery by air mail is absolutely essential to certain clients and they are willing to pay, if necessary, for that shipment. Others have much more time than money and choose to have documents shipped by sea mail. In several cases the decision to pay or not is dependent on the individual titles at a given time.

5. The most important functions for an information center in the opinions of these users were:
 - a. comprehensiveness
 - b. rapid response to requests
 - c. cover current literature quickly
 - d. responsive to users
 - e. as inexpensive as possible

6. Current services were rated in importance with all being positively evaluated. However, reference services were not evaluated by half the respondents and microfiche services were not evaluated or seen as unneeded by exactly half the respondents.

These recommendations are forming the basis for a number of changes whose effects will be reported in the next annual report.

G. Short Courses and Workshops

Two workshops were presented during the year - both in Nicaragua and both on the subject of food processing.

1. Nicaragua - AID/Managua. December 1 to 12, 1981. The AID Mission requested assistance for the Food Technology Laboratory in the Ministry of Industry in the areas of food plant sanitation and microbiological analyses of processed foods.

Dr. Marion Fields, food technologist, presented a seminar on the following subjects:

- Sanitation
- Rodent and insect control
- Water supply
- Chlorination of water
- Building construction and maintenance
- Equipment maintenance
- Waste treatment and disposal

Following the seminar, he held a workshop on the microbiological analyses of processed foods for vitamin and amino acid contents in support of a developing food processing industry.

There were 46 participants in the courses, representing various universities and government industries, such as health, internal trade, agricultural development, and fisheries. Furthermore, the interests covered canning, bottling, oils and fats, baking, frozen vegetables, and pickle and sauce industries.

2. Nicaragua - AID/Managua. January 13 to 18, 1982. The AID Mission requested that a seminar and workshop on sensory evaluation of processed foods be held for the Food Technology Laboratory in the Ministry of Industry.

The course was given by Dr. Ruth Baldwin, food technologist, for 28 students whose interests covered fruits, vegetables, seafoods, meats, dairy, cereals, oils, analytical chemistry, microbiology, food inspection, and the National University College of Agriculture.

The workshop included various methods of sensory evaluation and the validity of a sensory evaluation program. Because of the diverse interests represented in both Dr. Baldwin's and Dr. Fields' workshops, it appeared evident that there would be wide dissemination of the subject matter.

H. Loss Reduction Manuals, Graduate Students and Training Guides

Budgetary restrictions precluded any activities by PIP in these areas during the past year. This situation was reviewed with management personnel of S&T/AGR in AID during a meeting held in Washington, D.C. in mid-August, 1982. Everyone is aware of the problem and of the high level of importance that is attached to the three training categories in developing country programs. Nevertheless, there is a moratorium on plans for activities in these areas until additional funding can be provided.

I. International Meetings

The Decennial Anniversary Congress of the International Potato Center (CIP) was held at CIP's training and research center in Lima, Perú from February 22 to 25, 1982. R.L. Skiles attended as a representative of PIP and presented a paper entitled "The role of the Postharvest Institute for Perishables in potato processing in developing countries."

The congress was well-attended by basic and applied scientists from many developed and developing countries. The entire organization of the Congress was very professionally handled, so there were excellent opportunities for world-wide exchanges of information.

J. Multinational Cooperation

PIP associated to varying degrees, small and large, with numerous multinational organizations during the year.

1. The General Technical Service Team project in Bangladesh, described under C, 5, above, was jointly funded by PIP and the International Potato Center (CIP) in Lima, Perú. The project was concerned with potato preservation in fresh storage or by dehydration. CIP has a world-wide outreach program that is very active, so it was appropriate for the two organizations to collaborate on the project.

2. The PIP Information Center has established a linkage with numerous multinational organizations shown in section E, above. These linkages are functional and highly effective, and the cooperative efforts from all parties have been excellent.

In addition to the multinational linkages that have been established by the Information Center there have been some initial steps taken to develop satellite linkages. Dissemination of information to developing country clients would be facilitated in various ways by having PIP information Center satellites in strategic locations around the world. Organizations that have shown an interest in a satellite system are the ASEAN Postharvest Training and Research Center in Los Baños, Philippines and the Gesellschaft für Technische Zusammenarbeit (GTZ) Proyecto Dominico-Alemán in Santo Domingo, Dominican Republic.

3. PIP personnel have been attempting to obtain outside funding to support an international workshop entitled "Methods and Potentials for Cooling Perishable Crops in Developing Countries." When, and if, the funding is obtained, the International Potato Center (CIP) in Lima, Perú has offered its facilities for the workshop. It would be held in March 1983 immediately after the 6th Symposium of The International Society for Tropical Root Crops.

K. Additional Activities

1. A world conference on "How to Store Your Food Harvest" was sponsored by the International Food Storage Corporation, Spokane, Washington, and held in Pasco, Washington from October 11 to 22, 1982. The first week was spent on discussions and field trips concerned with perishable crops. Drs. R. Julian and R. Skiles attended this portion of the conference and assisted earlier in its planning. Also, R. Skiles presented a paper entitled "The Role of the Postharvest Institute in Developing Countries." The conference was attended by people with various postharvest storage interests from Latin America, Europe, Africa and Southeast Asia.

2. Paulette George, the Information Specialist in charge of the PIP Information Center, was invited to present a paper at an information science conference to be held in Cairo, Egypt in December, 1982. While traveling she plans to attend an ONLINE Conference in London.

3. Dr. R.J. Miller, Dean of the College of Agriculture at the University of Idaho, and Drs. R. Julian and R. Skiles of PIP visited AID/Washington in mid-August, 1982. The purpose was to review current PIP activities and to clarify program plans under the present conditions of a restricted budget. The meeting was held with Drs. Robins, Bertrand, Yone and Morris of AID/Washington.

4. While Drs. Miller, Julian and Skiles were in Washington, Dr. Morris (AID/Washington) arranged for a PIP presentation in the State Department. A review of PIP activities and capabilities was given to a group representing various AID desks, including PRE, Asia, and Latin America, the Peace Corps, and the Inter-American Development Bank.

5. R. Skiles gave a seminar on PIP to a Postharvest Physiology class at Washington State University.

6. Paulette George attended a seminar entitled "ONLINE 82" in Dallas, Texas that was concerned with computerized databases and recent developments and innovations.

7. R. Skiles was interviewed for a TV program that was aired from a Spokane, Washington station. The topic was PIP, its activities and plans, and developing-country concerns.

8. A paper entitled "Storing Perishables in the Tropics" by R. Skiles, was published in Rural Technology. This was an AID publication that was terminated after the March-August 1982 issue.

9. Visitors to PIP during the year:

- Deans of Agriculture and Heads of Departments from several Indonesian universities.

- Ms. Carmen Paterno, from Food Terminal, Incorporated, Manila, Philippines. She was also assisted by PIP and Dr. Morris in a tour of Castle and Cook in New York, Rutgers University, USDA and FDA in Washington, University of Maryland, private food distributors and processors in Colorado, and Washington, San Francisco Market area, USDA in Albany and Fresno, California, and vineyards and packing sheds in California.

- Dr. Emma Data, Head of Postharvest Technology Section, Philippine Root Crop Research and Training Center.

- Dr. C. Makambila, Chief of Biological Science Department, Marien Ngouabi University, Brazzaville, Congo.

- Mr. Phocas Kayinamura, Agricultural Adviser to OPROVIA, the government agricultural research institute, in Rwanda.

- Messrs. M. Oyono and A. Ndong, Technical Secretary of Agriculture and Technical Secretary of Livestock, respectively, in Equatorial Guinea.

- Dr. Chinkook Lee, U.S. Department of Agriculture, OICD/TID, Washington, D.C.

L. PIP Publications

1. Approximately at six-month intervals a letter is sent to AID Missions to reacquaint them with the assistance that can be provided by PIP to developing countries. Also, because of personnel changes in the Missions there may be individuals who are not familiar with PIP. During the year a letter was sent to 66 AID Missions around the world in accordance with this communications program.

2. When PIP was established a small brochure was developed for introductory purposes with new correspondents. This brochure was brought up to date and a new printing was done during the year (Appendix I).

3. Correspondents who request more details of information about PIP are sent a larger brochure. Because of its size, the mailing costs are more, so it is not used for routine introductory purposes. The brochure was made current and a new printing was done during the year (Appendix II). In addition, this brochure was translated and Spanish (Appendix III) and French (Appendix IV) versions were printed.

