UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	ISSUE DATE	PATENT NO.	ATTORNEY DOCKET NO.	CONFIRMATION NO.
14/375,361	07/05/2016	9380739	Q213621	3504

23373 7590 06/15/2016

SUGHRUE MION, PLLC
2100 PENNSYLVANIA AVENUE, N.W.
SUITE 800
WASHINGTON, DC 20037

ISSUE NOTIFICATION

The projected patent number and issue date are specified above.

Determination of Patent Term Adjustment under 35 U.S.C. 154 (b)
(application filed on or after May 29, 2000)

The Patent Term Adjustment is 0 day(s). Any patent to issue from the above-identified application will include an indication of the adjustment on the front page.

If a Continued Prosecution Application (CPA) was filed in the above-identified application, the filing date that determines Patent Term Adjustment is the filing date of the most recent CPA.

Applicant will be able to obtain more detailed information by accessing the Patent Application Information Retrieval (PAIR) WEB site (http://pair.uspto.gov).

Any questions regarding the Patent Term Extension or Adjustment determination should be directed to the Office of Patent Legal Administration at (571)-272-7702. Questions relating to issue and publication fee payments should be directed to the Application Assistance Unit (AAU) of the Office of Data Management (ODM) at (571)-272-4200.

APPLICANT(s) (Please see PAIR WEB site http://pair.uspto.gov for additional applicants):

Nicholas Jessop, Winchester, UNITED KINGDOM;
Exosect Limited, Winchester, Hampshire, UNITED KINGDOM;

PART B - FEE(S) TRANSMITTAL

Complete and send this form, together with applicable fee(s), to: **Mail**
Mail Stop ISSUE FEE
Commissioner for Patents
P.O. Box 1450
Alexandria, Virginia 22313-1450
or **Fax** (571) 273-2885

INSTRUCTIONS: This form should be used for transmitting the ISSUE FEE and PUBLICATION FEE (if required). Blocks 1 through 5 should be completed where appropriate. All further correspondence including the Patent, advance orders and notification of maintenance fees will be mailed to the current correspondence address as indicated unless corrected below or directed otherwise in Block 1, by (a) specifying a new correspondence address; and/or (b) indicating a separate "FEE ADDRESS" for maintenance fee notifications.

CURRENT CORRESPONDENCE ADDRESS
(Note: Use Block 1 for any change of address)

23373

SUGHRUE MION, PLLC
2100 PENNSYLVANIA AVENUE, NW
SUITE 800
WASHINGTON, DC 20037

Note: A certificate of mailing can only be used for domestic mailings of the Fee(s) Transmittal. This certificate cannot be used for any other accompanying papers. Each additional paper, such as an assignment or formal drawing, must have its own certificate of mailing or transmission.

Certificate of Mailing or Transmission

I hereby certify that this Fee(s) Transmittal is being deposited with the United States Postal Service with sufficient postage for first class mail in an envelope addressed to the Mail Stop ISSUE FEE address above, or being facsimile transmitted to the USPTO (571) 273-2885, on the date indicated below.

(Depositor's name)
(Signature)
(Date)

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
14/375,361	07/29/2014	Nicholas JESSOP	Q213621	3504

TITLE OF INVENTION: METHODS AND USES FOR IMPROVED SOWING OF SEEDS

APPLN. TYPE	ENTITY STATUS	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	Undiscounted	$960	$0	$0	$960	06/08/2016

EXAMINER	ART UNIT	CLASS-SUBCLASS
LOUIE, MANDY C	1715	427-004000

1. Change of correspondence address or indication of "Fee Address" (37 CFR 1.363)
- ☐ Change of correspondence address (or Change of Correspondence Address form PTO/SB/122) attached.
- ☐ "Fee Address" indication (or "Fee Address" Indication form PTO/SB/47; Rev 03-02 or more recent) attached. **Use of a Customer Number is required.**

2. For printing on the patent front page, list
(1) the names of up to 3 registered patent attorneys or agents OR, alternatively,
(2) the name of a single firm (having as a member a registered attorney or agent) and the names of up to 2 registered patent attorneys or agents. If no name is listed, no name will be printed.

1 Sughrue Mion, PLLC
2
3

3. ASSIGNEE NAME AND RESIDENCE DATA TO BE PRINTED ON THE PATENT (print or type)

PLEASE NOTE: Unless an assignee is identified below, no assignee data will appear on the patent. If an assignee is identified below, the document has been filed for recordation as set forth in 37 CFR 3.11. Completion of this form is NOT a substitute for filing an assignment.

(A) NAME OF ASSIGNEE: Exosect Limited
(B) RESIDENCE: (CITY and STATE OR COUNTRY): Winchester, United Kingdom

Please check the appropriate assignee category or categories (will not be printed on the patent): ☐ Individual ☑ Corporation or other private group entity ☐ Government

4a. The following fee(s) are submitted:
- ☑ Issue Fee
- ☐ Publication Fee (No small entity discount permitted)
- ☐ Advance Order - # of Copies

4b. Payment of Fee(s): **(Please first reapply any previously paid issue fee shown above)**
- ☐ A check is enclosed.
- ☑ Payment by credit card. Form PTO-2038 is attached.
- ☑ The Director is hereby authorized to charge the required fee(s), any deficiency, or credit any overpayment, to Deposit Account Number 19-4880 (enclose an extra copy of this form).

5. **Change in Entity Status** (from status indicated above)
- ☐ Applicant certifying micro entity status. See 37 CFR 1.29 — NOTE: Absent a valid certification of Micro Entity Status (see form PTO/SB/15A and 15B), issue fee payment in the micro entity amount will not be accepted at the risk of application abandonment.
- ☐ Applicant asserting small entity status. See 37 CFR 1.27 — NOTE: If the application was previously under micro entity status, checking this box will be taken to be a notification of loss of entitlement to micro entity status.
- ☐ Applicant changing to regular undiscounted fee status — NOTE: Checking this box will be taken to be a notification of loss of entitlement to small or micro entity status, as applicable.

NOTE: The Issue Fee and Publication Fee (if required) will not be accepted from anyone other than the applicant; a registered attorney or agent; or the assignee or other party in interest as shown by the records of the United States Patent and Trademark Office.

Authorized Signature	*/Alan J. Kasper/*	Date	June 3, 2016
Typed or Printed Name	Alan J. Kasper	Registration No.	25,426

This collection of information is required by 37 CFR 1.311. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, Virginia 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, Virginia 22313-1450.
Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

Electronic Patent Application Fee Transmittal

Application Number:	14375361
Filing Date:	29-Jul-2014
Title of Invention:	METHODS AND USES FOR IMPROVED SOWING OF SEEDS
First Named Inventor/Applicant Name:	Nicholas Jessop
Filer:	Brian William Hannon/Christopher Healey
Attorney Docket Number:	Q213621

Filed as Large Entity

Filing Fees for U.S. National Stage under 35 USC 371

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Basic Filing:				
Pages:				
Claims:				
Miscellaneous-Filing:				
Petition:				
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				
Utility Appl Issue Fee	1501	1	960	960

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Extension-of-Time:				
Miscellaneous:				
			Total in USD ($)	**960**

Electronic Acknowledgement Receipt

EFS ID:	25966335
Application Number:	14375361
International Application Number:	
Confirmation Number:	3504
Title of Invention:	METHODS AND USES FOR IMPROVED SOWING OF SEEDS
First Named Inventor/Applicant Name:	Nicholas Jessop
Customer Number:	23373
Filer:	Brian William Hannon/Christopher Healey
Filer Authorized By:	Brian William Hannon
Attorney Docket Number:	Q213621
Receipt Date:	03-JUN-2016
Filing Date:	29-JUL-2014
Time Stamp:	15:57:02
Application Type:	U.S. National Stage under 35 USC 371

Payment information:

Submitted with Payment	yes
Payment Type	Credit Card
Payment was successfully received in RAM	$960
RAM confirmation Number	2595
Deposit Account	194880
Authorized User	SUGHRUE MION, PLLC

The Director of the USPTO is hereby authorized to charge indicated fees and credit any overpayment as follows:

00005

Charge any Additional Fees required under 37 CFR 1.20 (Post Issuance fees)

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Issue Fee Payment (PTO-85B)	Q213621IssueFeeTransmittal.pdf	36717 b957b88beac3984862002931f7d97abb90465235	no	1
Warnings:					
Information:					
2	Fee Worksheet (SB06)	fee-info.pdf	30883 5587e19714805 4507b6cac1e3adae0569b9bcdc9	no	2
Warnings:					
Information:					
		Total Files Size (in bytes):	67600		

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111
If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371
If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office
If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

NOTICE OF ALLOWANCE AND FEE(S) DUE

23373 7590 03/08/2016

SUGHRUE MION, PLLC
2100 PENNSYLVANIA AVENUE, N.W.
SUITE 800
WASHINGTON, DC 20037

EXAMINER
LOUIE, MANDY C

ART UNIT	PAPER NUMBER
1715	

DATE MAILED: 03/08/2016

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
14/375,361	07/29/2014	Nicholas Jessop	Q213621	3504

TITLE OF INVENTION: METHODS AND USES FOR IMPROVED SOWING OF SEEDS

APPLN. TYPE	ENTITY STATUS	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	UNDISCOUNTED	$960	$0	$0	$960	06/08/2016

THE APPLICATION IDENTIFIED ABOVE HAS BEEN EXAMINED AND IS ALLOWED FOR ISSUANCE AS A PATENT. PROSECUTION ON THE MERITS IS CLOSED. THIS NOTICE OF ALLOWANCE IS NOT A GRANT OF PATENT RIGHTS. THIS APPLICATION IS SUBJECT TO WITHDRAWAL FROM ISSUE AT THE INITIATIVE OF THE OFFICE OR UPON PETITION BY THE APPLICANT. SEE 37 CFR 1.313 AND MPEP 1308.

THE ISSUE FEE AND PUBLICATION FEE (IF REQUIRED) MUST BE PAID WITHIN THREE MONTHS FROM THE MAILING DATE OF THIS NOTICE OR THIS APPLICATION SHALL BE REGARDED AS ABANDONED. THIS STATUTORY PERIOD CANNOT BE EXTENDED. SEE 35 U.S.C. 151. THE ISSUE FEE DUE INDICATED ABOVE DOES NOT REFLECT A CREDIT FOR ANY PREVIOUSLY PAID ISSUE FEE IN THIS APPLICATION. IF AN ISSUE FEE HAS PREVIOUSLY BEEN PAID IN THIS APPLICATION (AS SHOWN ABOVE), THE RETURN OF PART B OF THIS FORM WILL BE CONSIDERED A REQUEST TO REAPPLY THE PREVIOUSLY PAID ISSUE FEE TOWARD THE ISSUE FEE NOW DUE.

HOW TO REPLY TO THIS NOTICE:

I. Review the ENTITY STATUS shown above. If the ENTITY STATUS is shown as SMALL or MICRO, verify whether entitlement to that entity status still applies.

If the ENTITY STATUS is the same as shown above, pay the TOTAL FEE(S) DUE shown above.

If the ENTITY STATUS is changed from that shown above, on PART B - FEE(S) TRANSMITTAL, complete section number 5 titled "Change in Entity Status (from status indicated above)".

For purposes of this notice, small entity fees are 1/2 the amount of undiscounted fees, and micro entity fees are 1/2 the amount of small entity fees.

II. PART B - FEE(S) TRANSMITTAL, or its equivalent, must be completed and returned to the United States Patent and Trademark Office (USPTO) with your ISSUE FEE and PUBLICATION FEE (if required). If you are charging the fee(s) to your deposit account, section "4b" of Part B - Fee(s) Transmittal should be completed and an extra copy of the form should be submitted. If an equivalent of Part B is filed, a request to reapply a previously paid issue fee must be clearly made, and delays in processing may occur due to the difficulty in recognizing the paper as an equivalent of Part B.

III. All communications regarding this application must give the application number. Please direct all communications prior to issuance to Mail Stop ISSUE FEE unless advised to the contrary.

IMPORTANT REMINDER: Utility patents issuing on applications filed on or after Dec. 12, 1980 may require payment of maintenance fees. It is patentee's responsibility to ensure timely payment of maintenance fees when due.

PART B - FEE(S) TRANSMITTAL

Complete and send this form, together with applicable fee(s), to: Mail **Mail Stop ISSUE FEE**
Commissioner for Patents
P.O. Box 1450
Alexandria, Virginia 22313-1450
or Fax (571)-273-2885

INSTRUCTIONS: This form should be used for transmitting the ISSUE FEE and PUBLICATION FEE (if required). Blocks 1 through 5 should be completed where appropriate. All further correspondence including the Patent, advance orders and notification of maintenance fees will be mailed to the current correspondence address as indicated unless corrected below or directed otherwise in Block 1, by (a) specifying a new correspondence address; and/or (b) indicating a separate "FEE ADDRESS" for maintenance fee notifications.

CURRENT CORRESPONDENCE ADDRESS (Note: Use Block 1 for any change of address)

23373 7590 03/08/2016
SUGHRUE MION, PLLC
2100 PENNSYLVANIA AVENUE, N.W.
SUITE 800
WASHINGTON, DC 20037

Note: A certificate of mailing can only be used for domestic mailings of the Fee(s) Transmittal. This certificate cannot be used for any other accompanying papers. Each additional paper, such as an assignment or formal drawing, must have its own certificate of mailing or transmission.

Certificate of Mailing or Transmission
I hereby certify that this Fee(s) Transmittal is being deposited with the United States Postal Service with sufficient postage for first class mail in an envelope addressed to the Mail Stop ISSUE FEE address above, or being facsimile transmitted to the USPTO (571) 273-2885, on the date indicated below.

(Depositor's name)
(Signature)
(Date)

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
14/375,361	07/29/2014	Nicholas Jessop	Q213621	3504

TITLE OF INVENTION: METHODS AND USES FOR IMPROVED SOWING OF SEEDS

APPLN. TYPE	ENTITY STATUS	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	UNDISCOUNTED	$960	$0	$0	$960	06/08/2016

EXAMINER	ART UNIT	CLASS-SUBCLASS
LOUIE, MANDY C	1715	427-004000

1. Change of correspondence address or indication of "Fee Address" (37 CFR 1.363).
- ❑ Change of correspondence address (or Change of Correspondence Address form PTO/SB/122) attached.
- ❑ "Fee Address" indication (or "Fee Address" Indication form PTO/SB/47; Rev 03-02 or more recent) attached. **Use of a Customer Number is required.**

2. For printing on the patent front page, list
(1) The names of up to 3 registered patent attorneys or agents OR, alternatively,
(2) The name of a single firm (having as a member a registered attorney or agent) and the names of up to 2 registered patent attorneys or agents. If no name is listed, no name will be printed.
1 _____
2 _____
3 _____

3. ASSIGNEE NAME AND RESIDENCE DATA TO BE PRINTED ON THE PATENT (print or type)

PLEASE NOTE: Unless an assignee is identified below, no assignee data will appear on the patent. If an assignee is identified below, the document has been filed for recordation as set forth in 37 CFR 3.11. Completion of this form is NOT a substitute for filing an assignment.

(A) NAME OF ASSIGNEE (B) RESIDENCE: (CITY and STATE OR COUNTRY)

Please check the appropriate assignee category or categories (will not be printed on the patent) : ❑ Individual ❑ Corporation or other private group entity ❑ Government

4a. The following fee(s) are submitted:
- ❑ Issue Fee
- ❑ Publication Fee (No small entity discount permitted)
- ❑ Advance Order - # of Copies _____

4b. Payment of Fee(s): **(Please first reapply any previously paid issue fee shown above)**
- ❑ A check is enclosed.
- ❑ Payment by credit card. Form PTO-2038 is attached.
- ❑ The director is hereby authorized to charge the required fee(s), any deficiency, or credits any overpayment, to Deposit Account Number _____ (enclose an extra copy of this form).

5. **Change in Entity Status** (from status indicated above)
- ❑ Applicant certifying micro entity status. See 37 CFR 1.29 — NOTE: Absent a valid certification of Micro Entity Status (see forms PTO/SB/15A and 15B), issue fee payment in the micro entity amount will not be accepted at the risk of application abandonment.
- ❑ Applicant asserting small entity status. See 37 CFR 1.27 — NOTE: If the application was previously under micro entity status, checking this box will be taken to be a notification of loss of entitlement to micro entity status.
- ❑ Applicant changing to regular undiscounted fee status. — NOTE: Checking this box will be taken to be a notification of loss of entitlement to small or micro entity status, as applicable.

NOTE: This form must be signed in accordance with 37 CFR 1.31 and 1.33. See 37 CFR 1.4 for signature requirements and certifications.

Authorized Signature _____ Date _____

Typed or printed name _____ Registration No. _____

UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
14/375,361	07/29/2014	Nicholas Jessop	Q213621	3504

23373 7590 03/08/2016

SUGHRUE MION, PLLC
2100 PENNSYLVANIA AVENUE, N.W.
SUITE 800
WASHINGTON, DC 20037

EXAMINER	
LOUIE, MANDY C	
ART UNIT	PAPER NUMBER
1715	

DATE MAILED: 03/08/2016

Determination of Patent Term Adjustment under 35 U.S.C. 154 (b)
(Applications filed on or after May 29, 2000)

The Office has discontinued providing a Patent Term Adjustment (PTA) calculation with the Notice of Allowance.

Section 1(h)(2) of the AIA Technical Corrections Act amended 35 U.S.C. 154(b)(3)(B)(i) to eliminate the requirement that the Office provide a patent term adjustment determination with the notice of allowance. See Revisions to Patent Term Adjustment, 78 Fed. Reg. 19416, 19417 (Apr. 1, 2013). Therefore, the Office is no longer providing an initial patent term adjustment determination with the notice of allowance. The Office will continue to provide a patent term adjustment determination with the Issue Notification Letter that is mailed to applicant approximately three weeks prior to the issue date of the patent, and will include the patent term adjustment on the patent. Any request for reconsideration of the patent term adjustment determination (or reinstatement of patent term adjustment) should follow the process outlined in 37 CFR 1.705.

Any questions regarding the Patent Term Extension or Adjustment determination should be directed to the Office of Patent Legal Administration at (571)-272-7702. Questions relating to issue and publication fee payments should be directed to the Customer Service Center of the Office of Patent Publication at 1-(888)-786-0101 or (571)-272-4200.

OMB Clearance and PRA Burden Statement for PTOL-85 Part B

The Paperwork Reduction Act (PRA) of 1995 requires Federal agencies to obtain Office of Management and Budget approval before requesting most types of information from the public. When OMB approves an agency request to collect information from the public, OMB (i) provides a valid OMB Control Number and expiration date for the agency to display on the instrument that will be used to collect the information and (ii) requires the agency to inform the public about the OMB Control Number's legal significance in accordance with 5 CFR 1320.5(b).

The information collected by PTOL-85 Part B is required by 37 CFR 1.311. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, Virginia 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, Virginia 22313-1450. Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

Privacy Act Statement

The Privacy Act of 1974 (P.L. 93-579) requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. Accordingly, pursuant to the requirements of the Act, please be advised that: (1) the general authority for the collection of this information is 35 U.S.C. 2(b)(2); (2) furnishing of the information solicited is voluntary; and (3) the principal purpose for which the information is used by the U.S. Patent and Trademark Office is to process and/or examine your submission related to a patent application or patent. If you do not furnish the requested information, the U.S. Patent and Trademark Office may not be able to process and/or examine your submission, which may result in termination of proceedings or abandonment of the application or expiration of the patent.

The information provided by you in this form will be subject to the following routine uses:

1. The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether disclosure of these records is required by the Freedom of Information Act.
2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.
3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.
4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).
5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.
6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).
7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (i.e., GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.
8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspection or an issued patent.
9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

Notice of Allowability	Application No. 14/375,361	Applicant(s) JESSOP, NICHOLAS	
	Examiner MANDY LOUIE	Art Unit 1715	AIA (First Inventor to File) Status No

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to *the request for continuation filed on 01/22/16*.
   ☐ A declaration(s)/affidavit(s) under **37 CFR 1.130(b)** was/were filed on_____.
2. ☐ An election was made by the applicant in response to a restriction requirement set forth during the interview on _____; the restriction requirement and election have been incorporated into this action.
3. ☒ The allowed claim(s) is/are *1-5, 11-15, 21, 23*. As a result of the allowed claim(s), you may be eligible to benefit from the **Patent Prosecution Highway** program at a participating intellectual property office for the corresponding application. For more information, please see http://www.uspto.gov/patents/init_events/pph/index.jsp or send an inquiry to PPHfeedback@uspto.gov .
4. ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

   Certified copies:

   a) ☒ All b) ☐ Some *c) ☐ None of the:
   1. ☐ Certified copies of the priority documents have been received.
   2. ☐ Certified copies of the priority documents have been received in Application No. _____ .
   3. ☒ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

   * Certified copies not received: _____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.
THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

5. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
   ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.

   Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

1. ☒ Notice of References Cited (PTO-892)
2. ☒ Information Disclosure Statements (PTO/SB/08), Paper No./Mail Date 143753611/22/16
3. ☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material
4. ☐ Interview Summary (PTO-413), Paper No./Mail Date _____ .
5. ☐ Examiner's Amendment/Comment
6. ☒ Examiner's Statement of Reasons for Allowance
7. ☐ Other _____.

/MANDY LOUIE/
Primary Examiner, Art Unit 1715

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 01/22/16 has been entered.

Allowable Subject Matter

The following is an examiner's statement of reasons for allowance:

The instant invention is distinguished over the prior art of record by a method for coating plant seeds with a flowability enhancing agent that is made up of at least one species of electret particle made of a wax. The prior art of record neither teaches nor suggests the combination of limitations recited in the instant claims.

Porter [US 3621612] teaches coating seeds with waxy materials or wax [col 2, ln 39-41]; however, fails to teach the wax is an electret particle.

Reichert [US 20150072857] teaches coating seeds with wax [0006]; however, fails to teach the wax is an electret particle.

Since the prior art of record neither teaches nor suggests the combination of limitations recited in the instant claims, one skilled in the art would not have been motivated to perform the claimed process.

Acknowledgement of Applicant's Amendments

The rejection of the claims under 35 U.S.C. 112, second paragraph, is withdrawn due to Applicant's amendments.

The rejections of the claims under obviousness type double patenting are withdrawn due to applicant's proper submission of terminal disclaimers.

The rejection of the claims under 35 U.S.C. 103 is withdrawn due to Applicant's amendments; hence, subject matter is due for allowance.

Conclusion

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Any inquiry concerning this communication or earlier communications from the examiner should be directed to MANDY C. LOUIE whose telephone number is (571)270-5353. The examiner can normally be reached on Monday to Friday, 7:30AM - 5:00PM EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Timothy Meeks can be reached on (571)272-1423. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/MANDY LOUIE/

Primary Examiner, Art Unit 1715

Notice of References Cited	Application/Control No. 14/375,361	Applicant(s)/Patent Under Reexamination JESSOP, NICHOLAS	
	Examiner MANDY LOUIE	Art Unit 1715	Page 1 of 1

U.S. PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Name	CPC Classification	US Classification
*	A	US-3,621,612 A	11-1971	Porter	A01C1/06	111/900
	B	US-				
	C	US-				
	D	US-				
	E	US-				
	F	US-				
	G	US-				
	H	US-				
	I	US-				
	J	US-				
	K	US-				
	L	US-				
	M	US-				

FOREIGN PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Country	Name	CPC Classification
	N					
	O					
	P					
	Q					
	R					
	S					
	T					

NON-PATENT DOCUMENTS

*		Include as applicable: Author, Title Date, Publisher, Edition or Volume, Pertinent Pages)
	U	
	V	
	W	
	X	

*A copy of this reference is not being furnished with this Office action. (See MPEP § 707.05(a).)
Dates in MM-YYYY format are publication dates. Classifications may be US or foreign.

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	14/375,361
	Confirmation Number	3504
	Filing Date	July 29, 2014
	First Named Inventor	Nicholas JESSOP
	Art Unit	1715
	Examiner Name	LOUIE, MANDY C
	Attorney Docket Number	Q213621

U.S. PATENTS						
Examiner Initials*	Cite No	Patent Number	Kind Code[1]	Issue Date	Name of Patentee or Applicant of cited Document	Pages, Columns, Lines, where Relevant Passages or Relevant Figures Appear
	1.					

U.S. PATENT APPLICATION PUBLICATIONS						
Examiner Initials*	Cite No	Publication Number	Kind Code[1]	Publication Date	Name of Patentee or Applicant of cited Document	Pages, Columns, Lines, where Relevant Passages or Relevant Figures Appear
	2.	2015/0072857	A1	03/12/15	Reichert et al	

FOREIGN PATENT DOCUMENTS								
Examiner Initials*	Cite No	Foreign Document Number[3]	Country Code[2]	Kind Code[4]	Publication Date	Name of Patentee or Applicant of cited Document	Pages, Columns, Lines, where Relevant Passages or Relevant Figures Appear	T[5]
	3.							

NON-PATENT LITERATURE DOCUMENTS			
Examiner Initials*	Cite No	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city, and/or country where published.	T[5]
	4.		

EXAMINER SIGNATURE			
Examiner Signature	/MANDY C LOUIE/	Date Considered	02/20/2016

*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through a citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

1 See Kind Codes of USPTO Patent Documents at www.USPTO.GOV or MPEP 901.04. 2 Enter office that issued the document, by the two-letter code (WIPO Standard ST.3). 3 For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. 4 Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST.16 if possible. 5 Applicant is to place a check mark here if English language translation is attached.

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /M.C.L/

EAST Search History

EAST Search History (Prior Art)

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
L2	108	electret WITH wax	US-PGPUB; USPAT; USOCR	ADJ	ON	2016/02/20 16:19
L3	152	electret WITH wax	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	ADJ	ON	2016/02/20 16:20
L4	44	3 not 2	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	ADJ	ON	2016/02/20 16:28
L5	55	wax near (particle OR powder) WITH (coat$4 OR layer OR film OR deposit$4) WITH (seed OR seedling)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	ADJ	ON	2016/02/20 16:34
L6	5	("2002000088").PN.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2016/02/20 16:39
L12	289	(triboelectric OR tribo?electric OR tribocharg$4 OR tribo?charg$4) WITH wax	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	ADJ	ON	2016/02/20 16:55
L13	49	(triboelectric OR tribo?electric OR tribocharg$4 OR tribo?charg$4) WITH wax WITH (layer OR film OR coat$4 OR deposit$4)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	ADJ	ON	2016/02/20 16:55
L14	55	exosect.as.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	ADJ	ON	2016/02/20 17:37
L15	2	(("20060051388") or ("5172861")).PN.	US-PGPUB; USPAT; USOCR	OR	OFF	2016/02/20 17:38
L16	0	12 and a01c1/06.cpc.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	ADJ	ON	2016/02/20 18:00
L17	3	electret WITH wax and a01c1/06.cpc.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	ADJ	ON	2016/02/20 18:00
L18	73	wax WITH (coat$4 OR film OR layer OR deposit) and a01c1/06.cpc.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	ADJ	ON	2016/02/20 18:01
L19	73	wax WITH (coat$4 OR film OR layer OR deposit$4) and a01c1/06.cpc.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	ADJ	ON	2016/02/20 18:01
L20	42	"3621612"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	ADJ	ON	2016/02/20 18:03
L21	0	(triboelectric OR tribo?electric OR tribocharg$4 OR tribo?charg$4) WITH wax and a01c1/06.cpc.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	ADJ	ON	2016/02/20 18:05
L22	11	electret WITH paraffin	US-PGPUB; USPAT; USOCR; FPRS; EPO;	ADJ	ON	2016/02/20 18:06

			JPO; DERWENT; IBM_TDB			
L23	79	"323518"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	ADJ	ON	2016/02/20 18:08
L24	12	(("2502809") or ("2579733") or ("3223518") or ("3264088") or ("3264089") or ("3285223")).PN.	US-PGPUB; USPAT; USOCR	OR	OFF	2016/02/20 18:09
L25	19	("3621612").URPN.	USPAT	ADJ	ON	2016/02/20 18:14
L26	1	("20150072857").PN.	US-PGPUB; USPAT; USOCR	OR	OFF	2016/02/20 18:20

EAST Search History (Interference)

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
L11	40	wax near (particle OR powder) WITH (coat$4 OR layer OR film OR deposit$4) WITH (seed OR seedling)	US-PGPUB; USPAT	ADJ	ON	2016/02/20 16:49

2/20/2016 6:28:32 PM
C:\Users\mlouie\Documents\EAST\Workspaces\14375361_wax_coated_seed_reducing_dust_and_improve_flowability.wsp

Search Notes	Application/Control No.	Applicant(s)/Patent Under Reexamination
	14375361	JESSOP, NICHOLAS
	Examiner	Art Unit
	MANDY LOUIE	1715

CPC- SEARCHED		
Symbol	Date	Examiner

CPC COMBINATION SETS - SEARCHED		
Symbol	Date	Examiner

US CLASSIFICATION SEARCHED			
Class	Subclass	Date	Examiner

SEARCH NOTES		
Search Notes	Date	Examiner
inventor, EAST search conducted	3/17/2015	ML
search updated		

INTERFERENCE SEARCH			
US Class/ CPC Symbol	US Subclass / CPC Group	Date	Examiner
	PGPub text search conducted in EAST	2/20/2016	ML

	/MANDY LOUIE/ Primary Examiner.Art Unit 1715

Issue Classification	Application/Control No.	Applicant(s)/Patent Under Reexamination
	14375361	JESSOP, NICHOLAS
	Examiner	**Art Unit**
	MANDY LOUIE	1715

CPC						
Symbol					**Type**	**Version**
A01C		1	/	06	F	2013-01-01
A01G		1	/	001	I	2013-01-01
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CPC Combination Sets								
Symbol					**Type**	**Set**	**Ranking**	**Version**
			/					
			/					

NONE		**Total Claims Allowed:**	
(Assistant Examiner)	(Date)	12	
/MANDY LOUIE/ Primary Examiner.Art Unit 1715	02/20/2016	O.G. Print Claim(s)	O.G. Print Figure
(Primary Examiner)	(Date)	1	2

Issue Classification	Application/Control No.	Applicant(s)/Patent Under Reexamination
	14375361	JESSOP, NICHOLAS
	Examiner	**Art Unit**
	MANDY LOUIE	1715

US ORIGINAL CLASSIFICATION		INTERNATIONAL CLASSIFICATION										
CLASS	SUBCLASS	CLAIMED					NON-CLAIMED					
427	4	A	0	1	C	1 / 06 (2006.01.01)						
CROSS REFERENCE(S)												
CLASS	SUBCLASS (ONE SUBCLASS PER BLOCK)											

NONE		Total Claims Allowed:	
(Assistant Examiner)	(Date)	12	
/MANDY LOUIE/ Primary Examiner.Art Unit 1715	02/20/2016	O.G. Print Claim(s)	O.G. Print Figure
(Primary Examiner)	(Date)	1	2

Issue Classification	Application/Control No.	Applicant(s)/Patent Under Reexamination
	14375361	JESSOP, NICHOLAS
	Examiner	**Art Unit**
	MANDY LOUIE	1715

☐ Claims renumbered in the same order as presented by applicant ☐ CPA ☒ T.D. ☐ R.1.47

Final	Original	Final	Original	Final	Original	Final	Original	Final	Original	Final	Original	Final	Original	Final	Original
1	1		17												
2	2		18												
3	3		19												
4	4		20												
5	5	11	21												
	6		22												
	7	12	23												
	8														
	9														
	10														
6	11														
7	12														
8	13														
9	14														
10	15														
	16														

NONE		**Total Claims Allowed:**	
(Assistant Examiner)	(Date)	12	
/MANDY LOUIE/ Primary Examiner.Art Unit 1715	02/20/2016	O.G. Print Claim(s)	O.G. Print Figure
(Primary Examiner)	(Date)	1	2

Application Number	Application/Control No.	Applicant(s)/Patent under Reexamination	
	14/375,361	JESSOP, NICHOLAS	

Document Code - DISQ	Internal Document – DO NOT MAIL

TERMINAL DISCLAIMER	☒ APPROVED	☐ DISAPPROVED
Date Filed : 1/22/16	This patent is subject to a Terminal Disclaimer	

Approved/Disapproved by:

Felicia D. Roberts

8 TDs approved with this filing date

U.S. Patent and Trademark Office

REQUEST FOR CONTINUED EXAMINATION (RCE) TRANSMITTAL

Application Number	14/375,361	Filing Date	July 29, 2014	Confirmation Number	3504	Docket Number	Q213621
First Named Inventor	Nicholas JESSOP		Examiner Name	LOUIE, MANDY C		Art Unit	1715
Title	METHODS AND USES FOR IMPROVED SOWING OF SEEDS						

This is a Request for Continued Examination (RCE) under 37 CFR 1.114 of the above-identified application.

SUBMISSION REQUIRED UNDER 37 CFR 1.114

Note: If the RCE is proper, any previously filed unentered amendments and amendments enclosed with the RCE will be entered in the order in which they were filed unless applicant instructs otherwise. If applicant does not wish to have any previously filed unentered amendment(s) entered, applicant must request non-entry of such amendment(s).

☐ Previously submitted. If a final Office action is outstanding, any amendments filed after the final Office action may be considered as a submission even if this box is not checked.

- ☐ Consider the arguments in the Appeal Brief or Reply Brief previously filed on _____
- ☐ Other _____

☐ Do NOT consider the amendment(s)/reply under 37 CFR 1.116 previously filed on _____

☑ Enclosed

- ☑ Amendment/Reply
- ☑ Information Disclosure Statement (IDS)
- ☐ Affidavit(s)/Declaration(s)
- ☐ Other _____

MISCELLANEOUS

☐ Suspension of action on the above-identified application is requested under 37 CFR 1.103(c) for a period of _____ months. (Period of suspension shall not exceed 3 months; Fee under 37 CFR 1.17(i) required)

☐ Other _____

FEES

The RCE fee under 37 CFR 1.17(e) is required by 37 CFR 1.114 when the RCE is filed.

☑ Payment by credit card.

☑ The USPTO is directed and authorized to charge all required fees, except for the Issue Fee and the Publication Fee, to Deposit Account No. 19-4880. Please also credit any overpayments to said Deposit Account.

CORRESPONDENCE ADDRESS

Direct all correspondence to the address for SUGHRUE MION, PLLC filed under the Customer Number listed below:

WASHINGTON OFFICE
23373
CUSTOMER NUMBER

SIGNATURE OF REGISTERED U.S. PATENT PRACTITIONER

Signature /Alan J. Kasper/ Date January 22, 2016

Name Alan J. Kasper Registration No. 25,426

PETITION FOR EXTENSION OF TIME UNDER 37 CFR 1.136(a)

Docket Number	
Q213621	
Confirmation Number	
3504	

Application Number	14/375,361	Filed	July 29, 2014
For	METHODS AND USES FOR IMPROVED SOWING OF SEEDS		
Art Unit	1715	Examiner	LOUIE, MANDY C

This is a request under the provisions of 37 CFR 1.136(a) to extend the period for filing a reply in the above-identified application.

The requested extension and fee are as follows (check time period desired and enter the appropriate fee below):

		Fee	Small Entity Fee	Micro Entity Fee	
☐	One month (37 CFR 1.17(a)(1))	$200.00	$100.00	$50.00	
☐	Two month (37 CFR 1.17(a)(2))	$600.00	$300.00	$150.00	
☑	Three month (37 CFR 1.17(a)(3))	$1400.00	$700.00	$350.00	$1,400.00
☐	Four month (37 CFR 1.17(a)(4))	$2200.00	$1100.00	$550.00	
☐	Five month (37 CFR 1.17(a)(5))	$3000.00	$1500.00	$750.00	

☐ Previous Payment Amount Date Submitted

☐ Applicant asserts small entity status. See 37 CFR 1.27.

☐ Applicant certifies micro entity status. See 37 CFR 1.29.
Form PTO/SB/15A or B or equivalent must either be enclosed or have been submitted previously.

☐ A check in the amount of the fee is enclosed.

☑ Payment by credit card.

☐ The Director has already been authorized to charge fees in this application to a Deposit Account.

☑ The Director is hereby authorized to charge any fees, **except for the Issue Fee and the Publication Fee**, or credit any overpayment, to Deposit Account Number 19-4880.

☑ Payment made via EFS-Web.

I am the ☐ applicant.

☑ attorney or agent of record. Registration Number 25,426

☐ attorney or agent under 37 CFR 1.34. Registration number

WASHINGTON OFFICE
23373
CUSTOMER NUMBER

/Alan J. Kasper/
Signature

January 22, 2016
Date

Alan J. Kasper
Typed or printed name

202.293.7060
Telephone Number

Note: This form must be signed in accordance with 37 CFR 1.33. See 37 CFR 1.4 for signature requirements and certifications. Submit multiple forms if more than one signature is required, see below*.

☑ *Total of 1 form is submitted.

TERMINAL DISCLAIMER TO OBVIATE A PROVISIONAL DOUBLE PATENTING REJECTION OVER A PENDING "REFERENCE" APPLICATION	Docket Number	Q213621

In re Application of: Nicholas JESSOP

Application No.: 14/375,361

Filed: July 29, 2014

For: METHODS AND USES FOR IMPROVED SOWING OF SEEDS

The applicant, Exosect Limited, owner of 100 percent interest in the instant application hereby disclaims, except as provided below, the terminal part of the statutory term of any patent granted on the instant application which would extend beyond the expiration date of the full statutory term of any patent granted on pending **reference** Application Number 14/112,579, filed November 1, 2013, as the term of any patent granted on said **reference** application may be shortened by any terminal disclaimer filed prior to the grant of any patent on the pending **reference** application. The applicant hereby agrees that any patent so granted on the instant application shall be enforceable only for and during such period that it and any patent granted on the **reference** application are commonly owned. This agreement runs with any patent granted on the instant application and is binding upon the grantee, its successors or assigns.

In making the above disclaimer, the applicant does not disclaim the terminal part of any patent granted on the instant application that would extend to the expiration date of the full statutory term of any patent granted on said **reference** application, "as the term of any patent granted on said **reference** application may be shortened by any terminal disclaimer filed prior to the grant of any patent on the pending **reference** application," in the event that: any such patent granted on the pending **reference** application expires for failure to pay a maintenance fee, is held unenforceable, is found invalid by a court of competent jurisdiction, is statutorily disclaimed in whole or terminally disclaimed under 37 CFR 1.321, has all claims canceled by a reexamination certificate, is reissued, or is in any manner terminated prior to the expiration of its full statutory term as shortened by any terminal disclaimer filed prior to its grant.

Check either box 1 or 2 below, if appropriate.

1. ☐ The undersigned is the applicant. If the applicant is an assignee, the undersigned is authorized to act on behalf of the assignee.

I hereby acknowledge that any willful false statements made are punishable under 18 U.S.C. 1001 by fine or imprisonment of not more than five (5) years, or both.

2. ☑ The undersigned is an attorney or agent of record. Reg. No. 25,426

/Alan J. Kasper/ — Signature

January 22, 2016 — Date

Alan J. Kasper — Typed or printed name

Attorney — Title

202.293.7060 — Telephone Number

☑ Terminal disclaimer fee under 37 CFR 1.20(d) included.

☑ The USPTO is directed and authorized to charge all required fees, except for the Issue Fee and the Publication Fee, to Deposit Account No. 19-4880. Please also credit any overpayments to said Deposit Account.