4. Paulette George proposed a brochure (Appendix V) that was designed to acquaint people better in developing countries with the total services available from the PIP Information Center. Approximately 700 of the brochures were mailed to all UNDP offices, all international development agencies, all AID Missions, and scientific and agricultural libraries in developing countries in Asia, Africa and parts of Latin America. In the latter case the contacts were few in francophone Africa and in Latin America because it is anticipated that there will soon be funds to have the brochure printed in French and Spanish for distribution. The response to the initial mailing of the brochures was highly successful, and the Information Center was inundated with requests for literature.

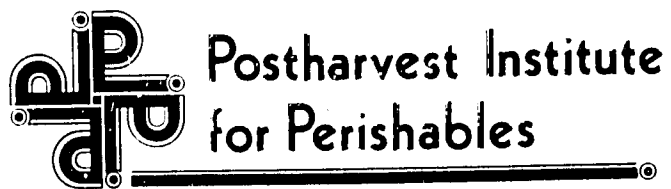
5. The PIP Information Center has developed a plan for periodic publication of "New Titles" which is distributed to clients in developing countries who are interested in receiving it. This publication brings the clients up to date on new literature in the field of postharvest loss reduction in its broadest sense. A copy of the most recent issue of "New Titles" is attached as Appendix VI .

6. In October, 1981, the PIP Information Center published the first issue of "Gleanings - A Postharvest Newsletter." It was designed to communicate current PIP events to clients and also contained the titles of new publications relative to postharvest studies. Subsequently it was decided that the publication was too inclusive and heavy and that "New Titles" (as described above) should be published separately and at more frequent intervals. The newsletter section of "Gleanings" will continue to be published, but less frequently and possibly under a different title.

Appendix I



**Technical Assistance and Training
To Reduce Postharvest
Losses in Perishables**



 University of Idaho

United States Agency
For International Development



Postharvest Institute for Perishables

Instituto para el Estudio de Pérdidas Post-cosecha en los Cultivos Perecederos
Institut Pour l'Etude des Pertes Post-récolt de Cultures Périssables

The Postharvest Institute for Perishables (PIP) was founded because of concern with food losses from harvest to consumption in developing countries. The Institute was founded in October, 1980, at the University of Idaho, Moscow, Idaho, U.S.A. by means of a Cooperative Agreement with USAID. PIP is also associated with two private development firms — Development Alternatives, Inc. (DAI) and Agri-Food Systems International, Inc. (AFSI) — which have substantial experience in providing technical assistance in and to developing countries.

The goals and objectives of the Postharvest Institute for Perishables are:

1. To increase the availability (without increasing production areas) of fruit, vegetable, root, tuber, spice, nut and oil seed crops, and to enhance the basic diet of people in developing countries by reducing post-harvest food losses.
2. To reduce costs of these perishable commodities by improving the efficiency of marketing.
3. To encourage the development of processing and other industries associated with fruit, vegetable, root, tuber, spice, nut and oil seed crops.

Technical Assistance Teams

PIP provides experienced technical assistance teams in response to requests from developing countries. World-wide technical assistance in reducing postharvest losses in perishables is available under the Cooperative Agreement with the United States Agency for International Development.

Upon request, postharvest specialists (economists, engineers, entomologists, food technologists, horticulturists, plant pathologists, rural sociologists and others) are available for direct technical assistance to USAID Missions, host countries and AID/Washington. PIP strives to send specialists with relevant developing country experience.

Adaptive and Practical Program Development

This assistance is directed at investigation and application of new or existing postharvest technology based upon the needs of the requesting countries.

Information Services

Information, documents and bibliographies on all phases of harvesting, handling, storage, marketing and processing related to reducing postharvest losses in fruit, vegetable, root, tuber, nut, oil seed and spice crops are available from the Postharvest Institute for Perishables Information Center.

Requests from developing countries will be answered free. Others will be assessed a nominal fee.

Specialized Training

Training consisting of degree programs, short courses, workshops and seminars designed to assist host country personnel solve postharvest problems of perishable commodities is provided by PIP.

Cost

Short term technical assistance and training is provided to host countries through AID Missions. Depending upon the circumstances and budgetary limitations, Missions may be asked to furnish local per diem and transportation costs. Extensive assistance, or repeat visits, would require funding from Missions or the project to support PIP teams.

The Mission will be requested to assist in funding short courses and degree programs on the University of Idaho campus or on other U.S. university campuses.

How to Apply

Host country institutions and agencies desiring technical assistance may request such assistance through USAID Missions. For additional information or for publications from the Information Center (PIPIC), write to the Postharvest Institute for Perishables, College of Agriculture, 216 Morrill Hall, University of Idaho, Moscow, Idaho 83843, U.S.A. (Telephone 208-885-6791) (Telex: FWX II: 510 776 0923 U1 CID MOCW)

International Coordination

PIP currently acts as the secretariat for the Group for Assistance on Perishable Products (GAPP), which is an international network of donor agencies interested in reducing losses of perishable products.

PIP interacts with international donor groups, research centers, bilateral and multilateral assistance groups, the U.S. Peace Corps, the private sector and others for the sharing of information, identification of research and educational needs, and the stimulation of cooperation to avoid duplication in reducing postharvest losses of perishable commodities in developing countries.

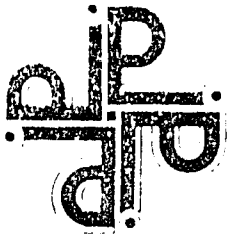
Example of Assistance

PIP is prepared to provide technical assistance in a variety of areas including, but not restricted to, the following:

1. Determine causes of postharvest losses including predisposing factors associated with infection/infestation of harvested commodities.
2. Assess postharvest losses from harvest to consumption.
3. Prolong the storage and shelf life of perishable commodities through improved harvesting and handling practices, pest control, storage design, cooling/refrigeration systems or marketing systems.
4. Conduct feasibility studies on the potential for processing specific perishable commodities.
5. Assist in promoting export of fresh or processed perishable commodities to regional, national and international markets.
6. Analyze and provide suggestions for governmental policies affecting transportation, marketing and export of fresh and processed commodities.
7. Help instructional institutions develop curricula and extension aids relevant to assessment and prevention of postharvest losses.
8. Coordinate the placement of developing country student candidates for masters degrees in U.S. universities with competence relevant to assessment, reduction and prevention of postharvest losses in perishable commodities.



Appendix II



Postharvest Institute for Perishables

POSTHARVEST INSTITUTE FOR PERISHABLES

Technical Assistance and Training
To Reduce Postharvest Losses
in Perishable Food Crops

University of Idaho
Moscow, Idaho

in cooperation with
UNITED STATES AGENCY FOR
INTERNATIONAL DEVELOPMENT



University of Idaho

The Postharvest Institute for Perishables (PIP) was founded because of great concern with food losses from harvest to consumption in developing countries. The Institute was established at the University of Idaho, Moscow, Idaho in 1980 under terms of a Cooperative Agreement with the United States Agency for International Development (USAID). PIP is also associated with two private development firms - Development Alternatives, Inc. (DAI) and Agri-Food Systems International, Inc. (AFSI). These firms have substantial experience in providing technical assistance of many types to developing countries.

OBJECTIVES

There are three objectives of the Postharvest Institute for Perishables:

1. To improve the diets of people in developing countries by increasing the availability of fruit, vegetable, root, tuber, nut and spice crops through the reduction of postharvest crop losses and without increasing production areas.
2. To reduce the costs and to improve the qualities of these perishable commodities by improving the efficiencies of postharvest handling, transportation, storage, packaging, and marketing practices.
3. To encourage the development or improvement of processing and other industries associated with fruit, vegetable, root, tuber, nut, oil seed and spice crops.

FUNCTIONS AND FACILITIES

The Postharvest Institute for Perishables has various functions and facilities which enable it to respond to requests for assistance in loss prevention in the entire postharvest marketing system. This assistance can be provided to developing countries on a wide variety of perishable crops.

A. Technical assistance teams.

PIP will provide teams of experienced and specialized people in response to requests from developing countries. In the PIP offices at the University of Idaho there is maintained a computerized roster of many experts who are available for short-term assistance in developing countries. The specialists may be economists, engineers, food technologists, horticulturists, plant pathologists, entomologists, rural sociologists, or others, according to the nature of the request. The teams may comprise two or more people of different specialities so that various aspects of the postharvest problem can be studied. The studies may include any of the following:

1. Analyze the marketing system to isolate the various factors contributing to postharvest losses, and recommend appropriate interventions.