TERMINAL DISCLAIMER TO OBVIATE A PROVISIONAL DOUBLE PATENTING REJECTION OVER A PENDING "REFERENCE" APPLICATION	Docket Number	Q213621

In re Application of: Nicholas JESSOP

Application No.: 14/375,361

Filed: July 29, 2014

For: METHODS AND USES FOR IMPROVED SOWING OF SEEDS

The applicant, Exosect Limited, owner of 100 percent interest in the instant application hereby disclaims, except as provided below, the terminal part of the statutory term of any patent granted on the instant application which would extend beyond the expiration date of the full statutory term of any patent granted on pending **reference** Application Number 14/112,647, filed November 13, 2013, as the term of any patent granted on said **reference** application may be shortened by any terminal disclaimer filed prior to the grant of any patent on the pending **reference** application. The applicant hereby agrees that any patent so granted on the instant application shall be enforceable only for and during such period that it and any patent granted on the **reference** application are commonly owned. This agreement runs with any patent granted on the instant application and is binding upon the grantee, its successors or assigns.

In making the above disclaimer, the applicant does not disclaim the terminal part of any patent granted on the instant application that would extend to the expiration date of the full statutory term of any patent granted on said **reference** application, "as the term of any patent granted on said **reference** application may be shortened by any terminal disclaimer filed prior to the grant of any patent on the pending **reference** application," in the event that: any such patent granted on the pending **reference** application expires for failure to pay a maintenance fee, is held unenforceable, is found invalid by a court of competent jurisdiction, is statutorily disclaimed in whole or terminally disclaimed under 37 CFR 1.321, has all claims canceled by a reexamination certificate, is reissued, or is in any manner terminated prior to the expiration of its full statutory term as shortened by any terminal disclaimer filed prior to its grant.

Check either box 1 or 2 below, if appropriate.

3. ☐ The undersigned is the applicant. If the applicant is an assignee, the undersigned is authorized to act on behalf of the assignee.

I hereby acknowledge that any willful false statements made are punishable under 18 U.S.C. 1001 by fine or imprisonment of not more than five (5) years, or both.

4. ☑ The undersigned is an attorney or agent of record. Reg. No. 25,426

/Alan J. Kasper/ — Signature

January 22, 2016 — Date

Alan J. Kasper — Typed or printed name

Attorney — Title

202.293.7060 — Telephone Number

☑ Terminal disclaimer fee under 37 CFR 1.20(d) included.

☑ The USPTO is directed and authorized to charge all required fees, except for the Issue Fee and the Publication Fee, to Deposit Account No. 19-4880. Please also credit any overpayments to said Deposit Account.

TERMINAL DISCLAIMER TO OBVIATE A PROVISIONAL DOUBLE PATENTING REJECTION OVER A PENDING "REFERENCE" APPLICATION	Docket Number	Q213621

In re Application of: Nicholas JESSOP

Application No.: 14/375,361

Filed: July 29, 2014

For: METHODS AND USES FOR IMPROVED SOWING OF SEEDS

The applicant, Exosect Limited, owner of 100 percent interest in the instant application hereby disclaims, except as provided below, the terminal part of the statutory term of any patent granted on the instant application which would extend beyond the expiration date of the full statutory term of any patent granted on pending **reference** Application Number 14/112,582, filed November 4, 2013, as the term of any patent granted on said **reference** application may be shortened by any terminal disclaimer filed prior to the grant of any patent on the pending **reference** application. The applicant hereby agrees that any patent so granted on the instant application shall be enforceable only for and during such period that it and any patent granted on the **reference** application are commonly owned. This agreement runs with any patent granted on the instant application and is binding upon the grantee, its successors or assigns.

In making the above disclaimer, the applicant does not disclaim the terminal part of any patent granted on the instant application that would extend to the expiration date of the full statutory term of any patent granted on said **reference** application, "as the term of any patent granted on said **reference** application may be shortened by any terminal disclaimer filed prior to the grant of any patent on the pending **reference** application," in the event that: any such patent granted on the pending **reference** application expires for failure to pay a maintenance fee, is held unenforceable, is found invalid by a court of competent jurisdiction, is statutorily disclaimed in whole or terminally disclaimed under 37 CFR 1.321, has all claims canceled by a reexamination certificate, is reissued, or is in any manner terminated prior to the expiration of its full statutory term as shortened by any terminal disclaimer filed prior to its grant.

Check either box 1 or 2 below, if appropriate.

5. ☐ The undersigned is the applicant. If the applicant is an assignee, the undersigned is authorized to act on behalf of the assignee.

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6. ☑ The undersigned is an attorney or agent of record. Reg. No. 25,426

/Alan J. Kasper/ — Signature

January 22, 2016 — Date

Alan J. Kasper — Typed or printed name

Attorney — Title

202.293.7060 — Telephone Number

☑ Terminal disclaimer fee under 37 CFR 1.20(d) included.

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TERMINAL DISCLAIMER TO OBVIATE A PROVISIONAL DOUBLE PATENTING REJECTION OVER A PENDING "REFERENCE" APPLICATION	Docket Number	Q213621

In re Application of: Nicholas JESSOP

Application No.: 14/375,361

Filed: July 29, 2014

For: METHODS AND USES FOR IMPROVED SOWING OF SEEDS

The applicant, Exosect Limited, owner of 100 percent interest in the instant application hereby disclaims, except as provided below, the terminal part of the statutory term of any patent granted on the instant application which would extend beyond the expiration date of the full statutory term of any patent granted on pending **reference** Application Number 14/112,792, filed November 5, 2013, as the term of any patent granted on said **reference** application may be shortened by any terminal disclaimer filed prior to the grant of any patent on the pending **reference** application. The applicant hereby agrees that any patent so granted on the instant application shall be enforceable only for and during such period that it and any patent granted on the **reference** application are commonly owned. This agreement runs with any patent granted on the instant application and is binding upon the grantee, its successors or assigns.

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Application No.: 14/375,361

Filed: July 29, 2014

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Alan J. Kasper — Typed or printed name

Attorney — Title

202.293.7060 — Telephone Number

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TERMINAL DISCLAIMER TO OBVIATE A PROVISIONAL DOUBLE PATENTING REJECTION OVER A PENDING "REFERENCE" APPLICATION	Docket Number	Q213621

In re Application of: Nicholas JESSOP

Application No.: 14/375,361

Filed: July 29, 2014

For: METHODS AND USES FOR IMPROVED SOWING OF SEEDS

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In re Application of: Nicholas JESSOP

Application No.: 14/375,361

Filed: July 29, 2014

For: METHODS AND USES FOR IMPROVED SOWING OF SEEDS

The applicant, Exosect Limited, owner of 100 percent interest in the instant application hereby disclaims, except as provided below, the terminal part of the statutory term of any patent granted on the instant application which would extend beyond the expiration date of the full statutory term of any patent granted on pending **reference** Application Number 14/112,640, filed November 6, 2013, as the term of any patent granted on said **reference** application may be shortened by any terminal disclaimer filed prior to the grant of any patent on the pending **reference** application. The applicant hereby agrees that any patent so granted on the instant application shall be enforceable only for and during such period that it and any patent granted on the **reference** application are commonly owned. This agreement runs with any patent granted on the instant application and is binding upon the grantee, its successors or assigns.

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/Alan J. Kasper/ — Signature

January 22, 2016 — Date

Alan J. Kasper — Typed or printed name

Attorney — Title

202.293.7060 — Telephone Number

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PATENT APPLICATION

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of

Nicholas JESSOP, et al.

Docket No: Q213621

Appln. No.: 14/375,361

Group Art Unit: 1715

Confirmation No.: 3504

Examiner: LOUIE, MANDY C

Filed: July 29, 2014

For: METHODS AND USES FOR IMPROVED SOWING OF SEEDS

SUBMISSION OF TERMINAL DISCLAIMER

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

Submitted herewith are seven (7) Terminal Disclaimers in the above-identified application. The statutory fee of $1120.00 (37 C.F.R. § 1.20(d)) is being remitted. The USPTO is directed and authorized to charge all required fees, except for the Issue Fee and the Publication Fee, to Deposit Account No. 19-4880. Please also credit any overpayments to said Deposit Account.

Respectfully submitted,

/Alan J. Kasper/

Alan J. Kasper
Registration No. 25,426

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WASHINGTON OFFICE
23373
CUSTOMER NUMBER

Date: January 22, 2016

PATENT APPLICATION

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of	Docket No: Q213621
Nicholas JESSOP	
Appln. No.: 14/375,361	Group Art Unit: 1715
Confirmation No.: 3504	Examiner: LOUIE, MANDY C
Filed: July 29, 2014	

For: METHODS AND USES FOR IMPROVED SOWING OF SEEDS

INFORMATION DISCLOSURE STATEMENT
UNDER 37 C.F.R. §§ 1.97 and 1.98

MAIL STOP AMENDMENT
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

In accordance with the duty of disclosure under 37 C.F.R. § 1.56, Applicant hereby notifies the U.S. Patent and Trademark Office of the documents which are listed on the attached PTO/SB/08 (modified) form and/or listed herein and which the Examiner may deem material to patentability of the claims of the above-identified application.

One copy of each of the listed documents is submitted herewith, except for the following: U.S. patents and/or U.S. patent publications; and co-pending non-provisional U.S. applications filed after June 30, 2003.

The present Information Disclosure Statement is being filed: Before the mailing date of the first Office Action after filing a request for continued examination (RCE) under §1.114, and therefore, no Statement under 37 C.F.R. § 1.97(e) or fee under 37 C.F.R. § 1.17(p) is required.

The submission of the listed documents is not intended as an admission that any such document constitutes prior art against the claims of the present application. Applicant does not waive any right to take any action that would be appropriate to antedate or otherwise remove any listed document as a competent reference against the claims of the present application.

The USPTO is directed and authorized to charge all required fees, except for the Issue Fee and the Publication Fee, to Deposit Account No. 19-4880. Please also credit any overpayments to said Deposit Account.

Respectfully submitted,

/Alan J. Kasper/

SUGHRUE MION, PLLC
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WASHINGTON OFFICE
23373
CUSTOMER NUMBER

Alan J. Kasper
Registration No. 25,426

Date: January 22, 2016

INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(Not for submission under 37 CFR 1.99)

Application Number	14/375,361
Confirmation Number	3504
Filing Date	July 29, 2014
First Named Inventor	Nicholas JESSOP
Art Unit	1715
Examiner Name	LOUIE, MANDY C
Attorney Docket Number	Q213621

U.S. PATENTS

Examiner Initials*	Cite No	Patent Number	Kind Code[1]	Issue Date	Name of Patentee or Applicant of cited Document	Pages, Columns, Lines, where Relevant Passages or Relevant Figures Appear
	1.					

U.S. PATENT APPLICATION PUBLICATIONS

Examiner Initials*	Cite No	Publication Number	Kind Code[1]	Publication Date	Name of Patentee or Applicant of cited Document	Pages, Columns, Lines, where Relevant Passages or Relevant Figures Appear
	2.	2015/0072857	A1	03/12/15	Reichert et al	

FOREIGN PATENT DOCUMENTS

Examiner Initials*	Cite No	Foreign Document Number[3]	Country Code[2]	Kind Code[4]	Publication Date	Name of Patentee or Applicant of cited Document	Pages, Columns, Lines, where Relevant Passages or Relevant Figures Appear	T[5]
	3.							

NON-PATENT LITERATURE DOCUMENTS

Examiner Initials*	Cite No	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city, and/or country where published.	T[5]
	4.		

EXAMINER SIGNATURE

Examiner Signature		Date Considered	

*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through a citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

1 See Kind Codes of USPTO Patent Documents at www.USPTO.GOV or MPEP 901.04. 2 Enter office that issued the document, by the two-letter code (WIPO Standard ST.3). 3 For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. 4 Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST.16 if possible. 5 Applicant is to place a check mark here if English language translation is attached.

Electronic Patent Application Fee Transmittal

Application Number:	14375361
Filing Date:	29-Jul-2014
Title of Invention:	METHODS AND USES FOR IMPROVED SOWING OF SEEDS
First Named Inventor/Applicant Name:	Nicholas Jessop
Filer:	Alan Joseph Kasper/Sandra Swann
Attorney Docket Number:	Q213621

Filed as Large Entity

Filing Fees for U.S. National Stage under 35 USC 371

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Basic Filing:				
Pages:				
Claims:				
Miscellaneous-Filing:				
Petition:				
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				
Extension-of-Time:				

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Extension - 3 months with $0 paid	1253	1	1400	1400
Miscellaneous:				
Request for Continued Examination	1801	1	1200	1200
Statutory or Terminal Disclaimer	1814	7	160	1120
		Total in USD ($)		**3720**

Electronic Acknowledgement Receipt

EFS ID:	24695433
Application Number:	14375361
International Application Number:	
Confirmation Number:	3504
Title of Invention:	METHODS AND USES FOR IMPROVED SOWING OF SEEDS
First Named Inventor/Applicant Name:	Nicholas Jessop
Customer Number:	23373
Filer:	Alan Joseph Kasper/Sandra Swann
Filer Authorized By:	Alan Joseph Kasper
Attorney Docket Number:	Q213621
Receipt Date:	22-JAN-2016
Filing Date:	29-JUL-2014
Time Stamp:	09:31:52
Application Type:	U.S. National Stage under 35 USC 371

Payment information:

Submitted with Payment	yes
Payment Type	Credit Card
Payment was successfully received in RAM	$3720
RAM confirmation Number	8290
Deposit Account	
Authorized User	

The Director of the USPTO is hereby authorized to charge indicated fees and credit any overpayment as follows:

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1		Q213621RCEandAmendment114cTD.pdf	231040 e5521c23743a5a99eb84815a090cabd27de30f15	yes	24

	Multipart Description/PDF files in .zip description		
	Document Description	**Start**	**End**
	Amendment Submitted/Entered with Filing of CPA/RCE	1	1
	Applicant Arguments/Remarks Made in an Amendment	2	14
	Request for Continued Examination (RCE)	15	15
	Extension of Time	16	16
	Terminal Disclaimer Filed	17	24

Warnings:

Information:

2		Q213621IDSSB08.pdf	40181 fd34b5d3fef215c7f3cee298431da32049ee03ec	yes	3

	Multipart Description/PDF files in .zip description		
	Document Description	**Start**	**End**
	Transmittal Letter	1	2
	Information Disclosure Statement (IDS) Form (SB08)	3	3

Warnings:

Information:

3	Fee Worksheet (SB06)	fee-info.pdf	34316 a599a33d7a106fcc7add0377981669b35c44bdf8	no	2

Warnings:

Information:

Total Files Size (in bytes):	305537

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111

If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371

If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office

If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

PATENT APPLICATION

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of	Docket No: Q213621
Nicholas JESSOP	
Appln. No.: 14/375,361	Group Art Unit: 1715
Confirmation No.: 3504	Examiner: LOUIE, MANDY C
Filed: July 29, 2014	

For: METHODS AND USES FOR IMPROVED SOWING OF SEEDS

AMENDMENT UNDER 37 C.F.R. § 1.114(c)

MAIL STOP RCE
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

In response to the Office Action dated July 23, 2015, please amend the above-identified application as follows on the accompanying pages.

TABLE OF CONTENTS

REMARKS 2

Terminal Disclaimers and Transmittals Attachments

REMARKS

Claims 1-5, 11-15 and 21-23 are all the claims pending in the application. No claims are amended, cancelled or added.

Amendment Accompanying an RCE

The present amendment accompanies the filing of an RCE, which is necessitated because newly discovered art was brought to the attention of Applicant more than three months prior to the filing of an IDS that is concurrently filed with this amendment.

Claim Rejections - 35 USC § 102/103

Claims 1, 5, 11 and 15 are rejected under pre-AIA 35 U.S.C. 102(b) as anticipated by Turnblad or Turbland evidenced by Kojimoto or, in the alternative, under pre-AIA 35 U.S.C. 103(a) as obvious over Turnblad in view of Kojimoto [US 5127185]. This rejection is traversed for at least the following reasons.

Pending Claim 1

The claim as currently pending defines the invention as follows:

> *A method of controlling the flowability of plant seeds by placing the plant seeds of a mass of seeds in contact with dry free flowing particles of a* ***flowability enhancing agent that is made up of at least one species of electret particle made up of a wax****, wherein the electret particle adheres more firmly to the plant seeds than do particles that comprise a dry free flowing substance that is or includes a mineral earth component.*

Definition of Electret

The term "electret" is defined in numerous resources, as the concept was developed over a century ago, and all recognize the need for human intervention to add an electrical/magnetic property to a material. A definition in Wikipedia is convenient and representative of those in other dictionaries and resources:

> ***Electret*** *(formed of elektr- from "electricity" and -et from "magnet") is a dielectric material that has a quasi-permanent electric charge or dipole*

polarisation. An electret generates internal and external electric fields, and is the electrostatic equivalent of a permanent magnet.

The preparation of electrets involves cooling a suitable dielectric material within a strong electric field, after heating it above its melting temperature. The field repositions the charge carriers or aligns the dipoles within the material. When the material cools, solidification secures them in position.

Turnblad

No Teaching of Electrets

The Examiner has failed to recognize that the wax particles of the instant invention are defined as ***electret*** particles, that is to say, particles to which a long-lasting electrostatic charge has been imparted, as defined in independent claim 1, as well as claim 11. Nowhere within Turnblad, whether by itself or in conjunction with Kojimoto, is there any reference to the waxes used therein being electrets.

The Examiner states in relation to claims 1 and 11 on page 2 of the Office Action that:

"Turnblad does not explicitly teach the wax particles adhering better to seeds than dry free flowing particles that include mineral earth component."

The reason for that omission on the part of Turnblad is that Turnblad does not teach use of wax particles that are ***electrets***. Applicant submits that mineral earth components do not hold charge and are susceptible to significantly contributing to, *inter alia*, dust drift when used in seed planting.

The Examiner goes further, stating that:

" … adhesiveness is a property that would have necessarily flown from forming an overcoat of wax material onto seeds (wherein it would seem that Turnblad recognizes wax powder as an adhesive)".

This statement ignores the limitation in the claim to ***electrets***. There is no teaching in Turnblad that electret particles are added to seeds.

As Turnblad does not teach the addition of electret particles, which are made up of wax, to seeds, there can be no anticipation. Further, since Turnblad merely discusses wax particles and does not teach the added step of making them into electrets, such alternative cannot be inherent under applicable law in the United States.

Turnblad's Purpose and Process Do Not Make Claimed Use of Electrets Obvious

Turnblad teaches insecticidal coatings for seeds that contain two main components, namely a) one or more binders and b) an insecticide (column 2, lines 55-56). The seed is treated with one or more adhering coating layers (column 2, lines 52-54). The purpose of using such coatings is provided at column 1, lines 24-26, namely to solve the problem of direct insecticide-induced phytotoxicity to the seed. A principal object of Turnblad is to provide a seed coated with a coating that protects the seed or an emerging seedling from physiological damage potentially caused by the insecticidal ingredient of the coating (column 2, lines 20-23). How the seed is coated is critical to achieving the stated purpose. The coating of Turnblad is employed to provide a matrix for the insecticide that renders the seed coating non-phytotoxic to the seed (column 1, lines 37-39; column 1, lines 50-52). In order for the binder in the coating layer to fulfil its purpose, namely to protect the seed from the phytotoxic effects of the added insecticide, the coating layer must be applied at least as a single layer. This coating layer envelops the seed in such a manner that either it does not allow the insecticide to present itself to the surface of the seed or it permits only a very much reduced amount of insecticide to make contact therewith. Either way, phytotoxic effects are prevented or reduced (column 2, lines 55-60). The binder is described as serving as a matrix for the insecticide (column 2, line 57).

The matrix binder is then described as "an adhesive polymer" (column 2, line 62) and a list of polymers is given beginning at column 2, line 62, through to column 3, line 20. Waxes are not included as possible binders in that list.

At column 3, lines 27-29 the matrix itself is defined:

"The term 'matrix' as used herein means a continuous solid phase of one or more binder compounds and contains vacancies, voids or spaces occupied by the insecticide and filler."

At column 8, lines 15-16 the reduced dust exposure is due to the coating, that is to say the use of a matrix loaded with insecticide on seed, and not to the use of a film-forming overcoat.

The film-forming overcoat is a conventional addition as commonly employed in the art, as is acknowledged at column 7, lines 27-28 of Turnblad.

Significantly, there is no reference in Turnblad, explicit or implied, to the film overcoat being responsible for reducing dust exposure and the only reference to the overcoating being able to contribute to flowability of seed is restricted to circumstances where conventional flow agents, e.g. calcium stearate, talc or vermiculite, are added. It is clear that the component used by Turnblad for reducing dust exposure or for contributing to seed flowability is not an electret particle made up of wax, as in the case of the present invention.

Consequently, the invention as defined in the claims of the present application is novel and unobvious over the teaching of Turnblad. Applicant respectfully submits that this rejection will not stand on appeal.

Kojimoto

Kojimoto does not describe a free flowing composition of wax particulates that can be used in a method to reduce dust drift. There is no teaching of ***electrets*** for this purpose. The Examiner only looks to Kojimoto for a teaching that "water repellent coatings protects better when directly adhered to the seed." The invention as defined in the claims is therefore also novel over the teaching of Kojimoto.

Turnblad and Kojimoto

The invention as defined in claim 1 is also unobvious over the combined teaching of Turnblad and Kojimoto, since it requires the presence of layering and does not make any mention of the use of dry, free flowing particles in a method for controlling dust drift and/or seed flowability.

The Examiner states that, in view of the teaching of Turnblad and Kojimoto (page 3, paragraph 2, of the current Office Action):

"Alternatively, it would have been inherent or obvious to one of ordinary skill in the art to use a material that is more adhesive to the seed such as wax than a dry flowing substances [sic] comprising mineral earth component such as talc, since Kojimoto teaches water repellent coatings better protect when directly adhered to the seed, whereas other coatings comprising

mineral earth components have issues with cracks being formed; thus, being susceptible to water infiltration … Kojimoto further teaches that wax is one such water repellent material …".

This statement assumes that the purpose of adding wax in the teaching of Turnblad equates with the same purpose as adding a dry free flowing electret substance to seeds, namely to act as a flow enhancing agent. This assumption is not correct.

Turnblad is not concerned with and neither teaches nor alludes to the use of a wax as an agent for controlling the flowability of seeds or controlling dust drift. At column 7, lines 27-42, of Turnblad it is stated that a "film overcoating" can be optionally applied to the coated seeds. The film overcoating is a standard addition commonly employed in the art and one to which improvements in flow and dust drift have not previously been ascribed. The Turnblad concept is directed, as shown above, to supplying seeds that are coated with a matrix loaded with insecticide. The film overcoating applied to the coated seeds of Turnblad is one in which additives other than insecticides are dissolved or dispersed in a liquid adhesive and then dried off. This results in a film overcoating in which additives of choice are present. Alternatively, it is stated at column 7, lines 34-35, that a powder adhesive can be used in conjunction with other additives to form the overcoating, although it is not shown how and this possibility is not taught in any of the examples. In both cases relating to the addition of an overcoating is not clear what the other additives may be, but at column 7, lines 43-47, a list of possible additives is provided and this list includes conventional flow agents selected from calcium stearate, talc and vermiculite. It is clear, therefore, that waxes - if used at all by Turnblad - are used not as flow enhancing agents, but only as an adhesive component to which other additives may be added to form a film overcoating. If such adhesive powders, that is to say waxes, were being used as flow agents Turnblad would not have needed to suggest adding conventional flow agents as additives to the film overcoat. Furthermore, the film overcoating that is formed by the teaching of Turnblad is not made up of dry, free flowing electret particles of wax, as in the coating of the present invention, because Turnblad did not realize that wax particles could be used by themselves as flow agents.

Put simply, Turnblad did not invent a method of controlling the flowability of plant seeds by using dry free flowing particles of wax as flow agents. He had apparently no idea that this was feasible.

At column 2, lines 36-38, Turnblad refers to seeds that have a seed coating made up of a binder and an insecticide, wherein the binder acts to minimize damage to seeds that may occur as a result of the insecticide coming into contact therewith. The binder and any filler incorporated into the seed coating provide a coating in which pesticides can be applied in a uniform way and loss of pesticides during transport and handling is prevented (column 8, lines 17-18). The reason for this reduction in loss of pesticide is because the seed coating layer is in the form of a matrix that holds insecticide within, is hard (dry) and adheres to the seed in a continuous layer (note definition of matrix – see above). The presence of a film overcoating as Turnblad acknowledges at column 7, lines 27-30, is an optional element that may be applied as a conventional addition (or it may not) to protect the coating layers. The overcoating may contain conventional flow agents as mentioned above.

At column 8, lines 15-16, the reduced dust exposure is due to the coating, that is to say the use of a matrix loaded with insecticide on seed, and not to the use of a film-forming overcoat. The film-forming overcoat is a conventional addition as commonly employed in the art as acknowledged at column 7, lines 27-28 of Turnblad. There is no reference, explicit or implied, pointing to the film overcoat being responsible for reducing dust exposure and the only reference to the overcoating being able to contribute to flowability of seed is restricted to circumstances where conventional flow agents (e.g. calcium stearate, talc or vermiculite) are added.

Accordingly, in the view of the Applicant the invention as defined in the claims of the preset application is not rendered obvious by the teaching of Turnblad.

Kojimoto does not describe a free-flowing composition of wax particulates that can be used in a method to reduce dust drift. Kojimoto is concerned with covering coated seed with a water repellent which "prevents the surface of seed from being sealed by the water infiltrating through the cracks of the coating layer" (column 2, lines 24-27). The teaching of Kojimoto requires a binder to be firstly used to ensure the adhesion of a water repellent to the seeds. The binder can be one that moistens the seed surface first and thereafter water repellent is added to the seed (column 2, lines 35-38). No specific wax is mentioned by Kojimoto and it is clear that preferred water repellents are selected from fatty acids and metal salts (column 2, lines 45-48), thus teaching away from the use of waxes as water repellents. The coating of Kojimoto is used to protect seed from water infiltration into cracks within the seed coating, and so helps prevent

the seed from dying as a result of oxygen starvation (column 2, lines 14-18). The use of wax by Kojimoto is not intended to enhance seed flowability or reduce dust drift. Clearly, a particulate wax component of the instant invention would not help in protecting seed in the manner attributable to the seed coat of Kojimoto.

Consequently, the invention as defined in the instant claims is not obvious in view of the teaching of Kojimoto.

Taking the teachings of both Turnblad and Kojimoto, the person skilled in the art is not taught or given any idea how the problems of dust drift and seed flowability may be addressed. As stated above, the overcoat of Turnblad - if it uses waxes at all - does not use waxes as flow enhancing agents, but only as an adhesive component to which other additives may be added to form a continuous film overcoating. Turnblad does not teach the use of waxes as flow agents since he relies on the use of conventional flow agents for that purpose. Kojimoto teaches that waxes may be used in a continuous coating layer admixed with other components to protect the seed from ingress of water and allegedly to prevent the seed from dying of oxygen deprivation. Thus, the teachings of both Turnblad and Kojimoto instruct the skilled person to form continuous seed coatings composed of many parts for the maintenance of viability of the seed by protecting the seed from exposure to insecticide (Turnblad) and preventing oxygen deprivation (Kojimoto). The combined teachings of Turnblad and Kojimoto do not in any way suggest or imply the simple application of dry free flowing particles of wax to address the problem of flowability or dust drift.

Accordingly, the invention as defined in claim 1 is not obvious over the teachings of Turnblad and Kojimoto taken singly or in combination.

Pending Claim 11

Claim 11 also requires the use of electrets and defines the invention as follows:

> *A method of controlling dust drift from a population of plant seeds by placing the plant seeds of a mass of seeds in contact with dry free flowing particles of* ***a flowability enhancement agent made up of electret particles made of a wax*** *that adheres more firmly to plant seeds than a dry particulate compound or composition that is a flowability enhancement agent that comprises a dry free flowing substance that is a mineral earth or includes a mineral earth component.*

The claim distinguishes over Turnblad alone, Kojimoto alone or the combination of Turnblad and Kojimoto for the reasons given for claim 1.

Claims 5 and 15

These claims depend from allowable claims 1 and 11, respectively, and would be patentable for the reasons given for their parent claim.

Claim Rejections - 35 USC § 103

Claims 2, 4, 12 and 14 are rejected under pre-AIA 35 U.S.C. 103(a) as being unpatentable over Turnblad OR Turnblad in view of Kojimoto as applied to claims 1, 5, 11 and 15, and further in view of Rosa [US 20070207927]. This rejection is traversed for at least the following reasons.

Turnblad in view of Kojimoto

Applicant directs the Examiner to the foregoing observations concerning Turnblad in view of Kojimoto, emphasizing that the combined teaching of the two citations does not point or allude to the use of dry free flowing electret particles made up of wax to control seed flowability or to reduce dust drift. The addition of the teaching of Rosa does not remedy this deficiency.

Rosa

The teaching of Rosa is limited to a seed coating in the form of a liquid suspension added to seeds. The suspension is made up of several components, namely a binder, a wax, a pigment and one or more stabilizers; the stabilizer may be a biocide [0013]. The binder is in the form of a liquid ([0020], line 7) and the coating is added to the seeds as a slurry ([0020], line 13). A binder is required to form the coating. The purpose behind coating the seeds with a coating composition as described by Rosa is to provide a coated seed that flows readily through planters. The solution offered by Rosa is to make the seed coat smoother so that the seeds flow through the planter easily [0008]. Rosa states that for efficient seed planting in conventional systems, conventional seed flowability agents (e.g. talc or graphite [0008]) are added to coated seeds, presumably to make such coated seeds 'smoother', thus allegedly enhancing seed flowability through planter apparatus. Rosa therefore recognizes that there is a need to supply seed coated with formulations that permit seeds to flow more readily through planters, but his solution relies

on the provision of a complex continuous coating that is dried onto seeds to form a smooth 'shell' that contains wax as lubricant. Rosa still requires conventional seed flowability agents to be added to his coated seeds in order to improve seed flowability. By adding such conventional seed flowability agents, it would be expected that seed flowability might be enhanced, but at the expense of increased dust drift, since such agents could be expected to detach from the seeds. As explained in previous submissions, it is clear that Rosa does not contemplate waxes used as lubricant in a dry free flowing form without using a binder to form a continuous coating. Furthermore, it is clear that the waxes of Rosa are not present as free-flowing particles on the seed at any stage and there is no suggestion that free-flowing particles of waxes could be employed to control flowability. By contrast, the present invention does not require the presence of a binder or the use of a liquid medium to apply a coating containing a lubricant (e.g. a wax) to seeds.

Taking the teachings of Turnblad, Kojimoto and Rosa together, the person skilled in the art is directed towards utilizing seed coatings that are adhered to seeds in a uniform, continuous coating. There is no suggestion in the teachings in any of the citations, taken singly or in combination, that dry free flowing particles could be used to better control seed flowability and dust drift in the process of planting seed.

Accordingly, claims 1, 5, 11 and 15 are believed to be non-obvious in relation to the teachings of Turnblad, Kojimoto and Rosa. Claims 2, 4, 12 and 14 are also not obvious over the teachings of Turnblad, Kojimoto and Rosa for the same reasons.

Claims 3 and 13 are rejected under pre-AIA 35 U.S.C. 103(a) as being unpatentable over Turnblad in view of Rosa OR Turnblad in view of Kojimoto and Rosa as applied to claims 2, 4, 12, 14, and further evidenced by Brenntagspecialties [Carnauba waxes]. This rejection is traversed for at least the following reasons.

Turnblad in view of Kojimoto and Rosa

Applicant again directs the Examiner to our comments on Turnblad in view of Kojimoto in view of Rosa in relation to claims 1 and 11 and submits the claims have been demonstrated to be patentable.

Claim 3 depends from claim 1 and is directed to a method in which the wax is one that is selected from those having a melting temperature ≥ 40° C. Similarly, claim 13 depends from claim 11.

In line with Applicant's comments above, the invention is centered on the realization that dry free flowing electret wax particles can be used to control dust drift and seed flowability. From that it follows that preferred waxes of use may be claimed with reference to melting temperature (e.g. claim 3). Since the cited prior art is silent as to the possibility of using dry free-flowing electret particles of wax for controlling seed flowability, it follows that the claimed subject matter of claims 3 and 13 to preferred waxes for use in the invention is also not obvious.

Brenntagspecialities

The fact that Brenntagspecialities teaches carnauba wax having a melting point of 80-86 °C does not add anything material to the objection of obviousness. The invention concerns use of dry free-flowing wax particles to control dust drift and seed flowability. Preferred waxes have been claimed in claims 3 and 13 with reference to melting temperature. The fact that a technical article states that a wax has a high melting temperature does not go to the nub of the invention, namely the realization that the wax may be applied as dry free flowing electret particles for controlling seed flowability. Adding the teaching of Brenntagspecialities to the teaching of Turnblad, Kojimoto and Rosa does not guide the person skilled in the art to the instant invention, because nowhere in the cited prior art is it taught or suggested that dry free-flowing electret particles of wax can be used to control seed flowability or dust drift.

Accordingly, claims 3 and 13 are not obvious over the teaching of Turnblad in view of Kojimoto in view of Rosa and as evidenced by Brenntagspecialities.

Claims 21 and 23 are rejected under pre-AIA 35 U.S.C. 103(a) as being unpatentable over Turnblad OR Turnblad in view of Kojimoto as applied to claims 1 and 11, and further in view of Pearce [US 4285994]. This rejection is traversed for at least the following reasons.

Turnblad in view of Kojimoto

Applicant directs the Examiner to the foregoing observations concerning Turnblad in view of Kojimoto, emphasizing that the combined teaching of the two citations does not point or

allude to the use of dry free flowing electret particles made up of wax to control seed flowability or to reduce dust drift. Addition of the teaching of Pearce does not remedy this deficiency.

Pearce

Aside from the fact that Pearce relates to a different field of art, the fact that claims 21 and 23 depend from claims 1 and 11, respectively, means that the patentability thereof is tied to the patentability of the parent claims and is therefore subject to the reasoning as applied to claims 1 and 11, as further presented herein and as presented in previous correspondence.

Applicant reiterates previous arguments that Pearce relates to a totally different field of art, namely, the production of novel free flowing pigment compositions for use in the plastics and ceramics industries (column 1, lines 14-19). The free-flowing products that are obtained are described as made up of wax particles mixed with pigment from 0.2mm to about 5mm in size (column 1, lines 53-54). The improvement of Pearce is to provide product compositions that have good flow properties through a metering device. The resultant product is then added to plastics. Nowhere is it suggested that the product particles of Pearce may or could be used to coat seeds. By adding the teaching of Pearce to that of Turnblad and Kojimoto, one is left with a possible suggestion that, according to the Examiner, the person skilled in the art is guided to follow, namely the possibility of addition to seeds of product particles, as used in the ceramics or plastics industries, of a size from 0.2mm to 5mm in diameter. This makes no sense in view of the fact that the product particles of Pearce if added to seeds would increase the seed diameter from 0.4mm to 10mm and almost certainly not act to control seed flowability in any helpful sense through a planter.

If, by adding the teaching of Pearce to that of Turnblad and Kojimoto, there is an argument that the person skilled in the art is led to the further possibility of adding wax particles in conjunction with conventional flow agents (e.g. calcium stearate), there is the inescapable issue that such a possibility is not desired by the person skilled in the art, since conventional flow agents may be expected to interfere with the control of seed flowability and/or dust drift when using dry free-flowing particles as in the present invention.

Accordingly, claims 1 and 11 are clearly not obvious over the teaching of Turnblad in view of Kojimoto in view of Pearce and for similar reasons claims 21 and 23 are not obvious over the same teaching.

Double Patenting

Claims 1-5, 11-15, 21, 23 are provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 47-61 of copending Application No. 14112579.

Applicant is filing a Terminal Disclaimer to overcome this rejection.

Claims 1-5, 11-15, 21, 23 are provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 48-60 of copending Application No. 14112647.

Applicant is filing a Terminal Disclaimer to overcome this rejection.

Claims 1-5, 11-15, 21, 23 are provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 43-54 of copending Application No. 14112582.

Applicant is filing a Terminal Disclaimer to overcome this rejection.

Claims 1-5, 11-15, 21, 23 are provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 48-53 of copending Application No. 14112792.

Applicant is filing a Terminal Disclaimer to overcome this rejection.

Claims 1-5, 11-15, 21, 23 are provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 28-37 of copending Application No. 14112816.

Applicant is filing a Terminal Disclaimer to overcome this rejection.

Claims 1-5, 11-15, 21, 23 are provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 25-35 of copending Application No. 14112837.

Applicant is filing a Terminal Disclaimer to overcome this rejection.

Claims 1-5, 11-15, 21, 23 are provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 48-61 of copending Application No. 14112640.

Applicant is filing a Terminal Disclaimer to overcome this rejection.

Conclusions

In view of the above, reconsideration and allowance of this application are now believed to be in order, and such actions are hereby solicited. If any points remain in issue which the Examiner feels may be best resolved through a personal or telephone interview, the Examiner is kindly requested to contact the undersigned at the telephone number listed below.

The USPTO is directed and authorized to charge all required fees, except for the Issue Fee and the Publication Fee, to Deposit Account No. 19-4880. Please also credit any overpayments to said Deposit Account.

Respectfully submitted,

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EXAMINER
LOUIE, MANDY C

ART UNIT	PAPER NUMBER
1715	

NOTIFICATION DATE	DELIVERY MODE
07/23/2015	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

PPROCESSING@SUGHRUE.COM
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USPTO@sughrue.com

Office Action Summary	Application No. 14/375,361	Applicant(s) JESSOP, NICHOLAS	
	Examiner MANDY LOUIE	Art Unit 1715	AIA (First Inventor to File) Status No

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTHS FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *06/19/15*.

☐ A declaration(s)/affidavit(s) under **37 CFR 1.130(b)** was/were filed on _____.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ An election was made by the applicant in response to a restriction requirement set forth during the interview on _____; the restriction requirement and election have been incorporated into this action.

4)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims*

5)☒ Claim(s) *1-5,11-15 and 21-23* is/are pending in the application.

5a) Of the above claim(s) _____ is/are withdrawn from consideration.

6)☐ Claim(s) _____ is/are allowed.

7)☒ Claim(s) *1-5,11-15 and 21-23* is/are rejected.

8)☐ Claim(s) _____ is/are objected to.

9)☐ Claim(s) _____ are subject to restriction and/or election requirement.

* If any claims have been determined allowable, you may be eligible to benefit from the **Patent Prosecution Highway** program at a participating intellectual property office for the corresponding application. For more information, please see http://www.uspto.gov/patents/init_events/pph/index.jsp or send an inquiry to PPHfeedback@uspto.gov.

Application Papers

10)☐ The specification is objected to by the Examiner.

11)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

Certified copies:

a)☒ All b)☐ Some** c)☐ None of the:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

** See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)

2) ☐ Information Disclosure Statement(s) (PTO/SB/08a and/or PTO/SB/08b) Paper No(s)/Mail Date _____.

3) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .

4) ☐ Other: _____.

DETAILED ACTION

1. The present application is being examined under the pre-AIA first to invent provisions.

Claim Rejections - 35 USC § 102/103

1. In the event the determination of the status of the application as subject to AIA 35 U.S.C. 102 and 103 (or as subject to pre-AIA 35 U.S.C. 102 and 103) is incorrect, any correction of the statutory basis for the rejection will not be considered a new ground of rejection if the prior art relied upon, and the rationale supporting the rejection, would be the same under either status.

2. The following is a quotation of the appropriate paragraphs of pre-AIA 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. Claims 1, 5, 11 and 15 are rejected under pre-AIA 35 U.S.C. 102(b) as anticipated by Turnblad or Turbland evidenced by Kojimoto or, in the alternative, under pre-AIA 35 U.S.C. 103(a) as obvious over Turnblad in view of Kojimoto [US 5127185].

Claims 1 and 11: Turnblad teaches seeds can be enveloped with an overcoat containing powder adhesives which can be of waxes [col 7, ln 27-42]. Turnblad does not explicitly teach the wax particles adhering better to seeds than dry free flowing that includes mineral earth component. However, adhesiveness is a property that would

have necessarily flown from forming an overcoat of wax material onto seeds (wherein it would seem that Turnblad recognizes wax powder as an adhesive). Furthermore, the aforementioned limitation appears to be intended use, since it does not add structure to the claim nor changes the function of the wax. It is also noted that Turnblad teaches it is desirable to improve flowability of the seed through a seed planter [col 2, ln 36-39] as well as reducing dust exposure to the operator [col 8, ln 15-16].

Alternatively, it would have been inherent or obvious to one of ordinary skill in the art to use a material that is more adhesive to the seed such as wax than a dry flowing substances comprising mineral earth component such as talc, since Kojimoto teaches water repellent coatings protects better when directly adhered to the seed, whereas other coatings comprising mineral earth components have issues with cracks being formed; thus, being susceptible to water infiltration [col 1, ln 25 to col 2, ln 40]. Kojimoto further teaches wax is one such water repellent material [col 2, ln 45]. Thus, the prior art suggests that these water repellent material such as wax adhere better to seeds than dry free flowing mineral earth component such as talc due to less likely formation of cracks and protecting the seed more from water infiltration.

Although prior art does not explicitly teach “controlling the flowability” or “controlling dust drift”, it is noted that the preamble is not a limitation on the claims if it merely states the purpose or intended use, and the remainder of the claim completely defines invention independent of preamble. On the other hand, if claims cannot be read independently of preamble, and preamble must be read to give meaning to claim or is essential to point out the invention, it constitutes a claim limitation. *Stewart-Warner*

Corp v. City of Pontiac, Mich. 219 USPQ 1162; *Marston v. J.C. Penny Co., Inc*. 148 USPQ 25; and *Kropa v. Robie and Mahlman,* 88 USPQ 478. Since the method steps can be performed independently of "controlling the flowability" or "controlling dust drift" the preamble will be construed as intended use. Turnblad recognizes it is desirable to improve flowability of the seed through a seed planter [col 2, ln 36-39] as well as reducing dust exposure to the operator [col 8, ln 15-16]. Therefore, since the prior art teaches the seeds are capable of improving flowability and reducing dust exposure, the preamble has been met.

Claims 5 and 15: Turnblad teaches the seeds can be of cereal seeds [col 5, ln 64].

Claim Rejections - 35 USC § 103

4. The following is a quotation of pre-AIA 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

5. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under pre-AIA 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.

2. Ascertaining the differences between the prior art and the claims at issue.

3. Resolving the level of ordinary skill in the pertinent art.

4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

6. This application currently names joint inventors. In considering patentability of the claims under pre-AIA 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of pre-AIA 35 U.S.C. 103(c) and potential pre-AIA 35 U.S.C. 102(e), (f) or (g) prior art under pre-AIA 35 U.S.C. 103(a).

7. Claims 2, 4, 12, 14 are rejected under pre-AIA 35 U.S.C. 103(a) as being unpatentable over Turnblad OR Turnblad in view of Kojimoto as applied to claims 1, 5, 11 and 15, and further in view of Rosa [US 20070207927].

Teaching of the prior art is aforementioned, but does not appear to specify the type of wax, such as those disclosed in claims 2, 4, 12, 14.

Claims 2, 4, 12, 14: Rosa teaches wax in a coating can facilitate the flowability [abstract; 0006-0010] and further teaches natural wax, vegetable wax (Carnauba,) mineral wax (montan or paraffin) or synthetic wax can be used as a lubricant [0012].

It would have been obvious to one of ordinary skill in the art at the time of the invention to use waxes disclosed by Rosa, since Turnblad does not teach any specific wax and Rosa teaches these waxes are operable for coating onto seeds, while also

teaching these waxes have desirable lubricating properties to provide ease in dispersion of seed in order to help maximize the economic potential for farmers [0006].

8. Claims 3, 13 are rejected under pre-AIA 35 U.S.C. 103(a) as being unpatentable over Turnblad in view of Rosa OR Turnblad in view of Kojimoto and Rosa as applied to claims 2, 4, 12, 14, and further evidenced by Brenntagspecialties [Carnauba waxes].

Teaching of the prior art is aforementioned, but does not appear to teach the wax has a melting temperature of greater than 40 Centigrade. Brenntagspecialties is provided.

Claims 3, 13: Brenntagspecialties teaches carnauba wax has an inherent melting point of about 80-86 degrees Centigrade.

9. Claims 21 and 23 are rejected under pre-AIA 35 U.S.C. 103(a) as being unpatentable over Turnblad OR Turnblad in view of Kojimoto as applied to claims 1 and 11, and further in view of Pearce [US 4285994].

Teaching of the prior art is aforementioned, but does not appear to teach the wax particles are of the claimed range of 10-200 micrometers. Pearce is provided.

Claims 21 and 23: Pearce, directed to coating pigment powders or pellets with wax to reduce dust and have good flow and handling for metering devices [col 1, ln 10-30], teaches grounded waxes of suitable size distribution ranges in diameter from 100-2000 microns (micrometers) [col 1, ln 49-52], where the claimed ranges “overlap or lie inside ranges disclosed by the prior art” a *prima facie* case of obviousness exists. (See MPEP 2144.05.I).

It would have been obvious to one of ordinary skill in the art at the time of the invention to use wax particles of the claimed diameter range since Pearce teaches these wax diameter sizes are operable for coating granules, which also allows for the granules to have good flowability and reducing dust production.

Double Patenting

1. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. A nonstatutory obviousness-type double patenting rejection is appropriate where the conflicting claims are not identical, but at least one examined application claim is not patentably distinct from the reference claim(s) because the examined application claim is either anticipated by, or would have been obvious over, the reference claim(s). See, e.g., *In re Berg*, 140 F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent either is shown to be commonly owned with this application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement.

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

2. Claims 1-5, 11-15, 21, 23 are provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 47-61 of copending Application No. 14112579. Although the conflicting claims are not identical,

they are not patentably distinct from each other because the claims of copending application anticipate the claim in the instant application.

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

3. Claims 1-5, 11-15, 21, 23 are provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 48-60 of copending Application No. 14112647. Although the conflicting claims are not identical, they are not patentably distinct from each other because the claims of copending application anticipate the claim in the instant application.

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

4. Claims 1-5, 11-15, 21, 23 are provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 43-54 of copending Application No. 14112582. Although the conflicting claims are not identical, they are not patentably distinct from each other because the claims of copending application anticipate the claim in the instant application.

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

5. Claims 1-5, 11-15, 21, 23 are provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 48-53 of copending Application No. 14112792. Although the conflicting claims are not identical,

they are not patentably distinct from each other because the claims of copending application anticipate the claim in the instant application.

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

6. Claims 1-5, 11-15, 21, 23 are provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 28-37 of copending Application No. 14112816. Although the conflicting claims are not identical, they are not patentably distinct from each other because the claims of copending application anticipate the claim in the instant application.

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

7. Claims 1-5, 11-15, 21, 23 are provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 25-35 of copending Application No. 14112837. Although the conflicting claims are not identical, they are not patentably distinct from each other because the claims of copending application anticipate the claim in the instant application.

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

8. Claims 1-5, 11-15, 21, 23 are provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 48-61 of copending Application No. 14112640. Although the conflicting claims are not identical,

they are not patentably distinct from each other because the claims of copending application anticipate the claim in the instant application.

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

Response to Arguments

1. Applicant's arguments filed 06/19/15 have been fully considered but they are not persuasive.

Regarding applicant's argument of Turnblad failing to teach the wax is responsible for improving flowability and reducing dust, it is argued that the preamble is construed as intended use since the claim body describes a structurally complete invention, in which the preamble does not affect the structure or steps of the claim. And even though Turnblad does not explicitly teach using wax for improving flowability or reducing dust, Turnblad does recognize the desirability of improving flowability and reducing dust exposure; thus, the taught coated seed including the optional wax overcoat would have been capable of enhancing flowability and reducing dust exposure. On the other hand, it is noted that claiming of a new use, new function or unknown property which is inherently present in the prior art does not necessarily make the claim patentable. *In re Best*, 562 F.2d 1252, 1254, 195 USPQ 430, 433 (CCPA 1977). The lubricating property, which would affect flowability, and adhering and film forming property would have been inherent to an overcoat of adhesive wax powder on a seed.

Regarding applicant's argument of wax failing to be recognized as a flowability enhancement in the prior art, it is argued that the lubricating or flowable property would have been inherent to the powder wax. It is also noted that Rosa teaches waxes are known as lubricants in the field of art [0012]. Additionally, even though Turnblad teaches the overcoat as being optional, all teachings of the prior art would be considered including optional embodiments.

Regarding applicant's arguments that Kojimoto teaches away from using waxes, it is argued that Kojimoto exemplifies waxes, and although Kojimoto may prefer fatty acids and metal salts as alleged by applicant, again, the prior art would be relied upon as a whole, wherein disclosed examples and preferred embodiments do not constitute a teaching away from a broader disclosure or nonpreferred embodiments (MPEP 2123.II.). Regarding applicant's arguments of Kojimoto teaching protection and not flowability or dust reduction, such arguments are redirected to the explanation to similar arguments above.

Regarding applicant's arguments that the prior art of record fails to recognize wax as a flow agent, it is argued that Rosa provides support that wax is a known lubricant in the field of art [0012]. Hence, recognizing inherent properties such as lubricating properties or enhancing flowability do not make the claimed invention patentable.

In regards to arguments over Rosa failing to recognize using a free flowing agent such as dry wax powder coating onto seeds, it is argued that Rosa recognizes waxes as lubricants or having lubricating effects and provides examples of specific waxes that can

be operably used to coat seeds. Although Rosa does not use wax in the free flowing form, Turnblad provides this teaching. In response to applicant's arguments against the references individually, one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.,* 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986).

Regarding applicant's arguments that Pearce is non-analogous art, wherein one of ordinary skill in the art would not have looked to Pearce to coat wax particles onto seeds, it is argued that since Turnblad teaches it is desirable to coat seeds with powder adhesive such as wax, but is silent over details regarding powder waxes, and Pearce teaches coating free flowing pigment granules can be coated with free flowing powder wax, wherein the sizes of the wax powder overlaps with the claimed ranges; it would have been obvious to one of ordinary skill in the art to look to Pearce to determine what wax powder size would be operable for coating free flowing particulates such as seeds in Turnblad since Pearce is directed to also coating particulates with free flowing wax powder. Although not in the field of seed coating, because Pearce is directed to solving the same or a similar problem (i.e. coating particles with wax powder), it would have been obvious to one of ordinary skill in the art to combine the other teachings of the prior art with Pearce.

Conclusion

1. No claim is allowed.

10. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. GB 201106763, GB 201206972, GB2490239, US 20150072857, US 20140274682.

Conclusion

2. No claim is allowed.

3. Claims 1-5, 11-15, 21, 23 are rejected for the reasons aforementioned.

4. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to MANDY C. LOUIE whose telephone number is (571)270-5353. The examiner can normally be reached on Monday to Friday, 7:30AM - 5:00PM EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Timothy Meeks can be reached on (571)272-1423. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/MANDY LOUIE/
Primary Examiner, Art Unit 1715

Search Notes	Application/Control No.	Applicant(s)/Patent Under Reexamination
	14375361	JESSOP, NICHOLAS
	Examiner	Art Unit
	MANDY LOUIE	1715

CPC- SEARCHED		
Symbol	Date	Examiner

CPC COMBINATION SETS - SEARCHED		
Symbol	Date	Examiner

US CLASSIFICATION SEARCHED			
Class	Subclass	Date	Examiner

SEARCH NOTES		
Search Notes	Date	Examiner
inventor, EAST search conducted	3/17/2015	ML

INTERFERENCE SEARCH			
US Class/ CPC Symbol	US Subclass / CPC Group	Date	Examiner

Index of Claims	Application/Control No.	Applicant(s)/Patent Under Reexamination
	14375361	JESSOP, NICHOLAS
	Examiner	Art Unit
	MANDY LOUIE	1715

✓	Rejected	-	Cancelled	N	Non-Elected	A	Appeal
=	Allowed	÷	Restricted	I	Interference	O	Objected

☐ Claims renumbered in the same order as presented by applicant ☐ CPA ☐ T.D. ☐ R.1.47

CLAIM		DATE								
Final	Original	02/26/2015	07/13/2015							
	1	✓	✓							
	2	✓	✓							
	3	✓	✓							
	4	✓	✓							
	5	✓	✓							
	6	✓	-							
	7	✓	-							
	8	✓	-							
	9	✓	-							
	10	-	-							
	11	✓	✓							
	12	✓	✓							
	13	✓	✓							
	14	✓	✓							
	15	✓	✓							
	16	✓	-							
	17	✓	-							
	18	✓	-							
	19	✓	-							
	20	-	-							
	21	✓	✓							
	22	✓	✓							
	23	✓	✓							
	24	✓	-							

PATENT APPLICATION

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of	Docket No: Q213621
Nicholas JESSOP	
Appln. No.: 14/375,361	Group Art Unit: 1715
Confirmation No.: 3504	Examiner: LOUIE, MANDY C
Filed: July 29, 2014	

For: METHODS AND USES FOR IMPROVED SOWING OF SEEDS

AMENDMENT UNDER 37 C.F.R. § 1.111

MAIL STOP AMENDMENT
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

In response to the Office Action dated March 23, 2015, please amend the above-identified application as follows on the accompanying pages.

TABLE OF CONTENTS

AMENDMENTS TO THE CLAIMS 2

REMARKS 4

AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions and listings of claims in the application:

LISTING OF CLAIMS:

1. (Original): A method of controlling the flowability of plant seeds by placing the plant seeds of a mass of seeds in contact with dry free flowing particles of a flowability enhancing agent that is made up of at least one species of electret particle made up of a wax, wherein the electret particle adheres more firmly to the plant seeds than do particles that comprise a dry free flowing substance that is or includes a mineral earth component.

2. (Currently Amended): [[A]] The method according to claim 1, wherein the wax comprises at least one species of wax selected from mineral waxes, natural waxes and synthetic waxes.

3. (Currently Amended): [[A]] The method according to claim 1, wherein the wax comprises at least one species of wax that has a melting temperature of $\geq 40°$ C.

4. (Currently Amended): [[A]] The method according to claim 2, wherein the wax comprises at least one species of wax selected from carnauba wax, montan wax, paraffin wax and a mixture of two or more thereof.

5. (Currently Amended): [[A]] The method according to claim 1, wherein the plant seeds are selected from seeds from the group consisting of fodder and forage plant seeds, cereal seeds, cotton seeds, legume plant seeds, maize seeds and field crop plant seeds.

6. - 10. (Cancelled).

11. (Original) A method of controlling dust drift from a population of plant seeds by placing the plant seeds of a mass of seeds in contact with dry free flowing particles of a flowability enhancement agent made up of electret particles made of a wax that adheres more firmly to plant seeds than a dry particulate compound or composition that is a flowability enhancement agent that

comprises a dry free flowing substance that is a mineral earth or includes a mineral earth component.

12. (Currently Amended): [[A]] The method according to claim 11, wherein the wax comprises at least one species of wax selected from mineral waxes, natural waxes and synthetic waxes.

13. (Currently Amended): [[A]] The method according to claim 11, wherein the wax comprises at least one species of wax that has a melting temperature of ≥ 40° C.

14. (Currently Amended): [[A]] The method according to claim 12, wherein the wax comprises at least one species of wax selected from carnauba wax, montan wax, paraffin wax and a mixture of two or more thereof.

15. (Currently Amended): [[A]] The method according to claim 11, wherein the plant seeds are selected from seeds from the group consisting of fodder and forage plant seeds, cereal seeds, cotton seeds, legume plant seeds, maize seeds and field crop plant seeds.

16. - 20. (Cancelled).

21. (Currently Amended): ~~Method~~ The method according to claim 1, wherein the electret particles of wax have a volume mean diameter of any conventional size in the range from 10 µm to 200 µm.

22. (Cancelled).

23. (Currently Amended): ~~Method~~ The method according to claim 11, wherein the electret particles of wax have a volume mean diameter of any conventional size in the range from 10 µm to 200 µm.

24. (Cancelled).

REMARKS

Claims 1-9, 11-19 and 21-24, all the claims pending in the application, are rejected. Claims 2-5, 12-15, 21 and 23 are amended. Claims 6-9, 16-19, 22, and 24 are cancelled.

Support for Amendments

Claims 2-5, 12-15, 21 and 23 are amended to introduce the claim with a proper article, according to US practice.

Legal Standards Applicable to Rejections

Before discussing the merits of this case, Applicant wishes to review the key principles of U.S. law relating to rejections under 35 USC §103 that Applicant believes clearly support patentability of the claims over the cited prior art.

(1) Patent office carries the burden of proof

"In rejecting claims under 35 U.S.C. § 103, the Examiner bears the initial burden of presenting a prima facie case of obviousness. Only if that burden is met, does the burden of coming forward with evidence or argument shift to the applicant." *In re Rijckaert*, 9 F.3d, 1531, 1532 (Fed. Cir. 1993), citing *In re Fine*, 837 F.2d 1071, 1074, 5 U.S.P.Q.2d 1596, 1598 (Fed. Cir. 1988).

(2) Patent office must show a reason to combine

"A patent composed of several elements is not proved obvious merely by demonstrating that each of its elements was, independently, known in the prior art. *KSR Int'l Co. v. Telejlex Inc.,* 550 U.S. 398, 418 (2007). The relevant question is "whether there was an apparent reason to combine the known elements in the fashion claimed by the patent at issue." *Id.*

As will become apparent from the presented analysis of the prior art, there is no apparent reason to combine the known elements in the fashion claimed by the claims of the instant invention (the so-referred 'patent at issue').

(3) Patent office must read the prior art fairly

Further, it is also necessary for the Examiner to properly construe what an applied reference fairly teaches or discloses. See, e.g., *In re Fracalossi and Wajer*, 681 F.2d 792 (CCPA 1982).

(4) Picking and choosing parts of a reference is forbidden

The prior art must teach or suggest all claimed elements as arranged in the claim. "It is impermissible within the framework of section 103 to pick and choose from any one reference only so much of it as will support a given position, to the exclusion of other parts necessary to the full appreciation of what such reference fairly suggests to one of ordinary skill in the art." *In re Wesslau*, 353 F.2d 238, 241 (CCPA 1965).

Clearly, the prior art does not teach or suggest all claimed elements as arranged in the claims of the instant invention. The Applicant considers that the Examiner has misunderstood or misconstrued what each reference fairly suggests to one of ordinary skill in the art as set out in the Applicant's comments herein.

(5) The Examiner's rationale has to be logical and reasonable without using the claims as merely a template to make out the rejection

In *KSR Int'l Co. v. Teleflex Inc.,* 550 U.S. 398, 415 (2007), while the Supreme Court emphasized "an expansive and flexible approach" to the obviousness question, it also reaffirmed that "rejections on obviousness grounds cannot be sustained by mere conclusory statements; instead, there must be some articulated reasoning with some rational underpinning to support the legal conclusion of obviousness." Id. at 418 (quoting In re Kahn, 441 F.3d 977, 988 (Fed. Cir. 2006) (emphasis added)). The Supreme Court also reaffirmed that, despite the importance of a flexible and commonsense approach when evaluating obviousness, fact finders "should be aware, of course, of the distortion caused by hindsight bias and must be cautious of arguments reliant upon ex post reasoning." *KSR, 550 U.S. at 421.* "It is impermissible, however, to simply engage in a hindsight reconstruction of the claimed invention, using applicant's structure as a

template and selecting elements from references to fill the gaps." *In re Gorman*, 18 USPQ2d 1885, 1888 (Fed. Cir. 1991).

In line with what is stated in *KSR Int'l Co. v. Teleflex Inc.,* 550 U.S. 398, 415 (2007), it is strongly considered that the Examiner has adopted *ex post facto* reasoning in the application of the objections raised.

Examination Under Pre-AIA Law

The Examiner advises that the present application is being examined under the pre-AIA first to invent provisions. Applicant's reply to the outstanding Office Action is made in reliance on the Examiner's advice.

Claim Rejections - 35 USC § 112

Claims 6-9, 16-19, 22, 24 are rejected under 35 U.S.C. 112(b) or 35 U.S.C. 112 (pre-AIA), second paragraph, as being indefinite. This rejection is moot in view of the cancellation of the rejected claims.

Claim Rejections - 35 USC § 101

Claims 6-9, 16-19, 22, 24 are rejected under 35 U.S.C. 101 as being directed to an improperly defined process. This rejection is moot in view of the cancellation of the rejected claims.

Claim Rejections - 35 USC § 102

Claims 1, 5, 6, 11, 15 and 16 are rejected under pre-AIA 35 U.S.C. 102(b) as anticipated by Turnblad [5,876,739]. This rejection is traversed for at least the following reasons.

First, as to claims 6 and 16, the rejection is moot in view of the cancellation of the rejected claims.

Second, as to the remaining claims, Applicant demonstrates below the basis for claims 1 and 11 being patentable over the cited art.

Third, the remaining claims 5 and 15 are patentable because of their dependence from

allowable claims 1 and 11, respectively.

Claim 1

Original claim 1 defines the invention as follows:

> *A method of controlling the flowability of plant seeds by placing the plant seeds of a mass of seeds in contact with dry free flowing particles of a* ***flowability enhancing agent*** *that is made up of* ***at least one species of electret particle made up of a wax****,*
>
> *wherein the electret particle* ***adheres more firmly*** *to the plant seeds than do particles that comprise a dry free flowing substance that is or includes a mineral earth component.*

The Invention Achieves Highly Effective Protection of Seeds Against Insecticide Coating

The claim describes a method that satisfies a principal object of the invention, namely, to provide a seed coated with a coating that protects the seed or an emerging seedling from physiological damage potentially caused by the insecticidal ingredient of the coating (column 2, lines 20-23). How the seed is coated is critical to achieving the stated purpose.

Turnblad

In framing the rejection of claim 1, the Examiner asserts that "Turnblad teaches seeds can be enveloped with an overcoat containing powder adhesives which comprises of waxes [col 7, In 27-42]."

The Examiner admits that "Turnblad does not explicitly teach the wax particles adhering better to seeds than dry free flowing that includes mineral earth component." The Examiner asserts that "such a property would have necessarily flown from using a wax as an overcoat material for seeds." Applicant respectfully disagrees.

The Examiner also asserts that Turnblad "teaches improving flowability of the seed through a seed planter is preferred result [col 2, In 36-39] as well as reducing dust exposure to the operator [col 8, In 15-16]." Again, Applicant respectfully disagrees in that the wax in Turnblad does not perform either function.

Coating Content Described by Turnblad

Turnblad teaches an ***insecticidal coating*** for seeds that contain two main components, namely a) one or more binders and b) an insecticide (column 2, lines 55-56). The seed is also treated with one or more ***adhering coating*** layers (column 2, lines 52-54). The purpose of using such ***insectacidal coatings*** is provided at column 1, lines 24-26, namely to solve the problem of direct insecticide-induced phytotoxicity to the seed.

The ***insecticidal coating*** of Turnblad is employed to provide a matrix for the insecticide that renders the seed coating non-phytotoxic to the seed (column 1, lines 37-39; column 1, lines 50-52). In order for the binder in the ***insecticidal coating*** layer to fulfil its purpose, namely to protect the seed from the phytotoxic effects of the added insecticide, the ***insecticidal coating*** layer ***must*** be applied as at least a ***single layer.*** This ***insecticidal coating*** layer envelops the seed in such a manner that it either does not allow the insecticide to make contact with the surface of the seed or at least permits a minimal amount of insecticide from making contact therewith.

Either way, phytotoxic effects are either prevented or are significantly reduced (column 2, lines 55-60).

There may be multiple layers, which may include other pesticides, fungicides and the like, as disclosed at col. 6, lines 40-53.

The binder-coated seed may be further coated with an "overcoat", as described at col. 7, lines 28-67. The overcoat may contain pesticides, fungicides, colorant and even bird repellant. The overcoat may include a wax (col. 7, line 37).

Turnblad's **Binder** is a ***Matrix*** for the Insecticide That ***Does NOT Include Waxes***

As is clear from the description in Turnblad, the ***binder*** is described as serving as a matrix for the insecticide (column 2, line 57).

The matrix binder is then described as "an adhesive polymer" (column 2, line 62) and a list of polymers is given beginning at column 2, line 62, through to column 3, line 20. Waxes are not included as possible binders in that list.

At column 3, lines 27-29 the matrix itself is defined:

"The term 'matrix' as used herein means a continuous solid phase of one or more binder compounds and contains vacancies, voids or spaces ***occupied by the insecticide*** and filler."

The filler is described at column 3, line 45 to column 4, line 13 as having several functions, including protection of the seed and providing incubation. Waxes are not included in the list of fillers.

Reduced Dust Exposure is Due to the Matrix and NOT the Overcoat

At column 8, lines 15-16 the reduced dust exposure is due to the coating, that is to say, the use of a matrix loaded with insecticide on seed and ***not*** to the use of a film-forming overcoat. The film forming overcoat is a conventional addition commonly employed in the art as acknowledged at column 7, lines 27-28 of Turnblad.

There is no reference, explicit or implied, that points to the film overcoat being responsible for reducing dust exposure. Further, the only reference to the overcoating being able to contribute to flowability of seed is restricted to circumstances where conventional flow agents (e.g. calcium stearate, talc or vermiculite) are added.

Claim 11

> *A method of controlling dust drift from a population of plant seeds by placing the plant seeds of a mass of seeds in contact with dry free flowing particles of a* ***flowability enhancement agent*** *made up of* ***electret particles made of a wax*** *that adheres more firmly to plant seeds than a dry particulate compound or composition that is a flowability enhancement agent that comprises a dry free flowing substance that is a mineral earth or includes a mineral earth component.*

The invention as defined in claims 1 and 11 is clearly novel over the teaching of Turnblad for the same reasons given for claim 1.

Claims 5 and 15

These claims depend from claims 1 and 11, respectively, and would be patentable for the reasons given for their parent claims.

Claim Rejections - 35 USC § 103

Claims 1, 5, 6, 11, 15 and 16 are rejected under pre-AIA 35 U.S.C. 103(a) as obvious over Turnblad in view of Kojimoto [US 5127185]. This rejection is traversed for at least the following reasons.

Turnblad

The Examiner states that, presumably in view if the teaching of Turnblad and Kojimoto (page 4, lines 3-7 of the current Office Action), "it would have been obvious to one of ordinary skill in the art to use a material that is more adhesive to the seed such as wax than a dry flowing substances (sic) comprising mineral earth component such as talc, since Kojimoto teaches wax is a material that can readily adhere and better envelop a seed surface, thus, protecting the seed more ...".

This statement assumes that the purpose of adding wax in the teaching of Turnblad equates with the purpose of adding a dry free flowing substance to seeds, namely to act as a flow enhancing agent. This assumption is not correct.

Turnblad Does NOT Teach Use of Wax as an Agent to Control Flow or Dust

Turnblad is ***not*** concerned with and does not teach or allude to the use of a wax as an agent for controlling the flowability of seeds or controlling dust drift.

At column 7, lines 27-42 of Turnblad it is stated that a '**film overcoating'** can **be optionally applied** to the coated seeds of the invention. The film overcoating is a standard addition which is commonly employed in the art and to which improvements in flow and dust drift have not previously been ascribed. The Turnblad invention is directed, as Applicant has shown above, towards supplying seeds that are coated with a matrix loaded with insecticide. The film overcoating that is applied to the coated seeds of Turnblad is one in which additives other than insecticides are dissolved or dispersed in a liquid adhesive and then dried off. This results in a film overcoating in which additives of choice are present.

Alternatively, it is stated at column 7, lines 34-35, that a powder adhesive can be used in conjunction with other additives to form the overcoating, although it is not shown how and this possibility is not taught in any of the examples.

In both cases relating to the addition of overcoating, is not clear what the other additives may be, but at column 7, lines 43-47 a list of possible additives is provided and this list includes flow agents selected from calcium stearate, talc and vermiculite. The list does not include waxes.

It is clear therefore, that waxes, if used at all by Turnblad, **are not being used as flow enhancing agents**, but only as an adhesive component to which other additives may be added to form a film overcoating. If such adhesive powders, that is to say waxes, were being used as flow agents Turnblad would not have needed to suggest adding flow agents as additives to the film overcoat.

NO Dry Free-Flowing Wax Particles as Flow Agent in Turnblad

Furthermore, the film overcoating that is formed by the teaching of Turnblad is not made up of dry, free-flowing particles of wax like the coating of the instant invention because Turnblad did not realize that wax particles could be used by themselves as flow agents. Put simply, Turnblad did not invent a method of controlling the flowability of plant seeds by using dry free flowing particles of wax as flow agents. Turnblad evidently had no idea that this was feasible.

At column 2, lines 36-38, Turnblad alludes to seeds of his invention, that is to say, seeds that have a seed coating made up of a binder and an insecticide, wherein the binder acts to minimize physiological damage to seeds that may occur as a result of the insecticide coming into contact therewith. The binder and any filler incorporated into the seed coating provide a coating in which pesticides can be applied in a uniform way and loss of pesticides during transport and handling is prevented (column 8, lines 17-18). The reason for this reduction in loss of pesticide is because the seed coating layer is in the form of a matrix that holds insecticide within, is hard (dry) and **adheres to the seed in a continuous layer** (note definition of matrix – see above). The presence of a film overcoating - as Turnblad acknowledges at column 7, lines 27-30 - is an ***optional*** element that may be applied as a conventional addition (or it may not) to protect the coating layers. While the overcoating may contain conventional flow agents as alluded to above, there is absolutely no teaching or suggestion that it may contain dry, free flowing particulates of waxes.

NO Teaching of Reduced Dust Exposure Due to Overcoat

At column 8, lines 15-16, of Turnblad the reduced dust exposure is due to the coating of the invention, that is to say, the use of a matrix loaded with insecticide on seed and not to the use of a film-forming overcoat. The film-forming overcoat is a conventional addition commonly employed in the art as acknowledged at column 7, lines 27-28, in Turnblad. There is no reference, explicit or implied, that points to the film overcoat being responsible for reducing dust exposure and the only reference to the overcoating being able to contribute to flowability of seed is restricted to circumstances where conventional flow agents (e.g. calcium stearate, talc or vermiculite) are added.

Clearly, the invention as defined in the instant claims is not obvious from the teaching of Turnblad alone.

Kojimoto

Kojimoto also fails to describe a free flowing composition of wax particulates that can be used in a method to reduce dust drift.

Kojimoto is concerned with covering coated seed with a water repellent which "prevents the surface of seed from being sealed by the water infiltrating through the cracks of the coating layer" (column 2, lines 24-27). The teaching of Kojimoto requires that a binder is first used to ensure the adhesion of water repellent to the seeds. The binder can be one that moistens the seed surface first and thereafter water repellent is added to the seed (column 2, lines 35-38). No specific wax is mentioned by Kojimoto and it is clear that preferred water repellents are selected from fatty acids and metal salts (column 2, lines 45-48), thus teaching away from the use of waxes as water repellents. The coating of Kojimoto is used to protect seed from water infiltration into cracks within seed coating, and so helps prevent the seed from dying as a result of oxygen starvation (column 2, lines 14-18). The use of wax by Kojimoto is clearly not intended to enhance seed flowability or reduce dust drift.

Clearly, a particulate wax component of the instant invention would not help in protecting seeds in the manner attributable to the seed coating of Kojimoto.

Kojimoto Teaches Protection NOT Flowability or Dust Reduction

Kojimoto teaches that waxes may be used in a continuous coating layer admixed with other components to protect the seed from ingress of water and to prevent the seed from dying of oxygen deprivation.

NO Teaching of Wax Rather Than Dry Flowing Substances

Finally, there is no teaching or suggestion in any of the prior art that would suggest that it would have been obvious to one of ordinary skill in the art to use a material that is more adhesive to the seed such as wax than a dry flowing substances comprising mineral earth component such as talc. Indeed, the opposite is the case since Kojimoto teaches wax is a material that can readily adhere and better envelop a seed surface, thus, protecting the seed more [col 2, In 19-55].

In sum, the invention as defined in the independent clams is thus not obvious from the teaching of Kojimoto alone.

Turnblad and Kojimoto

Taking the teachings of both Turnblad and Kojimoto the person skilled in the art is not taught how to address the problems of dust drift and seed flowability, and it is not elaborated upon or suggested how the problems of dust drift and seed flowability may be addressed, because as has been stated above the overcoat of Turnblad, if it uses waxes at all, does not use waxes **as flow enhancing agents**, but only as an adhesive component to which other additives may be added to form a continuous film overcoating. Turnblad does not teach the use of waxes as flow agents since he very clearly relies on the use of conventional flow agents for that purpose.

Thus, the teachings of both Turnblad and Kojimoto direct the skilled person to form continuous seed coatings comprised of many parts for the maintenance of viability of the seed by ***protecting*** the seed from exposure to insecticide (Turnblad) and ***preventing*** oxygen deprivation (Kojimoto). The combined teachings of Turnblad and Kojimoto do not suggest or imply the simple application of dry free-flowing particles of wax to address the problem of flowability or dust drift.

NO Teaching of Layering and Dry, Free Flowing Particles of Wax

Clearly, the invention as defined in the instant claims is patentable over the combined teaching of Turnblad and Kojimoto since it requires the presence of layering and does not make any mention of the use of dry, free-flowing particles **of waxes** in a method for controlling dust drift and/or for seed flowability.

Accordingly, the invention as defined in claims 1, 5, 11 and 15 is not obvious from the teachings of Turnblad and Kojimoto taken in combination.

Claims 2, 4, 7, 9, 12, 14, 17, 19 are rejected under pre-AIA 35 U.S.C. 103(a) as being unpatentable over Turnblad OR Turnblad in view of Kojimoto as applied to claims 1, 6, 11 and 16, and further in view of Rosa [US 20070207927]. This rejection is traversed for at least the following reasons.

In framing the rejection, the Examiner states that "[t]eaching of the prior art is aforementioned, but does not appear to specify the type of wax, such as those disclosed in claims 2, 4, 7, 9, 12, 14, 17, 19." The Examiner looks to Rosa solely for a teaching that "wax in a coating can facilitate the flowability [abstract; 0009-0010] and further teaches natural wax, vegetable wax (Carnauba,) mineral wax (montan or paraffin) or synthetic wax can be used [0012]."

Claims 1 and 11

The Examiner is directed to the above observations concerning Turnblad alone or Turnblad in view of Kojimoto. It is emphasized that Turnblad alone or the combined teaching of the two citations does not point or suggest the use of dry free-flowing particles of wax to control seed flowability or to reduce dust drift.

Rosa

The teaching of Rosa is limited to a seed coating in the form of a liquid suspension which is added to seeds. The suspension is made up of several components, namely, a binder, a wax, a pigment and one or more stabilizers; the stabilizer may be a biocide [0013]. The binder is in the form of a liquid ([0020], line 7) and the coating is added to the seeds as a slurry ([0020], line 13). A binder is required to form the coating. The purpose behind coating the seeds with a coating

composition as described by Rosa is to provide a seed coating that flows readily through planters. The solution proffered by Rosa is to make the seed coat smoother so that the seeds flow through the planter easily [0008]. Rosa states that for efficient seed planting in conventional systems, conventional seed flowability agents (e.g. talc or graphite [0008] are added to coated seeds. Thus, Rosa recognizes that there is a need to supply seed coated with formulations that permit seeds to flow more readily through planters, but his solution relies on the provision of a complex continuous coating that is dried onto seeds forming a smooth 'shell' that contains wax as lubricant. It is quite clear that Rosa does not contemplate use of the waxes as lubricant in a dry free-flowing form without the need to use a binder to form a continuous coating. Furthermore, it is clear that the waxes of Rosa are not present as free-flowing particles on the seed at any stage and there is no suggestion that free-flowing particles of waxes could be employed to control flowability.

In stark contrast, the present invention does not require the presence of a binder or the use of a liquid medium to apply a coating containing a lubricant (e.g. a wax) to seeds.

Taking the teachings of Turnblad, Kojimoto and Rosa, the person skilled in the art is directed to utilizing seed coatings that adhere to seeds in a uniform, continuous coating. There is no suggestion in the teachings of the citations, taken singly or in combination, that dry free-flowing particles could be used to better control seed flowability and dust drift.

Accordingly, claims 1 and 11 are clearly not obvious from the teaching of Turnblad, Kojimoto and Rosa.

Claims 2, 4, 7, 9, 12, 14, 17, 19

These claims depend from claims 1 or 11, respectively, and would be patentable for the reasons given for their parent claim.

Claims 3, 8, 13 and 18 are rejected under pre-AIA 35 U.S.C. 103(a) as being unpatentable over Turnblad in view of Rosa OR Turnblad in view of Kojimoto in view of Rosa, and evidenced by Brenntagspecialties [Carnauba waxes]. This rejection is traversed for at least the following reasons.

First, with regard to claims 8 and 18, the rejection is moot in view of the cancellation of

the rejected claims.

Second, the additional teachings of Brenntagspecialities does not remedy the deficiencies of the rejections of the parent claims 1 and 11.

Turnblad in view of Rosa or Turnblad and Kojimoto in view of Rosa and Brenntagspecialities

The Examiner's attention is directed to the above comments on Turnblad and Rosa in relation to claim 1.

Claim 3 depends from claim 1 and is directed to a method in which the wax is selected from those having a melting temperature ≥ 40° C. The invention is centered on the realization that dry free-flowing wax particles can be used successfully to control dust drift and seed flowability. Once that realization is made, preferred waxes of use in the instant invention may be claimed with reference to melting temperature (e.g. claim 3). Since the cited prior art is silent as to the possibility of using dry free-flowing particles of wax for controlling seed flowability, it follows that the claimed subject matter of claim 3 to preferred waxes of use in the invention is also not obvious.

Claim 13 depends from claim 11 and has similar content to claim 3.

Accordingly, claims 3 and 13 are clearly not obvious from the teaching of Turnblad in view of Rosa.

The Examiner is directed to the above comments on Turnblad in view of Kojimoto and in view of Rosa in relation to claim 1. Claim 3 is appended to claim 1 and is directed to a method in which the wax is one that is selected from those having a melting temperature ≥ 40° C. In line with our comments under the heading immediately above, the invention is centered on the realization that dry free-flowing wax particles can be used successfully to control dust drift and seed flowability. Once that realization is made, preferred waxes of use in the instant invention may be claimed with reference to melting temperature (e.g. claim 3). Since the cited prior art is silent as to the possibility of using dry free-flowing particles of wax for controlling seed flowability, it follows that the claimed subject matter of claim 3 to preferred waxes of use in the invention, is also not obvious.

Brenntagspecialities

In explaining the rejection, the Examiner states that "[t]eaching of the prior art is aforementioned, but does not appear to teach the wax has a melting temperature of greater than 40 Centigrade. Brenntagspecialties is provided.

Specifically, the Examiner states that "Brenntagspecialties teaches carnauba wax has a melting point of about 80-86 degrees Centigrade."