2. The recommendations may be concerned with harvesting, packaging, handling, transportation, storage or marketing methods.
3. Determine causes of postharvest losses, including predisposing factors associated with losses that occur later in the marketing channel.
4. Assess the relative importance of various factors in postharvest losses and their cumulative effects in the marketing chain.
5. Determine priorities for additional studies on the causes or methods of reduction of postharvest food losses.
6. Feasibility studies on the application of postharvest loss technology under various conditions.
7. Feasibility studies on the potential for alternative methods of handling perishable crops, such as drying or other types of processing, that will prolong storage life.
8. Assist in the promotion of fresh or processed perishable commodities for export to regional, national and international markets.
9. Analyze and provide suggestions on local administrative practices affecting transportation, marketing, and export of fresh and processed commodities.

B. Adaptive and Practical Program Development

This is directed at the investigation and application of new or existing postharvest technology that could serve the needs of the requesting country. The technology may be concerned with postharvest losses that occur at any stage from harvest to consumption. The principal effort is made to develop a technology that is appropriate to the country after social, economic and other factors are evaluated in relation to the postharvest problem and the proposed method for its reduction. One of the principal means of introducing technology for adaptation into a country is by specialized training, which is described below.

C. Information Services.

The Postharvest Institute for Perishables Information Center (PIPIC) has accumulated and will continue to accumulate, much of the world's literature on postharvest loss in any of its phases in perishable crops. The literature is computerized for ready retrieval, and can be made available to any individual or organization upon request. The requests may be for specific publications or for general bibliographies on a particular topic. The material that is prepared for the requestor may be on full-sized pages or on 24X microfiche reduction, according to the desires of the requestor.

In addition to the computerized file of literature that is maintained at PIPIC, there is the capability of searching other databases located in various parts of the world. This contributes greatly to the efficiency of PIPIC and its ability to provide a good literature background in postharvest losses for any proposed study.

Requests to PIPIC from developing countries will be fulfilled at no charge. Those from developed countries will be charged a nominal fee for reproduction and mailing.

D. Specialized Training.

PIP is prepared to sponsor promising students from developing countries for advanced university studies. This program is primarily designed for a Master of Science degree in some area of postharvest loss reduction of perishables. The studies will be done in the United States at the University of Idaho or at other appropriate universities.

The purpose of the program is to prepare the students technologically so that they can return to their countries and transfer their technology at the farm or extension service level.

In certain cases the student who is recommended for advanced studies in the U.S. may not meet the minimum university entrance requirements. Arrangements may be made for some special advanced studies at the University, but no degree is conferred. Rather, the student receives a Certificate of Merit.

PIP can also send specialists in various fields to developing countries to conduct seminars or workshops upon request. The expert roster in the PIP offices can be searched to locate the specialists, then PIP will arrange for them to be provided with literature or other audio/visual materials for presentation to the appropriate audience in the host country. It is desirable to have as many people as possible attend the seminars or workshops in the developing countries in order to obtain maximum benefit and distribution of the information.

International Coordination

PIP is currently the secretariat for the Group for Assistance on Perishable Products (GAPP), which is an international network of donor agencies working to reduce losses of perishable products.

The purpose of GAPP is to develop informal communication channels among international donor groups, the United States Peace Corps, the private sector and others with similar interests. The communications are accomplished by sharing information, identification of research and educational needs and the stimulation of cooperation to avoid duplication in reducing postharvest losses of perishable commodities in developing countries.

Cost

Short term technical assistance and training can be provided to host country and AID Missions. Depending upon the circumstances and budgetary limitations, Missions may be asked to furnish local per diem and transportation costs. Extensive assistance, or repeat visits, would call for funding from Missions or the project to support PIP teams.

The Mission may be requested to assist in funding short courses and degree programs on the University of Idaho campus or at other U.S. universities.

How to Apply

Host country institutions and agencies desiring technical assistance may request such assistance through USAID Missions. For additional information or for publications from the Information Center (PIPIC), write to the Postharvest Institute for Perishables, College of Agriculture, 216 Morrill Hall, University of Idaho, Moscow, Idaho 83843, United States of America, (Telephone 208-885-6791), or by completing the attached form.

USAID Missions should address cables to S&T/AGR AIS/Washington, Attention: Robert F. Morris.

REQUEST FOR ADDITIONAL INFORMATION

NAME _____

ADDRESS _____

My agency/organization/institution
is _____

Assistance in perishable food losses is most needed
for _____

Please send further information on :

___ Technical Assistance Teams

___ Seminars/Workshops in my country

___ Graduate Study

___ PIP Information Services

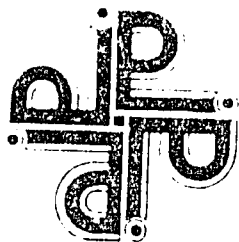
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SEND TO:

Postharvest Institute for Perishables
College of Agriculture
216 Morrill Hall
University of Idaho
Moscow, Idaho 83843
United States of America

Appendix III



Postharvest Institute for Perishables

INSTITUTO POST-COSECHA PARA CULTIVOS PERECEDEROS

ASISTENCIA TECNICA Y ENTRENAMIENTO PARA REDUCIR LAS PERDIDAS
POST-COSECHA DE LOS CULTIVOS PERECEDEROS

Universidad de Idaho
Moscow, Idaho
EE. UU.

EN COOPERACION CON LA AGENCIA ESTADOUNIDENSE
PARA EL DESARROLLO INTERNACIONAL



University of Idaho

El Instituto Post-Cosecha para Perecederos (PIP) fué fundado como resultado de la preocupación ocasionada por las pérdidas de alimentos durante el período comprendido entre la cosecha y el consumo, en los países en vías de desarrollo. El Instituto fué fundado en la Universidad de Idaho, Moscow, Idaho en 1980 por un acuerdo cooperativo con la Agencia Internacional de Desarrollo (USAID). El PIP está también asociado con dos compañías privadas - Development Alternatives, Inc. (DAI) y Agri-Food Systems International, Inc. (AFSI). Estas firmas tienen una vasta experiencia en proporcionar asistencia técnica de varias clases a países en vías de desarrollo.

OBJETIVOS

El Instituto Post-Cosecha para Perecederos tiene tres objetivos:

1. Mejorar la dieta alimenticia de la población por medio de aumentar la disponibilidad de frutas, vegetales, raíces, tubérculos, nueces, aceite de semilla, y especias por medio de la reducción de pérdidas post-cosechas y sin aumentar las áreas de producción.
2. Reducir los costos y mejorar las calidades de estas mercancías perecederas por medio de mejorar las técnicas de transportación, almacenamiento, empacamiento y costumbres de comercio.
3. Estimular el desarrollo o mejoramiento de industrias de procesamiento y otras relacionadas con las cosechas de frutas, vegetales, tubérculos, raíces, nueces, aceite de semillas y especias.

FUNCIONES Y FACILIDADES

El Instituto Post-Cosecha para Perecederos tiene varias funciones y facilidades para dar asistencia en la prevención de pérdidas en todo el sistema de mercadeo de cultivos. Esta ayuda puede ser proveída a países en vías de desarrollo en relación con una amplia variedad de cosechas perecederas.

A. Equipos de Asistencia Técnica.

El PIP proveerá grupos de gente especializada y con experiencia a todos los que lo soliciten. Las oficinas del PIP en la Universidad de Idaho mantienen un registro computarizado de muchos expertos que están disponibles para prestar asistencia por cortos períodos de tiempo a los países que lo soliciten. Estos profesionales son de las tres instituciones que están cooperando, PIP, DAI, y AFSI, y por eso constituyen un capacidad para asistir en solicitudes relacionadas con empresas privadas de mercadeo, ingeniería, procesamiento o tecnología de alimentos. Estos especialistas pueden ser economistas, ingenieros, técnicos de alimentos, horticultores, fitopatólogos, entomólogos, sociólogos rurales, u otros de acuerdo a la naturaleza de la solicitud. Los equipos pueden estar formados por dos o más personas de diferentes especialidades de tal manera que varios aspectos del problema de post-cosecha pueden ser estudiados. Este estudio podría incluir cualquier de los siguientes puntos:

1. Analizar el sistema de mercadeo para identificar los factores que están contribuyendo a las pérdidas de los alimentos en el período después de las cosechas, y recomendar intervenciones apropiadas.
2. Las recomendaciones pueden ser relacionadas con los métodos de cosecha, empacamiento, manejo, transportación, almacenamiento o mercadeo.
3. Identificación de las causas que producen pérdidas en los alimentos después de ser cosechados incluyendo factores predisponentes asociados con las pérdidas que ocurren después en los canales de mercadeo.
4. Medir la importancia relativa de varios factores en las pérdidas post-cosecha y sus efectos acumulativos en el proceso de mercadeo.
5. Determinar prioridades para estudios adicionales de las causas o métodos de reducción de pérdidas de cultivos cosechados.
6. Estudio de la viabilidad en la aplicación de la tecnología de post-cosecha bajo varias condiciones.
7. Estudio de la viabilidad en el potencial de otros métodos de manejo de cosechas perecederas, como el secamiento u otros tipos de procesamiento que prolongan el tiempo de almacenamiento.
8. Asistir en la promoción de alimentos frescos o procesados para la exportación a mercados regionales, nacionales e internacionales.
9. Analizar y dar sugerencias concernientes a las prácticas administrativas que afectan la transportación, el mercadeo y exportación de alimentos procesados o frescos.

B. Desarrollo de un Programa Práctico y Adaptable.

Esta función está orientada a la investigación y aplicación de tecnología de post-cosecha ya existente o nueva que podría ser útil a las necesidades de un país. Esta tecnología puede referirse a pérdidas de productos cosechados que pueden ocurrir en cualquier época comprendida entre la cosecha y el consumo. El esfuerzo principal está enfocado en el desarrollo de una tecnología que es apropiada para el país después de que los factores sociales, económicos y otros han sido evaluados en relación al problema de post-cosecha y al método sugerido para su reducción. Uno de los medios principales de introducción de tecnología para ser adaptada a un país es por medio de entrenamiento especializado que se describe abajo.

C. Servicios de Información.

El Centro de Información del Instituto Post-Cosecha para Perecederos (PIPIC) ha acumulado y lo continuará haciendo; la mayoría de la literatura mundial que se refiere a las pérdidas post-cosechas en todas las fases en cultivos perecederos. Esta información está computarizada y está disponible para cualquier individuo u organización que la solicite. La solicitud puede referirse a una publicación específica o para bibliografías generales de un tema en particular. El material que se prepara para el solicitante puede ser en páginas de tamaño oficio o en 24X microfiche de acuerdo a los deseos del interesado.

Además del archivo computarizado de información que se mantiene en el PIPIC, existe la capacidad para buscar otros datos localizados en computadoras en varias partes del mundo. Esto contribuye grandemente a la eficiencia del PIPIC y a su capacidad para proveer una buena preparación en el conocimiento de pérdidas de post-cosecha a cualquier individuo que se dedicará a su estudio.

Las solicitudes al PIPIC provenientes de países en vías de desarrollo serán contestadas gratuitamente. Las provenientes de países desarrollados pagarán un precio nominal por la reproducción y envío de información.

D. Entrenamiento Especializado.

El PIP está preparado para patrocinar buenos estudiantes de países en vías de desarrollo para estudios universitarios avanzados. Este programa está principalmente diseñado para obtener el título de "Master of Science" en alguna área de reducción de pérdidas post-cosechas de alimentos perecederos. Los estudios serán en los EE. UU. en la Universidad de Idaho o en otras universidades apropiadas.

El propósito del programa es el preparar tecnológicamente a los estudiantes de manera que puedan regresar a sus países y transferir la tecnología al nivel de los terrenos agrícolas o a servicios de divulgación.

En algunos casos el estudiante que es recomendado para estudios avanzados en los EE. UU. puede no tener todos los requisitos mínimos para ingresar a la universidad. Se puede hacer algunas gestiones para ciertos estudios avanzados, y en tal caso no se le conferirá un título universitario sino más bien recibirá un Certificado de Mérito.

Si se le solicita el PIP puede también mandar especialistas en varias áreas para conducir seminarios o talleres en los países en desarrollo. El catálogo de expertos puede ser revisado en las oficinas del PIP para localizar a los especialistas, entonces el PIP hará las gestiones necesarias para proveer con la literatura y otros materiales audiovisuales para la presentación a las audiencias apropiadas en el país anfitrión. Es aconsejable que tanta gente como sea posible atiendan a los seminarios o talleres para obtener un beneficio y distribución de información máximos.

COORDINACION INTERNACIONAL

Actualmente el PIP es la secretaria para el Grupo de Asistencia para Productos Perecederos (GAPP), el cual es una red internacional de agencias donantes que trabajan con el propósito de reducir las pérdidas de productos perecederos.

El propósito del GAPP es el desarrollar canales informales de comunicación entre grupos donantes internacionales, el Cuerpo de Paz de los EE. UU., el sector privado y otros grupos con intereses similares. Las comunicaciones se realizarán compartiendo información de investigaciones y necesidades educativas y la estimulación de cooperación para evitar la duplicación en la reducción de las pérdidas post-cosechas de alimentos perecederos en los países en vías de desarrollo.

COSTO

La asistencia técnica por corto plazo, y el entrenamiento pueden ser proveídos a países anfitriones y a agencias locales de la USAID. Dependiendo de las circunstancias y de las limitaciones económicas, tal vez a las agencias locales se les solicitará proveer los gastos diarios y de transportación. La asistencia extensiva, o visitas repetidas requerirán de fondos de las oficinas locales de la USAID o del proyecto para apoyar a los equipos del PIP.

Quizás la oficina local de la USAID será solicitado para financiar cursos cortos o estudios para títulos en la Universidad de Idaho o en otras universidades de los EE. UU.

COMO SOLICITAR

Las instituciones y agencias de los países anfitriones que deseen asistencia técnica pueden solicitar tal ayuda a través de las agencias locales de la USAID. Para más detalles o para pedir publicaciones del Centro de Información (PIPIC), escriba a:

Postharvest Institute for Perishables
College of Agriculture
216 Merrill Hall
University of Idaho
Moscow, Idaho 83863
U.S.A.
(teléfono 208-885-6791)
Telex: (IME 11) 510 776 0923 UI CID MOCW

También puede llenar el formulario adjunto.

Las Agencias locales de USAID deben enviar sus cables a S&T/AGR, AID/Washington, Attention: Robert F. Morris.

SOLICITUD PARA INFORMACION ADICIONAL

NOMBRE _____

DIRECCION _____

MI AGENCIA/ORGANIZACION/INSTITUCION ES _____

SE NECESITA AYUDA PARA LA PREVENCION DE PERDIDAS EN CULTIVOS PERECEDEROS:

FAVOR DE ENVIAR MAYOR INFORMACION CON RESPECTO A:

_____ Equipos/asistencia técnica _____ Seminario y estudios en mi país

_____ Estudios Graduados _____ Servicios de Información del PIP

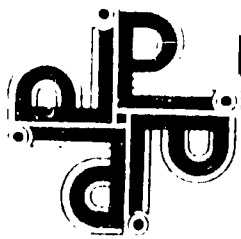
ENVIAR A

Postharvest Institute for Perishables
College of Agriculture
216 Morrill Hall
University of Idaho
Moscow, Idaho 83843
United States of America

Telephone: (208) 885-6791

Telex: (TWX II) 510 776 0923 UI CID MOCW

Appendix IV



Postharvest Institute for Perishables

Institut Pour l'Étude de Pertes Post-récolte des Cultures Périssables

Assistance Technique et Formation
Aidant à Réduire les Pertes
Post-récolte

University of Idaho
Moscow, Idaho

En coopération avec
United States Agency for
International Development (USAID)



University of Idaho

L'Institut Pour L'Etude des Pertes Post-récolte des Cultures Périssables (PIP) a été créé en réponse à un souci concernant les pertes dites "post-récolte" dans les pays en voie de développement. Le siège du PIP a été installé à l'Université d'Idaho, Moscow, Idaho, en 1980, en accord avec the United States Agency for International Development, USAID. PIP est également associé avec deux autres entreprises du secteur privé: Development Alternatives, Inc. (DAI) et Agri-Food Systems International, Inc. (AFSI). Ces entreprises ont une grande expérience dans le domaine d'aide technique dans les pays en voie de développement.

BUTS

L'Institut Pour l'Etude des Pertes Post-récolte des Cultures Périssables a trois buts principaux:

1. Améliorer la nourriture des personnes dans les pays en voie de développement par une augmentation de la production des fruits, légumes, noix, plantes oléagineuses, racines, tubercules, et épices, et pour une diminution des pertes post-récolte sans pour cela accroître les régions de production.
2. Réduire le prix de revient et améliorer la qualité de ces denrées périssables ainsi que ces traitements, moyens de transport, stockage, marketing, emballage, etc.
3. Encourager le développement ou l'amélioration des différents moyens de traitement et d'autres industries liées aux fruits, légumes, noix, plantes oléagineuses, racines, tubercules, et épices.

FONCTIONS ET ORGANISATIONS

L'Institut Pour l'Etude des Pertes Post-récolte des Cultures Périssables a différentes fonctions et facilités qui permettent de répondre aux demandes d'aides techniques dans la prévention des pertes dans le domaine de marketing. Cette assistance peut être fournie aux pays en voie de développement, et pour une large variété de denrées périssables.