Applicant respectfully submits that the fact that Brenntagspecialities teaches carnauba wax having a melting point of 80-86° C does not add anything material to the objection of obviousness. The invention is centered on the realization that dry free-flowing wax particles can be used successfully to control dust drift and seed flowability. Once that realization is made, preferred waxes of use in the instant invention may be claimed with reference to melting temperature. The fact that a technical article states that a wax has a high melting temperature does not go to the nub of the invention, namely, the realization that the wax may be applied as dry free-flowing particles for controlling seed flowability. Adding the teaching of Brenntagspecialities to the teachings of Turnblad, Kojimoto and Rosa does not guide the person skilled in the art to the instant invention, because nowhere in the cited prior art is it taught or suggested that dry free flowing particles of wax can be used to control seed flowability or dust drift.

Accordingly, claims 3 and 13 are clearly not obvious over the teaching of Turnblad, in view of Kojimoto in view of Rosa and as evidenced by Brenntagspecialities.

Claims 21-24 are rejected under pre-AIA 35 U.S.C. 103(a) as being unpatentable over Turnblad OR Turnblad in view of Kojimoto as applied to claims 1, 6, 11 and 16, and further in view of Pearce [US 4285994]. This rejection is traversed for at least the following reasons.

First, with regard to claims 22 and 24, the rejection is moot in view of the cancellation of the rejected claims.

Second, with regard to Pearce, the reference does not remedy the deficiencies of Turnblad, alone or in combination with Kojimoto.

Turnblad

Turnblad does not teach, suggest or allude to the use of dry free-flowing particles of wax for controlling seed flowability or dust drift. In addition, there is no apparent teaching of sizing relating to particles of any kind. It is reiterated that the invention is centered on the realization that dry free flowing wax particles can be used successfully to control dust drift and seed flowability. Once that realization is made, preferred waxes of use in the instant invention may be claimed with reference to melting temperature (e.g. claim 3). Since the cited prior art is silent as to the possibility of using dry free-flowing particles of wax for controlling seed flowability, it follows that the claimed subject matter of claims 21 and 23 is clearly not obvious from the teaching of Turnblad.

Turnblad in view of Kojimoto

Claims 1 and 11 are independent claims to methods for controlling seed flowability and dust drift. In interpreting the claims, all elements recited in them should be viewed as a whole. It is this 'whole' that is the invention and not an arbitrary part of it.

The Examiner is referred to the above comments relating to Turnblad in view of Kojimoto. As shown above, the combined teachings of Turnblad and Kojimoto do not instruct, suggest or allude to the use of dry free-flowing particles of wax for controlling seed flowability or dust drift. In addition, there is no apparent teaching of sizing relating to particles of any kind. It is reiterated that the invention is centered on the realization that dry free-flowing wax particles can be used successfully to control dust drift and seed flowability. Since the cited prior art is silent as to the possibility of using dry free-flowing particles of wax for controlling seed flowability, it follows that the claimed subject matter of claims 1 and 11 is clearly not obvious from the teaching of Turnblad in view of Kojimoto.

Pearce

In explaining the rejection, the Examiner states that "[t]eaching of the prior art is aforementioned, but does not appear to teach the wax particles are of the claimed range of 10-200 micrometers. Pearce is provided....Pearce, directed to coating pigment powders or pellets with wax to reduce dust and have good flow and handling for metering devices [col 1, In 10-30], teaches grounded waxes of suitable size distribution ranges in diameter from 100-2000 microns

(micrometers) [col 1, In 49-52], where the claimed ranges "overlap or lie inside ranges disclosed by the prior art" a *prima facie* case of obviousness exists. (See MPEP 2144.05.1)."

However, Pearce relates to a totally different field of art, namely, the production of novel free-flowing pigment compositions for use in the plastics and ceramics industries (column 1, lines 14-19). The free-flowing products that are obtained are described as being made up of wax particles mixed with pigment **from 0.2mm to about 5mm in size (column 1, lines 53-54).** The improvement of Pearce is to provide product compositions that have good flow properties through a metering device. The resultant product is then added to plastic. Nowhere is it suggested that the product particles of Pearce may or could be used to coat seeds. By adding the teaching of Pearce to the teachings of Turnblad and Kojimoto, one is left with a possible suggestion that, according to the Examiner, the person skilled in the art is guided to follow: product particles of use in the ceramics or plastics industries of a size from 0.2mm to 5mm in diameter could be added to seeds. This makes no sense in view of the fact that the product particles of Pearce if added to seeds would increase the seed diameter from 0.4mm to 10mm and almost certainly not act to control seed flowability in any helpful sense through a planter.

By adding the teaching of Pearce to the teachings of Turnblad and Kojimoto, the person skilled in the art is led to a further possibility, namely, that one could add wax particles in conjunction with conventional flow agents (e.g. calcium stearate). However, this possibility is in no way attractive to contemplate for the person skilled in the art, since conventional flow agents may be expected to interfere with the control of seed flowability and/or dust drift using dry free flowing particles of use in the invention.

Accordingly, claims 1 and 11 are clearly not obvious form the teaching of Turnblad, in view of Kojimoto in view of Pearce.

Double Patenting

Claims 1-9, 11-19, 21-24 are provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 47-61 of copending Application No. 14112579. This rejection is traversed for at least the following reasons.

First, as to claims 6-9, 16-19, 22, and 24, the rejection is moot in view of the cancellation of the rejected claims.

Second, Applicant respectfully submits that, since there are not allowed claims that form the basis for rejection, the rejection is premature. Applicant is prepared to file a Terminal Disclaimer once allowable subject matter is identified that results in conflicting claims.

Claims 1-9, 11-19, 21-24 are provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 48-60 of copending Application No. 14112647. This rejection is traversed for at least the following reasons.

First, as to claims 6-9, 16-19, 22, and 24, the rejection is moot in view of the cancellation of the rejected claims.

Second, Applicant respectfully submits that, since there are not allowed claims that form the basis for rejection, the rejection is premature. Applicant is prepared to file a Terminal Disclaimer once allowable subject matter is identified that results in conflicting claims.

Claims 1-9, 11-19, 21-24 are provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 43-54 of copending Application No. 14112582. This rejection is traversed for at least the following reasons.

First, as to claims 6-9, 16-19, 22, and 24, the rejection is moot in view of the cancellation of the rejected claims.

Second, Applicant respectfully submits that, since there are not allowed claims that form the basis for rejection, the rejection is premature. Applicant is prepared to file a Terminal Disclaimer once allowable subject matter is identified that results in conflicting claims.

Claims 1-9, 11-19, 21-24 are provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 48-53 of copending Application No. 14112792. This rejection is traversed for at least the following reasons.

First, as to claims 6-9, 16-19, 22, and 24, the rejection is moot in view of the cancellation

of the rejected claims.

Second, Applicant respectfully submits that, since there are not allowed claims that form the basis for rejection, the rejection is premature. Applicant is prepared to file a Terminal Disclaimer once allowable subject matter is identified that results in conflicting claims.

Claims 1-9, 11-19, 21-24 are provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 28-37 of copending Application No. 14112816. This rejection is traversed for at least the following reasons.

First, as to claims 6-9, 16-19, 22, and 24, the rejection is moot in view of the cancellation of the rejected claims.

Second, Applicant respectfully submits that, since there are not allowed claims that form the basis for rejection, the rejection is premature. Applicant is prepared to file a Terminal Disclaimer once allowable subject matter is identified that results in conflicting claims.

Claims 1-9, 11-19, 21-24 are provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 25-35 of copending Application No. 14112837. This rejection is traversed for at least the following reasons.

First, as to claims 6-9, 16-19, 22, and 24, the rejection is moot in view of the cancellation of the rejected claims.

Second, Applicant respectfully submits that, since there are not allowed claims that form the basis for rejection, the rejection is premature. Applicant is prepared to file a Terminal Disclaimer once allowable subject matter is identified that results in conflicting claims.

Claims 1-9, 11-19, 21-24 are provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 48-61 of copending Application No. 14/112,640. This rejection is traversed for at least the following reasons.

First, as to claims 6-9, 16-19, 22, and 24, the rejection is moot in view of the cancellation of the rejected claims.

Second, Applicant respectfully submits that, since there are not allowed claims that form the basis for rejection, the rejection is premature. Applicant is prepared to file a Terminal Disclaimer once allowable subject matter is identified that results in conflicting claims.

Conclusions

In view of the above, reconsideration and allowance of this application are now believed to be in order, and such actions are hereby solicited. If any points remain in issue which the Examiner feels may be best resolved through a personal or telephone interview, the Examiner is kindly requested to contact the undersigned at the telephone number listed below.

The USPTO is directed and authorized to charge all required fees, except for the Issue Fee and the Publication Fee, to Deposit Account No. 19-4880. Please also credit any overpayments to said Deposit Account.

Respectfully submitted,

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23373
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Date: June 19, 2015

Electronic Acknowledgement Receipt

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Application Number:	14375361
International Application Number:	
Confirmation Number:	3504
Title of Invention:	METHODS AND USES FOR IMPROVED SOWING OF SEEDS
First Named Inventor/Applicant Name:	Nicholas Jessop
Customer Number:	23373
Filer:	Alan Joseph Kasper/Sandra Swann
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Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1		Q213621Amendment111asfiled.pdf	140260 2d4fda425c5a964861b91bff4022878edecc309d	yes	22

	Multipart Description/PDF files in .zip description		
	Document Description	**Start**	**End**
	Amendment/Req. Reconsideration-After Non-Final Reject	1	1
	Claims	2	4
	Applicant Arguments/Remarks Made in an Amendment	5	22
Warnings:			
Information:			
	Total Files Size (in bytes):	140260	

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New Applications Under 35 U.S.C. 111
If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371
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New International Application Filed with the USPTO as a Receiving Office
If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

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PATENT APPLICATION FEE DETERMINATION RECORD Substitute for Form PTO-875	Application or Docket Number 14/375,361	Filing Date 07/29/2014	☐ To be Mailed

ENTITY: ☒ LARGE ☐ SMALL ☐ MICRO

APPLICATION AS FILED – PART I

	(Column 1)	(Column 2)		
FOR	NUMBER FILED	NUMBER EXTRA	RATE ($)	FEE ($)
☐ BASIC FEE (37 CFR 1.16(a), (b), or (c))	N/A	N/A	N/A	
☐ SEARCH FEE (37 CFR 1.16(k), (i), or (m))	N/A	N/A	N/A	
☐ EXAMINATION FEE (37 CFR 1.16(o), (p), or (q))	N/A	N/A	N/A	
TOTAL CLAIMS (37 CFR 1.16(i))	minus 20 =	*	X $ =	
INDEPENDENT CLAIMS (37 CFR 1.16(h))	minus 3 =	*	X $ =	
☐ APPLICATION SIZE FEE (37 CFR 1.16(s))	If the specification and drawings exceed 100 sheets of paper, the application size fee due is $310 ($155 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR 1.16(s).			
☐ MULTIPLE DEPENDENT CLAIM PRESENT (37 CFR 1.16(j))				
* If the difference in column 1 is less than zero, enter "0" in column 2.			TOTAL	

APPLICATION AS AMENDED – PART II

		(Column 1)		(Column 2)	(Column 3)		
	06/19/2015	CLAIMS REMAINING AFTER AMENDMENT		HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA	RATE ($)	ADDITIONAL FEE ($)
AMENDMENT	Total (37 CFR 1.16(i))	* 12	Minus	** 24	= 0	X $80 =	0
	Independent (37 CFR 1.16(h))	* 2	Minus	***4	= 0	X $420 =	0
	☐ Application Size Fee (37 CFR 1.16(s))						
	☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))						
						TOTAL ADD'L FEE	**0**

		(Column 1)		(Column 2)	(Column 3)		
		CLAIMS REMAINING AFTER AMENDMENT		HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA	RATE ($)	ADDITIONAL FEE ($)
AMENDMENT	Total (37 CFR 1.16(i))	*	Minus	**	=	X $ =	
	Independent (37 CFR 1.16(h))	*	Minus	***	=	X $ =	
	☐ Application Size Fee (37 CFR 1.16(s))						
	☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))						
						TOTAL ADD'L FEE	

* If the entry in column 1 is less than the entry in column 2, write "0" in column 3.

** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20".

*** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3".

The "Highest Number Previously Paid For" (Total or Independent) is the highest number found in the appropriate box in column 1.

LIE
/KIM P. DOZIER/

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14/375,361	07/29/2014	Nicholas Jessop	Q213621	3504

23373 7590 03/23/2015

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EXAMINER	
LOUIE, MANDY C	

ART UNIT	PAPER NUMBER
1715	

NOTIFICATION DATE	DELIVERY MODE
03/23/2015	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

PPROCESSING@SUGHRUE.COM
sughrue@sughrue.com
USPTO@sughrue.com

Office Action Summary	Application No. 14/375,361	Applicant(s) JESSOP, NICHOLAS	
	Examiner MANDY LOUIE	Art Unit 1715	AIA (First Inventor to File) Status No

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTHS FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *07/29/14*.

☐ A declaration(s)/affidavit(s) under **37 CFR 1.130(b)** was/were filed on _____.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ An election was made by the applicant in response to a restriction requirement set forth during the interview on _____; the restriction requirement and election have been incorporated into this action.

4)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims*

5)☒ Claim(s) *1-9,11-19 and 21-24* is/are pending in the application.

5a) Of the above claim(s) _____ is/are withdrawn from consideration.

6)☐ Claim(s) _____ is/are allowed.

7)☒ Claim(s) *1-9, 11-19, 21-24* is/are rejected.

8)☐ Claim(s) _____ is/are objected to.

9)☐ Claim(s) _____ are subject to restriction and/or election requirement.

* If any claims have been determined allowable, you may be eligible to benefit from the **Patent Prosecution Highway** program at a participating intellectual property office for the corresponding application. For more information, please see http://www.uspto.gov/patents/init_events/pph/index.jsp or send an inquiry to PPHfeedback@uspto.gov.

Application Papers

10)☐ The specification is objected to by the Examiner.

11)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

Certified copies:

a)☒ All b)☐ Some** c)☐ None of the:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

** See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)

2) ☒ Information Disclosure Statement(s) (PTO/SB/08a and/or PTO/SB/08b) Paper No(s)/Mail Date *7/29/14*.

3) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .

4) ☐ Other: _____.

DETAILED ACTION

1. The present application is being examined under the pre-AIA first to invent provisions.

Claim Rejections - 35 USC § 112

1. The following is a quotation of 35 U.S.C. 112(b):
(b) CONCLUSION.—The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the inventor or a joint inventor regards as the invention.

The following is a quotation of 35 U.S.C. 112 (pre-AIA), second paragraph:
The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. Claims 6-9, 16-19, 22, 24 are rejected under 35 U.S.C. 112(b) or 35 U.S.C. 112 (pre-AIA), second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which the inventor or a joint inventor, or for pre-AIA the applicant regards as the invention.

3. Claims 6-9, 16-19, 22, 24 provide for the use of a dry particulate, but, since the claim does not set forth any steps involved in the method/process, it is unclear what method/process applicant is intending to encompass. A claim is indefinite where it merely recites a use without any active, positive steps delimiting how this use is actually practiced.

Claims 6-9, 16-19, 22, 24 are rejected under 35 U.S.C. 101 because the claimed recitation of a use, without setting forth any steps involved in the process, results in an improper definition of a process, i.e., results in a claim which is not a proper process

claim under 35 U.S.C. 101. See for example *Ex parte Dunki*, 153 USPQ 678 (Bd.App. 1967) and *Clinical Products, Ltd.* v. *Brenner*, 255 F. Supp. 131, 149 USPQ 475 (D.D.C. 1966).

Claim Rejections - 35 USC § 102/103

1. In the event the determination of the status of the application as subject to AIA 35 U.S.C. 102 and 103 (or as subject to pre-AIA 35 U.S.C. 102 and 103) is incorrect, any correction of the statutory basis for the rejection will not be considered a new ground of rejection if the prior art relied upon, and the rationale supporting the rejection, would be the same under either status.

2. The following is a quotation of the appropriate paragraphs of pre-AIA 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. Claims 1, 5-6, 11 and 15-16 are rejected under pre-AIA 35 U.S.C. 102(b) as anticipated by or, in the alternative, under pre-AIA 35 U.S.C. 103(a) as obvious over Turnblad in view of Kojimoto [US 5127185].

Claim 1: Turnblad teaches seeds can be enveloped with an overcoat containing powder adhesives which comprises of waxes [col 7, ln 27-42]. Although Turnblad does not explicitly teach the wax particles adhering better to seeds than dry free flowing that includes mineral earth component, such a property would have necessarily flown from using a wax as an overcoat material for seeds. Turnblad also teaches improving

flowability of the seed through a seed planter is preferred result [col 2, ln 36-39] as well as reducing dust exposure to the operator [col 8, ln 15-16].

Alternatively, it would have been obvious to one of ordinary skill in the art to use a material that is more adhesive to the seed such as wax than a dry flowing substances comprising mineral earth component such as talc, since Kojimoto teaches wax is a material that can readily adhere and better envelop a seed surface, thus, protecting the seed more [col 2, ln 19-55].

Claims 5 and 15: Turnblad teaches the seeds can be of cereal seeds [col 5, ln 64].

Claim Rejections - 35 USC § 103

4. The following is a quotation of pre-AIA 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

5. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under pre-AIA 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.

2. Ascertaining the differences between the prior art and the claims at issue.

3. Resolving the level of ordinary skill in the pertinent art.

4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

6. This application currently names joint inventors. In considering patentability of the claims under pre-AIA 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of pre-AIA 35 U.S.C. 103(c) and potential pre-AIA 35 U.S.C. 102(e), (f) or (g) prior art under pre-AIA 35 U.S.C. 103(a).

7. Claims 2, 4, 7, 9, 12, 14, 17, 19 are rejected under pre-AIA 35 U.S.C. 103(a) as being unpatentable over Turnblad OR Turnblad in view of Kojimoto as applied to claims 1, 6, 11 and 16, and further in view of Rosa [US 20070207927].

Teaching of the prior art is aforementioned, but does not appear to specify the type of wax, such as those disclosed in claims 2, 4, 7, 9, 12, 14, 17, 19.

Claims 2, 4, 7, 9, 12, 14, 17, 19: Rosa teaches wax in a coating can facilitate the flowability [abstract; 0009-0010] and further teaches natural wax, vegetable wax (Carnauba,) mineral wax (montan or paraffin) or synthetic wax can be used [0012].

It would have been obvious to one of ordinary skill in the art at the time of the invention to use waxes disclosed by Rosa, since Turnblad does not teach any specific wax and Rosa teaches these waxes are operable in increasing flowability to seed handling [abstract].

8. Claims 3, 8, 13 and 18 are rejected under pre-AIA 35 U.S.C. 103(a) as being unpatentable over Turnblad in view of Rosa OR Turnblad in view of Kojimoto in view of Rosa, and evidenced by Brenntagspecialties [Carnauba waxes].

Teaching of the prior art is aforementioned, but does not appear to teach the wax has a melting temperature of greater than 40 Centigrade. Brenntagspecialties is provided.

Claims 3, 8, 13 and 18: Brenntagspecialties teaches carnauba wax has a melting point of about 80-86 degrees Centigrade.

9. Claims 21-24 are rejected under pre-AIA 35 U.S.C. 103(a) as being unpatentable over Turnblad OR Turnblad in view of Kojimoto as applied to claims 1, 6, 11 and 16, and further in view of Pearce [US 4285994].

Teaching of the prior art is aforementioned, but does not appear to teach the wax particles are of the claimed range of 10-200 micrometers. Pearce is provided.

Claims 21-24: Pearce, directed to coating pigment powders or pellets with wax to reduce dust and have good flow and handling for metering devices [col 1, ln 10-30], teaches grounded waxes of suitable size distribution ranges in diameter from 100-2000 microns (micrometers) [col 1, ln 49-52], where the claimed ranges “overlap or lie inside ranges disclosed by the prior art” a *prima facie* case of obviousness exists. (See MPEP 2144.05.I).

It would have been obvious to one of ordinary skill in the art at the time of the invention to use wax particles of the claimed diameter range since Pearce teaches

these wax diameter sizes are operable for coating granules, which also allows for the granules to have good flowability and reducing dust production.

Double Patenting

1. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. A nonstatutory obviousness-type double patenting rejection is appropriate where the conflicting claims are not identical, but at least one examined application claim is not patentably distinct from the reference claim(s) because the examined application claim is either anticipated by, or would have been obvious over, the reference claim(s). See, e.g., *In re Berg*, 140 F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent either is shown to be commonly owned with this application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement.

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

2. Claims 1-9, 11-19, 21-24 are provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 47-61 of copending Application No. 14112579. Although the conflicting claims are not identical, they are not patentably distinct from each other because the claims of copending application anticipate the claim in the instant application.

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

3. Claims 1-9, 11-19, 21-24 are provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 48-60 of copending Application No. 14112647. Although the conflicting claims are not identical, they are not patentably distinct from each other because the claims of copending application anticipate the claim in the instant application.

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

4. Claims 1-9, 11-19, 21-24 are provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 43-54 of copending Application No. 14112582. Although the conflicting claims are not identical, they are not patentably distinct from each other because the claims of copending application anticipate the claim in the instant application.

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

5. Claims 1-9, 11-19, 21-24 are provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 48-53 of copending Application No. 14112792. Although the conflicting claims are not identical, they are not patentably distinct from each other because the claims of copending application anticipate the claim in the instant application.

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

6. Claims 1-9, 11-19, 21-24 are provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 28-37 of copending Application No. 14112816. Although the conflicting claims are not identical, they are not patentably distinct from each other because the claims of copending application anticipate the claim in the instant application.

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

7. Claims 1-9, 11-19, 21-24 are provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 25-35 of copending Application No. 14112837. Although the conflicting claims are not identical, they are not patentably distinct from each other because the claims of copending application anticipate the claim in the instant application.

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

8. Claims 1-9, 11-19, 21-24 are provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 48-61 of copending Application No. 14112640. Although the conflicting claims are not identical, they are not patentably distinct from each other because the claims of copending application anticipate the claim in the instant application.

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

Conclusion

1. No claim is allowed.

10. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. US 20150072857, US 20140274682.

2. Claims 1-9, 11-19, 21-24 are rejected for the reasons aforementioned.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to MANDY C. LOUIE whose telephone number is (571)270-5353. The examiner can normally be reached on Monday to Friday, 7:30AM - 5:00PM EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Timothy Meeks can be reached on (571)272-1423. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/MANDY LOUIE/
Primary Examiner, Art Unit 1715

Notice of References Cited	Application/Control No. 14/375,361	Applicant(s)/Patent Under Reexamination JESSOP, NICHOLAS	
	Examiner MANDY LOUIE	Art Unit 1715	Page 1 of 1

U.S. PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Name	Classification
*	A	US-5,127,185	07-1992	Kojimoto et al.	47/57.6
*	B	US-2007/0207927	09-2007	Rosa et al.	504/100
*	C	US-4,285,994	08-1981	Pearce et al.	427/222
*	D	US-2015/0072857	03-2015	Reichert et al.	504/100
*	E	US-2014/0274682	09-2014	WU et al.	504/100
	F	US-			
	G	US-			
	H	US-			
	I	US-			
	J	US-			
	K	US-			
	L	US-			
	M	US-			

FOREIGN PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Country	Name	Classification
	N					
	O					
	P					
	Q					
	R					
	S					
	T					

NON-PATENT DOCUMENTS

*		Include as applicable: Author, Title Date, Publisher, Edition or Volume, Pertinent Pages)
	U	Carnauba Waxes <http://www.brenntagspecialties.com/en/downloads/Products/Multi_Market_Principals/Koster_Keunen/Ink_Waxes/Carnauba_Wax_103_104_105_TDS.pdf> accessed on 3/16/15
	V	
	W	
	X	

*A copy of this reference is not being furnished with this Office action. (See MPEP § 707.05(a).)
Dates in MM-YYYY format are publication dates. Classifications may be US or foreign.

Index of Claims	Application/Control No.	Applicant(s)/Patent Under Reexamination
	14375361	JESSOP, NICHOLAS
	Examiner	Art Unit
	MANDY LOUIE	1715

✓	Rejected	-	Cancelled	N	Non-Elected	A	Appeal
=	Allowed	÷	Restricted	I	Interference	O	Objected

☐ Claims renumbered in the same order as presented by applicant ☐ CPA ☐ T.D. ☐ R.1.47

CLAIM		DATE								
Final	Original	02/26/2015								
	1	✓								
	2	✓								
	3	✓								
	4	✓								
	5	✓								
	6	✓								
	7	✓								
	8	✓								
	9	✓								
	10	-								
	11	✓								
	12	✓								
	13	✓								
	14	✓								
	15	✓								
	16	✓								
	17	✓								
	18	✓								
	19	✓								
	20	-								
	21	✓								
	22	✓								
	23	✓								
	24	✓								

INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(Not for submission under 37 CFR 1.99)

Application Number	Not Yet Assigned
Confirmation Number	Not Yet Assigned
Filing Date	July 29, 2014
First Named Inventor	Nicholas JESSOP
Art Unit	Not Yet Assigned
Examiner Name	Not Yet Assigned
Attorney Docket Number	Q213621

U.S. PATENTS

Examiner Initials	Cite No	Patent Number	Kind Code	Issue Date	Name of Patentee or Applicant of cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
	1.	5,876,739	A	1999-03-02	TURNBLAD et al.	

U.S. PATENT APPLICATION PUBLICATIONS

Examiner Initials	Cite No	Publication Number	Kind Code	Publication Date	Name of Patentee or Applicant of cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
	2.	2007/0207927	A1	2007-09-06	ROSA et al.	

FOREIGN PATENT DOCUMENTS

Examiner Initials	Cite No	Foreign Document Number	Country Code	Kind Code	Publication Date	Name of Patentee or Applicant of cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear	T
	3.	2005/077169	WO	A1	2005-08-25	BASF AKTEINGESELLSCHAFT		Cited in Cites 7 and 8
	4.	2011/148144	WO	A1	2011-12-01	EXOSECT LIMITED		Cited in Cite 7
	5.	830 655	GB	A	1960-03-16	SHELL RES LTD.		Cited in Cite 7
	6.	417 501	GB	A	1934-09-28	TERNION		Cited in Cite 8

NON-PATENT LITERATURE DOCUMENTS

Examiner Initials	Cite No	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city, and/or country where published.	T
	7.	International Search Report for PCT/GB2013/000153 dated August 22, 2013	
	8.	Search Report for British Application 1306086.8 dated August 5, 2013	

EXAMINER SIGNATURE

Examiner Signature	/Mandy Louie/ (03/17/2015)	Date Considered	

*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through a citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

1 See Kind Codes of USPTO Patent Documents at www.USPTO.GOV or MPEP 901.04. 2 Enter office that issued the document, by the two-letter code (WIPO Standard ST.3). 3 For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. 4 Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST.16 if possible. 5 Applicant is to place a check mark here if English language translation is attached.

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /M.L./

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BIB DATA SHEET

CONFIRMATION NO. 3504

SERIAL NUMBER	FILING or 371(c) DATE	CLASS	GROUP ART UNIT	ATTORNEY DOCKET NO.
14/375,361	07/29/2014 RULE	427	1715	Q213621

APPLICANTS

Exosect Limited, Winchester, Hampshire, UNITED KINGDOM, Assignee (with 37 CFR 1.172 Interest);

INVENTORS

Nicholas Jessop, Winchester, UNITED KINGDOM;

**** CONTINUING DATA ***************************

This application is a 371 of PCT/GB2013/000153 04/03/2013

**** FOREIGN APPLICATIONS ***************************

UNITED KINGDOM 1206138.8 04/04/2012
UNITED KINGDOM 1206139.6 04/04/2012
UNITED KINGDOM 1206141.2 04/04/2012
UNITED KINGDOM 1206142.0 04/04/2012
UNITED KINGDOM 1206143.8 04/04/2012
UNITED KINGDOM 1206144.6 04/04/2012

**** IF REQUIRED, FOREIGN FILING LICENSE GRANTED ****

10/04/2014

Foreign Priority claimed ☑ Yes ☐ No 35 USC 119(a-d) conditions met ☑ Yes ☐ No Verified and Acknowledged /MANDY C LOUIE/ Examiner's Signature	☐ Met after Allowance Initials	STATE OR COUNTRY	SHEETS DRAWINGS	TOTAL CLAIMS	INDEPENDENT CLAIMS
		UNITED KINGDOM	4	24	4

ADDRESS

SUGHRUE MION, PLLC
2100 PENNSYLVANIA AVENUE, N.W.
SUITE 800
WASHINGTON, DC 20037
UNITED STATES

TITLE

METHODS AND USES FOR IMPROVED SOWING OF SEEDS

FILING FEE RECEIVED		
2360	FEES: Authority has been given in Paper No._____ to charge/credit DEPOSIT ACCOUNT No._____ for following:	☐ All Fees ☐ 1.16 Fees (Filing) ☐ 1.17 Fees (Processing Ext. of time) ☐ 1.18 Fees (Issue) ☐ Other _____ ☐ Credit

EAST Search History

EAST Search History (Prior Art)

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
S1	1	(14/375361).APP.	US-PGPUB; USPAT; USOCR	OR	OFF	2015/03/13 21:16
S2	2	("20070207927" | "5876739").PN.	US-PGPUB; USPAT; USOCR	ADJ	ON	2015/03/13 21:24
S3	1090	seed and dust SAME wax	US-PGPUB; USPAT; USOCR	ADJ	ON	2015/03/13 22:52
S4	574	seed SAME dust SAME wax	US-PGPUB; USPAT; USOCR	ADJ	ON	2015/03/13 22:52
S5	482	seed SAME dust SAME wax and seed WITH wax	US-PGPUB; USPAT; USOCR	ADJ	ON	2015/03/13 22:52
S6	414	seed SAME dust SAME wax and seed WITH wax and wax WITH (Dispers$6)	US-PGPUB; USPAT; USOCR	ADJ	ON	2015/03/13 22:53
S7	0	seed SAME dust SAME wax and seed WITH wax and wax WITH (Dispers$6) and 427/4.ccls.	US-PGPUB; USPAT; USOCR	ADJ	ON	2015/03/13 23:42
S8	0	seed SAME dust SAME wax and seed WITH wax and wax WITH (Dispers$6) SAME clump$4	US-PGPUB; USPAT; USOCR	ADJ	ON	2015/03/13 23:42
S9	1	seed SAME dust SAME wax and seed WITH wax and wax SAME clump$4	US-PGPUB; USPAT; USOCR	ADJ	ON	2015/03/13 23:42
S10	5	seed SAME dust SAME wax and seed SAME wax and clump$4	US-PGPUB; USPAT; USOCR	ADJ	ON	2015/03/13 23:42
S11	478	(coat$4 OR deposit$4 OR film) WITH (wax) WITH (seed) and dust	US-PGPUB; USPAT; USOCR	ADJ	ON	2015/03/13 23:43
S12	436	(coat$4 OR deposit$4 OR film) WITH (wax) WITH (seed) and dust and wax WITH disper$6	US-PGPUB; USPAT; USOCR	ADJ	ON	2015/03/13 23:44
S13	0	(coat$4 OR deposit$4 OR film) WITH (wax) WITH (seed).ab. and dust	US-PGPUB; USPAT; USOCR	ADJ	ON	2015/03/13 23:47
S14	11	(coat$4 OR deposit$4 OR film) WITH (wax) WITH (seed).ab.	US-PGPUB; USPAT; USOCR	ADJ	ON	2015/03/13 23:47
S15	2	("20070207927" | "5876739").PN.	US-PGPUB; USPAT; USOCR	ADJ	ON	2015/03/13 23:51
S16	214	(coat$4 OR deposit$4 OR film) WITH (wax) WITH (seed)	FPRS; EPO; JPO; DERWENT; IBM_TDB	ADJ	ON	2015/03/13 23:55
S17	97	S16 and seed	FPRS; EPO; JPO; DERWENT; IBM_TDB	ADJ	ON	2015/03/14 01:00
S18	5	S16 and dust	FPRS; EPO; JPO; DERWENT; IBM_TDB	ADJ	ON	2015/03/14 01:01
S20	23	(("2007103076") or ("5876739") or ("0010630") or ("9011011") or ("2012143674")).PN.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2015/03/14 01:09
S21	1	dust.ab. and (wax).ab. and (seed).ab.	US-PGPUB; USPAT; USOCR	ADJ	ON	2015/03/14 01:12
S22	2	dust.ab. and (lubrica$6).ab. and (seed).ab.	US-PGPUB; USPAT; USOCR	ADJ	ON	2015/03/14 01:13
S23	117	dust SAME lubrica$6 SAME seed	US-PGPUB; USPAT; USOCR	ADJ	ON	2015/03/14 01:14
S24	7122	seed WITH (lubrica$6 OR wax) and seed	US-PGPUB; USPAT; USOCR	ADJ	ON	2015/03/14 01:25
S25	1375	seed WITH (lubrica$6 OR wax) and dust	US-PGPUB; USPAT; USOCR	ADJ	ON	2015/03/14 01:26
S26	498	seed WITH (lubrica$6 OR wax) WITH (deposit$4 OR	US-PGPUB;	ADJ	ON	2015/03/14

		overcoat$4 OR over?coat$4 OR overlayer OR over?layer OR coat$4) and dust	USPAT; USOCR			01:26
S27	297	seed WITH (lubrica$6 OR wax) WITH (deposit$4 OR overcoat$4 OR over?coat$4 OR overlayer OR over?layer OR coat$4) SAME dust	US-PGPUB; USPAT; USOCR	ADJ	ON	2015/03/14 01:26
S28	12	("0181136" | "3698133" | "3911183" | "4067141" | "4250660" | "4735015" | "4779376").PN. OR ("5787640").URPN.	US-PGPUB; USPAT; USOCR	ADJ	ON	2015/03/14 01:27
S29	298	seed WITH (lubrica$6 OR wax) WITH (deposit$4 OR overcoat$4 OR over?coat$4 OR overlayer OR over?layer OR coat$4 OR envelop$6) SAME dust	US-PGPUB; USPAT; USOCR	ADJ	ON	2015/03/14 01:29
S30	21	seed near (lubrica$6 OR wax) near (deposit$4 OR overcoat$4 OR over?coat$4 OR overlayer OR over?layer OR coat$4 OR envelop$6)	US-PGPUB; USPAT; USOCR	ADJ	ON	2015/03/14 01:33
S31	6	seed WITH (lubrica$6 OR wax) WITH (deposit$4 OR overcoat$4 OR over?coat$4 OR overlayer OR over?layer OR coat$4 OR envelop$6) SAME dust	FPRS; EPO; JPO; DERWENT; IBM_TDB	ADJ	ON	2015/03/14 01:33
S32	156	seed WITH (lubrica$6 OR wax) WITH (deposit$4 OR overcoat$4 OR over?coat$4 OR overlayer OR over?layer OR coat$4 OR envelop$6) WITH (handling OR plant$4 OR transport$4)	US-PGPUB; USPAT; USOCR	ADJ	ON	2015/03/14 01:38
S33	77	seed WITH (lubrica$6 OR wax) WITH (deposit$4 OR overcoat$4 OR over?coat$4 OR overlayer OR over?layer OR coat$4 OR envelop$6) WITH (handling OR plant$4 OR transport$4)	FPRS; EPO; JPO; DERWENT; IBM_TDB	ADJ	ON	2015/03/14 01:44
S34	1	("20070004811").PN.	US-PGPUB; USPAT; USOCR	OR	OFF	2015/03/14 02:01
S35	46	wax WITH dust.ab.	US-PGPUB; USPAT; USOCR	ADJ	ON	2015/03/14 02:02
S36	31	("2829040" | "3223518" | "3252786" | "3295950" | "3565599" | "4642196" | "4780233" | "5238480" | "5328497" | "5360465" | "5413856" | "5431708" | "5454851" | "5500220" | "5603745" | "6039892").PN. OR ("6355083").URPN.	US-PGPUB; USPAT; USOCR	ADJ	ON	2015/03/14 02:05
S37	1	("5603745").PN.	US-PGPUB; USPAT; USOCR	OR	OFF	2015/03/14 02:06
S38	2	("3362913").PN.	US-PGPUB; USPAT; USOCR	OR	OFF	2015/03/14 02:06
S39	2	("2585026").PN.	US-PGPUB; USPAT; USOCR	OR	OFF	2015/03/14 02:09
S40	1	("5698186").PN.	US-PGPUB; USPAT; USOCR	OR	OFF	2015/03/14 02:14
S41	1	("6329319").PN.	US-PGPUB; USPAT; USOCR	OR	OFF	2015/03/14 02:17
S42	19	("3113399" | "3598565" | "4169902" | "4272417" | "4729190" | "5129180" | "5849320" | "5876739" | "6199318").PN. OR ("6329319").URPN.	US-PGPUB; USPAT; USOCR	ADJ	ON	2015/03/14 02:18
S43	1	("5968222").PN.	US-PGPUB; USPAT; USOCR	OR	OFF	2015/03/14 02:19
S44	4708	talc and wax and seed and dust	US-PGPUB; USPAT; USOCR	ADJ	ON	2015/03/15 21:29
S45	86	talc SAME wax SAME seed and dust	US-PGPUB; USPAT; USOCR	ADJ	ON	2015/03/15 21:29
S46	22	talc SAME wax SAME seed SAME adhes$6	US-PGPUB; USPAT; USOCR	ADJ	ON	2015/03/15 21:36
S47	46	wax WITH diameter and wax WITH seed WITH (deposit$4 OR overcoat$4 OR over?coat$4 OR overlayer OR over?layer OR coat$4 OR envelop$6)	US-PGPUB; USPAT; USOCR	ADJ	ON	2015/03/16 18:53
S48	40	wax WITH diameter and wax WITH seed	FPRS; EPO; JPO; DERWENT; IBM_TDB	ADJ	ON	2015/03/16 21:03
S49	154	wax WITH diameter and wax WITH seed	US-PGPUB; USPAT; USOCR	ADJ	ON	2015/03/16 21:04
S50	329	wax WITH (coat$4 OR Film OR layer).ab. and (wax) WITH (particle OR powder OR particulate) WITH (diameter OR micrometer OR micron OR radius)	US-PGPUB; USPAT; USOCR	ADJ	ON	2015/03/16 21:09

S51	3	wax WITH (coat$4 OR Film OR layer).ab. and (wax) WITH (particle OR powder OR particulate) WITH (diameter OR micrometer OR micron OR radius) and 427/212.ccls.	US-PGPUB; USPAT; USOCR	ADJ	ON	2015/03/16 21:11
S52	8	(nicholas near2 jessop.in. OR exosect.as.) and (method OR process).clm. and seed.clm. and wax.clm.	US-PGPUB; USPAT; USOCR	ADJ	ON	2015/03/16 21:25

EAST Search History (Interference)

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
S53	8	(nicholas near2 jessop.in. OR exosect.as.) and (method OR process).clm. and seed.clm. and wax.clm.	US-PGPUB; USPAT; UPAD	ADJ	ON	2015/03/16 21:26

3/17/2015 12:10:35 AM
C:\Users\mlouie\Documents\EAST\Workspaces\14375361_wax_coated_seed_reducing_dust_and_improve_flowability.wsp

Search Notes	Application/Control No.	Applicant(s)/Patent Under Reexamination
	14375361	JESSOP, NICHOLAS
	Examiner	Art Unit
	MANDY LOUIE	1715

CPC- SEARCHED		
Symbol	Date	Examiner

CPC COMBINATION SETS - SEARCHED		
Symbol	Date	Examiner

US CLASSIFICATION SEARCHED			
Class	Subclass	Date	Examiner

SEARCH NOTES		
Search Notes	Date	Examiner
inventor, EAST search conducted	3/17/2015	ML

INTERFERENCE SEARCH			
US Class/ CPC Symbol	US Subclass / CPC Group	Date	Examiner

	/MANDY LOUIE/ Primary Examiner.Art Unit 1715

UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
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P.O. Box 1450
Alexandria, Virginia 22313-1450
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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
14/375,361	07/29/2014	Nicholas Jessop	Q213621	3504

23373 7590 02/20/2015

SUGHRUE MION, PLLC
2100 PENNSYLVANIA AVENUE, N.W.
SUITE 800
WASHINGTON, DC 20037

EXAMINER	
POON, PETER M	

ART UNIT	PAPER NUMBER
3643	

NOTIFICATION DATE	DELIVERY MODE
02/20/2015	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

PPROCESSING@SUGHRUE.COM
sughrue@sughrue.com
USPTO@sughrue.com

Commissioner for Patents
United States Patent and Trademark Office
P.O. Box 1450
Alexandria, VA 22313-1450
www.uspto.gov

In re Application of	:
Nicholas Jessop	: DECISION ON REQUEST TO
Application No.: 14/375,361	: PARTICIPATE IN THE PATENT
Filed: July 29, 2014	: PROSECUTION HIGHWAY
Attorney Docket No.: Q213621	: PROGRAM AND PETITION
For: METHODS AND USES FOR	: TO MAKE SPECIAL UNDER
IMPROVED SOWING OF SEEDS	: 37 CFR 1.102(a)

This is a decision on the renewed request to participate in the Patent Prosecution Highway (PPH) program and the petition under 37 CFR 1.102(a), filed December 17, 2014, to make the above-identified application special.

The request and petition are **GRANTED**.

DISCUSSION

A grantable request to participate in the PPH pilot program and petition to make special require:

1. The U.S. application for which participation in the Global/IP5 PPH pilot program is requested must have the same earliest date, whether this is the priority date or filing date, as that of a corresponding national or regional application filed with another Global/IP5 PPH participating office or a corresponding PCT international application for which one of the Global/IP5 PPH participating offices was the International Searching Authority (ISA) or the International Preliminary Examining Authority (IPEA).

2. Applicant must:
    a. Ensure all the claims in the U.S. application must sufficiently correspond or be amended to sufficiently correspond to the allowable/patentable claim(s) in the corresponding Office of Earlier Examination (OEE) application and
    b. Submit a claims correspondence table in English;

3. Examination of the U.S. application has not begun;

4. Applicant must submit:
    a. Documentation of prior office action:
        i. a copy of the office action(s) just prior to the "Decision to Grant a Patent" from each of the Global/IP5 PPH participating office application(s) containing the allowable/patentable claim(s) or
        ii. if the allowable/patentable claims(s) are from a "Notification of Reasons for Refusal" then the Notification of Reasons for Refusal or

iii. if the Global/IP5 PPH participating office application is a first action allowance then no office action from the Global/IP5 PPH participating office is necessary should be indicated on the request/petition form or
iv. the latest work product in the international phase of the OEE PCT application;

b. An English language translation of the Global/IP5 PPH participating office action or work product from (4)(a)(i)-(ii) or (iv) above;

5. Applicant must submit:
   a. An IDS listing the documents cited by the Global/IP5 PPH participating office examiner in the Global/IP5 PPH participating office action or work product (unless already submitted in this application)
   b. Copies of the documents except U.S. patents or U.S. patent application publications (unless already submitted in this application);

The request to participate in the PPH pilot program and petition comply with the above requirements. Accordingly, the above-identified application has been accorded "special" status.

This application will be forwarded to the examiner for action on the merits commensurate with this decision.

Telephone inquiries concerning this decision should be directed to the undersigned at (571) 272-3226. All other inquiries concerning the examination or status of the application is accessible in the PAIR system at http://www.uspto.gov/ebc.index.html.

/Andrea Smith/
Andrea Smith
Lead Paralegal Specialist
Office of Petitions

Office of Petitions: Routing Sheet

Application No. 14/375,361

This application is being forwarded to your office for further processing. A decision has been rendered on a petition filed in this application.

- [X] **GRANTED**
- [ ] **DISMISSED**
- [ ] **DENIED**

Office of Petitions: Decision Count Sheet

Mailing Month: 2

Application No.: 14375361

14375361

For US serial numbers: enter number only, no slashes or commas. Ex: 10123456
For PCT: enter "51+single digit of year of filing+last 5 numbers", Ex. for PCT/US05/12345, enter 51512345

Deciding Official: SMITH, ANDREA

Count (1) - Palm Credit 14/375,361

Decision: GRANT

FINANCE WORK NEEDED
☐ Select Check Box for YES

GRANT

Decision Type: 652 - Petition to make special-PPH

Notes:

Count (2)

Decision: n/a

FINANCE WORK NEEDED
☐ Select Check Box for YES

Decision Type: NONE

Notes:

Count (3)

Decision: n/a

FINANCE WORK NEEDED
☐ Select Check Box for YES

Decision Type: NONE

Notes:

Initials of Approving Official (if required)

If more than 3 decisions, attach 2nd count sheet & mark this box ☐

Printed on: *2/12/2015*

Office of Petitions Internal Document - Ver. 5.0

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APPLICATION NUMBER	FILING OR 371(C) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
14/375,361	07/29/2014	Nicholas Jessop	Q213621

CONFIRMATION NO. 3504

23373
SUGHRUE MION, PLLC
2100 PENNSYLVANIA AVENUE, N.W.
SUITE 800
WASHINGTON, DC 20037

PUBLICATION NOTICE

OC000000072863366

Title:METHODS AND USES FOR IMPROVED SOWING OF SEEDS

Publication No.US-2015-0013221-A1
Publication Date:01/15/2015

NOTICE OF PUBLICATION OF APPLICATION

The above-identified application will be electronically published as a patent application publication pursuant to 37 CFR 1.211, et seq. The patent application publication number and publication date are set forth above.

The publication may be accessed through the USPTO's publically available Searchable Databases via the Internet at www.uspto.gov. The direct link to access the publication is currently http://www.uspto.gov/patft/.

The publication process established by the Office does not provide for mailing a copy of the publication to applicant. A copy of the publication may be obtained from the Office upon payment of the appropriate fee set forth in 37 CFR 1.19(a)(1). Orders for copies of patent application publications are handled by the USPTO's Office of Public Records. The Office of Public Records can be reached by telephone at (703) 308-9726 or (800) 972-6382, by facsimile at (703) 305-8759, by mail addressed to the United States Patent and Trademark Office, Office of Public Records, Alexandria, VA 22313-1450 or via the Internet.

In addition, information on the status of the application, including the mailing date of Office actions and the dates of receipt of correspondence filed in the Office, may also be accessed via the Internet through the Patent Electronic Business Center at www.uspto.gov using the public side of the Patent Application Information and Retrieval (PAIR) system. The direct link to access this status information is currently http://pair.uspto.gov/. Prior to publication, such status information is confidential and may only be obtained by applicant using the private side of PAIR.

Further assistance in electronically accessing the publication, or about PAIR, is available by calling the Patent Electronic Business Center at 1-866-217-9197.

Office of Data Managment, Application Assistance Unit (571) 272-4000, or (571) 272-4200, or 1-888-786-0101

PATENT APPLICATION

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of

Nicholas JESSOP

Appln. No.: 14/375,361

Confirmation No.: 3504

Filed: July 29, 2014

Docket No: Q213621

Group Art Unit: 3643

Examiner: Not Yet Assigned

For: METHODS AND USES FOR IMPROVED SOWING OF SEEDS

PRELIMINARY AMENDMENT

MAIL STOP AMENDMENT
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

Prior to examination, please amend the above-identified application as follows on the accompanying pages.

TABLE OF CONTENTS

AMENDMENTS TO THE CLAIMS 2

REMARKS 6

AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions and listings of claims in the application:

LISTING OF CLAIMS:

1. (Original) A method of controlling the flowability of plant seeds by placing the plant seeds of a mass of seeds in contact with dry free flowing particles of a flowability enhancing agent that is made up of at least one species of electret particle made up of a wax, wherein the electret particle adheres more firmly to the plant seeds than do particles that comprise a dry free flowing substance that is or includes a mineral earth component.

2. (Original) A method according to claim 1, wherein the wax comprises at least one species of wax selected from mineral waxes, natural waxes and synthetic waxes.

3. (Previously presented) A method according to claim 1, wherein the wax comprises at least one species of wax that has a melting temperature of $\geq 40°$ C.

4. (Previously presented) A method according to claim 2, wherein the wax comprises at least one species of wax selected from carnauba wax, montan wax, paraffin wax and a mixture of two or more thereof.

5. (Previously presented) A method according to claim 1, wherein the plant seeds are selected from seeds from the group consisting of fodder and forage plant seeds, cereal seeds, cotton seeds, legume plant seeds, maize seeds and field crop plant seeds.

6. (Original) Use of a dry particulate free flowing formulation or composition in improving the flowability of seeds within a population of plant seeds, wherein the formulation or composition comprises at least a flowability enhancing agent that is made up of at least one species of electret particle selected from waxes, wherein the electret particles adhere more firmly

to individual plant seeds than do particles that comprise a dry free flowing substance that is or includes a mineral earth component.

7. (Original) Use according to claim 6, wherein the electret particles are formed of at least one species of wax selected from mineral waxes, natural waxes and synthetic waxes.

8. (Previously presented) Use according to claim 6, wherein the wax comprises at least one species of wax that has a melting temperature of $\geq 40°$ C.

9. (Previously presented) Use according to claim 7, wherein the wax comprises at least one species of wax selected from carnauba wax, montan wax, paraffin wax and a mixture of two or more thereof.

10. (cancelled).

11. (Original) A method of controlling dust drift from a population of plant seeds by placing the plant seeds of a mass of seeds in contact with dry free flowing particles of a flowability enhancement agent made up of electret particles made of a wax that adheres more firmly to plant seeds than a dry particulate compound or composition that is a flowability enhancement agent that comprises a dry free flowing substance that is a mineral earth or includes a mineral earth component.

12. (Original) A method according to claim 11, wherein the wax comprises at least one species of wax selected from mineral waxes, natural waxes and synthetic waxes.

13. (Previously presented) A method according to claim 11, wherein the wax comprises at least one species of wax that has a melting temperature of $\geq 40°$ C.

14. (Previously presented) A method according to claim 12, wherein the wax comprises at least one species of wax selected from carnauba wax, montan wax, paraffin wax and a mixture of

two or more thereof.

15. (Previously presented) A method according to claim 11, wherein the plant seeds are selected from seeds from the group consisting of fodder and forage plant seeds, cereal seeds, cotton seeds, legume plant seeds, maize seeds and field crop plant seeds.

16. (Original) Use of a particulate, free flowing formulation or composition in controlling dust drift, preferably in reducing the level or amount of dust drift, from a population of plant seeds, wherein the particulate free flowing formulation or composition comprises at least a flowability enhancing agent made up of dry electret particles made of wax that are able to adhere to individual plant seeds more firmly than a dry particulate compound or composition that is a free flowing flowability enhancing agent that comprises a substance that is a mineral earth or includes a mineral earth component.

17. (Original) Use according to claim 16, wherein the wax comprises at least one species of wax selected from mineral waxes, natural waxes and synthetic waxes.

18. (Previously presented) Use according to claim 16, wherein the wax comprises at least one species of wax that has a melting temperature of $\geq 40°$ C.

19. (Previously presented) Use according to claim 17, wherein the wax comprises at least one species of wax selected from carnauba wax, montan wax and paraffin wax or a mixture of two or more thereof.

20. (Cancelled).

21. (Previously presented) Method according to claim 1, wherein the electret particles of wax have a volume mean diameter of any conventional size in the range from 10 µm to 200 µm.

22. (Previously presented) Use according to claim 6, wherein the electret particles of wax have a volume mean diameter of any conventional size in the range from 10 μm to 200 μm.

23. (Previously presented) Method according to claim 11, wherein the electret particles of wax have a volume mean diameter of any conventional size in the range from 10 μm to 200 μm.

24. (Previously presented) Use according to claim 16, wherein the electret particles of wax have a volume mean diameter of any conventional size in the range from 10 μm to 200 μm.

REMARKS

Entry and consideration of this Amendment are respectfully requested.

Respectfully submitted,

/Alan J. Kasper/

Alan J. Kasper
Registration No. 25,426

SUGHRUE MION, PLLC
Telephone: 202.293.7060
Facsimile: 202.293.7860

WASHINGTON OFFICE
23373
CUSTOMER NUMBER

Date: December 17, 2014

Electronic Acknowledgement Receipt

EFS ID:	20986800
Application Number:	14375361
International Application Number:	
Confirmation Number:	3504
Title of Invention:	METHODS AND USES FOR IMPROVED SOWING OF SEEDS
First Named Inventor/Applicant Name:	Nicholas Jessop
Customer Number:	23373
Filer:	Alan Joseph Kasper/Sandra Swann
Filer Authorized By:	Alan Joseph Kasper
Attorney Docket Number:	Q213621
Receipt Date:	17-DEC-2014
Filing Date:	29-JUL-2014
Time Stamp:	12:06:13
Application Type:	U.S. National Stage under 35 USC 371

Payment information:

Submitted with Payment	no

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Petition to make special under Patent Prosecution Hwy	Q213621RequestforReconsiderationofPPHDecisionandClaimsCorrespondenceTable.pdf	124709 60d7d208209a268d50c8cd7388cebe5541805611	no	3

Warnings:	
Information:	

2	Preliminary Amendment	Q213621PreliminaryAmendment.pdf	41968 885072741de086b67ed4d636673cbab01f55599c	no	6

Warnings:	
Information:	
Total Files Size (in bytes):	166677

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111
If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371
If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office
If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

PATENT APPLICATION

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of	Docket No: Q213621
Nicholas JESSOP	
Appln. No.: 14/375,361	Group Art Unit: 3643
Confirmation No.: 3504	Examiner: Not Yet Assigned
Filed: July 29, 2014	

For: METHODS AND USES FOR IMPROVED SOWING OF SEEDS

REQUEST FOR RECONSIDERATION OF DECISION ON REQUEST TO PARTICIPATE IN PATENT PROSECUTION HIGHWAY PROGRAM

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

In response to the Decision on Request to Participate in the Patent Prosecution Highway Program mailed November 18, 2014, which found the Applicant's Petition defective in only one respect, please consider the remarks and evidence as follows.

A. Basis for Decision

In the Decision, the Examiner advises that:

"The request to participate in the PPH pilot program and petition fails to meet condition 2. In this regard, the claims correspondence table shows that U.S. claim 10 is of a new/different category than the OEE claim 8 and U.S. claim 20 is of a new/different category than the OEE claim 8. Therefore, applicant must ensure that all the claims in the U.S. application sufficiently correspond or be amended to sufficiently correspond to the allowable/patentable claim(s) in the corresponding OEE.

Requirement 2 reads in relevant part:

"Applicant must:

a. Ensure all the claims in the U.S. application must sufficiently correspond or be amended to sufficiently correspond to the allowable/patentable claim(s) in the corresponding Office of Earlier Examination (OEE) application and

b. Submit a claims correspondence table in English;

B. Basis for Reconsideration

First, Applicant notes that no other basis for denial of Applicant's request has been identified.

Second, Applicant is submitting herewith a revised Claims Correspondence Table that shows claims 10 and 20 to be deleted. In all other aspects, the content of the accompanying revised Claims Correspondence Table is identical to the original submission.

Third, concurrently, Applicant is filing a Preliminary Amendment that cancels claims 10 and 20.

In view of this submission, and for the three reasons given, Applicant respectfully requests the PTO to grant the PPH request.

The USPTO is directed and authorized to charge all required fees, except for the Issue Fee and the Publication Fee, to Deposit Account No. 19-4880. Please also credit any overpayments to said Deposit Account.

Respectfully submitted,

/Alan J. Kasper/

SUGHRUE MION, PLLC
Telephone: 202.293.7060
Facsimile: 202.293.7860

WASHINGTON OFFICE
23373
CUSTOMER NUMBER

Alan J. Kasper
Registration No. 25,426

Date: December 17, 2014

REQUEST FOR PARTICIPATION IN THE GLOBAL/IP5 PPH PILOT PROGRAM IN THE USPTO
(continued)

Application No.:	14/375,361	First Named Inventor:	Nicholas JESSOP

II. Claims Correspondence Table:

Claims in US Application	Patentable Claims in OEE Application	Explanation regarding the correspondence
1	1	Identical
2	3	Substantially the same
3	4	Substantially the same
4	7	Substantially the same
5	8	Substantially the same
6	10	Substantially the same
7	12	Substantially the same
8	13	Substantially the same
9	16	Substantially the same
10	8	Claim 10 is cancelled
11	2	Substantially the same
12	3	Substantially the same
13	4	Substantially the same
14	7	Substantially the same
15	8	Substantially the same
16	11	Identical
17	12	Substantially the same
18	13	Substantially the same
19	16	Substantially the same
20	8	Claim 20 is cancelled
21	18	Substantially the same
22	18	Substantially the same
23	18	Substantially the same
24	18	Substantially the same

III. All the claims in the US application sufficiently correspond to the patentable/allowable claims in the OEE application.

Signature /Alan J. Kasper/	Date 12/17/2014
Name (Print/Typed) Alan Kasper	Registration Number 25,426

PTO/SB/06 (09-11)
Approved for use through 1/31/2014. OMB 0651-0032
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

PATENT APPLICATION FEE DETERMINATION RECORD Substitute for Form PTO-875	Application or Docket Number 14/375,361	Filing Date 07/29/2014	☐ To be Mailed

ENTITY: ☒ LARGE ☐ SMALL ☐ MICRO

APPLICATION AS FILED – PART I

FOR	(Column 1) NUMBER FILED	(Column 2) NUMBER EXTRA	RATE ($)	FEE ($)
☐ BASIC FEE (37 CFR 1.16(a), (b), or (c))	N/A	N/A	N/A	
☐ SEARCH FEE (37 CFR 1.16(k), (i), or (m))	N/A	N/A	N/A	
☐ EXAMINATION FEE (37 CFR 1.16(o), (p), or (q))	N/A	N/A	N/A	
TOTAL CLAIMS (37 CFR 1.16(i))	minus 20 =	*	X $ =	
INDEPENDENT CLAIMS (37 CFR 1.16(h))	minus 3 =	*	X $ =	
☐ APPLICATION SIZE FEE (37 CFR 1.16(s))	If the specification and drawings exceed 100 sheets of paper, the application size fee due is $310 ($155 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR 1.16(s).			
☐ MULTIPLE DEPENDENT CLAIM PRESENT (37 CFR 1.16(j))				
* If the difference in column 1 is less than zero, enter "0" in column 2.			TOTAL	

APPLICATION AS AMENDED – PART II

AMENDMENT **12/17/2014**

	(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA	RATE ($)	ADDITIONAL FEE ($)
Total (37 CFR 1.16(i))	* 22	Minus	** 24	= 0	X $80 =	0
Independent (37 CFR 1.16(h))	* 3	Minus	***4	= 0	X $420 =	0
☐ Application Size Fee (37 CFR 1.16(s))						
☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))						
					TOTAL ADD'L FEE	0

AMENDMENT

	(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA	RATE ($)	ADDITIONAL FEE ($)
Total (37 CFR 1.16(i))	*	Minus	**	=	X $ =	
Independent (37 CFR 1.16(h))	*	Minus	***	=	X $ =	
☐ Application Size Fee (37 CFR 1.16(s))						
☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))						
					TOTAL ADD'L FEE	

* If the entry in column 1 is less than the entry in column 2, write "0" in column 3.
** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20".
*** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3".
The "Highest Number Previously Paid For" (Total or Independent) is the highest number found in the appropriate box in column 1.

LIE
/ROZENIA HARMON/

UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
14/375,361	07/29/2014	Nicholas Jessop	Q213621	3504

23373 7590 11/18/2014

SUGHRUE MION, PLLC
2100 PENNSYLVANIA AVENUE, N.W.
SUITE 800
WASHINGTON, DC 20037

EXAMINER	

ART UNIT	PAPER NUMBER
3643	

NOTIFICATION DATE	DELIVERY MODE
11/18/2014	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

PPROCESSING@SUGHRUE.COM
sughrue@sughrue.com
USPTO@sughrue.com

UNITED STATES PATENT AND TRADEMARK OFFICE

Commissioner for Patents
United States Patent and Trademark Office
P.O. Box 1450
Alexandria, VA 22313-1450
www.uspto.gov

In re Application of	:
Nicholas Jessop	: DECISION ON REQUEST TO
Application No.: 14/375,361	: PARTICIPATE IN THE PATENT
Filed: July 29, 2014	: PROSECUTION HIGHWAY
Attorney Docket No.: Q213621	: PROGRAM AND PETITION
For: METHODS AND USES FOR	: TO MAKE SPECIAL UNDER
IMPROVED SOWING OF SEEDS	: 37 CFR 1.102(a)

This is a decision on the request to participate in the Patent Prosecution Highway (PPH) program and the petition under 37 CFR 1.102(a), filed August 8, 2014, to make the above-identified application special.

The request and petition are **dismissed**.

DISCUSSION

A grantable request to participate in the PPH pilot program and petition to make special require:

1. The U.S. application for which participation in the Global/IP5 PPH pilot program is requested must have the same earliest date, whether this is the priority date or filing date, as that of a corresponding national or regional application filed with another Global/IP5 PPH participating office or a corresponding PCT international application for which one of the Global/IP5 PPH participating offices was the International Searching Authority (ISA) or the International Preliminary Examining Authority (IPEA).

2. Applicant must:
    a. Ensure all the claims in the U.S. application must sufficiently correspond or be amended to sufficiently correspond to the allowable/patentable claim(s) in the corresponding Office of Earlier Examination (OEE) application and
    b. Submit a claims correspondence table in English;

3. Examination of the U.S. application has not begun;

4. Applicant must submit:
    a. Documentation of prior office action:
        i. a copy of the office action(s) just prior to the "Decision to Grant a Patent" from each of the Global/IP5 PPH participating office application(s) containing the allowable/patentable claim(s) or
        ii. if the allowable/patentable claims(s) are from a "Notification of Reasons for Refusal" then the Notification of Reasons for Refusal or
        iii. if the Global/IP5 PPH participating office application is a first action allowance then no office action from the Global/IP5 PPH participating office is necessary should be indicated on the request/petition form or

iv. the latest work product in the international phase of the OEE PCT application;

b. An English language translation of the Global/IP5 PPH participating office action or work product from (4)(a)(i)-(ii) or (iv) above;

5. Applicant must submit:

a. An IDS listing the documents cited by the Global/IP5 PPH participating office examiner in the Global/IP5 PPH participating office action or work product (unless already submitted in this application)

b. Copies of the documents except U.S. patents or U.S. patent application publications (unless already submitted in this application);

The request to participate in the PPH pilot program and petition comply with requirements (1), and (3-5) above. However, the present request fails to comply with requirement (2). In this regard, the claims correspondence table shows that U.S. claim 10 is of a new/different category than the OEE claim 8 and US claim 20 is of a new/different category than the OEE claim 8. Therefore, applicant must ensure that all the claims in the U.S. application sufficiently correspond or be amended to sufficiently correspond to the allowable/patentable claim(s) in the corresponding OEE.

Applicant is given **ONE** opportunity within a time period of **ONE MONTH or THIRTY DAYS**, whichever is longer, from the mailing date of this decision to correct the deficiencies. **NO EXTENSION OF TIME UNDER 37 CFR 1.136 IS PERMITTED.** If the deficiencies are not corrected with the time period given, the application will await action in its regular turn.

Response must be filed via the Electronic Filing System (EFS) using the document description: Petition to make special under Patent Pros Hwy. Any preliminary amendments and IDS submitted with the PPH documents must be separately indexed as a preliminary amendment and IDS, respectively.

Telephone inquiries concerning this decision should be directed to the undersigned at (571) 272-3226. All other inquiries concerning the examination or status of the application is accessible in the PAIR system at http://www.uspto.gov/ebc.index.html.

/Andrea Smith/
Andrea Smith
Paralegal Specialist
Office of Petitions

Office of Petitions: Decision Count Sheet

Mailing Month 11

Application No. 14375361

14375361

For US serial numbers: enter number only, no slashes or commas. Ex: 10123456
For PCT: enter "51+single digit of year of filing+last 5 numbers", Ex. for PCT/US05/12345, enter 51512345

Deciding Official: SMITH, ANDREA

Count (1) - Palm Credit 14/375,361

Decision: DISMISSED

FINANCE WORK NEEDED
☐ Select Check Box for YES

DISMISSED

Decision Type: 652 - Petition to make special-PPH

652

Notes:

Count (2)

Decision: n/a

FINANCE WORK NEEDED
☐ Select Check Box for YES

Decision Type: NONE

Notes:

Count (3)

Decision: n/a

FINANCE WORK NEEDED
☐ Select Check Box for YES

Decision Type: NONE

Notes:

Initials of Approving Official (if required)

If more than 3 decisions, attach 2nd count sheet & mark this box ☐

Printed on: *11/13/2014*

Office of Petitions Internal Document - Ver. 5.0

Office of Petitions: Routing Sheet

Application No. 14/375,361

This application is being forwarded to your office for further processing. A decision has been rendered on a petition filed in this application.

- [ ] **GRANTED**
- [X] **DISMISSED**
- [ ] **DENIED**

UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NUMBER	FILING or 371(c) DATE	GRP ART UNIT	FIL FEE REC'D	ATTY.DOCKET.NO	TOT CLAIMS	IND CLAIMS
14/375,361	07/29/2014		2360	Q213621	24	4

CONFIRMATION NO. 3504

23373
SUGHRUE MION, PLLC
2100 PENNSYLVANIA AVENUE, N.W.
SUITE 800
WASHINGTON, DC 20037

FILING RECEIPT

OC000000071182157

Date Mailed: 10/08/2014

Receipt is acknowledged of this non-provisional patent application. The application will be taken up for examination in due course. Applicant will be notified as to the results of the examination. Any correspondence concerning the application must include the following identification information: the U.S. APPLICATION NUMBER, FILING DATE, NAME OF APPLICANT, and TITLE OF INVENTION. Fees transmitted by check or draft are subject to collection. Please verify the accuracy of the data presented on this receipt. **If an error is noted on this Filing Receipt, please submit a written request for a Filing Receipt Correction. Please provide a copy of this Filing Receipt with the changes noted thereon. If you received a "Notice to File Missing Parts" for this application, please submit any corrections to this Filing Receipt with your reply to the Notice. When the USPTO processes the reply to the Notice, the USPTO will generate another Filing Receipt incorporating the requested corrections**

Inventor(s)

Nicholas Jessop, Winchester, UNITED KINGDOM;

Applicant(s)

Exosect Limited, Winchester, Hampshire, UNITED KINGDOM

Assignment For Published Patent Application

EXOSECT LIMITED, Winchester, Hampshire, GB

Power of Attorney: The patent practitioners associated with Customer Number 23373

Domestic Priority data as claimed by applicant

This application is a 371 of PCT/GB2013/000153 04/03/2013

Foreign Applications (You may be eligible to benefit from the **Patent Prosecution Highway** program at the USPTO. Please see http://www.uspto.gov for more information.)
UNITED KINGDOM 1206138.8 04/04/2012 No Access Code Provided
UNITED KINGDOM 1206139.6 04/04/2012 No Access Code Provided
UNITED KINGDOM 1206141.2 04/04/2012 No Access Code Provided
UNITED KINGDOM 1206142.0 04/04/2012 No Access Code Provided
UNITED KINGDOM 1206143.8 04/04/2012 No Access Code Provided
UNITED KINGDOM 1206144.6 04/04/2012 No Access Code Provided

Permission to Access - A proper **Authorization to Permit Access to Application by Participating Offices** (PTO/SB/39 or its equivalent) has been received by the USPTO.

If Required, Foreign Filing License Granted: 10/04/2014

The country code and number of your priority application, to be used for filing abroad under the Paris Convention, is **US 14/375,361**

Projected Publication Date: 01/15/2015

Non-Publication Request: No

Early Publication Request: No
Title

METHODS AND USES FOR IMPROVED SOWING OF SEEDS

Preliminary Class

Statement under 37 CFR 1.55 or 1.78 for AIA (First Inventor to File) Transition Applications: No

PROTECTING YOUR INVENTION OUTSIDE THE UNITED STATES

Since the rights granted by a U.S. patent extend only throughout the territory of the United States and have no effect in a foreign country, an inventor who wishes patent protection in another country must apply for a patent in a specific country or in regional patent offices. Applicants may wish to consider the filing of an international application under the Patent Cooperation Treaty (PCT). An international (PCT) application generally has the same effect as a regular national patent application in each PCT-member country. The PCT process **simplifies** the filing of patent applications on the same invention in member countries, but **does not result** in a grant of "an international patent" and does not eliminate the need of applicants to file additional documents and fees in countries where patent protection is desired.

Almost every country has its own patent law, and a person desiring a patent in a particular country must make an application for patent in that country in accordance with its particular laws. Since the laws of many countries differ in various respects from the patent law of the United States, applicants are advised to seek guidance from specific foreign countries to ensure that patent rights are not lost prematurely.

Applicants also are advised that in the case of inventions made in the United States, the Director of the USPTO must issue a license before applicants can apply for a patent in a foreign country. The filing of a U.S. patent application serves as a request for a foreign filing license. The application's filing receipt contains further information and guidance as to the status of applicant's license for foreign filing.

Applicants may wish to consult the USPTO booklet, "General Information Concerning Patents" (specifically, the section entitled "Treaties and Foreign Patents") for more information on timeframes and deadlines for filing foreign patent applications. The guide is available either by contacting the USPTO Contact Center at 800-786-9199, or it can be viewed on the USPTO website at http://www.uspto.gov/web/offices/pac/doc/general/index.html.

For information on preventing theft of your intellectual property (patents, trademarks and copyrights), you may wish to consult the U.S. Government website, http://www.stopfakes.gov. Part of a Department of Commerce initiative, this website includes self-help "toolkits" giving innovators guidance on how to protect intellectual property in specific countries such as China, Korea and Mexico. For questions regarding patent enforcement issues, applicants may call the U.S. Government hotline at 1-866-999-HALT (1-866-999-4258).

LICENSE FOR FOREIGN FILING UNDER

Title 35, United States Code, Section 184

Title 37, Code of Federal Regulations, 5.11 & 5.15

GRANTED

The applicant has been granted a license under 35 U.S.C. 184, if the phrase "IF REQUIRED, FOREIGN FILING LICENSE GRANTED" followed by a date appears on this form. Such licenses are issued in all applications where the conditions for issuance of a license have been met, regardless of whether or not a license may be required as set forth in 37 CFR 5.15. The scope and limitations of this license are set forth in 37 CFR 5.15(a) unless an earlier license has been issued under 37 CFR 5.15(b). The license is subject to revocation upon written notification. The date indicated is the effective date of the license, unless an earlier license of similar scope has been granted under 37 CFR 5.13 or 5.14.

This license is to be retained by the licensee and may be used at any time on or after the effective date thereof unless it is revoked. This license is automatically transferred to any related applications(s) filed under 37 CFR 1.53(d). This license is not retroactive.

The grant of a license does not in any way lessen the responsibility of a licensee for the security of the subject matter as imposed by any Government contract or the provisions of existing laws relating to espionage and the national security or the export of technical data. Licensees should apprise themselves of current regulations especially with respect to certain countries, of other agencies, particularly the Office of Defense Trade Controls, Department of State (with respect to Arms, Munitions and Implements of War (22 CFR 121-128)); the Bureau of Industry and Security, Department of Commerce (15 CFR parts 730-774); the Office of Foreign AssetsControl, Department of Treasury (31 CFR Parts 500+) and the Department of Energy.

NOT GRANTED

No license under 35 U.S.C. 184 has been granted at this time, if the phrase "IF REQUIRED, FOREIGN FILING LICENSE GRANTED" DOES NOT appear on this form. Applicant may still petition for a license under 37 CFR 5.12, if a license is desired before the expiration of 6 months from the filing date of the application. If 6 months has lapsed from the filing date of this application and the licensee has not received any indication of a secrecy order under 35 U.S.C. 181, the licensee may foreign file the application pursuant to 37 CFR 5.15(b).

UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

U.S. APPLICATION NUMBER NO.	FIRST NAMED INVENTOR	ATTY. DOCKET NO.
14/375,361	Nicholas Jessop	Q213621

23373
SUGHRUE MION, PLLC
2100 PENNSYLVANIA AVENUE, N.W.
SUITE 800
WASHINGTON, DC 20037

INTERNATIONAL APPLICATION NO.	
PCT/GB2013/000153	
I.A. FILING DATE	PRIORITY DATE
04/03/2013	04/04/2012

CONFIRMATION NO. 3504
371 ACCEPTANCE LETTER

OC000000071182158

Date Mailed: 10/08/2014

NOTICE OF ACCEPTANCE OF APPLICATION UNDER 35 U.S.C 371 AND 37 CFR 1.495

The applicant is hereby advised that the United States Patent and Trademark Office, in its capacity as a Designated / Elected Office (37 CFR 1.495), has ACCEPTED the above identified international application for national patentability examination in the United States Patent and Trademark Office.

The United States Application Number assigned to the application is shown above. A Filing Receipt will be issued for the present application in due course. **THE DATE APPEARING ON THE FILING RECEIPT AS THE "FILING DATE or 371(c) DATE" IS THE DATE ON WHICH THE LAST OF THE 35 U.S.C. 371 (c)(1) and (c)(2) REQUIREMENTS HAS BEEN RECEIVED IN THE OFFICE. THIS DATE IS SHOWN BELOW.** The filing date of the above identified application is the international filing date of the international application (Article 11(3) and 35 U.S.C. 363)

07/29/2014
DATE OF RECEIPT OF 35 U.S.C.
371(c)(1) and (c)(2) REQUIREMENTS

The following items have been received:

- Copy of the International Application filed on 07/29/2014
- Copy of the International Search Report filed on 07/29/2014
- Preliminary Amendments filed on 07/29/2014
- Information Disclosure Statements filed on 07/29/2014
- Inventor's Oath or Declaration filed on 09/08/2014
- Request for Immediate Examination filed on 09/08/2014
- U.S. Basic National Fees filed on 07/29/2014
- Assignment filed on 09/08/2014
- Priority Documents filed on 07/29/2014
- Power of Attorney filed on 09/08/2014
- Authorization to Permit Access filed on 07/29/2014
- Application Data Sheet (37 CFR 1.76) filed on 07/29/2014

Applicant is reminded that any communications to the United States Patent and Trademark Office must be mailed to the address given in the heading and include the U.S. application no. shown above (37 CFR 1.5)

MARILYN J YOUNGER

Telephone: (571) 272-8183

PATENT APPLICATION FEE DETERMINATION RECORD

Substitute for Form PTO-875

Application or Docket Number: 14/375,361

APPLICATION AS FILED - PART I

FOR	(Column 1) NUMBER FILED	(Column 2) NUMBER EXTRA	SMALL ENTITY RATE($)	SMALL ENTITY FEE($)	OR	OTHER THAN SMALL ENTITY RATE($)	OTHER THAN SMALL ENTITY FEE($)
BASIC FEE (37 CFR 1.16(a), (b), or (c))	N/A	N/A	N/A			N/A	280
SEARCH FEE (37 CFR 1.16(k), (i), or (m))	N/A	N/A	N/A			N/A	480
EXAMINATION FEE (37 CFR 1.16(o), (p), or (q))	N/A	N/A	N/A			N/A	720
TOTAL CLAIMS (37 CFR 1.16(i))	24 minus 20 =	* 4			OR	x 80 =	320
INDEPENDENT CLAIMS (37 CFR 1.16(h))	4 minus 3 =	* 1				x 420 =	420
APPLICATION SIZE FEE (37 CFR 1.16(s))	If the specification and drawings exceed 100 sheets of paper, the application size fee due is $310 ($155 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR 1.16(s).						0.00
MULTIPLE DEPENDENT CLAIM PRESENT (37 CFR 1.16(j))							0.00
* If the difference in column 1 is less than zero, enter "0" in column 2.			TOTAL			TOTAL	2220

APPLICATION AS AMENDED - PART II

		(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA	SMALL ENTITY RATE($)	SMALL ENTITY ADDITIONAL FEE($)	OR	OTHER THAN SMALL ENTITY RATE($)	OTHER THAN SMALL ENTITY ADDITIONAL FEE($)
AMENDMENT A	Total (37 CFR 1.16(i))	*	Minus	**	=	x =		OR	x =	
	Independent (37 CFR 1.16(h))	*	Minus	***	=	x =		OR	x =	
	Application Size Fee (37 CFR 1.16(s))									
	FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))							OR		
						TOTAL ADD'L FEE		OR	TOTAL ADD'L FEE	

		(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA	RATE($)	ADDITIONAL FEE($)		RATE($)	ADDITIONAL FEE($)
AMENDMENT B	Total (37 CFR 1.16(i))	*	Minus	**	=	x =		OR	x =	
	Independent (37 CFR 1.16(h))	*	Minus	***	=	x =		OR	x =	
	Application Size Fee (37 CFR 1.16(s))									
	FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))							OR		
						TOTAL ADD'L FEE		OR	TOTAL ADD'L FEE	

* If the entry in column 1 is less than the entry in column 2, write "0" in column 3.
** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20".
*** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3".
The "Highest Number Previously Paid For" (Total or Independent) is the highest found in the appropriate box in column 1.

MULTIPLE DEPENDENT CLAIM FEE CALCULATION SHEET

Substitute for Form PTO-1360
(For use with Form PTO/SB/06)

Application Number	Filing Date
14375361	

Applicant(s) Nicholas JESSOP

* May be used for additional claims or amendments

CLAIMS	AS FILED		AFTER FIRST AMENDMENT		AFTER SECOND AMENDMENT	
	Indep	Depend	Indep	Depend	Indep	Depend
1	1		1			
2		1		1		
3		2		1		
4		(1)		1		
5		(1)		1		
6	1		1			
7		1		1		
8		2		1		
9		(1)		1		
10		(1)		1		
11	1		1			
12		1		1		
13		2		1		
14		(1)		1		
15		(1)		1		
16	1		1			
17		1		1		
18		2		1		
19		(1)		1		
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Total Indep	4		4		0	
Total Depend	21	↵	20	↵	0	↵
Total Claims	25		24		0	

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	Indep	Depend	Indep	Depend	Indep	Depend
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TRANSMITTAL FOR POWER OF ATTORNEY TO ONE OR MORE REGISTERED PRACTITIONERS			
NOTE: This form is to be submitted with the Power of Attorney by Applicant form (PTO/AIA/82B) to identify the application to which the Power of Attorney is directed, in accordance with 37 CFR 1.5, unless the application number and filing date are identified in the Power of Attorney by Applicant form. If neither form PTO/AIA/82A nor form PTO/AIA82B identifies the application to which the Power of Attorney is directed, the Power of Attorney will not be recognized in the application.			
Application Number	14/375,361		
Filing Date	July 29, 2014		
First Named Inventor	Nicholas JESSOP		
Title	METHODS AND USES FOR IMPROVED SOWING OF SEEDS		
Art Unit	Not Yet Assigned		
Examiner Name	Not Yet Assigned		
Attorney Docket Number	Q213621		
SIGNATURE of Applicant or Patent Practitioner			
Signature	/Alan J. Kasper/	Date (Optional)	September 8, 2014
Name	Alan J. Kasper	Registration Number	25,426
Title (if Applicant is a juristic entity)			
Applicant Name (if Applicant is a juristic entity)			
NOTE: This form must be signed in accordance with 37 CFR 1.33. See 37 CFR 1.4(d) for signature requirements and certifications. If more than one applicant, use multiple forms.			
☑ *Total of 1 forms are submitted.			