A. Equipes d'assistance technique

PIP fournira des équipes expérimentées capables de répondre aux besoins formulés par les pays en voie de développement. Dans les bureaux du PIP à l'Université d'Idaho, se trouve un système d'ordinateur permettant de déterminer les différents experts disponibles pour des missions à court terme dans les pays en voie de développement. Ces experts proviendront des trois associations coopératives, i.e., PIP, DAI, et AFSI, qui fourniront des expertises dans les domaines de marketing, engineering, traitement alimentaire, et technologie alimentaire. Ces spécialistes peuvent être des économistes, ingénieurs, sociologues (pour les régions rurales), etc. selon les différents cas à étudier. Les équipes pourront être constituées de deux ou trois spécialistes de différents domaines de telle sorte que divers aspects des problèmes post-récolte pourront être étudiés. Exemples d'études qui peuvent être effectués:

1. Analyse du système de marketing afin de déterminer les différents facteurs contribuant aux pertes post-récolte et de recommander les solutions appropriées.

2. Solutions qui peuvent porter sur les méthodes de manutention, de transport, de stockage, ou de marketing.
3. Déterminations des causes des pertes post-récolte, ceci incluant les facteurs liés aux pertes se produisant plus tard dans le système de marketing.
4. Calculs de l'importance des différents facteurs sur les pertes post-récolte et leurs effets cumulatifs lors du marketing.
5. Déterminations des priorités pour des études complémentaires sur les causes ou méthodes de réductions des pertes post-récolte.
6. Etudes de praticabilité sur les applications techniques post-récolte sous différentes conditions.
7. Etudes de praticabilité pour l'utilisation possible de méthodes alternatifs concernant la manutention des denrées périssables, le séchage ou autres méthodes de traitement prolongeant le stockage.
8. Promotion des denrées fraîches ou traitées, destinées aux marchés locaux, nationaux, et internationaux.
9. Analyses et suggestions sur les pratiques administratives locales influençant le transport, le marketing, et l'exportation des denrées fraîches et traitées.

B. Programme de Développement

Ce programme s'applique aux technologies déjà existantes et nouvelles destinées à répondre aux besoins formulés par les pays demandeurs. Cette méthode peut prendre en considération les pertes post-récolte qui se produisent à tous les niveaux s'échelant de la récolte à la consommation. L'effort principal permettant de développer cette technique tient compte des problèmes spécifiques de chaque pays après diverses études de différents facteurs sociaux, économiques, etc., en corrélation avec les problèmes post-récolte et à la méthode proposée. Un des principaux moyens introduisant la technologie dans un pays inclut des stages de formation, décrits ci-dessous.

C. Service d'Informations

Le centre d'informations de l'Institut Pour l'Etude des Pertes Post-récolte de Cultures Périssables (PIPIC) dispose une grande collection d'informations sur les problèmes des pertes post-récolte. Ces informations sont stockées sur ordinateur et peuvent être disponibles sur simple demande. Ces informations peuvent être spécifiques ou sur les bibliographies générales d'un sujet particulier. Ces informations peuvent être disponibles également en microfiche (réduite au 24ème) ou format 23,0 x 29,7.

Parallèlement à ces informations, le PIPIC est capable d'établir des recherches complémentaires possédées par d'autres pays, ceci contribuant de manière efficace à l'obtention d'un plus grand nombre d'informations sur les problèmes des pertes post-récolte ou tout autre cas d'étude.

Les demandes traitées au PIPIC par les pays en voie de développement seront fournies gratuitement. En revanche, pour les autres pays, ces informations seront offertes à des frais minimes couvrant les frais de reproduction et de postage.

D. Stage de Formation

PIP envisage de former les étudiants sélectionnés pour les pays en voie de développement. Les études effectuées conduiront à l'obtention d'un M.S. (Master of Sciences) dans les domaines post-récolte. Ces études seront faites aux Etats-Unis à l'Université d'Idaho ou sur tout autre campus offrant les mêmes programmes.

Le but de ces programmes est de former les étudiants techniquement, ce qui fera bénéficier les pays d'origine de ces étudiants.

Dans certains cas, un étudiant sélectionné pour suivre ces études aux Etats-Unis peut ne pas répondre aux conditions officielles à l'admission à l'université. Néanmoins, il pourra suivre le programme de formation, ne recevant pas de diplôme officiel mais un certificat de participation (Certificate of Merit).

PIP s'engage à fournir les meilleurs experts disponibles à chaque domaine. PIP se charge également d'accumuler les documentations techniques et le matériel pédagogique (audio-visuel) pour une présentation dans les pays d'hôte. Il est spécialement important que le plus grand nombre de personnes intéressées par ces programmes y assiste afin de les sensibiliser sur les problèmes existants et de faciliter la distribution du résultat de ces conférences.

COORDINATION INTERNATIONALE

PIP agit actuellement comme secrétariat du Group for Assistance on Perishable Products (GAPP), qui est un réseau international d'agences donatrices traitant des problèmes des pertes post-récolte.

Le but de GAPP est de développer des moyens de communication entre les groupes internationaux donateurs, le Corps de la Paix aux Etats-Unis, le secteur privé, et autres possédant des intérêts communs. Ces communications sont effectuées par un partage d'informations, une identification des besoins en matière de recherche, les stages de formation, et une réduction des efforts duplicatifs en ce qui concerne les pertes post-récolte dans les pays en voie de développement.

FRAIS

Une assistance à court terme, ainsi qu'une formation technique, peuvent être fournies aux pays d'hôte et aux missions AID. Selon les circonstances et les limitations financières, les missions peuvent avoir à subvenir les frais quotidiens de séjour et de transport. Une assistance à plus long terme ou des visites répétées peuvent demander des fonds de la part des missions ou du projet à l'intention des équipes PIP.

Les missions peuvent avoir à contribuer au financement des minicours et des programmes de diplôme sur le campus de l'Université d'Idaho ou dans d'autres universités américaines.

DEMANDES D'INFORMATIONS COMPLEMENTAIRES

Les pays ou organisations désirant des informations plus amples peuvent en faire la demande auprès de USAID. Pour des informations complémentaires concernant les diverses publications disponibles du Centre d'Informations (PIPIC), écrire à:

Postharvest Institute for Perishables
College of Agriculture
216 Morrill Hall
University of Idaho
Moscow, Idaho 83843
United States of America
(Telephone: 208-885-6791)
Telex - TWX 11: 510 776 0923 UI CID MOCW

ou en retournant la fiche ci-jointe.

Les missions USAID devront adresser ses cablogrammes à: S&T/AGR
AID/Washington, Attention: Robert F. Morris.

POUR PLUS AMPLES INFORMATIONS

Nom _____

Poste/Titre _____

Affiliation (Institution/Agence/Entreprise) _____

Adresse _____

Je m'intéresse aux récoltes suivantes: _____

Veuillez m'envoyer des informations concernant:

___ Equipes d'assistance technique

___ Seminaires/Stages de formation
dans mon pays

___ Etudes supérieures

___ PIP Centre d'Informations

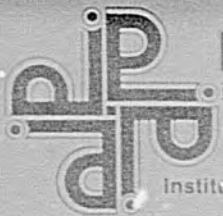
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Retournez à:

Postharvest Institute for Perishables
College of Agriculture
216 Morrill Hall
University of Idaho
Moscow, Idaho 83843
United States of America

Appendix V



Postharvest Institute for Perishables

Information Center

Instituto para el Estudio de Pérdidas Post-cosecha en los Cultivos Perecederos
Institut Pour l'Etude des Pertes Post-récolte de Cultures Périssables

WE HAVE POSTHARVEST INFORMATION ON...

...transportation, storage, marketing, packaging, appropriate level technology, methods for estimating losses, processing, handbooks, economic feasibility studies, training materials, drying...

for perishables, including:

- roots,
- tubers,
- fruits,
- vegetables,
- oilseeds,
- nuts and spices.

TO ANSWER YOUR NEEDS WE CAN SUPPLY:

1. *Bibliographies.*
2. *Newsletters with lists of new titles from our center.*
3. *Copies of articles, technical reports or conference papers. (photocopies or 24x microfiche reduction)*
4. *Answers to postharvest questions concerning perishable crops.*

There is no cost to persons in developing nations eligible for U.S. foreign assistance. (Services given at cost to others.)

Return the attached card to receive the information you need.

I need information.