POWER OF ATTORNEY BY APPLICANT

I hereby revoke all previous powers of attorney given in the application identified in the attached transmittal letter.

I hereby appoint:

Patent Practitioner(s) associated with the following Customer Number:

23373

as my/our attorney(s) or agent(s), and to transact all business in the United States Patent and Trademark Office connected therewith for the application referenced in the attached transmittal letter (Form PTO/AIA/82A).

Please recognize or change the correspondence address for the application identified in the attached transmittal letter to:

The address associated with the above-mentioned Customer Number.

I am the Applicant (if the Applicant is a juristic entity, list the Applicant name in the box):

EXOSECT LIMITED

- ☐ Inventor or Joint Inventor (title not required below)
- ☐ Legal Representative of a Deceased or Legally Incapacitated Inventor (title not required below)
- ☑ Assignee or Person to Whom the Inventor is Under an Obligation to Assign (provide signer's title if applicant is a juristic entity)
- ☐ Person Who Otherwise Shows Sufficient Proprietary Interest (e.g., a Petition under 37 CFR 1.46(b)(2) was granted in the application or is concurrently being filed with this document)(provide signer's title if applicant is a juristic entity)

SIGNATURE of Applicant for Patent

The undersigned (whose title is supplied below) is authorized to act on behalf of the applicant (e.g., where the applicant is a juristic entity).

Signature	P.Hayes	Date (Optional)	
Name	P.Hayes,		
Title	COMPANY SECRETARY, EXOSECT LIMITED		

NOTE: Signature - This form must be signed by the applicant in accordance with 37 CFR 1.33. See 37 CFR 1.4 for signature requirements and certifications. If more than one applicant, use multiple forms.

☑ Total of 1 forms are submitted.

Electronic Patent Application Fee Transmittal

Application Number:	14375361
Filing Date:	
Title of Invention:	METHODS AND USES FOR IMPROVED SOWING OF SEEDS
First Named Inventor/Applicant Name:	Nicholas JESSOP
Filer:	Alan Joseph Kasper/Justin Aviles
Attorney Docket Number:	Q213621

Filed as Large Entity

U.S. National Stage under 35 USC 371 Filing Fees

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Basic Filing:				
Pages:				
Claims:				
Miscellaneous-Filing:				
Oath/Decl > 30 Mos From 371 commencement	1617	1	140	140
Petition:				
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				
Extension-of-Time:				

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Miscellaneous:				
			Total in USD ($)	**140**

Electronic Acknowledgement Receipt

EFS ID:	20071963
Application Number:	14375361
International Application Number:	
Confirmation Number:	3504
Title of Invention:	METHODS AND USES FOR IMPROVED SOWING OF SEEDS
First Named Inventor/Applicant Name:	Nicholas JESSOP
Customer Number:	23373
Filer:	Alan Joseph Kasper/Justin Aviles
Filer Authorized By:	Alan Joseph Kasper
Attorney Docket Number:	Q213621
Receipt Date:	08-SEP-2014
Filing Date:	
Time Stamp:	14:54:47
Application Type:	U.S. National Stage under 35 USC 371

Payment information:

Submitted with Payment	yes
Payment Type	Credit Card
Payment was successfully received in RAM	$140
RAM confirmation Number	1126
Deposit Account	
Authorized User	

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
00[illegible]					

1	Applicant Response to Pre-Exam Formalities Notice	Q213621TransmittalLetterPCT.pdf	55305 b15320fc8e4569bf674da39c952723813c446913	no	3
Warnings:					
Information:					
2	Applicant Response to Pre-Exam Formalities Notice	Q213621SubmissionofExecutedDeclaration.pdf	22561 6adc06ee1a5475d0164591ab278fec952d751ab1	no	1
Warnings:					
Information:					
3	Oath or Declaration filed	Q213621CombinedDeclarationandAssignmentExecuted.pdf	1608713 61bebd4b3b5caf32f4e0af315da6d3625c68101b	no	2
Warnings:					
Information:					
4	Power of Attorney	Q213621PowerofAttorney.pdf	1075604 44403c589b908301148dcd477f8b431ba47ecfa7	no	2
Warnings:					
Information:					
5	Fee Worksheet (SB06)	fee-info.pdf	30165 80bdcd4c3c86a1a7ae58d5ff28e83406029635dd	no	2
Warnings:					
Information:					
		Total Files Size (in bytes):	2792348		

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

<u>New Applications Under 35 U.S.C. 111</u>
If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

<u>National Stage of an International Application under 35 U.S.C. 371</u>
If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

<u>New International Application Filed with the USPTO as a Receiving Office</u>
If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

TRANSMITTAL LETTER TO THE UNITED STATES DESIGNATED/ELECTED OFFICE (DO/EO/US) CONCERNING A SUBMISSION UNDER 35 U.S.C. 371		ATTORNEY DOCKET NO. Q213621
		U.S. APPLICATION NO. (If known, see 37 CFR 1.5) 14/375,361
INTERNATIONAL APPLICATION NO. PCT/GB2013/000153	INTERNATIONAL FILING DATE April 3, 2013	PRIORITY DATE CLAIMED April 4, 2012

TITLE OF INVENTION
METHODS AND USES FOR IMPROVED SOWING OF SEEDS

FIRST NAMED INVENTOR
Nicholas JESSOP

Applicant herewith submits to the United States Designated/Elected Office (DO/EO/US) the following items and other information.

1. ☑ This is an express request to begin national examination procedures (35 U.S.C. 371(f)). NOTE: The express request under 35 U.S.C. 371(f) will not be effective unless the requirements under 35 U.S.C. 371(c)(1), (2), and (4) for payment of the basic national fee, copy of the International Application and English translation thereof (if required), and the oath or declaration of the inventor(s) have been received.
2. ☐ A copy of the International Application (35 U.S.C. 371(c)(2)) is attached hereto (not required if the International Application was previously communicated by the International Bureau or was filed in the United States Receiving Office (RO/US)).
3. ☐ An English language translation of the International Application (35 U.S.C. 371(c)(2))
   a. ☐ is attached hereto.
   b. ☐ has been previously submitted under 35 U.S.C. 154(d)(4).
4. ☑ An oath or declaration of the inventor(s) (35 U.S.C. 371(c)(4))
   a. ☑ is attached.
   b. ☐ was previously filed in the international phase under PCT Rule 4.17(iv).

Items 5 to 8 below concern amendments made in the international phase.

PCT Article 19 and 34 amendments

5. ☐ Amendments to the claims under PCT Article 19 are attached (not required if communicated by the International Bureau) (35 U.S.C. 371(c)(3)).
6. ☐ English translation of the PCT Article 19 amendment is attached (35 U.S.C. 371(c)(3)).
7. ☐ English translation of annexes (Article 19 and/or 34 amendments only) of the International Preliminary Examination Report is attached (35 U.S.C. 371(c)(5)).

Cancellation of amendments made in the international phase

8a. ☐ Do not enter the amendment made in the international phase under PCT Article 19.

8b. ☐ Do not enter the amendment made in the international phase under PCT Article 34.

NOTE: A proper amendment made in English under Article 19 or 34 will be entered in the U.S. national phase application absent a clear instruction from applicant not to enter the amendment(s).

The following items 9 to 17 concern a document(s) or information included.

9. ☐ An Information Disclosure Statement under 37 CFR 1.97 and 1.98.
10. ☐ A preliminary amendment.
11. ☐ An Application Data Sheet under 37 CFR 1.76.
12. ☐ A substitute specification. NOTE: A substitute specification cannot include claims. See 37 CFR 1.125(b).
13. ☑ A power of attorney and/or change of address letter.
14. ☐ A computer-readable form of the sequence listing in accordance with PCT Rule 13*ter*.3 and 37 CFR 1.821- 1.825.
15. ☐ Assignment papers *(cover sheet and document(s))*. Name of Assignee: EXOSECT LIMITED
16. ☐ 37 CFR 3.73(c) Statement *(when there is an Assignee)*.

U.S. APPLN NO. (if known, see 37 CFR 1.5) 14/375,361	INTERNATIONAL APPLICATION NO. PCT/GB2013/000153	ATTORNEY DOCKET NO. Q213621

17. ☑ Other items or information:
Submission of Executed Declaration

The following fees have been submitted.	**CALCULATIONS**	PTO USE ONLY
18. ☐ Basic national fee (37 CFR 1.492(a)) **$280**	$	
19. ☐ Examination fee (37 CFR 1.492(c)) If the written opinion prepared by ISA/US or the international preliminary examination report prepared by IPEA/US indicates all claims satisfy provisions of PCT Article 33(1)-(4) ..... **$0** All other situations **$720**	$	
20. ☐ Search fee (37 CFR 1.492(b)) If the written opinion prepared by ISA/US or the international preliminary examination report prepared by IPEA/US indicates all claims satisfy provisions of PCT Article 33(1)-(4) ..... **$0** Search fee (37 CFR 1.445(a)(2)) has been paid on the international application to the USPTO as an International Searching Authority ..... **$120** International Search Report prepared by an ISA other than the US and provided to the Office or previously communicated to the US by the IB ..... **$480** All other situations... ..... **$600**	$	
TOTAL OF 18, 19 and 20 =	$	

☐ Additional fee for specification and drawings filed in paper over 100 sheets (excluding sequence listing in compliance with 37 CFR 1.821(c) or (e) in an electronic medium or computer program listing in an electronic medium) (37 CFR 1.492(j)).
Fee for each additional 50 sheets of paper or fraction thereof..... **$400**

Total Sheets	Extra Sheets	Number of each additional 50 or fraction thereof (round **up** to a whole number)	RATE	
- 100 =	/50 =		x **$400**	$

Surcharge of **$140.00** for furnishing any of the search fee, examination fee, or the oath or declaration after the date of commencement of the national stage (37 CFR 1.492(h)).	**$140**	

CLAIMS	NUMBER FILED	NUMBER EXTRA	RATE		
Total claims	- 20 =		x **$80**	$	
Independent claims	- 3 =		x **$420**	$	
MULTIPLE DEPENDENT CLAIM(S) (if applicable)			+ **$780**	$	

Processing fee of **$140.00** for furnishing the English translation later than 30 months from the earliest claimed priority date (37 CFR 1.492(i)). +	$	
TOTAL OF ABOVE CALCULATIONS =	**$140**	
☐ **Applicant asserts small entity status.** See 37 CFR 1.27. Fees above are reduced by ½		
☐ **Applicant certifies micro entity status.** See 37 CFR 1.29. Fees above are reduced by ¾. Applicant must attach form PTO/SB/15A or B or equivalent.		
TOTAL NATIONAL FEE =	**$140**	
Fee for recording the enclosed assignment (37 CFR 1.21(h)). The assignment must be accompanied by an appropriate cover sheet (37 CFR 3.28, 3.31). **$40/EFS - $0** per property +		
Fee for Extension of Time		
TOTAL FEES ENCLOSED =	**$140**	
	Amount to be refunded:	$
	Amount to be charged	$

a. ☐ A check in the amount of $_____ to cover the above fees is enclosed.

b. ☐ Please charge my Deposit Account No. 19-4880 in the amount of $ _____ to cover the above fees.

c. ☑ The USPTO is directed and authorized to charge all required fees, except for the Issue Fee and the Publication Fee to Deposit Account No. 19-4880. Please also credit any overpayments to said Deposit Account.

d. ☑ Fees are to be charged to a credit card. **WARNING**: Information on this form may become public. Credit card information should not be included on this form. Provide credit card information and authorization on PTO-2038. The PTO-2038 should only be mailed or faxed to the USPTO. However, when paying the basic national fee, the PTO-2038 may NOT be faxed to the USPTO.

ADVISORY: If filing by EFS-Web, do **NOT** attach the PTO-2038 form as a PDF along with your EFS-Web submission. Please be advised that this is not recommended and by doing so **your credit card information may be displayed via PAIR**. To protect your information, it is recommended to pay fees online by using the electronic payment method.

NOTE: Where an appropriate time limit under 37 CFR 1.495 has not been met, a petition to revive (37 CFR 1.137(a) or (b)) must be filed and granted to restore the International Application to pending status.

Statement under 37 CFR 1.55 or 1.78 for AIA (First Inventor to File) Transition Applications

☐ This application (1) claims priority to or the benefit of an application filed before March 16, 2013, and (2) also contains, or contained at any time, a claim to a claimed invention that has an effective filing date on or after March 16, 2013.

NOTE 1: By providing this statement under 37 CFR 1.55 or 1.78, **this application, with a filing date on or after March 16, 2013, will be examined under the first inventor to file provisions of the AIA.**

NOTE 2: A U.S. national stage application may not claim priority to the international application of which it is the national phase. The filing date of a U.S. national stage application is the international filing date. See 35 U.S.C. 363.

SEND ALL CORRESPONDENCE TO:
The address associated with Customer Number:

WASHINGTON OFFICE
23373
CUSTOMER NUMBER

SIGNATURE	/Alan J. Kasper/	DATE	September 8, 2014
NAME (Print/Type)	Alan J. Kasper	REGISTRATION NO. (Attorney/Agent)	25,426

PATENT APPLICATION

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of	Docket No: Q213621
Nicholas JESSOP	
Appln. No.: 14/375,361	Group Art Unit: Not Yet Assigned
Confirmation No.: 3504	Examiner: Not Yet Assigned
Filed: July 29, 2014	

For: METHODS AND USES FOR IMPROVED SOWING OF SEEDS

SUBMISSION OF EXECUTED DECLARATION

MAIL STOP PCT
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

In view of the application filed on July 29, 2014, Applicant submits herewith a copy of the Declaration (2 pages) properly executed by the inventor for the above identified application and a Power of Attorney (2 pages).

The USPTO is directed and authorized to charge all required fees, except for the Issue Fee and the Publication Fee, to Deposit Account No. 19-4880. Please also credit any overpayments to said Deposit Account.

Respectfully submitted,

/Alan J. Kasper/

Alan J. Kasper
Registration No. 25,426

SUGHRUE MION, PLLC
Telephone: 202.293.7060
Facsimile: 202.293.7860

WASHINGTON OFFICE
23373
CUSTOMER NUMBER

Date: September 8, 2014

Docket No.: Q213621
Only After Sept 16, 2012

ASSIGNMENT WITH DECLARATION FOR UTILITY OR DESIGN PATENT APPLICATION (37 CFR 1.63)

Whereas, I, the undersigned inventor hereinafter called assignor, have invented certain improvements described in the application identified below; and

Whereas, EXOSECT LIMITED of Leylands Business Park, Colden Common, Winchester, Hampshire, SO21 1TH, United Kingdom (assignee), desires to acquire the entire right, title, and interest in the application and invention, and to any United States patents to be obtained therefor;

Now therefore, for valuable consideration, receipt whereof is hereby acknowledged,

I, the above named assignor, hereby sell, assign and transfer to the above named assignee, its successors and assigns, the entire right, title and interest in the application and the invention disclosed therein for the United States of America, including all divisions, and continuations thereof, and all Letters Patent of the United States that may be granted thereon, and all reissues thereof, and all countries foreign thereto, including rights of priority under the International Convention of Paris (1883) as amended, including the right to claim priority under 35 USC 119 and the right to sue for past damages, and I request the Director of the U.S. Patent and Trademark Office to issue any Letters Patent granted upon the invention set forth in the application to the assignee, its successors and assigns; and I hereby agree that the assignee may apply for foreign Letters Patent on the invention and I will execute without further consideration all papers deemed necessary by the assignee in connection with the United States and foreign applications when called upon to do so by the assignee.

(Legalization not required for recording but is prima facie evidence of execution under 35 USC 261)

As the below named inventor, I hereby declare that:

This assignment with declaration is directed to:

- ☐ The attached application, or
- ☑ United States Application or PCT International Application Number PCT/GB2013/000153 filed on April 3, 2013.

The application is entitled:

METHODS AND USES FOR IMPROVED SOWING OF SEEDS

The above identified application was made or was authorized to be made by me.

I believe that I am the original inventor or an original joint inventor of a claimed invention in the application.

I have reviewed and understand the contents of the application for which this assignment with declaration is being submitted.

I am aware of the duty to disclose to the Office all information known to me to be material to patentability as defined in 37 CFR 1.56.

I hereby acknowledge that any willful false statement made in this assignment with declaration is punishable under 18 USC 1001 by fine or imprisonment of not more than five (5) years, or both.

NAME OF SOLE OR FIRST INVENTOR:			
Given Name (first and middle [if any])	Nicholas	Family Name or Surname	JESSOP
Inventor's signature		Date	12/08/14
Residence:	Winchester, United Kingdom		
Mailing Address:	c/o Exosect Limited, Leylands Business Park, Colden Common, Winchester, Hampshire, SO21 1TH, United Kingdom		

PATENT ASSIGNMENT COVER SHEET

Electronic Version v1.1
Stylesheet Version v1.2

EPAS ID: PAT3013080

SUBMISSION TYPE:	NEW ASSIGNMENT
NATURE OF CONVEYANCE:	ASSIGNMENT

CONVEYING PARTY DATA

Name	Execution Date
NICHOLAS JESSOP	08/12/2014

RECEIVING PARTY DATA

Name:	EXOSECT LIMITED
Street Address:	LEYLANDS BUSINESS PARK
Internal Address:	COLDEN COMMON
City:	WINCHESTER, HAMPSHIRE
State/Country:	UNITED KINGDOM
Postal Code:	2O21 1TH

PROPERTY NUMBERS Total: 1

Property Type	Number
Application Number:	14375361

CORRESPONDENCE DATA

Fax Number: (202)293-7860

Correspondence will be sent to the e-mail address first; if that is unsuccessful, it will be sent using a fax number, if provided; if that is unsuccessful, it will be sent via US Mail.

Phone: 2022937060
Email: javiles@sughrue.com, sughrue@sughrue.com
Correspondent Name: SUGHRUE MION PLLC
Address Line 1: 2100 PENNSYLVANIA AVENUE, NW
Address Line 4: WASHINGTON, D.C. 20037-3213

ATTORNEY DOCKET NUMBER:	Q213621
NAME OF SUBMITTER:	JUSTIN AVILES, NEW APPLICATIONS SPEC
SIGNATURE:	/Justin Aviles/
DATE SIGNED:	09/08/2014
	This document serves as an Oath/Declaration (37 CFR 1.63).

Total Attachments: 2
source=Q213621CombinedDeclarationandAssignmentExecuted#page1.tif
source=Q213621CombinedDeclarationandAssignmentExecuted#page2.tif

Docket No.: Q21362I
Only After Sept 16, 2013

ASSIGNMENT WITH DECLARATION FOR UTILITY OR DESIGN PATENT APPLICATION (37 CFR 1.63)

Whereas, I, the undersigned inventor hereinafter called assignor, have invented certain improvements described in the application identified below; and

Whereas, EXOSECT LIMITED of Leylands Business Park, Colden Common, Winchester, Hampshire, SO21 1TH, United Kingdom (assignee), desires to acquire the entire right, title, and interest in the application and invention, and to any United States patents to be obtained therefor;

Now therefore, for valuable consideration, receipt whereof is hereby acknowledged,

I, the above named assignor, hereby sell, assign and transfer to the above named assignee, its successors and assigns, the entire right, title and interest in the application and the invention disclosed therein for the United States of America, including all divisions, and continuations thereof, and all Letters Patent of the United States that may be granted thereon, and all reissues thereof, and all countries foreign thereto, including rights of priority under the International Convention of Paris (1883) as amended, including the right to claim priority under 35 USC 119 and the right to sue for past damages, and I request the Director of the U.S. Patent and Trademark Office to issue any Letters Patent granted upon the invention set forth in the application to the assignee, its successors and assigns; and I hereby agree that the assignee may apply for foreign Letters Patent on the invention and I will execute without further consideration all papers deemed necessary by the assignee in connection with the United States and foreign applications when called upon to do so by the assignee.

(Legalization not required for recording but is prima facie evidence of execution under 35 USC 261)

As the below named inventor, I hereby declare that:

This assignment with declaration is directed to:

- ☐ The attached application, or
- ☑ United States Application or PCT International Application Number PCT/GB2013/000153 filed on April 3, 2013.

The application is entitled:

METHODS AND USES FOR IMPROVED SOWING OF SEEDS

The above identified application was made or was authorized to be made by me.

I believe that I am the original inventor or an original joint inventor of a claimed invention in the application.

I have reviewed and understand the contents of the application for which this assignment with declaration is being submitted.

I am aware of the duty to disclose to the Office all information known to me to be material to patentability as defined in 37 CFR 1.56.

I hereby acknowledge that any willful false statement made in this assignment with declaration is punishable under 18 USC 1001 by fine or imprisonment of not more than five (5) years, or both.

NAME OF SOLE OR FIRST INVENTOR:			
Given Name (first and middle [if any])	Nicholas	Family Name or Surname	JESSOP
Inventor's signature		Date	12/08/14
Residence:	Winchester, United Kingdom		
Mailing Address:	c/o Exoseet Limited, Leylands Business Park, Colden Common, Winchester, Hampshire, SO21 1TH, United Kingdom		

PTO/SB/20GLBL (01-14)
Approved for use through 01/31/2015. OMB 0651-0058
U.S. Patent and Trademark Office; U.S DEPARTMENT OF COMMERCE

REQUEST FOR PARTICIPATION IN THE GLOBAL/IP5 PATENT PROSECUTION HIGHWAY (PPH) PILOT PROGRAM IN THE USPTO

Application No.:	14/375,361	First Named Inventor:	Nicholas JESSOP
Filing Date:	July 29, 2014	Attorney Docket No.:	Q213621
Title of the Invention:	METHODS AND USES FOR IMPROVED SOWING OF SEEDS		

THIS REQUEST FOR PARTICIPATION IN THE PPH PILOT PROGRAM ALONG WITH THE REQUIRED DOCUMENTS MUST BE SUBMITTED VIA EFS-WEB. INFORMATION REGARDING EFS-WEB IS AVAILABLE AT HTTP://WWW.USPTO.GOV/PATENTS/PROCESS/FILE/EFS/.

APPLICANT HEREBY REQUESTS PARTICIPATION IN THE PATENT PROSECUTION HIGHWAY (PPH) PILOT PROGRAM AND PETITIONS TO MAKE THE ABOVE-IDENTIFIED APPLICATION SPECIAL UNDER THE PPH PILOT PROGRAM.

Office of earlier examination (OEE): United Kingdom (United Kingdom Intellectual Property Office)

OEE application number: 13 06 086.8 (corresponds to PCT/GB2013/000153)

Both the OEE application and the above-identified U.S. application have the following earliest date (filing or priority date): April 4, 2012

Type of OEE work product relied upon: Decision to grant a patent

Mailing date of OEE work product: February 18, 2014

I. Required Documents:

a. **A copy of the most recent office action prior to the decision to grant a patent or the most recent PCT work product (along with an English translation, if not in the English language):**

- ☐ is attached.
- ☐ is already present in the U.S. application.
- ☒ is not attached because it is available to the USPTO via the Dossier Access System or WIPO's PATENTSCOPE system.
- ☒ is not attached because the decision to grant a patent was the first office action.

b. **(1) An information disclosure statement listing the documents cited in the OEE work product:**

- ☐ is attached.
- ☒ has already been filed in the U.S. application.
- ☐ is not attached because no references were cited in the document in section a. above.

(2) Copies of all cited documents (except for U.S. patents or U.S. patent application publications)

- ☐ are attached.
- ☒ have already been filed in the U.S. application.
- ☐ are not attached because no references were cited in the document in section a. above.

REQUEST FOR PARTICIPATION IN THE GLOBAL/IP5 PPH PILOT PROGRAM IN THE USPTO
(continued)

Application No.:	14/375,361	First Named Inventor:	Nicholas JESSOP

II. Claims Correspondence Table:

Claims in US Application	Patentable Claims in OEE Application	Explanation regarding the correspondence
1	1	Identical
2	3	Substantially the same
3	4	Substantially the same
4	7	Substantially the same
5	8	Substantially the same
6	10	Substantially the same
7	12	Substantially the same
8	13	Substantially the same
9	16	Substantially the same
10	8	Substantially the same but reworded as a "method" instead of "use"
11	2	Substantially the same
12	3	Substantially the same
13	4	Substantially the same
14	7	Substantially the same
15	8	Substantially the same
16	11	Identical
17	12	Substantially the same
18	13	Substantially the same
19	16	Substantially the same
20	8	Substantially the same but directed to method instead of use
21	18	Substantially the same
22	18	Substantially the same
23	18	Substantially the same
24	18	Substantially the same

III. All the claims in the US application sufficiently correspond to the patentable/allowable claims in the OEE application.

Signature /Alan J. Kasper/	Date 08/08/2014
Name (Print/Typed) Alan Kasper	Registration Number 25,426

Privacy Act Statement

The **Privacy Act of 1974 (P.L. 93-579)** requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. Accordingly, pursuant to the requirements of the Act, please be advised that: (1) the general authority for the collection of this information is 35 U.S.C. 2(b)(2); (2) furnishing of the information solicited is voluntary; and (3) the principal purpose for which the information is used by the U.S. Patent and Trademark Office is to process and/or examine your submission related to a patent application or patent. If you do not furnish the requested information, the U.S. Patent and Trademark Office may not be able to process and/or examine your submission, which may result in termination of proceedings or abandonment of the application or expiration of the patent.

The information provided by you in this form will be subject to the following routine uses:

1. The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether disclosure of these records is required by the Freedom of Information Act.
2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.
3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.
4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).
5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.
6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).
7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (*i.e.*, GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.
8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspection or an issued patent.
9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

Electronic Acknowledgement Receipt

EFS ID:	19819635
Application Number:	14375361
International Application Number:	
Confirmation Number:	3504
Title of Invention:	METHODS AND USES FOR IMPROVED SOWING OF SEEDS
First Named Inventor/Applicant Name:	Nicholas JESSOP
Customer Number:	23373
Filer:	Alan Joseph Kasper/Darryl Hunter
Filer Authorized By:	Alan Joseph Kasper
Attorney Docket Number:	Q213621
Receipt Date:	08-AUG-2014
Filing Date:	
Time Stamp:	16:42:01
Application Type:	U.S. National Stage under 35 USC 371

Payment information:

Submitted with Payment	no

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Petition to make special under Patent Prosecution Hwy	Q213621GlobalPPH.pdf	305799 ba53baf203241a16064feac5f9a0c0e37d2b61b4	no	3

Warnings:	
Information:	

Total Files Size (in bytes):	305799

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111

If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371

If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office

If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

TRANSMITTAL LETTER TO THE UNITED STATES DESIGNATED/ELECTED OFFICE (DO/EO/US) CONCERNING A SUBMISSION UNDER 35 U.S.C. 371		ATTORNEY DOCKET NO. Q213621
		U.S. APPLICATION NO. (If known, see 37 CFR 1.5) Not Yet Assigned
INTERNATIONAL APPLICATION NO. PCT/GB2013/000153	INTERNATIONAL FILING DATE April 3, 2013	PRIORITY DATE CLAIMED April 4, 2012

TITLE OF INVENTION
METHODS AND USES FOR IMPROVED SOWING OF SEEDS

FIRST NAMED INVENTOR
Nicholas JESSOP

Applicant herewith submits to the United States Designated/Elected Office (DO/EO/US) the following items and other information.

1. ☐ This is an express request to begin national examination procedures (35 U.S.C. 371(f)). NOTE: The express request under 35 U.S.C. 371(f) will not be effective unless the requirements under 35 U.S.C. 371(c)(1), (2), and (4) for payment of the basic national fee, copy of the International Application and English translation thereof (if required), and the oath or declaration of the inventor(s) have been received.
2. ☑ A copy of the International Application (35 U.S.C. 371(c)(2)) is attached hereto (not required if the International Application was previously communicated by the International Bureau or was filed in the United States Receiving Office (RO/US)).
3. ☐ An English language translation of the International Application (35 U.S.C. 371(c)(2))
   a. ☐ is attached hereto.
   b. ☐ has been previously submitted under 35 U.S.C. 154(d)(4).
4. ☐ An oath or declaration of the inventor(s) (35 U.S.C. 371(c)(4))
   a. ☐ is attached.
   b. ☐ was previously filed in the international phase under PCT Rule 4.17(iv).

Items 5 to 8 below concern amendments made in the international phase.

PCT Article 19 and 34 amendments

5. ☐ Amendments to the claims under PCT Article 19 are attached (not required if communicated by the International Bureau) (35 U.S.C. 371(c)(3)).
6. ☐ English translation of the PCT Article 19 amendment is attached (35 U.S.C. 371(c)(3)).
7. ☐ English translation of annexes (Article 19 and/or 34 amendments only) of the International Preliminary Examination Report is attached (35 U.S.C. 371(c)(5)).

Cancellation of amendments made in the international phase

8a. ☐ Do not enter the amendment made in the international phase under PCT Article 19.

8b. ☐ Do not enter the amendment made in the international phase under PCT Article 34.

NOTE: A proper amendment made in English under Article 19 or 34 will be entered in the U.S. national phase application absent a clear instruction from applicant not to enter the amendment(s).

The following items 9 to 17 concern a document(s) or information included.

9. ☑ An Information Disclosure Statement under 37 CFR 1.97 and 1.98.
10. ☑ A preliminary amendment.
11. ☑ An Application Data Sheet under 37 CFR 1.76.
12. ☐ A substitute specification. NOTE: A substitute specification cannot include claims. See 37 CFR 1.125(b).
13. ☐ A power of attorney and/or change of address letter.
14. ☐ A computer-readable form of the sequence listing in accordance with PCT Rule 13*ter*.3 and 37 CFR 1.821- 1.825.
15. ☐ Assignment papers *(cover sheet and document(s))*. Name of Assignee: Exosect Limited
16. ☐ 37 CFR 3.73(c) Statement *(when there is an Assignee)*.

U.S. APPLN NO. (if known, see 37 CFR 1.5) Not Yet Assigned	INTERNATIONAL APPLICATION NO. PCT/GB2013/000153	ATTORNEY DOCKET NO. Q213621

17. ☑ Other items or information:
A copy of the ISR, a PTO/SB/08 (modified) listing the ISR references, and a copy of each reference cited in the ISR, PCT Request, PCT/RO/102, PCT/RO/105, PCT/RO/106, PCT/IB/301, PCT/IB/304, PCT/IB/308, PCT/IB/311.

The following fees have been submitted.	**CALCULATIONS** PTO USE ONLY	
☑ Basic national fee (37 CFR 1.492(a)) **$280**	$280	
☑ Examination fee (37 CFR 1.492(c)) If the written opinion prepared by ISA/US or the international preliminary examination report prepared by IPEA/US indicates all claims satisfy provisions of PCT Article 33(1)-(4) ..... **$0** All other situations **$720**	$720	
☑ Search fee (37 CFR 1.492(b)) If the written opinion prepared by ISA/US or the international preliminary examination report prepared by IPEA/US indicates all claims satisfy provisions of PCT Article 33(1)-(4) ..... **$0** Search fee (37 CFR 1.445(a)(2)) has been paid on the international application to the USPTO as an International Searching Authority ..... **$120** International Search Report prepared by an ISA other than the US and provided to the Office or previously communicated to the US by the IB ..... **$480** All other situations... ..... **$600**	$480	
TOTAL OF 18, 19 and 20 =	$1,480	

☐ Additional fee for specification and drawings filed in paper over 100 sheets (excluding sequence listing in compliance with 37 CFR 1.821(c) or (e) in an electronic medium or computer program listing in an electronic medium) (37 CFR 1.492(j)).
Fee for each additional 50 sheets of paper or fraction thereof..... **$400**

Total Sheets	Extra Sheets	Number of each additional 50 or fraction thereof (round **up** to a whole number)	RATE	
44 - 100 =	0/50 =	0	x **$400**	$0

Surcharge of **$140.00** for furnishing any of the search fee, examination fee, or the oath or declaration after the date of commencement of the national stage (37 CFR 1.492(h)).	$	

CLAIMS	NUMBER FILED	NUMBER EXTRA	RATE		
Total claims	24 - 20 =	4	x **$80**	$320	
Independent claims	4 - 3 =	1	x **$420**	$420	
MULTIPLE DEPENDENT CLAIM(S) (if applicable)			+ **$780**	$0	

Processing fee of **$140.00** for furnishing the English translation later than 30 months from the earliest claimed priority date (37 CFR 1.492(i)). +	$	
TOTAL OF ABOVE CALCULATIONS =	$2,220	
☐ **Applicant asserts small entity status.** See 37 CFR 1.27. Fees above are reduced by ½		
☐ **Applicant certifies micro entity status.** See 37 CFR 1.29. Fees above are reduced by ¾. Applicant must attach form PTO/SB/15A or B or equivalent.		
TOTAL NATIONAL FEE =	$2,220	
Fee for recording the attached assignment (37 CFR 1.21(h)). The assignment must be accompanied by an appropriate cover sheet (37 CFR 3.28, 3.31). **$40.00** per property +		
Fee for Extension of Time		
TOTAL FEES ATTACHED =	$2,220	
	Amount to be refunded:	$
	Amount to be charged	$

a. ☐ A check in the amount of $_____ to cover the above fees is attached.

b. ☐ Please charge my Deposit Account No. 19-4880 in the amount of $ _____ to cover the above fees.

c. ☑ The USPTO is directed and authorized to charge all required fees, except for the Issue Fee and the Publication Fee to Deposit Account No. 19-4880. Please also credit any overpayments to said Deposit Account.

d. ☑ Fees are to be charged to a credit card. **WARNING**: Information on this form may become public. Credit card information should not be included on this form. Provide credit card information and authorization on PTO-2038. The PTO-2038 should only be mailed or faxed to the USPTO. However, when paying the basic national fee, the PTO-2038 may NOT be faxed to the USPTO.

ADVISORY: If filing by EFS-Web, do **NOT** attach the PTO-2038 form as a PDF along with your EFS-Web submission. Please be advised that this is not recommended and by doing so **your credit card information may be displayed via PAIR**. To protect your information, it is recommended to pay fees online by using the electronic payment method.

NOTE: Where an appropriate time limit under 37 CFR 1.495 has not been met, a petition to revive (37 CFR 1.137(a) or (b)) must be filed and granted to restore the International Application to pending status.

Statement under 37 CFR 1.55 or 1.78 for AIA (First Inventor to File) Transition Applications

☐ This application (1) claims priority to or the benefit of an application filed before March 16, 2013, and (2) also contains, or contained at any time, a claim to a claimed invention that has an effective filing date on or after March 16, 2013.

NOTE 1: By providing this statement under 37 CFR 1.55 or 1.78, **this application, with a filing date on or after March 16, 2013, will be examined under the first inventor to file provisions of the AIA.**

NOTE 2: A U.S. national stage application may not claim priority to the international application of which it is the national phase. The filing date of a U.S. national stage application is the international filing date. See 35 U.S.C. 363.

SEND ALL CORRESPONDENCE TO:
The address associated with Customer Number:

WASHINGTON OFFICE
23373
CUSTOMER NUMBER

SIGNATURE	/Alan J. Kasper/	DATE	July 29, 2014
NAME (Print/Type)	Alan J. Kasper	REGISTRATION NO. (Attorney/Agent)	25,426

**TRANSMITTAL LETTER TO THE UNITED STATES DESIGNATED/ELECTED OFFICE (DO/EO/US)
CONCERNING A SUBMISSION UNDER 35 U.S.C. 371
ADDITIONAL PAGE**

Priority is claimed from:

Country	Application No	Filing Date
GB	1206138.8	2012-04-04
GB	1206139.6	2012-04-04
GB	1206141.2	2012-04-04
GB	1206142.0	2012-04-04
GB	1206143.8	2012-04-04
GB	1206144.6	2012-04-04

Attorney Docket No.			Q213621
CORRESPONDENCE ADDRESS			
☑ The address associated with Customer Number:	[CN]	OR	☐ Correspondence address below

PTO/AIA/14 (12-13)
Approved for use through 01/31/2014. OMB 0651-0032
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

Application Data Sheet 37 CFR 1.76	Attorney Docket Number	Q213621
	Application Number	
Title of Invention	METHODS AND USES FOR IMPROVED SOWING OF SEEDS	

The application data sheet is part of the provisional or nonprovisional application for which it is being submitted. The following form contains the bibliographic data arranged in a format specified by the United States Patent and Trademark Office as outlined in 37 CFR 1.76.
This document may be completed electronically and submitted to the Office in electronic format using the Electronic Filing System (EFS) or the document may be printed and included in a paper filed application.

Secrecy Order 37 CFR 5.2

☐ Portions or all of the application associated with this Application Data Sheet may fall under a Secrecy Order pursuant to 37 CFR 5.2 (Paper filers only. Applications that fall under Secrecy Order may not be filed electronically.)

Inventor Information:

Inventor 1 Remove

Legal Name

Prefix	Given Name	Middle Name	Family Name	Suffix
	Nicholas		JESSOP	

Residence Information (Select One) ○ US Residency ◉ Non US Residency ○ Active US Military Service

City	Winchester	Country of Residence i	GB

Mailing Address of Inventor:

Address 1	c/o EXOSECT LIMITED		
Address 2	Leylands Business Park, Colden Common		
City	Winchester, Hampshire	**State/Province**	
Postal Code	SO21 1TH	**Country** i	GB

All Inventors Must Be Listed - Additional Inventor Information blocks may be generated within this form by selecting the **Add** button. Add

Correspondence Information:

Enter either Customer Number or complete the Correspondence Information section below.
For further information see 37 CFR 1.33(a).

☐ **An Address is being provided for the correspondence Information of this application.**

Customer Number	23373		
Email Address	sughrue@sughrue.com	Add Email	Remove Email

Application Information:

Title of the Invention	METHODS AND USES FOR IMPROVED SOWING OF SEEDS		
Attorney Docket Number	Q213621	**Small Entity Status Claimed**	☐
Application Type	Nonprovisional		
Subject Matter	Utility		
Total Number of Drawing Sheets (if any)	4	**Suggested Figure for Publication (if any)**	

Application Data Sheet 37 CFR 1.76	Attorney Docket Number	Q213621
	Application Number	
Title of Invention	METHODS AND USES FOR IMPROVED SOWING OF SEEDS	

Filing By Reference :

Only complete this section when filing an application by reference under 35 U.S.C. 111(c) and 37 CFR 1.57(a). Do not complete this section if application papers including a specification and any drawings are being filed. Any domestic benefit or foreign priority information must be provided in the appropriate section(s) below (i.e., "Domestic Benefit/National Stage Information" and "Foreign Priority Information").

For the purposes of a filing date under 37 CFR 1.53(b), the description and any drawings of the present application are replaced by this reference to the previously filed application, subject to conditions and requirements of 37 CFR 1.57(a).

Application number of the previously filed application	Filing date (YYYY-MM-DD)	Intellectual Property Authority or Country

Publication Information:

☐ Request Early Publication (Fee required at time of Request 37 CFR 1.219)

☐ **Request Not to Publish.** I hereby request that the attached application not be published under 35 U.S.C. 122(b) and certify that the invention disclosed in the attached application **has not and will not** be the subject of an application filed in another country, or under a multilateral international agreement, that requires publication at eighteen months after filing.

Representative Information:

Representative information should be provided for all practitioners having a power of attorney in the application. Providing this information in the Application Data Sheet does not constitute a power of attorney in the application (see 37 CFR 1.32).
Either enter Customer Number or complete the Representative Name section below. If both sections are completed the customer Number will be used for the Representative Information during processing.