Name _____
 Title _____
 Address _____

The crops I am interested in are: _____

Please Send:

a bibliography on the following subject: _____

Gleanings, the RIPIC newsletter.

the following documents

microfiche photocopies

author _____

title _____

source _____

author _____ pub. date _____

title _____

source _____


other: _____

WE ARE THE INFORMATION CENTER
POSTHARVEST INSTITUTE FOR PERISHABLES



University of Idaho

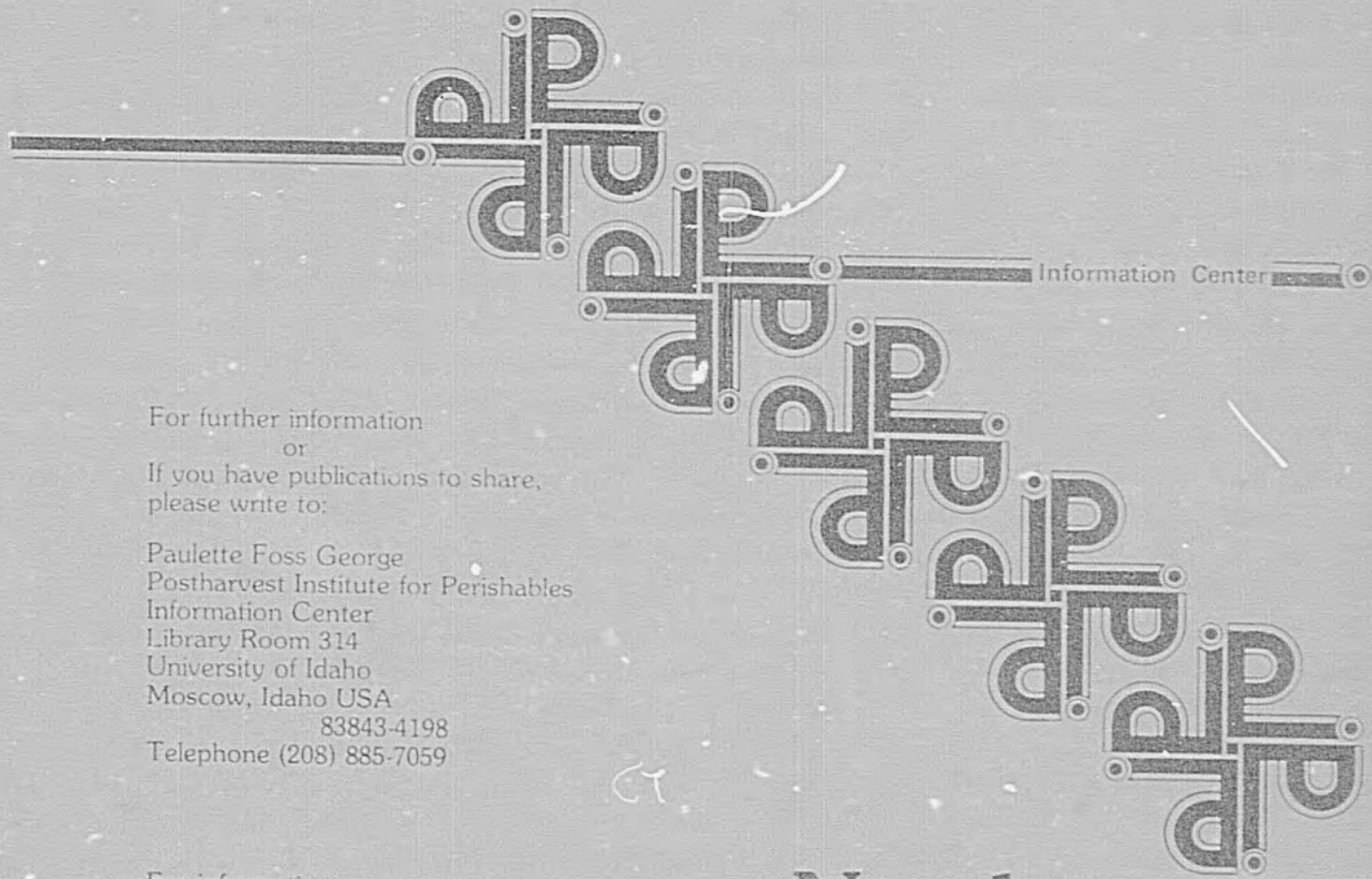
in cooperation with
United States Agency for
International Development


Postharvest Institute for Perishables
Instituto para el Estudio de Peridas Post-cosecha en los Cultivos Perederados
Institut Pour l'Etude des Pertes Post-recolte de Culturs Perissables

Paulette Foss George
Postharvest Institute for Perishables Information Center
Library Room 314
University of Idaho
Moscow, Idaho USA

83843-4198

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Information Center

For further information
or
If you have publications to share,
please write to:

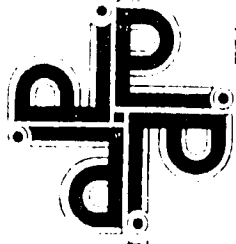
Paulette Foss George
Postharvest Institute for Perishables
Information Center
Library Room 314
University of Idaho
Moscow, Idaho USA
83843-4198
Telephone (208) 885-7059

For information on
Postharvest grain and dry legumes
contact:

Cherie Geiser
Postharvest Documentation Service
Farrell Library Room 411
Kansas State University
Manhattan, Kansas USA
66506
Telephone (913) 532-6516

**Need
Postharvest
Information?**

Appendix VI



Postharvest Institute for Perishables

AUGUST, 1982

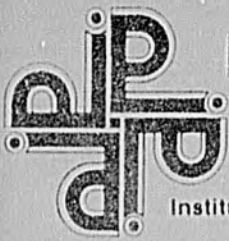
Volume 1, Number 4

New Titles



University of Idaho

in cooperation with
United States Agency for
International Development



Postharvest Institute for Perishables

Instituto para el Estudio de Pérdidas Post-cosecha en los Cultivos Perecederos
Institut Pour l'Etude des Pertes Post-récolte de Cultures Périssables

Volume 1, Number 4
August, 1982

NEW TITLES

Here are the newest additions to the Postharvest Institute for Perishables Information Center. The entries are arranged alphabetically by crop in the following sections:

Fruits & Vegetables
Fruits
Vegetables
Roots & Tubers
Nuts & Oilseeds
Spices
General

An order form is included as the final page. Again, please remember that we must now limit orders sent by airmail to 20 documents. Those in excess of 20 documents will be sent by surface mail. Documents over 50 pages in length will be sent as microfiche only.

Please note: there is a cost of \$7/document for requestors from developed nations. Full payment is due in advance. A complete bibliographic citation for any of these titles will be sent free upon request to anyone regardless of geographic location.

Our annual survey is enclosed with this issue. I urge you to please complete and return the questionnaire by 15 September 1982. Your response to the questionnaire will help determine which services PIPIC will be able to offer free of charge to developing country clientele. This information is critical to our continued performance. NOTE: ANYONE WHO DOES NOT RETURN THE SURVEY WILL BE DROPPED FROM OUR REGULAR MAILING LIST.

Thank you for your cooperation.

Postharvest Institute for Perishables Information Center
Paulette F. George, Information Specialist
University of Idaho
Library, Room 314
Moscow, Idaho 83843
U.S.A.

Telephone: (208) 885-7059
Telex: (TWX II) 510 776 0923 UI CID MOCW



University of Idaho

Postharvest Institute for Perishables
College of Agriculture
Moscow Idaho U.S.A. 83843
Phone (208) 885-6791

FRUITS AND VEGETABLES

- M00458 PERISHABLE POSTHARVEST LOSSES IN SELECTED EASTERN CARIBBEAN COUNTRIES: CAUSES AND RECOMMENDATIONS.
- M00459 REDUCING LOSSES IN POTATOES, FRUITS AND VEGETABLES THROUGH ENVIRONMENTAL CONTROL.
- M00467 FRUIT, VEGETABLE AND NUT COOPERATIVES. /HISTORY. BUSINESS PROFILE. MARKETING OPERATIONS. COMMODITIES./
- M00700 THE COMMERCIAL STORAGE OF FRUITS, VEGETABLES, AND FLORIST AND NURSERY STOCKS.
- M00480 LE PRINCIPALI MACCHINE PER IL TRATTAMENTO POST-RACCOLTA DEGLI ORTOFRUTTICOLI. /ITALIAN. MACHINERY. POSTHARVEST HANDLING. PROCESSING./
- M00482 CONSIDERAZIONI SULLA PROGETTAZIONE DEI COMPLESSI PER GLIORTOFRUTTICOLI. /ITALIAN. PRESERVATION. HANDLING. NUTRITION. PROCESSING COMPLEX./
- M00473 EFFECTS OF HARVESTING AND HANDLING ON FRUITS AND VEGETABLES.
- M00474 PHYSIOLOGICAL ROLES OF PEROXIDASE IN POSTHARVEST FRUITS AND VEGETABLES.
- M00476 USES OF ENDOGENOUS ENZYMES IN FRUIT AND VEGETABLE PROCESSING.
- M00478 ECONOMIC PLANTS IN A RURAL NIGERIAN MARKET. /ROOTS. TUBERS. FRUIT. VEGETABLES./
- M00479 LIPID OXIDATION IN FRUITS AND VEGETABLES.
- F00746 LA MATURAZIONE ACCELERATA: UN PROBLEMA AFFRONTATO DALLA RICERCA. /ITALIAN. ACCELERATED MATURATION./
- G00545 ASPETTI TECNICO-ECONOMICI DELLA MATURAZIONE CONTROLLATA CON PROCEDIMENTO TECTROL. /ITALIAN. CONTROLLED RIPENING. TECHNICAL CONSIDERATIONS. ECONOMIC CONSIDERATIONS./
- M00481 QUALITY AND SIZE STANDARDS FOR FRESH FRUITS AND VEGETABLES. /ACTIVITIES. GRADING STANDARDS. EXPORTS. QUESTIONNAIRES./