Please Select One:	◉ Customer Number	○ US Patent Practitioner	○ Limited Recognition (37 CFR 11.9)
Customer Number	23373		

Domestic Benefit/National Stage Information:

This section allows for the applicant to either claim benefit under 35 U.S.C. 119(e), 120, 121, or 365(c) or indicate National Stage entry from a PCT application. Providing this information in the application data sheet constitutes the specific reference required by 35 U.S.C. 119(e) or 120, and 37 CFR 1.78.
When referring to the current application, please leave the application number blank.

Prior Application Status	Pending		Remove
Application Number	Continuity Type	Prior Application Number	Filing Date (YYYY-MM-DD)
	a 371 of international	PCT/GB2013/000153	2013-04-03

Additional Domestic Benefit/National Stage Data may be generated within this form by selecting the **Add** button. Add

Foreign Priority Information:

Application Data Sheet 37 CFR 1.76	Attorney Docket Number	Q213621
	Application Number	
Title of Invention	METHODS AND USES FOR IMPROVED SOWING OF SEEDS	

This section allows for the applicant to claim priority to a foreign application. Providing this information in the application data sheet constitutes the claim for priority as required by 35 U.S.C. 119(b) and 37 CFR 1.55(d). When priority is claimed to a foreign application that is eligible for retrieval under the priority document exchange program (PDX) [i] the information will be used by the Office to automatically attempt retrieval pursuant to 37 CFR 1.55(h)(1) and (2). Under the PDX program, applicant bears the ultimate responsibility for ensuring that a copy of the foreign application is received by the Office from the participating foreign intellectual property office, or a certified copy of the foreign priority application is filed, within the time period specified in 37 CFR 1.55(g)(1).

			Remove
Application Number	Country [i]	Filing Date (YYYY-MM-DD)	Access Code[i] (if applicable)
1206138.8	GB	2012-04-04	
			Remove
Application Number	Country [i]	Filing Date (YYYY-MM-DD)	Access Code[i] (if applicable)
1206139.6	GB	2012-04-04	
			Remove
Application Number	Country [i]	Filing Date (YYYY-MM-DD)	Access Code[i] (if applicable)
1206141.2	GB	2012-04-04	
			Remove
Application Number	Country [i]	Filing Date (YYYY-MM-DD)	Access Code[i] (if applicable)
1206142.0	GB	2012-04-04	
			Remove
Application Number	Country [i]	Filing Date (YYYY-MM-DD)	Access Code[i] (if applicable)
1206143.8	GB	2012-04-04	
			Remove
Application Number	Country [i]	Filing Date (YYYY-MM-DD)	Access Code[i] (if applicable)
1206144.6	GB	2012-04-04	

Additional Foreign Priority Data may be generated within this form by selecting the **Add** button. Add

Application Data Sheet 37 CFR 1.76	Attorney Docket Number	Q213621
	Application Number	
Title of Invention	METHODS AND USES FOR IMPROVED SOWING OF SEEDS	

Statement under 37 CFR 1.55 or 1.78 for AIA (First Inventor to File) Transition Applications

☐ This application (1) claims priority to or the benefit of an application filed before March 16, 2013 and (2) also contains, or contained at any time, a claim to a claimed invention that has an effective filing date on or after March 16, 2013.
NOTE: By providing this statement under 37 CFR 1.55 or 1.78, this application, with a filing date on or after March 16, 2013, will be examined under the first inventor to file provisions of the AIA.

Authorization to Permit Access:

☒ Authorization to Permit Access to the Instant Application by the Participating Offices

If checked, the undersigned hereby grants the USPTO authority to provide the European Patent Office (EPO), the Japan Patent Office (JPO), the Korean Intellectual Property Office (KIPO), the World Intellectual Property Office (WIPO), and any other intellectual property offices in which a foreign application claiming priority to the instant patent application is filed access to the instant patent application. See 37 CFR 1.14(c) and (h). This box should not be checked if the applicant does not wish the EPO, JPO, KIPO, WIPO, or other intellectual property office in which a foreign application claiming priority to the instant patent application is filed to have access to the instant patent application.

In accordance with 37 CFR 1.14(h)(3), access will be provided to a copy of the instant patent application with respect to: 1) the instant patent application-as-filed; 2) any foreign application to which the instant patent application claims priority under 35 U.S.C. 119(a)-(d) if a copy of the foreign application that satisfies the certified copy requirement of 37 CFR 1.55 has been filed in the instant patent application; and 3) any U.S. application-as-filed from which benefit is sought in the instant patent application.

In accordance with 37 CFR 1.14(c), access may be provided to information concerning the date of filing this Authorization.

Applicant Information:

Providing assignment information in this section does not substitute for compliance with any requirement of part 3 of Title 37 of CFR to have an assignment recorded by the Office.

Application Data Sheet 37 CFR 1.76	Attorney Docket Number	Q213621
	Application Number	
Title of Invention	METHODS AND USES FOR IMPROVED SOWING OF SEEDS	

Applicant 1 Remove

If the applicant is the inventor (or the remaining joint inventor or inventors under 37 CFR 1.45), this section should not be completed. The information to be provided in this section is the name and address of the legal representative who is the applicant under 37 CFR 1.43; or the name and address of the assignee, person to whom the inventor is under an obligation to assign the invention, or person who otherwise shows sufficient proprietary interest in the matter who is the applicant under 37 CFR 1.46. If the applicant is an applicant under 37 CFR 1.46 (assignee, person to whom the inventor is obligated to assign, or person who otherwise shows sufficient proprietary interest) together with one or more joint inventors, then the joint inventor or inventors who are also the applicant should be identified in this section.

Clear

(•) Assignee	( ) Legal Representative under 35 U.S.C. 117	( ) Joint Inventor
( ) Person to whom the inventor is obligated to assign.	( ) Person who shows sufficient proprietary interest	

If applicant is the legal representative, indicate the authority to file the patent application, the inventor is:

Name of the Deceased or Legally Incapacitated Inventor :

If the Applicant is an Organization check here. [X]

Organization Name	Exosect Limited		
Mailing Address Information:			
Address 1	Leylands Business Park, Colden Common		
Address 2			
City	Winchester, Hampshire	**State/Province**	
Country [i]	GB	Postal Code	SO21 1TH
Phone Number		Fax Number	
Email Address			

Additional Applicant Data may be generated within this form by selecting the Add button. Add

Assignee Information including Non-Applicant Assignee Information:

Providing assignment information in this section does not subsitute for compliance with any requirement of part 3 of Title 37 of CFR to have an assignment recorded by the Office.

Assignee 1

Complete this section if assignee information, including non-applicant assignee information, is desired to be included on the patent application publication . An assignee-applicant identified in the "Applicant Information" section will appear on the patent application publication as an applicant. For an assignee-applicant, complete this section only if identification as an assignee is also desired on the patent application publication.

Remove

If the Assignee or Non-Applicant Assignee is an Organization check here. [X]

PTO/AIA/14 (12-13)
Approved for use through 01/31/2014. OMB 0651-0032
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

Application Data Sheet 37 CFR 1.76	Attorney Docket Number	Q213621
	Application Number	
Title of Invention	METHODS AND USES FOR IMPROVED SOWING OF SEEDS	

Organization Name	Exosect Limited

Mailing Address Information For Assignee including Non-Applicant Assignee:

Address 1	Leylands Business Park, Colden Common		
Address 2			
City	Winchester, Hampshire	**State/Province**	
Country i	GB	Postal Code	SO21 1TH
Phone Number		Fax Number	
Email Address			

Additional Assignee or Non-Applicant Assignee Data may be generated within this form by selecting the Add button. Add

Signature:

Remove

NOTE: This form must be signed in accordance with 37 CFR 1.33. See 37 CFR 1.4 for signature requirements and certifications

Signature	/Alan J. Kasper/			Date (YYYY-MM-DD)	2014-07-29
First Name	Alan J.	Last Name	Kasper	Registration Number	25426

Additional Signature may be generated within this form by selecting the Add button. Add

This collection of information is required by 37 CFR 1.76. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 23 minutes to complete, including gathering, preparing, and submitting the completed application data sheet form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

Privacy Act Statement

The Privacy Act of 1974 (P.L. 93-579) requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. Accordingly, pursuant to the requirements of the Act, please be advised that: (1) the general authority for the collection of this information is 35 U.S.C. 2(b)(2); (2) furnishing of the information solicited is voluntary; and (3) the principal purpose for which the information is used by the U.S. Patent and Trademark Office is to process and/or examine your submission related to a patent application or patent. If you do not furnish the requested information, the U.S. Patent and Trademark Office may not be able to process and/or examine your submission, which may result in termination of proceedings or abandonment of the application or expiration of the patent.

The information provided by you in this form will be subject to the following routine uses:

1. The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C. 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether the Freedom of Information Act requires disclosure of these records.

2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.

3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.

4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).

5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.

6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).

7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (i.e., GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.

8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspections or an issued patent.

9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

METHODS AND USES FOR IMPROVED SOWING OF SEEDS

The present invention relates to improvements in methods of controlling seed flowability and dust drift, uses of formulations or compositions for controlling flowability and dust drift, and improved methods of sowing seed. In particular, the present invention relates to improvements in methods of enhancing seed flowability and controlling dust drift, uses of formulations or compositions for enhancing flowability and controlling dust drift and improved methods of sowing seed wherein dust drift is decreased.

There exist problems associated with the sowing of seed using conventional sowing equipment, such as dust drift and seed flowability. 'Dust drift' is a term of the art and relates to *inter alia* frictional erosion between seeds causing the loss of elements of the seed coat *per se* through the rubbing together of seeds during haulage and storage movement which results in a dust made up *inter alia* of very small parts of the seed coat. The damage caused by friction to the seeds causes a loss of viability to a significant fraction of the seeds in any one batch which in turn leads to agronomic losses. The generated dust is lost to the environment through wind dispersal when seeds are loaded into seed planters and during planting operations from commercial planting machinery, and the like. Other forms of dust making up dust drift occur when prior-coated or prior-pelleted seed is subject to haulage and storage where again, damage caused by frictional erosion within seed masses leads to the formation of dust that gets into the environment. Coated or pelleted seed generally includes active agents such as pesticides and/or fertilisers and in these forms dust loaded with such active agents gets into the environment and can be spread far and wide. Indeed, it is known that dust drift that contains pesticides is responsible for harming and killing social insect populations beneficial to man, such as domesticated bee populations. Dust drift is also thought to be responsible *inter alia* for the rise in the number of cases of asthma and other respiratory diseases in humans and is suspected of contributing to a rise in incidence of certain cancers.

For the purposes of the present invention, "Seed flowability" relates to the ability of individual seeds in a seed population to flow or slide past each other. The ease of seed flowability is important in many situations such as in the use of conventional seed sowing equipment and in the use of seed storage equipment. The greater the degree of ease of flowability of seed means that seed flow can be controlled better and so germination losses due to damage to the seed coat or due to seed clumping causing blockages in conventional sowing equipment can be minimised. Conventional crop seed typically uses a mineral earth component such as talc, diatomaceous earth or kaolin as a drying agent which also acts as a flowability agent, however, such mineral earth components tend to detach from plant seeds over time.

Furthermore, such drying agents tend to cause clumping of seeds within the seed mass and as a result the clumping of seed gives rise to blockages in sowing equipment, making the sowing process less efficient. Furthermore, plant seed coating compositions tend to be added to plant seeds in the form of wet slurry which then requires drying either through the application of heat and/or the addition of further mineral earth components such as talc, kaolin or diatomaceous earth. Either way, the finished coated seed product is subjected to frictional forces during haulage, storage and sowing which results in the added seed coatings being damaged and so contributes to clumping of the seeds and concomitant losses in germination efficiency.

Commercial preparations of coated seeds such as Poncho® (Bayer) comprising pesticides are available that are alleged to be free flowing but such preparations tend to have complex coatings that *inter alia* make use of several polymer layers and other components that are expensive to produce.

There exists a need to provide seeds for planting that have improved flowability and improved dust drift control over conventional seeds.

According to the present invention, there is provided a method of controlling the flowability of plant seeds by placing the plant seeds of a mass of seeds in contact with dry free flowing particles of a flowability enhancing agent that is made up of at least one species of electret particle made up of a wax, wherein the electret particle adheres more firmly to the plant seeds than do particles that comprise a dry free flowing substance that is or includes a mineral earth component.

Typically, the control of flowability of a population of plant seeds is enhanced, that is to say, the seeds are more free-flowing than conventional plant seed populations, and exhibit reduced clumping of seeds within the seed mass than conventional plant seed populations.

The plant seeds, whether pre-coated or coated with other polymers or uncoated, are placed in contact with a the flowability enhancing agent in powdered form. The flowability enhancing agent is made up of electret particles made up of a wax material as herein defined, and does not contain other flowability agents such as particles comprising inorganic materials such as mineral earths, such as kaolin, diatomaceous earth, talc and the like.

Reference to “seed” and “seeds” is used interchangeably herein and means plant seeds selected from fodder and forage plant seeds, cereal seeds, cotton seeds, legume plant seeds, maize seeds, and field crop plant seeds, typically such seeds are viable seeds, to which compositions of use in the invention may be applied. Plant seed as provided herein means

seeds that are capable of germinating to at least conventional levels of germination typical of the relevant plant species under consideration. Thus, a plant seed of use in a method or use of the invention is one that may be grown for industrial purposes, human and/or domesticated farm animal consumption.

Thus, for the purposes of the present invention it is to be understood that the term “seed” or "seeds" herein refers to seeds produced from plants that are of commercial importance.

Cereal seeds suitable for coating with compositions of use in the invention include seeds of rice (*Oryza sativa*), wheat (Triticum spp. such as *T. aestivum*) including species such as spelt (*T. spelta*), einkorn (*T. monococcum*), emmer (*T. dicoccum*) and durum (*T. durum*), barley (*Hordeum vulgare*) including two row and six row barley, sorghum (*Sorghum bicolor*), millet species such as pearl millet (*Pennisetum glaucum*), foxtail millet (*Setaria italica*), proso millet (*Panicum miliaceum*) and finger millet (*Eleusine coracana*), oats (*Avena sativa*), rye (*Secale cereale*), Triticale (*x Triticosecale*), buckwheat (*Fagopyrum esculentum*).

For the purposes of the present invention it is to be understood that the term “cotton plant seed” refers to commercially used seeds of the family Malvaceae, typically *Gossypium* seeds which are collectively referred to herein as “cotton plant seeds” unless context demands otherwise. Cotton seeds suitable for coating with compositions of use in the invention include cotton seeds of the family Malvaceae and include representative species such as *Gossypium hirsutum* (90% of world cotton production), *Gossypium barbadense* (8% of world cotton production), and *Gossypium arboreum* (2% of world cotton production).

For the purposes of the present invention it is to be understood that the term “legume plant seed” refers to seeds of leguminous plants. Legume plant seeds suitable for coating with compositions of use in the invention include seeds of legume species of the family Fabaceae that includes species such as Alfalfa (*Medicago sativa*), Austrian winter pea (*Pisum sativum*), Berseem clover (*Trifolium alexandrinum*), Black medic (*Medicago lupulina*), Chickling vetch/pea (*Lathyrus sativus*) Cowpea (*Vigna unguiculata*), Crimson clover (*Trifolium incarnatum*), Field peas (*Pisum sativum subsp. arvense*), Hairy vetch (*Vicia villosa*), Horse beans (*Vicia faba*), Kura clover (*Trifolium ambiguum*), Mung beans (*Vigna radiate*), Red clover (*Trifolium pratense*), Soya beans (*Glycine max*), Subterranean clover (*Trifolium subterraneum*), Sunn hemp (*Crotalaria juncea L*), White clover (*Trifolium repens*), White sweet clover (*Melilotus alba*), Woolypod vetch (*Vicia villosa ssp. dasycarpa*), Yellow sweet clover (*Melilotus officinalis*), Adzuki bean, (Vigna angularis, syn.: *Phaseolus angularis*), Broad bean (*V. faba* var. major), field bean (*Vicia faba*), Vetch (*Vicia sativa*), Common beans (*Phaseolus vulgaris*), including green beans, runner beans, haricot beans and the like, Chick pea (*Cicer arietinum*), Guar bean (*Cyamopsis tetragonoloba*), Hyacinth bean (*Dolichos lablab*), Lentil

(*Lens culinaris*), Lima bean (*Phaseolus lunatus*), Lupin (*Lupinus* spp.), Mung bean (*Vigna radiata*, syn.: *Phaseolus aureus*), Pea (*Pisum sativum*), Peanut (*Arachis hypogaea*), Pigeon pea (*Cajanus cajan*), Tepary bean (*Phaseolus acutifolius*) and the like.

For the purposes of the present invention it is to be understood that the term "maize seed" refers to any kind of maize seed from a *Zea mays* plant that is for food-related production or other industrial purpose such as starch production, bio-fuel manufacture, typically ethanol manufacture, animal fodder production and the like. Examples of Zea mays varieties used in industry include flour corn (*Zea mays* var. *Amylacea*); popcorn used as a food and in packaging materials (*Zea mays* var. *Evert*); flint corn used for hominy production (*Zea mays* var. *Indurata*); sweet corn used as a food (*Zea mays* var. *saccharata* and *Zea mays* var. *Rugosa*); Waxy corn used in producing food thickening agents, in the preparation of certain frozen foods, and in the adhesive industry (*Zea mays* var. *Ceratina*); Amylomaize maiz used in the production of biodegradeable plastics (*Zea mays*); and striped maize used as an ornamental (*Zea mays* var. *Japonica*).

Maize is also known as "corn" and these two terms may be used interchangeably unless context demands otherwise.

For the purposes of the present invention it is to be understood that the term "field crop plant seed" refers to "oilseeds" and "vegetable seeds" which are collectively referred to herein as "field crop plant seeds" unless context demands otherwise.

Field crop plant seeds suitable for coating with compositions of use in the invention include oil seeds of the Crucifer family such as canola (*B. campestris*) and oilseed rape (*B. napus*); seeds of other Crucifer plant species including those of plants of the *B. oleraceae* such as seeds of types of cabbages, broccolis, cauliflowers, kales, Brussels sprouts, and kohlrabis; seeds of alliums including onion, leek and garlic. Other field crop plant seeds suitable for coating with compositions of use in methods of, and in uses of the invention include capsicums, tomatoes, cucurbits such as cucumbers, cantaloupes, summer squashes, pumpkins, butternut squashes, tropical pumpkins, calabazas, winter squashes, *w*atermelons, lettuces, zucchinis (courgettes), aubergines, carrots, parsnips, swedes, turnips, sugar beet, celeriacs, Jerusalem artichokes, artichokes, bok choi, celery, Chinese cabbage, horse radish, musk melons, parsley, radish, spinach, beetroot for table consumption, linseed, sunflower, safflower, sesame, carob, coriander, mustard, grape, flax, dika, hemp, okra, poppy, castor, jojoba and the like.

Fodder crop plant seed of use in a method or use of the invention is seed that may be grown as a stock feed for further processing such as in bio-fuel production, processed animal feed

production, field planting for farm animal consumption and the like.

For the purposes of the present invention it is to be understood that the term "fodder crop plant seed" refers to fodder crop plant seeds suitable for coating with compositions of use in the invention and includes species of the Poaceae, including *Lolium spp* such as Italian Ryegrass, Hybrid Ryegrass, and rye grasses such as perennial ryegrass (*Lolium perenne*); Festuca species such as red fescue, fescue, meadow fescue, Tall fescue, Lucerne Fescue, and the forage herbs such as chicory, Sheep's Burnett, Ribgrass (aka Robwort Plantain), Sainfoin, Yarrow, Sheep's Parsley and the like.

A flowability enhancing agent is made up of electret particles and is one that reduces the level of clumping in a seed population, such as a batch of seeds that is destined for sowing. Suitable flowability enhancement agents of use in the invention are waxes selected from natural, synthetic and mineral waxes. Typically, waxes of use as flowability enhancing agents in the invention have a melting temperature of ≥40°C, depending on design. Preferably, waxes of use in the invention include waxes having a melting point of preferably ≥50ºC, and most preferably are made up of so-called hard waxes having a melting point of ≥70ºC. Examples of natural waxes of use in the present invention include carnauba wax, beeswax, Chinese wax, shellac wax, spermaceti wax, myricyl palmitate, cetyl palmitate, candelilla wax, castor wax, ouricury wax, wool wax, sugar cane wax, retamo wax, rice bran wax and the like.

Synthetic waxes of use as flowability enhancing agents in the present invention include suitable waxes selected from paraffin wax, microcrystalline wax, Polyethylene waxes, Fischer-Tropsch waxes, substituted amide waxes, polymerized α-olefins and the like.

Mineral waxes of use as flowability enhancing agents in the invention include montan wax (e.g. Lumax® Bayer) ceresin wax, ozocerite, peat wax and the like. More preferably, the wax of use in the method of the invention comprises at least one species of wax selected from carnauba wax, montan wax, and paraffin wax or a mixture of two or more thereof.

The particles of flowability enhancing agent are added as a powder to plant seeds as a formulation of dry particles, preferably of an appropriate known volume mean diameter for the seed type to which the formulation is being added. The plant seeds may comprise pre-coated seed, partially coated seed or untreated seed, that is to say, naked seed to which a coating formulation or coating composition has not been applied prior to the addition of the flowability enhancing agent. Preferably, the flowability enhancing agent is added to a mass of plant seeds that is made up of untreated seed. The flowability enhancing agent in the form of dry particulates is simply admixed into the mass of seeds which is then gently agitated or stirred until the mixing is complete and the seeds are observed to be free flowing. The size of the particles of flowability enhancing agent typically have a volume mean diameter of any

conventional size, such as up to 200μm, preferably from 10 – 100 μm, and most preferably from 10-50μm depending on the type and size of plant seed that the particles are being applied to. Generally, the particles of use in the invention possess a volume mean diameter of ≥10μm, such as in the range of from ≥10μm to 200μm, for example from ≥10μm to 100μm; or from ≥10μm to 40μm; or from ≥10μm to 30μm or any desired volume mean diameter value in between. Preferably, dry powder formulations or compositions of the invention comprise particles having a volume mean diameter of ≥10μm, for example of 10μm, 11μm, 12μm, 13μm, 14μm, 15μm and the like up to any volume mean diameter of choice, such as up to 200μm or any volume mean diameter in between for example 40μm or 30μm. In one preferment, compositions of the invention comprise electret particles having a volume mean diameter of from about 12μm to 200μm. One advantage of such formulations or compositions of the invention is that they are observed to limit dust drift from the seeds. A further advantage is that are also considered to be less of a thoracic hazard to humans and are not thought to be allergenic.

Preferably still, the flowability enhancing agent typically does not include added further components such as added UV blockers or added antioxidants or the like. The flowability enhancing agent of use in the present invention may be made up of a mixture of one or more waxes of use in the invention in dry powder form that have a melting point at or above 40° Centigrade as herein described. Suitable mixtures of waxes may include any combination of two or more waxees selected from natural, synthetic, and mineral waxes, such as, carnauba wax and montan wax; montan wax and paraffin wax; carnauba wax and montan wax;and the like. Alternatively, the particles of wax used as flowability enhancing agents of use in the invention may be made out of two or more waxes through melting and then mixing together in the molten state. Once the molten state cools down and solidifies, the resulting composite block may be broken up and kibbled and comminuted to size conventionally as outlined herein below. In a further alternative, particles of use in the invention may be made by compressing two or more sets of particles or sheets of flowability enhancing agents together, forming a composite structure or block that may then be broken up and kibbled and comminuted to size before being applied to a seed mass. Thus, flowability enhancing agents of use in the invention may be applied as a coating composition to plant seeds by

i) obtaining organic material as a dry powder formulation of separate particles of a pre-determined VMD; and

ii) applying the said population of particles to plant seeds.

The skilled addressee will also appreciate that the pre-determined VMD will be appropriate to the plant seed to which the coating is to be applied.

The skilled addressee will appreciate that a method of coating a plant seed with a coating composition that comprises a flowability enhancing agent of use in the invention, typically comprises

i) obtaining at least one flowability enhancing agent suitable for coating plant seeds;

ii) heating the flowability enhancing agent so as to form a liquid phase or a gaseous phase;

iii) cooling the liquid phase or gaseous phase of ii) to below the melting point of the flowability enhancing agent, forming a solid;

iv) machining the solid flowability enhancing agent of step iii) into particles of a pre-determined VMD as herein defined; and

v) applying the particles of iv) to plant seeds.

"Plant seeds" and "plant seed" is used interchangeably herein and means plant seeds selected from fodder and forage plant seeds, cereal seeds, cotton seeds, legume plant seeds, maize seeds, and field crop plant seeds, typically such seeds are viable seeds, to which formulations or compositions of use in the invention may be applied. Depending on design, the plant seeds may be viable (e.g. for planting purposes), or not viable (for example, after washing for use in beer or lager production; for milling into flour, or as feedstock for other industrial processes). Preferably, plant seed as provided herein means seeds that are capable of germinating to at least conventional levels of germination typical of the relevant plant species under consideration. Thus, a plant seed of use in a method or use of the invention is one that may be grown for industrial purposes, including seed production, human and/or domesticated farm animal consumption.

Thus, for the purposes of the present invention it is to be understood that the term “seed” or "seeds" herein refers to seeds produced from plants that are of commercial importance.

Cereal seeds suitable for coating with compositions of use in the invention include seeds of rice (*Oryza sativa*), wheat (Triticum spp. such as *T. aestivum*) including species such as spelt (*T. spelta*), einkorn (*T. monococcum*), emmer (*T. dicoccum*) and durum (*T. durum*), barley (*Hordeum vulgare*) including two row and six row barley, sorghum (*Sorghum bicolor*), millet species such as pearl millet (*Pennisetum glaucum*), foxtail millet (*Setaria italica*), proso millet (*Panicum miliaceum*) and finger millet (*Eleusine coracana*), oats (*Avena sativa*), rye (*Secale cereale*), Triticale (*x Triticosecale*), buckwheat (*Fagopyrum esculentum*).

For the purposes of the present invention it is to be understood that the term “cotton plant seed” refers to commercially used seeds of the family Malvaceae, typically *Gossypium* seeds

which are collectively referred to herein as "cotton plant seeds" unless context demands otherwise. Cotton seeds suitable for coating with compositions of use in the invention include cotton seeds of the family Malvaceae and include representative *Gossypium spp.*, such as *Gossypium hirsutum* (90% of world cotton production), *Gossypium barbadense* (8% of world cotton production), and *Gossypium arboreum* (2% of world cotton production).

For the purposes of the present invention it is to be understood that the term "legume plant seed" refers to seeds of leguminous plants. Legume plant seeds suitable for coating with compositions of use in the invention include seeds of legume species of the family Fabaceae that includes species such as Alfalfa (*Medicago sativa*), Austrian winter pea (*Pisum sativum*), Berseem clover (*Trifolium alexandrinum*), Black medic (*Medicago lupulina*), Chickling vetch/pea (*Lathyrus sativus*) Cowpea (*Vigna unguiculata*), Crimson clover (*Trifolium incarnatum*), Field peas (*Pisum sativum subsp. arvense*), Hairy vetch (*Vicia villosa*), Horse beans (*Vicia faba*), Kura clover (*Trifolium ambiguum*), Mung beans (*Vigna radiate*), Red clover (*Trifolium pratense*), Soya beans (*Glycine max*), Subterranean clover (*Trifolium subterraneum*), Sunn hemp (*Crotalaria juncea L*), White clover (*Trifolium repens*), White sweet clover (*Melilotus alba*), Woolypod vetch (*Vicia villosa ssp. dasycarpa*), Yellow sweet clover (*Melilotus officinalis*), Adzuki bean, (Vigna angularis, syn.: *Phaseolus angularis*), Broad bean (*V. faba* var. major), field bean (*Vicia faba*), Vetch (*Vicia sativa*), Common beans (*Phaseolus vulgaris*), including green beans, runner beans, haricot beans and the like, Chick pea (*Cicer arietinum*), Guar bean (*Cyamopsis tetragonoloba*), Hyacinth bean (*Dolichos lablab*), Lentil (*Lens culinaris*), Lima bean (*Phaseolus lunatus*), Lupin (*Lupinus* spp.), Mung bean (*Vigna radiata*, syn.: *Phaseolus aureus*), Pea (*Pisum sativum*), Peanut (*Arachis hypogaea*), Pigeon pea (*Cajanus cajan*), Tepary bean (*Phaseolus acutifolius*) and the like.

For the purposes of the present invention it is to be understood that the term "maize seed" refers to any kind of maize seed from a *Zea mays* plant that is for food-related production or other industrial purpose such as starch production, bio-fuel manufacture, typically ethanol manufacture, animal fodder production and the like. Examples of *Zea mays* varieties used in industry include flour corn (*Zea mays* var. *Amylacea*); popcorn used as a food and in packaging materials (*Zea mays* var. *Evert*); flint corn used for hominy production (*Zea mays* var. *Indurata*); sweet corn used as a food (*Zea mays* var. *saccharata* and *Zea mays* var. *Rugosa*); Waxy corn used in producing food thickening agents, in the preparation of certain frozen foods, and in the adhesive industry (*Zea mays* var. *Ceratina*); Amylomaize maiz used in the production of biodegradeable plastics (*Zea mays*); and striped maize used as an ornamental (*Zea mays* var. *Japonica*).

Maize is also known as "corn" and these two terms may be used interchangeably unless

context demands otherwise.

For the purposes of the present invention it is to be understood that the term "field crop plant seed" refers to "oilseeds" and "vegetable seeds" which are collectively referred to herein as "field crop plant seeds" unless context demands otherwise.

Field crop plant seeds suitable for coating with compositions of use in the invention include oil seeds of the Crucifer family such as canola (*B. campestris*) and oilseed rape (*B. napus*); seeds of other Crucifer plant species including those of plants of the *B. oleraceae* such as seeds of types of cabbages, broccolis, cauliflowers, kales, Brussels sprouts, and kohlrabis; seeds of alliums including onion, leek and garlic. Other field crop plant seeds suitable for coating with compositions of use in methods of, and in uses of the invention include capsicums, tomatoes, cucurbits such as cucumbers, cantaloupes, summer squashes, pumpkins, butternut squashes, tropical pumpkins, calabazas, winter squashes, *w*atermelons, lettuces, zucchinis (courgettes), aubergines, carrots, parsnips, swedes, turnips, sugar beet, celeriacs, Jerusalem artichokes, artichokes, bok choi, celery, Chinese cabbage, horse radish, musk melons, parsley, radish, spinach, beetroot for table consumption, linseed, sunflower, safflower, sesame, carob, coriander, mustard, grape, flax, dika, hemp, okra, poppy, castor, jojoba and the like.

Fodder crop plant seed of use in a method or use of the invention is seed that may be grown as a stock feed for further processing such as in bio-fuel production, processed animal feed production, field planting for farm animal consumption and the like.

For the purposes of the present invention it is to be understood that the term "fodder crop plant seed" refers to fodder crop plant seeds suitable for coating with compositions of use in the invention and includes species of the Poaceae, including *Lolium spp* such as Italian Ryegrass, Hybrid Ryegrass, and rye grasses such as perennial ryegrass (*Lolium perenne*); *Festuca spp.* such as red fescue, fescue, meadow fescue, Tall fescue, Lucerne Fescue, and the forage herbs such as chicory, Sheep's Burnett, Ribgrass (aka Robwort Plantain), Sainfoin, Yarrow, Sheep's Parsley and the like.

The flowability enhancing agent is made up of electret particles and is one that reduces the level of clumping in a seed population, such as a batch of seeds that is destined for sowing. Suitable flowability enhancement agents of use in the invention are waxes selected from natural, synthetic and mineral waxes. Typically, waxes of use as flowability enhancing agents in the invention have a melting temperature of ≥40°C, depending on design. Preferably, waxes of use in the invention include waxes having a melting point of preferably ≥50ºC, and most preferably are made up of so-called hard waxes having a melting point of ≥70ºC. Examples of

natural waxes of use in the present invention include carnauba wax, beeswax, Chinese wax, shellac wax, spermaceti wax, myricyl palmitate, cetyl palmitate, candelilla wax, castor wax, ouricury wax, wool wax, sugar cane wax, retamo wax, rice bran wax and the like.

Synthetic waxes of use as flowability enhancing agents in the present invention include suitable waxes selected from paraffin wax, microcrystalline wax, Polyethylene waxes, Fischer-Tropsch waxes, substituted amide waxes, polymerized α-olefins and the like.

Mineral waxes of use as flowability enhancing agents in the invention include montan wax (e.g. Luwax® Bayer) ceresin wax, ozocerite, peat wax and the like.

The flowability enhancing agent of use in the invention may comprise one or more waxes as herein defined. Preferably, the wax is selected from montan wax, paraffin wax and carnauba wax. Most preferably the wax of choice is carnauba wax. Where two or more waxes of use in the invention are employed as the flowability enhancing agent in a seed coating composition of use in the invention they may be heated together so as to form a liquid phase or a gaseous phase during which phases the waxes may be mixed, if required. Once the waxes are mixed they may be cooled to below the melting point of the wax possessing the lowest melting point in the liquid phase (where a gas phase is employed, this will be cooled to a liquid phase), forming a solid which may then be machined, such as by comminution, into particles of a pre-determined VMD as herein defined using conventional procedures. Once the wax is in the form of particles of a known VMD, the particles may be applied to plant seeds via conventional means.

The flowability enhancement agent of use in the invention is applied to plant seeds in dry particulate form. The flowability enhancing agent may be selected from organic materials selected from organic waxes having a melting point of ≥40, ≥50ºC, more preferably of ≥60ºC, and most preferably are made up of hard waxes having a melting point of ≥70ºC. Suitable waxes for use in the invention include mineral waxes, synthetic waxes and natural waxes as hereinbefore defined. Examples of waxes of use in the invention include carnauba wax, beeswax, Chinese wax, shellac wax, spermaceti wax, myricyl palmitate, cetyl palmitate, candelilla wax, castor wax, ouricury wax, wool wax, sugar cane wax, retamo wax, rice bran wax or a mixture of two or more thereof. Preferably, the flowability enhancement agent includes a substantial proportion of carnauba wax up to 100%, for example 1%, 5%, 10%, 20%, 30%, 40%, 50%, 60%, 70%, 80%, 90% or any proportion thereinbetween, the rest being made up of at least one other flowability enhancement agent as herein defined. Preferably, the selected flowability enhancement agent is a wax selected from mineral waxes and natural waxes or a mixture of two or more thereof such as carnauba wax, montan wax, paraffin wax or a mixture of two or more thereof. Preferably the flowability enhancement agent

is one of or a mixture of carnauba wax and montan wax. Most preferably, the flowability enhancement agent is carnauba wax.

The skilled addressee will appreciate that the waxes of use in the invention may be applied simply as flowability enhancement agents *per se*, and in that form do not carry or contain an active agent such as a pesticide, a growth enhancing agent or other agents such as a fertiliser. Furthermore, the skilled addressee will appreciate that flowability enhancement agents of use in the invention may be added to seed coats (testa) of uncoated or non-pelleted seed typically in the form of dry particles. The skilled addressee will also appreciate that flowability enhancement agents of use in the invention may be added as an external layer on a conventional dry, pelleted seed or on a conventional dry, coated seed in the form of dry, free flowing particles. In any context of addition of flowability enhancement agents to coated, pelleted or uncoated plant seeds, the skilled addressee will appreciate that the flowability enhancing agent should be added to plant seeds in a dry particulate formulation or a powder formulation and not in a semi-liquid or a liquid form because it is envisaged that in either form, the flowability enhancing properties of such added agents are thought likely to be compromised. Naturally, the skilled addressee will appreciate that the viability of the plant seeds should not be significantly adversely affected by the addition of flowability enhancing agent.

The skilled addressee will also appreciate that where active agents may be added to flowability enhancing agents of use in the invention, effective amounts of active agent may be encapsulated or carried by the flowability enhancing agent but the level of such active agents should not significantly interfere with the ability of the flowability enhancing agent to adhere to plant seeds or of the ability of the flowability enhancing agent to control dust drift. Flowability enhancing agents of the invention may include active agents that may make up to 20% by mass of the particles, preferably up to about 10% by mass of the particles, and most preferably from about 5%-8% by mass of the particles. The choice of active agent that may be carried or encapsulated by a flowability enhancing particle of use in the invention is selected by design. Suitable active agents that may be carried by particles of use in the invention may be selected from pesticides, fertilizers, growth enhancing agents and the like.

In a further aspect of the invention there is provided use of a dry particulate free flowing formulation or composition in improving the flowability of seeds within a population of plant seeds, wherein the formulation or composition comprises at least a flowability enhancing agent that is made up of at least one species of electret particle selected from waxes, wherein the electret particles adhere more firmly to individual plant seeds than do particles that comprise a dry free flowing substance that is or includes a mineral earth component. The particles of wax of use in the invention comprise at least one species of wax selected from

mineral waxes, natural waxes and synthetic waxes as defined herein above. The selected wax comprises at least one species of wax that has a melting temperature of ≥40°C, preferably a melting temperature of ≥50°C, and most preferably a melting temperature of ≥70°C. In a preferment, the wax comprises at least one species of wax selected from carnauba wax, montan wax, and paraffin wax or a mixture of two or more thereof.

In a further aspect of the invention there is provided use of a particulate, free flowing formulation or composition in controlling dust drift, preferably in reducing the level or amount of dust drift, from a population of plant seeds, wherein the particulate free flowing formulation or composition comprises at least a flowability enhancing agent made up of dry electret particles made of wax as herein defined that are able to adhere to individual plant seeds more firmly than a dry particulate compound or composition that is a free flowing flowability enhancing agent that comprises a substance that is a mineral earth or includes a mineral earth component.

The particles of wax of use in controlling dust drift are selected from at least one species of wax selected from mineral waxes, natural waxes and synthetic waxes as defined herein above. The selected wax comprises at least one species of wax that has a melting temperature of ≥40°C, preferably a melting temperature of ≥50°C, and most preferably a melting temperature of ≥70°C. In a preferment, the wax comprises at least one species of wax selected from carnauba wax, montan wax, and paraffin wax or a mixture of two or more thereof. Most preferably, the wax is carnauba wax.

The size of the particles used in controlling dust drift typically have a volume mean diameter of any conventional size, such as up to 200µm, preferably from 10 – 100 µm, and most preferably from 10-50µm depending on the type and size of plant seed that the particles are being applied to. Generally, the particles of use in the invention possess a volume mean diameter of ≥10µm, such as in the range of from ≥10µm to 200µm, for example from ≥10µm to 100µm; or from ≥10µm to 40µm; or from ≥10µm to 30µm or any desired volume mean diameter value in between. Preferably, dry powder formulations or compositions of the invention comprise particles having a volume mean diameter of ≥10µm, for example of 10µm, 11µm, 12µm, 13µm, 14µm, 15µm and the like up to any volume mean diameter of choice, such as up to 200µm or any volume mean diameter in between for example 40µm or 30µm. In one preferment, compositions of the invention comprise electret particles having a volume mean diameter of from about 12µm to 200µm. One advantage of such formulations or compositions of the invention is that they are observed to limit dust drift from the seeds.

In a further aspect of the invention there is provided a method of controlling dust drift from a population of plant seeds by placing the plant seeds of a mass of seeds in contact with dry

free flowing particles of a flowability enhancement agent made up of electret particles made of a wax that adheres more firmly to plant seeds than a dry particulate compound or composition that is a flowability enhancement agent that comprises a substance that is a mineral earth or includes a mineral earth component.

In this aspect of the invention, the wax comprises at least one species of wax selected from mineral waxes, natural waxes and synthetic waxes. Preferably, the at least one species of wax is a wax that has a melting temperature of ≥40 °C. More preferably, the species of wax is at least one species of wax that has a melting temperature of ≥50 °C. More preferably still, the at least one species of wax has a melting temperature of ≥70 °C. Most preferably, the species of wax comprises at least one species of wax selected from carnauba wax, montan wax, and paraffin wax or a mixture of two or more thereof.