FRUIT

- F00743 INFLUENZE DEI DIVERSI GAS COMPONENTI L'ATMOSFERA CONTROLLATA SULLA FISILOGIA E PATOLOGIA DEI FRUTTI. /ITALIAN. CONTROLLED ATMOSPHERE STORAGE. GAS COMPONENTS. FRUIT PHYSIOLOGY & PATHOLOGY./
- F00744 L'IMPIANTISTICA NELL'IMPIEGO DELL'ATMOSFERE ARTIFICIALI PER L'ACCELERAZIONE DELLA MATURAZIONE DELLA FRUTTA. /ITALIAN. ACCELERATED MATURATION. MODIFIED ATMOSPHERE./
- F00748 CONTROL BY IMAZALIL OF FRUIT STORAGE ROTTS CAUSED BY ALTERNARIA.
- F00749 A METHOD FOR PRE-HARVEST ASSESSMENT OF LATENT INFECTIONS IN FRUITS.
- F00734 ESTABLISHING CRITERIA FOR DETERMINING THE AUTHENTICITY OF FRUIT JUICE CONCENTRATES.
- M00475 ENZYMES INVOLVED IN FRUIT SOFTENING.
- F00729 EFFECT OF HYPOBARIC STORAGE CONDITIONS ON THE QUALITY OF FRUITS AND ACTIVITY DEGRADATION OF GCM FUNGICIDES IN APPLES, STRAWBERRIES AND OTHER FRUITS DURING STORAGE.
- F00705 FUNGI OF THE GENUS PENICILLIUM ON APPLES AND PEARS DURING THE STORAGE PERIOD.
- APPLES
- F00737 QUALITY AND QUALITY CONTROL OF THE APPLE INDUSTRY IN INDIA: AN APPROACH TO THE PROBLEM. /CONCEPT OF QUALITY. CAUSES OF LOW QUALITY. DEFECTS. DISEASES AND THEIR CONTROL./
- F00704 DYNAMICS OF DISAPPEARANCE OF BENZIMIDAZOLE DERIVATIVES IN STORED APPLES.
- F00707 LA CONSERVAZIONE DELLA CV. "LAVINA" IN A.C. IN RELAZIONE AL TRATTAMENTO CON "SANTOCHINA": ESITI SPERIMENTALI. /ITALIAN. ETHOXYQUIN DIPPING. GAS STORAGE. APPLES. CONTROLLED ATMOSPHERE./

F00708 LA CONSERVAZIONE DELLA MELA "JONATHAN" IN A.C. ED IN CONFEZIONI POLIETILENICHE. /ITALIAN. GAS STORAGE. POLYTHENE. APPLES. STORAGE. CONTROLLED ATMOSPHERE./

F00709 PROVE ORIENTATIVE SULLA SERBEVOLEZZA DELLA "GOLDEN DELICIOUS" IN A.C. AD ALTI TENORI DI CO2. /ITALIAN. GAS STORAGE. APPLES. CONTROLLED ATMOSPHERE./

F00710 POST-MATURAZIONE DELLA CV "GOLDEN DELICIOUS" APPLES. /ITALIAN. DEGREENING. GAS STORAGE. APPLES. CONTROLLED ATMOSPHERES./

F00712 PROVE ORIENTATIVE SULLA MISCIBILITA' DELLA SANTOCHINA CON IL CAPTANO. /ITALIAN. ETHOXYQUIN. CAPTAN. APPLES./

F00713 INFLUENZA DEL TRATTAMENTO CON SANTOCHINA SUL "RISCALDO MOLLE" DELLA CV "STAYMAN WINESAP". /ITALIAN. SOFT SCALE. APPLES./

F00714 TRATTAMENTI PRE- E POST-RACCOLTA CON SANTOCHINA SULLA CV "DELICIOUS COMUNE". /ITALIAN. APPLES. ETHOXYQUIN./

F00715 TRATTAMENTI PRE- E POST-RACCOLTA CON SANTOCHINA SULLA CV "IMPERATORE". /ITALIAN. APPLES. ETHOXYQUIN./

F00717 TRATTAMENTI ANTIRISCALDO POST-RACCOLTA CON DIFENILAMINA ESANTOCHINA SULLA CV "STARK DELICIOUS". /ITALIAN. APPLES. ETHOXYQUIN. DPA. SCALD./

F00718 TRATTAMENTI ANTIRISCALDO POST-RACCOLTA CON DIFENILAMINA ESANTOCHINA SULLA CV "STAYMAN WINESAP". /ITALIAN. APPLES. ETHOXYQUIN. DPA. SCALD./

F00719 TRATTAMENTI ANTIRISCALDO POST-RACCOLTA CON DIFENILAMINA ESANTOCHINA SULLA CV "IMPERATORE". /ITALIAN. DIPPING. APPLES. ETHOXYQUIN. DPA. SCALD./

F00725 LA CONSERVAZIONE A TEMPERATURA AMBIENTE DELLA MELA "ABBONDANZA" CON L'AUSILIO DEI FILMS PLASTICI. /ITALIAN. STORAGE. APPLES. POLYTHENE BAGS./

CITRUS

F00738 MPDC ACTIVITIES ON POSTHARVEST TECHNOLOGY. MANDARIN ORANGES, AN EXAMPLE. /MARKET PLANNING AND DESIGN CENTER. MARKETING. NAGPUR ORANGES./

F00750 METALAXYL FOR POSTHARVEST CONTROL OF BROWN ROT OF CITRUS FRUIT.

M00487 TWO UNRECORDED STORAGE AND DISORDERS OF CITRUS RETICULATA L. AND SOLANUM TUBEROSUM L.

F00755 SOME FACTORS AFFECTING FRUIT DECAY DURING STORAGE OF TWO ORANGE VARIETIES.

F00754 DRAFT PROPOSAL OF QUALITY AND SIZE STANDARDS FOR NAGPUR ORANGES (MANDARINS).

F00728 FRESH AND PROCESSED CITRUS FRUITS -- NORTHERN HEMISPHERE CITRUS SITUATION.

F00720 RICE HUL'S COMBUSTOR: THIS IS HOW IT WORKS. /ALTERNATIVE FUELS. DRYING. PROCESSING./

F00731 ENZYMES AFFECTING FLAVOR AND APPEARANCE OF CITRUS PRODUCTS.

F00735 FLAVONOIDS, MUTAGENS, AND CITRUS.

GRAPES

F00711 IL TRATTAMENTO ANTIBOTRITICO CON METABISOLFITO NELLA CONSERVAZIONE DELL'UVA "ITALIA" IN CONFEZIONI POLIETILENICHE. /ITALIAN. BOTRYTIS. GRAPES. POLYTHENE. METABISULPHITE./

F00732 QUALITY CHARACTERISTICS OF MUSCADINE GRAPE PRODUCTS.

F00733 RAISIN AND DRIED FIG VOLATILE COMPONENTS: POSSIBLE INSECT ATTRACTANTS.

F00756 HOME PRESERVATION OF FLORIDA GRAPES.

F00757 HOME WINE MAKING IN FLORIDA.

F00767 ETHEPHON AS A HARVESTING AID FOR 'CONCORD' GRAPES.

PEARS

F00716 PROVE ORIENTATIVE SULL'IMPORTANZA DELL'IRRIGAZIONE SULL'INSORGENZA DELL "IMBRUNIMENTO INTERNO". /ITALIAN. INTERNAL BROWNING. PEARS./

F00726 LA BUTTERATURA AMARA DELLE MELE. /ITALIAN. BITTER-PIT. APPLES./

F00751 PREDICTION OF BRUISING IN IMPACTED MULTILAYERED APPLE PACKS. /PACKAGING. MATHEMATICAL MODELS./

F00752 STUDIES ON THE RELATIONSHIP BETWEEN MINERALS AND THE DEVELOPMENT OF STORAGE BREAKDOWN IN APPLES.

F00739 PREVENZIONE E CURA DEL -BOLLATO- (GLOEOSPORIUM ALBUM) SU MELE-ABBONDANZA-NELL'ANNATA 1968/69. /ITALIAN. PREVENTION. CURE./

F00740 NUOVA E VECCHIA TECNOLOGIA DELL'INGIALLIMENTO DELLA -GOLDEN DELICIOUS. /ITALIAN. YELLOWING. PREMATURE RIPENING. TECHNIQUES./

F00741 LA CONSERVAZIONE DELLA -GRANNY SMITH-: PRIMI ESITI SPERIMENTALI. /ITALIAN. EXPERIMENTAL STORAGE./

F00753 APPLE TRADE DEVELOPMENT PROJECT -- MANUAL OF PROCEDURE FOR GRADING, PACKING AND EVALUATION OF TRIAL CONSIGNMENTS.

M00483 CONSIDERAZIONI SULLA CONSERVAZIONE IN A.C. DELLE MELE. /ITALIAN. ELECTRICITY. CONSERVATION./

F00758 INFLUENCE OF PRE - HARVEST FUNGICIDAL SPRAYS ON SOOTY BLOTCH, FLY SPECK AND STORAGE ROTS OF APPLE.

F00759 STUDIES ON THE ADAPTATION OF APPLE RESPIRATION TO TEMPERATURE.

F00760 STUDIES ON THE ROLE OF INDIVIDUAL OXIDASES IN APPLE RESPIRATION.

F00761 THE ADAPTATION OF APPLE RESPIRATION TO THE ENVIRONMENT.

F00762 THE FORMATION OF ETHANOL AND ACETALDEHYDE IN APPLE TISSUES.

F00763 DEHYDROGENASES OF APPLE TISSUES.

F00764 THE PREVENTION OF FUNCTIONAL DISTURBANCES IN APPLES DURING STORAGE.

BANANAS

F00736 DRAFT PROPOSAL OF QUALITY AND SIZE STANDARDS FOR BANANAS.

F00747 PRE-STORAGE TREATMENT. /HYDROCOOLING./

F00721 INFLUENZA DEL "CARICO" PRODUTTIVO SULL'"IMBRUNIMENTO INTERNO". /ITALIAN. YIELD. INTERNAL BROWNING. PEARS./

F00722 INFLUENZA DELL'EPOCA DI RACCOLTA, DELLA TEMPERATURA DI CONSERVAZIONE E DEL FILM POLIETILENICO SULL'INSORGENZA DELL'"IMBRUNIMENTO INTERNO". /ITALIAN. PICKING TIME. STORAGE. POLYTHENE. PEARS. HARVEST./

F00742 L'IMBRUNIMENTO INTERNO DELLA -PASSA CRASSANA- IN RAPPORTO ALL E NUOVE TECNICHE DI CONSERVAZIONE: ESITI DI UNA PROVA SEMICOMMERCIALE. /ITALIAN. INTERNAL BROWNING. PRESERVATION TECHNIQUES./

PINEAPPLE

F00768 CANNED DECIDUOUS FRUITS: FRESH AND CANNED PINEAPPLE SITUATION IN MAJOR PRODUCING COUNTRIES.

PLANTAIN

F00730 EFFECT OF ETHYLENE ABSORBENT ON THE STORAGE LIFE OF PLANTAIN PACKED IN POLYETHYLENE BAGS.

STRAWBERRIES

F00706 RECENT INVESTIGATION ON THE CONTROL OF GRAY MOLD OF STRAWBERRIES IN POLAND.

F00723 LOTTA ANTIBOTRITICA POSTRACCOLTA DELLA FRAGOLA. /ITALIAN. BOTRYTIS. STRAWBERRIES./

F00724 LA CONSERVAZIONE E LA DISTRIBUZIONE DELLA FRAGOLA CON L'AUSILIO DEI FILMS PLASTICI. /ITALIAN. POLYTHENE. STORAGE. MARKETING. STRAWBERRIES./

F00727 LOTTA ANTIBOTRITICA CON LA POSTMATURAZIONE DELLA FRAGOLA. /ITALIAN. RIPENING. BOTRYTIS. STRAWBERRIES./

F00766 CRITERI E TECNICHE DI CONSERVAZIONE POST-RACCOLTA DELLE FRAGOLE. /POSTHARVEST CONSERVATION. TREATMENT. HANDLING./

TROPICAL FRUITS

F00765 MONOGRAFIA IV: FORMAS DE ELABORAR FRUTAS TROPICALES. /SPANISH. PROCESSING./

VEGETABLES

V00609 CHEMICALS FOR CONTROL OF POSTHARVEST DECAY OF VEGETABLES.

V00610 VEGETABLES: TRADE STATISTICS IN SELECTED COUNTRIES.

V00613 HOST SPECIFICITY IN THE BRUCHIDAE. VII. THE EFFECT OF CARBOHYDRATE COMPOSITION ON VARIETAL RESISTANCE OF GARDEN PEAS TO CALLOSOBRUCHUS CHINENSIS L.

V00623 RECENTI ACQUISIZIONI SPERIMENTALI SULLA SURGELAZIONE DEL PISELLO: INDIVIDUAZIONE DEGLI - INDICI DI QUALITA - E VALUTAZIONE DELL'ATTITUDINE VARIETALE. /ITALIAN. PROCESSING. DRYING. QUALITY INDICATORS./

S00017 VIABILIDADE ECONOMICA DO CULTIVO DA PIMENTA-DO-REINO NA REGIAO CACAUEIRA DA BAHIA --- ESTIMATIVA DAS DESPESAS DE CAPITAL PARA FORMACAO DE UM HECTARE DE PIMENTA-DO-REINO NA REGIAO CACAUEIRA DA BAHIA. /PORTUGUESE. CAPITAL FORMATION. ECONOMIC ANALYSIS. INTERCROPPING./

V00620 VOLATILES FROM RED PEPPER (CAPSICUM SPP.).

V00615 PROTECTION OF SEED CROP OF RADISH AGAINST MUSTARD APHID, LIPAPHIS ERYSIMI KALT. BY INSECTICIDAL ROOT DIPPING DURING TRANSPLANTING.

V00621 THE ROLE OF HUMIDITY, TEMPERATURE, AND ATMOSPHERIC COMPOSITION IN MAINTAINING VEGETABLE QUALITY DURING STORAGE.

V00627 WAYS OF REDUCING FIELD AND RESPIRATORY HEAT.

F00745 E POSSIBILE CONSERVARE GLI AGRUMI IN ATMOSFERA CONTROLLATA? /ITALIAN. PRESERVATION. CONTROLLED ATMOSPHERE. STORAGE./

V00629 DAMAGE EVALUATION OF MACHINE HARVESTED FRESH MARKET TOMATOES.

V00630 GENETIC RESOURCES OF TOMATOES AND WILD RELATIVES -- A GLOBAL REPORT.

ROOTS & TUBERS

R00891 CHEMICAL COMPOSITION OF THE EDIBLE PARTS OF AROIDS GROWN IN BANGLADESH.

M00469 METHODS OF REDUCING POSTHARVEST LOSSES OF ROOTS, TUBERS, FRUITS AND VEGETABLES IN DEVELOPING COUNTRY ECONOMIES.

CASSAVA

R00890 EFFECT OF PROCESSING ON THE CHEMICAL COMPOSITION AND ENERGY VALUE OF CASSAVA.

R00895 CHANGES IN SOME CHEMICAL CONSTITUENTS DURING THE FERMENTATION OF CASSAVA TUBERS (MANIHOT ESCULENTA CRANTZ).

R00915 GROWTH OF CANDIDA UTILIS ON ENZYMATICALLY HYDROLYSED CASSAVA.

R00925 SYMBIOTIC GROWTH OF A YEAST AND A BACTERIA IN BATCH FERMENTORS.

R00914 STUDIES ON THE MECHANISED HARVESTING OF CASSAVA IN FIJI.

POTATOES

R00934 NEW SPANISH COMPENDIUM ON POTATO DISEASES PUBLISHED.

M00460 LOSSES TO POTATOES, FRESH FRUITS AND VEGETABLES.

R00897 POTATOES, EARLY AND WARE: INTERNATIONAL STANDARDISATION OF FRUITS AND VEGETABLES. /STANDARDS/

R00916 CARE AND PROCEDURES AT HARVEST TIME.

R00917 POTATO STORAGE STRUCTURES.

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Appendix VIII

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