Again, the size of the particles used in the method of controlling dust drift typically have a volume mean diameter of any conventional size, such as up to 200µm, preferably from 10 – 100 µm, and most preferably from 10-50µm depending on the type and size of plant seed that the particles are being applied to. Generally, the particles of use in the invention possess a volume mean diameter of ≥10µm, such as in the range of from ≥10µm to 200µm, for example from ≥10µm to 100µm; or from ≥10µm to 40µm; or from ≥10µm to 30µm or any desired volume mean diameter value in between. Preferably, dry powder formulations or compositions of the invention comprise particles having a volume mean diameter of ≥10µm, for example of 10µm, 11µm, 12µm, 13µm, 14µm, 15µm and the like up to any volume mean diameter of choice, such as up to 200µm or any volume mean diameter in between for example 40µm or 30µm. In one preferment, compositions of the invention comprise electret particles having a volume mean diameter of from about 12µm to 200µm. One advantage of such formulations or compositions of the invention is that they are observed to limit dust drift from the seeds.

There now follow examples and figures that illustrate the invention. It is to be understood that the examples are not to be construed as limiting the invention in any way.

Figure 1: (Soya bean) Boxplot of Heubach Test Results

Figure 2: (maize) Boxplot of Heubach Test results

Figure 3: (wheat) Boxplot of Heubach Test Results (n=3)

Figure 4: (oilseed rape) Boxplot of Heubach Test Results

Examples Section:

1. Soya Bean

Objective: to assess the adhesion properties for carnauba wax (Entostat™) at a range of loadings using soya bean seed (*Glycine max*)

STUDY OUTLINE

The purpose of the study was two-fold: firstly, to assess the ability of carnauba wax particles to adhere to seed in a situation designed to replicate a commercial seed sowing environment, and, secondly, to determine a relationship between seed type, loading and adhesion. It is intended that the resulting data is applicable to a number of individual elements of the seed treatment project. Information regarding optimum loading can be combined with enumeration studies using microbial control agents to indicate the potential for carnauba wax as a simple 'dust-on" application method for biofungicides. It will also provide insight as to the possibility of a role for carnauba wax in reformulation of existing chemical seed treatments, with special emphasis on the reduction of dust-drift. Recent studies [Krupke, C.H. et al. Multiple Routes of Pesticide Exposure for Honey Bees Living Near Agricultural Fields. *PLoS ONE* **7**, e29268 (2012); Pistorius J. et al Bee Poisoning Incidents in Germany in Spring 2008 Caused by Abrasion of Active Substance from Treated Seeds During Sowing of Maize. *Julius-Kühn-Archiv* **423**, (2009)] have identified that the drift of material from treated seeds during sowing is responsible for large scale bee mortality.

The described method is intended to assess the amount of free floating dust and abrasion particles of treated seeds under defined mechanical stress conditions.

Treated seeds are mechanically stressed inside a rotating drum. A vacuum pump creates an air flow through the rotating drum, the connected glass cylinder and the attached filter unit. By the air flow, abraded dust particles are transported out of the rotating drum through the glass cylinder and subsequently through the filter unit. Coarse non-floating particles are separated and collected in the glass cylinder while floating dust particles are deposited onto a filter. The amount of floating dust collected on the filter is determined gravimetrically.

TEST ITEM DETAILS

Steps in Air Milling in Boyes Micronisation Process (for carnauba wax particles having a VMD of approx. 10µm)

1. 2kg carnauba wax blocks are first kibbled into approximately 4 to 6mm pieces in a KT Handling Ltd Model 04 kibbler (serial no. 729/C) following the manufacturer's instructions.

2. The kibbled pieces are then passed through a Apex Construction Ltd Model 314.2 Comminuting Mill (serial no. A21306) and reduced further in size to a range of 250 to 300um.

3. The comminuted particles are then passed through a Hosokawa Micron Ltd Alpine 100AFG jet mill (serial no. 168092) following the manufacturer's instructions, setting the mill at a speed of 12500rpm, with a positive system pressure of 0.03bar.

4. The grinding air is to be kept to 6 bar, the system rinsing air flow and Classifying Wheel gap rinsing air are both to be set at a minimum of 0.5 bar and no more than 0.75bar, the cleaning air filter is to register a delta of no more than 5bar to achieve a final particle size with a VMD of 9.58um.

Carnauba wax was combined with soya bean seed at three loadings (see below).

Soya bean seed (Pripyat), supplied by Soya UK (West End, Hampshire).

REFERENCE ITEM DETAILS

- Soya bean pre-treated with Thiraflo (Chemtura, Laurenceville, USA)
- Talc – Simple Talc, Unscented, Johnsons

TREATMENTS

1. Soybean treated with 0.01% carnauba wax (by mass)
2. Soybean treated with 0.1% carnauba wax (by mass)
3. Soybean treated with 1% carnauba (by mass)
4. Soybean treated with 1% Talc (by mass)
5. Soybean, untreated

All treatments were replicated three times

TEST SYSTEM

Apparatus: An analytical balance (accuracy 0.1 mg). As the last digit of a scale carries a larger error it is recommended to use a 5-decimal scale to achieve an accurate reading of the 4th decimal.

Heubach Dustmeter device (Heubach GmbH, Heubachstrasse 7, 38685 Langelsheim, Germany)

- Metal rotating drum
- Glass cylinder
- Non-electrostatic filter housing with conditioned glassfibre filter disc (Whatman GF 92 or Macherey Nagel Type MN 85/70 BF, or equivalent specification)
- Drive & control unit with touchscreen control panel

Constant climate chamber (e.g. Binder, KBF 720)

Paper bags (not airtight)

Air ionizer (e.g. Sartorius, STAT-FAN YIB-01, or PRX U field ionizer from Haug GmbH, Germany, or equivalent)

Seed Counter (e.g. Pfeuffer, Contador or GTA Sensorik, Marvin, or equivalent)

SAMPLE

A sample must consist of at least 500 g +/- 5% of seeds. The thousand grain weight (TGW) of the seeds is listed below:

Seed Type	**Thousand Grain Weight g (TGW)**
Soya bean	161

Samples were prepared in block bottom bags (1.4kg)150x32x310mm. 250g of seed were added, followed by the appropriate quantity of the required treatment, before the final 250g of seed were added. The bags were then agitated for 20 seconds to ensure an even distribution of treatment throughout the seed sample. The bags were then labelled and sealed and sent to the test site at INCOTEC Analytical Lab Europe BV, Graanmarkt 3a,1681 PA Zwaagdijk-Oost, The Netherlands.

Sample Schedule

sample number	**Crop**	**Treatment**	**%age**	**by mass (g)**	**Replicate**
1	Soybean	untreated control	n/a	n/a	1
2	Soybean	untreated control	n/a	n/a	2
3	Soybean	untreated control	n/a	n/a	3
4	Soybean	Entostat™	0.01	0.05	1
5	Soybean	Entostat™	0.01	0.05	2
6	Soybean	Entostat™	0.01	0.05	3
7	Soybean	Entostat™	0.1	0.5	1
8	Soybean	Entostat™	0.1	0.5	2
9	Soybean	Entostat™	0.1	0.5	3
10	Soybean	Entostat™	1.0	5	1
11	Soybean	Entostat™	1.0	5	2
12	Soybean	Entostat™	1.0	5	3
13	Soybean	Commercial	n/a	n/a	1
14	Soybean	Commercial	n/a	n/a	2
15	Soybean	Commercial	n/a	n/a	3
16	Soybean	Talc	1.0	5	1

17	Soybean	Talc	1.0	5	2
18	Soybean	Talc	1.0	5	3

Commercial Seed Treatments used:

Soybean Thiraflo

Procedure: use guidelines defined by European Seed Association STAT Dust Working Group,(Version 1.0, 23.03.2011).

Laboratory Conditions

The test has to be performed in a laboratory (separated from the treating area) at 20ºC to 25ºC and 30% to 70% relative humidity which is free of free floating dust particles. Any other testing which could interfere with the analytical scales (electrostatics, vibrations etc.) should be avoided.

Calibration

No calibration is necessary before measurement. It is recommended that the air flow rate, time of measurements and rotational settings are checked on a routine basis (every 2-3 years) by the technical service of the manufacturer or an equivalent qualified technical service.

Apparatus preparation

During initial installation of the Heubach equipment make sure that the same is horizontally levelled.

After disconnecting the vacuum tube from the filter unit, the Heubach device is stepwise disassembled: the filter unit is removed and opened, the glass cylinder removed and finally the metal drum removed and opened.

Make sure that all components which are in contact with seed or dust (i.e. rotating drum, glass cylinder, and filter unit including rubber O-ring) have been thoroughly cleaned. Cleaning is routinely done using a vacuum cleaner with a pointed nozzle.

Note: If the drum is either used for the first time in this test or has been cleaned with alcohol there is a need to run 2 cycles with treated seeds before starting the actual measurements on your samples. This ensures a constant occupancy of the pores in the metal surface.

Switch on the main power of the Heubach device min. 30 minutes before starting any measurement in order to allow proper warm-up of the flow meter. For setting the parameters on the control panel choose the program “User Method” in which the parameters are manually set to the values below. It is recommended to set the parameters after full assembly of the device.

Parameter settings

Rotation speed	=	30 [rpm]
Rotation time	=	120 s
Airflow rate	=	20 [litres per minute]

Sample Preparation

Prior to testing, seed samples are stored in a constant climate chamber for at least 48 hours (2 days) at 20°C ± 2°C and at 50% ± 10% relative humidity. To allow equilibration, seeds must be kept in paper bags (not airtight) when entering the climate chamber.

For obtaining a working sample a gentle method should be used to reduce the submitted sample in size to the size needed for the test. This to avoid damage to the treated seed which could lead to artificially enhanced dust levels. Examples of gentle methods are the modified halving method, the spoon method and the hand halving method described in the ISTA Rules.

Measurement

Carefully transfer (avoid dust) 100 ± 1 grams of the conditioned seeds (weight seeds w_S [g]; accuracy: 0.01 gram) into the metal drum of the Heubach device, then correctly close and reassemble the drum and connect the glass cylinder. The system has to be levelled perfectly horizontally and no obstruction of the rotating parts and of the internal or external airflow must take place.

The time for transferring and analysing the sample is to be kept as short as possible in order to avoid a change in its relative humidity. A contamination with non-seed dust particles must be excluded.

Place a glassfibre filter disc (Whatman GF 92 or similar specification) in the filter unit according to the description in the manual. For equilibration with the laboratory conditions, the filter discs will be stored in an open box next to the Heubach device. In order to prevent effects resulting from electrostatic charging, the use of a non-electrostatic filter-housing offered by HEUBACH is compulsory to use**.** The filter unit including the filter disc is weighed (weight filter assembly w0 [g]; accuracy: 0.1 mg), placed on the glass cylinder and connected to the vacuum tube.

On the control panel pre-select the “time” option. Start the rotation cycle by pressing “I” on the control panel. After completion of the run, the rotation must have fully stopped before any parts of the apparatus may be disassembled. Remove the filter unit including the filter disc carefully from the glass cylinder and weigh it in the same manner as described before (weight filter assembly w1 [g]; accuracy: 0.1 mg).

If significant amounts of dust have passed *through* the filter disc (by visible inspection), the test must be stopped immediately and the filter unit checked for incorrect assembly or damages. If necessary, it has to be replaced and the test has to be repeated.

The test has to be performed twice. After each measurement, the apparatus must be cleaned.

If the rotation speed (rpm) displayed on the control panel during the measurement deviates more than ±10 % from the pre-set value or if the total air volume sampled during the measurement deviates more than ±10 % from the expected volume of 40 L (20 L/min for 2 min) the measurement has to be redone.

As a back-up control for the air volume a separate flow-meter [e.g. DFM Typ SVB (Uniflux ¼") from VAF-Fluid-Technik GmbH, Germany; www.vaf-fluidtechnik.de] can be inserted in the plastic air hose.

Evaluation and Calculation of Results

The Heubach dust value is expressed in g / 100 kg of treated seeds. Depending on requirements and seed type tested, the result can be also expressed in g / 100,000 kernels, taking into account the Thousand Seed Weight (TSW) of the tested sample.
Use the following formula to convert the measured result to the Heubach dust value:

$$\text{Heubach dust value} = \frac{(W_1 - W_0) \times 100{,}000}{W_S} \text{ [g / 100 kg]}$$

or alternatively expressed in g / 100,000 kernels :

$$\text{Heubach dust value} = \frac{(W_1 - W_0) \times 100 \times TGW}{W_S} \text{ [g / 100,000 kernels]}$$

wherein:

W_1	=	weight of the loaded filter unit incl. filter disc [g]
W_0	=	weight of the empty filter unit incl. filter disc [g]
W_S	=	weight of the treated seeds [g]
100,000	=	conversion factor a [ ]
100	=	conversion factor b [ ]
TGW	=	Thousand Grain Weight [g / 1000 kernels]

The final result is the mean of the two measurements. If a threshold value is defined the test must be repeated if one test result is higher than 50% of the threshold value and if the two test results differ more than 20% from each other. In case of experimental or voluntarily purposes without a mandated threshold value (e.g. small seeded crops) the test must be repeated if the

two test results differ more than 20% and at least one test result exceeds 1 g/100 kg. If both test results are below 1 g/100 kg and the two results differ more than 0.2 g the test must be repeated.

Simultaneous Tests for General Linear Hypotheses

Source	DF	SS	MS	F	P
Treatment	5	6018.0	1203.6	21.78	>0.0001
Error	12	663.2	55.3		
Total	17	6681.2			

Multiple Comparisons of Means: Tukey Contrasts

Grouping Information Using Tukey Method

Treatment	N	Mean	Grouping
Soya beanTalc1	3	50.370	A
Soya beanEnto1	3	5.495	B
Soya beancontrol	3	0.668	B
Soya beanEnt0.1	3	0.590	B
Soya beanEnt0.01	3	0.536	B
Soya beanComm	3	0.442	B

Means that do not share a letter are significantly different.

Fit: aov(formula = MeanDust ~ Crop, data = Soybean)

Linear Hypotheses:

	Estimate	Std. Error	t value	Pr(>|t|)
Soyacontrol–SoyaComm	0.22633	6.06997	0.037	1.000
SoyaEnt0.01-SoyaComm	0.09433	6.06997	0.016	1.000
SoyaEnt0.1-SoyaComm	0.14800	6.06997	0.024	1.000
SoyaEnto1-SoyaComm	5.05333	6.06997	0.833	0.955
SoyaTalc1-SoyaComm	49.92833	6.06997	8.225	<1e-04 ***
SoyaEnt0.01-Soyac'trl	0.13200	6.06997	-0.022	1.000
SoyaEnt0.1–Soyac'trl	0.07833	6.06997	-0.013	1.000

SoyaEnt1–Soyac'trl	4.82700	6.06997	0.795	0.963
SoyaTalc1–Soyac'trl	49.70200	6.06997	8.188	<1e-04 ***
SoyaEnt0.1-SoyaEnt0.01	0.05367	6.06997	0.009	1.000
SoyaEnto1-SoyaEnt0.01	4.95900	6.06997	0.817	0.959
SoyaTalc1-SoyaEnt0.01	49.83400	6.06997	8.210	<1e-04 ***
SoyaEnt1-SoyaEnt0.1	4.90533	6.06997	0.808	0.960
SoyaTalc1-SoyaEnt0.1	49.78033	6.06997	8.201	<1e-04 ***
SoyaTalc1-SoyaEnto1	44.87500	6.06997	7.393	<1e-04 ***

Signif. codes: 0 '***'

Results are shown in Figure 1

METHOD FOR ASSESSING FLOWABILITY/PLANTABILITY

Seed treatments are assessed to measure their impact on the plantability and flowability of the treated seed. "Plantability" relates to a measurement of sowing inaccuracies, such as, seed dropping failures and double seed drops occurring within a predetermined distance or area. "Flowability" refers to the treated seeds ability to flow or move through a typical planting process using conventional sowing equipment. Clogging and clumping of seeds that may occur through the sowing process is a factor that affects the efficiency of flowability of seed. If clumping and clogging occurs it can lead to an uneven stand of crops. Internal friction angles and the flowability index (the ratio of the highest consolidation stress and unconfined yield strength) of the material are measured.

The coefficient of uniformity for the Entostat treated seed is compared to that of untreated and commercially treated seed (polymer-coated and talc).

SGS Crop and Seed Services (Geneva, Switzerland) provide a testing service for the determination of flowability/plantability of seed to the public in accordance with standardised protocols that are widely acceptable to the seed industry.

Results

Differences in flowability/plantability from the treated soya bean seed are observed relative to controls.

2. Perennial Rye Grass

Objective: to assess the adhesion properties for carnauba wax (Entostat™) at a range of loadings using seeds of perennial rye grass (*Lolium perenne*).

STUDY OUTLINE

Same as for example 1 (soya bean).

TEST ITEM DETAILS

Steps in air milling are the same as for soya bean (above) with the exception that carnauba wax was combined with perennial rye grass seed at three loadings (see below).

Perennial rye grass seed was supplied by Herbiseeds Ltd. (Twyford, UK)

REFERENCE ITEM DETAILS

- Perennial rye grass seed pre-treated with Advance, thiazole (Chemtura Agrosolutions)
- Talc - Simple Talc, unscented, Johnsons

TREATMENTS

1. Rye grass seed treated with 0.01% carnauba wax (by mass)
2. Rye grass seed treated with 0.1% carnauba wax (by mass)
3. Rye grass seed treated with 1% carnauba wax (by mass)
4. Rye grass seed treated with 1% Talc (by mass)
5. Rye grass seed, untreated

All treatments were replicated three times

TEST SYSTEM

Apparatus: same as for soya bean example 1.

SAMPLE

A sample must consist of at least 500 g +/- 5% of seeds. The thousand grain weight (TGW) of the seeds is listed below:

Seed Type	Thousand Grain Weight g (TGW)
Rye grass seed	1.5

Samples are prepared in block bottom bags (1.4kg) 150x32x310mm. 250g of seed is added, followed by the appropriate quantity of the required treatment, before the final 250g of seed is added. The bags are then agitated for 20 seconds to ensure an even distribution of treatment throughout the seed sample. The bags are then labelled and sealed and are sent to the test site.

Sample Schedule

Sample No.	Crop	Treatment	%	by mass	Replicate
1	Rye	untreated control	n/a	n/a	1
2	Rye	untreated control	n/a	n/a	2
3	Rye	untreated control	n/a	n/a	3
4	Rye	Entostat™	0.01	0.05	1
5	Rye	Entostat™	0.01	0.05	2
6	Rye	Entostat™	0.01	0.05	3
7	Rye	Entostat™	0.1	0.5	1
8	Rye	Entostat™	0.1	0.5	2
9	Rye	Entostat™	0.1	0.5	3
10	Rye	Entostat™	1.0	5	1
11	Rye	Entostat™	1.0	5	2
12	Rye	Entostat™	1.0	5	3
13	Rye	Commercial	n/a	n/a	1
14	Rye	Commercial	n/a	n/a	2
15	Rye	Commercial	n/a	n/a	3
16	Rye	Talc	1.0	5	1
17	Rye	Talc	1.0	5	2
18	Rye	Talc	1.0	5	3

Commercial Seed Treatments

Rye grass Advance, thiazole

PROCEDURE: see guidelines defined by European Seed Association STAT Dust Working Group, (Version 1.0, 23.03.2011)

Laboratory Conditions

The test is performed in a laboratory (separated from the treating area) at 20ºC to 25ºC and 30% to 70% relative humidity, free of free floating dust particles.

Calibration

No calibration is necessary before measurement. It is recommended that the air flow rate, time of measurements and rotational settings are checked on a routine basis (every 2-3 years) by the technical service of the manufacturer or an equivalent qualified technical service.

Apparatus preparation

Same as for example 1 (soya bean).

Parameter settings

Same as for example 1 (soya bean).

Sample Preparation

Same as for example 1.

Measurement

Same as for example 1.

Evaluation and Calculation of Results

Same as for example 1.

METHOD FOR ASSESSING FLOWABILITY/PLANTABILITY

Same as for example 1.

Results

Differences in flowability/plantability from the treated rye grass seed are observed relative to controls.

3. Cotton

Objective: to assess the adhesion properties for Entostat™ at a range of loadings using seed types: cotton (*Gossypium hirsutum*).

STUDY OUTLINE

Same as for example 1.

TEST ITEM DETAILS

Steps in air milling are the same as for soya bean (above) with the exception that carnauba wax (Entostat™) was combined with cotton seed at three loadings (see below).

Cotton seed (MRC 270, non-GMO) was supplied by MRC Seeds (Houston, TX, USA).

REFERENCE ITEM DETAILS

- Cotton seed pre-treated with Headline – F500 (BASF Agro, Germany), supplied by MRC seeds, Houston, TX, USA
- Talc - simple talc, unscented, Johnsons

TREATMENTS

1. Cotton seed treated with 0.01% carnauba wax (by mass)
2. Cotton seed treated with 0.1% carnauba wax (by mass)
3. Cotton Seed treated with 1% carnauba wax (by mass)
4. Cotton Seed treated with 1% Talc (by mass)
5. Cotton Seed, untreated

All treatments were replicated three times

TEST SYSTEM

Apparatus: same as for example 1.

SAMPLE

A sample must consist of at least 500 g +/- 5% of seeds. The thousand grain weight (TGW) of

the seeds is listed below:

Seed Type	Thousand Grain Weight g (TGW)
Cotton	125

Samples are prepared as in example 1.

Sample Schedule

sample number	Crop	Treatment	%age	by mass	Replicate
1	Cotton	untreated control	n/a	n/a	1
2	Cotton	untreated control	n/a	n/a	2
3	Cotton	untreated control	n/a	n/a	3
4	Cotton	Entostat™	0.01	0.05	1
5	Cotton	Entostat™	0.01	0.05	2
6	Cotton	Entostat™	0.01	0.05	3
7	Cotton	Entostat™	0.1	0.5	1
8	Cotton	Entostat™	0.1	0.5	2
9	Cotton	Entostat™	0.1	0.5	3
10	Cotton	Entostat™	1.0	5	1
11	Cotton	Entostat™	1.0	5	2
12	Cotton	Entostat™	1.0	5	3
13	Cotton	Commercial	n/a	n/a	1
14	Cotton	Commercial	n/a	n/a	2
15	Cotton	Commercial	n/a	n/a	3
16	Cotton	Talc	1.0	5	1
17	Cotton	Talc	1.0	5	2
18	Cotton	Talc	1.0	5	3

Commercial Seed Treatments

Cotton Headline – F500

Procedure: see guidelines defined by European Seed Association STAT Dust Working Group, (Version 1.0, 23.03.2011)

Laboratory Conditions

The test is performed in a laboratory (separated from the treating area) at 20ºC to 25ºC and 30% to 70% relative humidity which is free of free floating dust particles.

Calibration

Same as for example 1.

Apparatus preparation

Same as for example 1.

Parameter settings

Same as for example 1.

Sample Preparation

Same as for example 1.

Measurement

Same as for example 1.

Evaluation and Calculation of Results

Same as for example 1.

METHOD FOR ASSESSING FLOWABILITY/PLANTABILITY

Same as for example 1.

Results

Differences in flowability/plantability from treated cotton seed are observed relative to controls.

4. Maize

Objective: to assess the adhesion properties of Entostat® (Exosect Limited) at a range of loadings using maize (*Zea mays*) seed.

STUDY OUTLINE

The same as that for example 1.

TEST ITEM DETAILS

Steps in Air Milling are the same as for example 1 except that Entostat™ was combined with maize seed at three loadings (see below).

Maize seed (DUO maize) was supplied by Bright Seeds Ltd. (Burcombe, Wiltshire)

REFERENCE ITEM DETAILS

- Maize seed pre-treated with Poncho, (Bayer CropScience AG, Monheim am Rhein, Germany)
- Talc – Simple Talc, Unscented, Johnsons

TREATMENTS

1. Maize treated with 0.01% Entostat™ (by mass)
2. Maize treated with 0.1% Entostat™ (by mass)
3. Maize treated with 1% Entostat™ (by mass)
4. Maize treated with 1% Talc (by mass)
5. Maize, untreated

All treatments were replicated three times

TEST SYSTEM

Apparatus: same as that used in example 1.

SAMPLE

A sample must consist of at least 500 g +/- 5% of seeds. The thousand grain weight (TGW) of the seeds is listed below:

Seed Type	**Thousand Grain Weight g (TGW)**
Maize	380

Samples were prepared in block bottom bags as in example 1, and sent off to The Netherlands for testing.

Sample Schedule

sample number	**Crop**	**Treatment**	**%age**	**by mass**	**Replicate**
1	Maize	untreated control	n/a	n/a	1
2	Maize	untreated control	n/a	n/a	2
3	Maize	untreated control	n/a	n/a	3
4	Maize	Entostat™	0.01	0.05	1
5	Maize	Entostat™	0.01	0.05	2
6	Maize	Entostat™	0.01	0.05	3
7	Maize	Entostat™	0.1	0.5	1
8	Maize	Entostat™	0.1	0.5	2
9	Maize	Entostat™	0.1	0.5	3
10	Maize	Entostat™	1.0	5	1
11	Maize	Entostat™	1.0	5	2
12	Maize	Entostat™	1.0	5	3
13	Maize	Commercial	n/a	n/a	1
14	Maize	Commercial	n/a	n/a	2
15	Maize	Commercial	n/a	n/a	3
16	Maize	Talc	1.0	5	1
17	Maize	Talc	1.0	5	2
18	Maize	Talc	1.0	5	3

Commercial Seed Treatments Used

Maize Poncho

Procedure: use guidelines defined by European Seed Association STAT Dust Working

Group(Version 1.0, 23.03.2011).

Laboratory Conditions

Same as for example 1.

Calibration

Same as for example 1.

Apparatus preparation

Same as for example 1.

Parameter settings

Same as for example 1.

Sample Preparation

Same as for example 1.

Measurement

Same as for example 1.

Evaluation and Calculation of Results

Same as for example 1.

Results are shown in Figure 2

Simultaneous Tests for General Linear Hypotheses

Source	DF	SS	MS	F	P
Crop	5	9001.2	1800.2	71.73	>0.0001
Error	12	301.2	25.1		
Total	17	9302.4			

Multiple Comparisons of Means: Tukey Contrasts

Grouping Information Using Tukey Method

Crop	N	Mean	Grouping
MaizeTalc1	3	61.014	A
MaizeEnt1	3	22.872	B
MaizeEnt0.1	3	1.620	C
MaizeComm	3	0.537	C
MaizeEnt0.01	3	0.386	C
Maizecontrol	3	0.121	C

Means that do not share a letter are significantly different.

Linear Hypotheses:

	Estimate	Std.Error	t value	Pr(>|t|)
Maizecont – MaizeComm	0.416	4.090	0.102	1.000
MaizeEnt0.01 – MaizeComm	0.151	4.090	0.037	1.000
MaizeEnt0.1 – MaizeComm	1.083	4.090	0.265	0.999
MaizeEnt1 – MaizeComm	22.335	4.090	5.460	0.001**
MaizeTalc1 – MaizeComm	60.476	4.090	14.785	<0.001***
MaizeEnt0.01 – Maizecont	0.265	4.090	0.065	1.000
MaizeEnt0.1 – Maizecont	1.499	4.090	0.367	0.998
MaizeEnt1 – Maizecont	22.751	4.090	5.562	0.001**
MaizeTalc1 – Maizecont	60.893	4.090	14.887	<0.001***
MaizeEnt0.1 - MaizeEnt0.01	1.234	4.090	0.302	0.999
MaizeEnt1 - MaizeEnt0.01	22.486	4.090	5.497	0.001**
MaizeTalc1 - MaizeEnt0.01	60.628	4.090	14.822	<0.001***
MaizeEnt1 - MaizeEnt0.1	21.252	4.090	5.196	0.002**
MaizeTalc1 - MaizeEnt0.1	59.393	4.090	14.520	<0.001***
MaizeTalc1 - MaizeEnt1	38.141	4.090	9.325	<0.001***

Statistical significance codes: 0 '***' 0.001 '**'

METHOD FOR ASSESSING FLOWABILITY/PLANTABILITY

Same as that used in example 1.

Results

Differences in flowability/plantability from the treated maize seed are observed relative to controls.

5. Wheat

Objective: to assess the adhesion properties for carnauba wax (Entostat™, Exosect Ltd) at a range of loadings using wheat seed (*Triticum aestivum*).

STUDY OUTLINE

The same as that described in example 1.

TEST ITEM DETAILS

Steps in Air Milling are the same as those used in example 1 except that Entostat™ was combined with wheat seed at three loadings (see below). Wheat seed was supplied by a local farmer.

REFERENCE ITEM DETAILS

- Wheat pre-treated with Kinto (BASF SE, Limburgerhof, Germany)
- Talc – Simple Talc, Unscented, Johnsons

TREATMENTS

1. Wheat treated with 0.01% Entostat™ (by mass)
2. Wheat treated with 0.1% Entostat™ (by mass)
3. Wheat treated with 1% Entostat™ (by mass)
4. Wheat treated with 1% Talc (by mass)
5. Wheat, untreated

All treatments were replicated three times

TEST SYSTEM

Apparatus: same as that used in example 1.

SAMPLE

A sample must consist of at least 500 g +/- 5% of seeds. The thousand grain weight (TGW) of the seeds is listed below:

Seed Type	**Thousand Grain Weight g (TGW)**
Wheat	50

Samples were prepared as in example 1 and sent for testing in The Netherlands (see example 1).

Sample Schedule

sample number	**Crop**	**Treatment**	**%age**	**by mass**	**Replicate**
1	Wheat	untreated control	n/a	n/a	1
2	Wheat	untreated control	n/a	n/a	2
3	Wheat	untreated control	n/a	n/a	3
4	Wheat	Entostat™	0.01	0.05	1
5	Wheat	Entostat™	0.01	0.05	2
6	Wheat	Entostat™	0.01	0.05	3

7	Wheat	Entostat™	0.1	0.5	1
8	Wheat	Entostat™	0.1	0.5	2
9	Wheat	Entostat™	0.1	0.5	3
10	Wheat	Entostat™	1.0	5	1
11	Wheat	Entostat™	1.0	5	2
12	Wheat	Entostat™	1.0	5	3
13	Wheat	Commercial	n/a	n/a	1
14	Wheat	Commercial	n/a	n/a	2
15	Wheat	Commercial	n/a	n/a	3
16	Wheat	Talc	1.0	5	1
17	Wheat	Talc	1.0	5	2
18	Wheat	Talc	1.0	5	3

Commercial Seed Treatments Used

Wheat Kinto

Procedure: see guidelines defined by European Seed Association STAT Dust Working Group, (Version 1.0, 23.03.2011)

Laboratory Conditions

The test is performed in a laboratory (separated from the treating area) at 20ºC to 25ºC and 30% to 70% relative humidity which is free of free floating dust particles. Any other testing which could interfere with the analytical scales (electrostatics, vibrations etc.) should be avoided.

Calibration

Same as for example 1.

Apparatus preparation

Same as for example 1.

Parameter settings

Same as for example 1.

Sample Preparation

Same as for example 1.

Measurement

Same as for example 1.

Evaluation and Calculation of Results

Same as for example 1.

Results are shown in Figure 3.

Simultaneous Tests for General Linear Hypotheses

Source	DF	SS	MS	F	P
Treatment	5	14705.2	2941.0	223.74	>0.0001
Error	12	157.7	13.1		
Total	17	14862.9			

Multiple Comparisons of Means: Tukey Contrasts

Grouping Information Using Tukey Method

Treatment	N	Mean	Grouping
WheatTalc1	3	83.299	A
WheatEnt1	3	33.020	B
WheatEnt0.1	3	16.002	C
WheatEnt0.01	3	5.651	D
Wheatcontrol	3	3.229	D
WheatComm	3	2.276	D

Means that do not share a letter are significantly different.

Linear Hypotheses:

	Estimate	**Std. Error**	**t value**	**Pr(>|t|)**
Wheatcontrol – WheatComm	0.953	2.960	0.322	0.999
WheatEnt0.01 – WheatComm	3.375	2.960	1.140	0.855
WheatEnt0.1 – WheatComm	13.726	2.960	4.637	0.005 **
WheatEnt1 – WheatComm	30.744	2.960	10.385	<0.001***
WheatTalc1 – WheatComm	81.023	2.960	27.370	<0.001***
WheatEnt0.01 – Wheatcont	2.422	2.960	0.818	0.958
WheatEnt0.1 – Wheatcont	12.773	2.960	4.315	0.009 **
WheatEnt1 – Wheatcont	29.791	2.960	10.063	<0.001***
WheatTalc1 – Wheatcont	80.070	2.960	27.048	<0.001***
WheatEnt0.1 – WheatEnt0.01	10.351	2.960	3.497	0.039 *
WheatEnt1 - WheatEnt0.01	27.369	2.960	9.245	<0.001***
WheatTalc1 - WheatEnt0.01	77.648	2.960	26.230	<0.001 ***
WheatEnt1 - WheatEnt0.1	17.018	2.960	5.749	<0.001***
WheatTalc1 - WheatEnt0.1	67.297	2.960	22.733	<0.001 ***
WheatTalc1 - WheatEnt1	50.279	2.960	16.984	<0.001 ***

Statistical significance codes: 0 '***' 0.001 '**' 0.01 '*'

METHOD FOR ASSESSING FLOWABILITY/PLANTABILITY

Same as for example 1.

Results

Differences in flowability/plantability from the treated wheat seed are observed relative to controls.

6. Oilseed rape (OSR)

Objective: to assess the adhesion properties for Entostat at a range of loadings using oilseed rape (*Brassica napus*).

STUDY OUTLINE

Same as for example 1.

TEST ITEM DETAILS

Steps in Air Milling are the same as for example 1 with the exception that Entostat was combined with oilseed rape seed at three loadings (see below). Oilseed Rape seed (Sesame, LS Plant Breeding) was supplied by Ebbage Seeds Ltd. (Downham Market, Norfolk)

REFERENCE ITEM DETAILS

- Oilseed Rape (Sesame, LS Plant Breeding) pre-treated with Modesto (Bayer CropScience AG, Monheim am Rhein, Germany)
- Talc – Simple Talc, Unscented, Johnsons

TREATMENTS

1. Oilseed Rape treated with 0.01% Entostat (by mass)
2. Oilseed Rape treated with 0.1% Entostat (by mass)
3. Oilseed Rape treated with 1% Entostat (by mass)
4. Oilseed Rape treated with 1% Talc (by mass)
5. Oilseed Rape, untreated

All treatments were replicated three times

TEST SYSTEM

Apparatus: same as that used in example 1.

SAMPLE

A sample must consist of at least 500 g +/- 5% of seeds. The thousand grain weight (TGW) of

the seeds is listed below:

Seed Type	Thousand Grain Weight g (TGW)
Oilseed Rape	2.9

Samples were prepared in block bottom bags as described in example 1, and tested in The Netherlands.

Sample Schedule

sample number	Crop	Treatment	%age	by mass	Replicate
1	OSR	untreated control	n/a	n/a	1
2	OSR	untreated control	n/a	n/a	2
3	OSR	untreated control	n/a	n/a	3
4	OSR	Entostat™	0.01	0.05	1
5	OSR	Entostat™	0.01	0.05	2
6	OSR	Entostat™	0.01	0.05	3
7	OSR	Entostat™	0.1	0.5	1
8	OSR	Entostat™	0.1	0.5	2
9	OSR	Entostat™	0.1	0.5	3
10	OSR	Entostat™	1.0	5	1
11	OSR	Entostat™	1.0	5	2
12	OSR	Entostat™	1.0	5	3
13	OSR	Commercial	n/a	n/a	1
14	OSR	Commercial	n/a	n/a	2
15	OSR	Commercial	n/a	n/a	3
16	OSR	Talc	1.0	5	1
17	OSR	Talc	1.0	5	2
18	OSR	Talc	1.0	5	3

Commercial Seed Treatments Used: Modesto on oilseed rape

Procedure: see the guidelines defined by European Seed Association STAT Dust Working Group, (Version 1.0, 23.03.2011).

Laboratory Conditions

The test was performed in a laboratory (separated from the treating area) at 20ºC to 25ºC and 30% to 70% relative humidity free of free floating dust particles.

Calibration

No calibration is necessary before measurement. Air flow rate, time of measurements and rotational settings are checked on a routine basis (every 2-3 years) by the technical service of the manufacturer or an equivalent qualified technical service.

Apparatus preparation

Same as for example 1.

Parameter settings

Same as for example 1.

Sample Preparation

Same as for example 1.

Measurement

Same as for example 1.

Evaluation and Calculation of Results

Same as for example 1.

Results are shown in Figure 4.

Simultaneous Tests for General Linear Hypotheses

Source	DF	SS	MS	F	P
Treatment	5	3426.83	685.37	76.66	>0.0001
Error	12	107.28	8.94		
Total	17	3534.11			

Multiple Comparisons of Means: Tukey Contrasts

Grouping Information Using Tukey Method

Treatment	N	Mean	Grouping
OSRTalc1	3	37.339	A
OSREnto1	3	0.589	B
OSRComm	3	0.576	B
OSRcontrol	3	0.260	B
OSREnto0.1	3	0.088	B
OSREnto0.01	3	0.083	B

Means that do not share a letter are significantly different.

Linear Hypotheses:

	Estimate	**Std.Error**	**t value**	**Pr(>|t|)**
OSRcont – OSRComm	0.316	2.441	0.130	1.000

OSREnt0.01 - OSRComm	0.493	2.441	0.202	1.000
OSREnt0.1 – OSRComm	0.488	2.441	0.200	1.000
OSREnt1 – OSRComm	0.013	2.441	0.005	1.000
OSRTalc1 – OSRComm	36.762	2.441	15.059	<1e-06***
OSREnt0.01 – OSRcont	0.176	2.441	0.072	1.000
OSREnt0.1 – OSRcont	0.172	2.441	0.071	1.000
OSREnt1 – OSRcont	0.329	2.441	0.135	1.000
OSRTalc1 – OSRcont	37.078	2.441	15.188	<1e-06***
OSREnt0.1-OSREnt0.01	0.004	2.441	0.002	1.000
OSREnt1-OSREnt0.01	0.506	2.441	0.207	1.000
OSRTalc1-OSREnt0.01	37.255	2.441	15.261	<1e-06***
OSREnt1 - OSREnt0.1	0.501	2.441	0.205	1.000
OSRTalc1-OSREnt0.1	37.251	2.441	15.259	<1e-06***
OSRTalc1 - OSREnt1	36.749	2.441	15.053	<1e-06***

Statistical significance code: 0 '***'

Ent = Entostat® Trade mark of Exosect Limited for carnauba wax particles

OSRCOmm = commercial oilseed rape seed

OSRcont = oilseed rape control

METHOD FOR ASSESSING FLOWABILITY/PLANTABILITY

Same as that for example 1.

Results

Differences in flowability/plantability from treated oilseed rape seed are observed relative to controls.

CLAIMS

1. A method of controlling the flowability of plant seeds by placing the plant seeds of a mass of seeds in contact with dry free flowing particles of a flowability enhancing agent that is made up of at least one species of electret particle made up of a wax, wherein the electret particle adheres more firmly to the plant seeds than do particles that comprise a dry free flowing substance that is or includes a mineral earth component.

2. A method according to claim 1, wherein the wax comprises at least one species of wax selected from mineral waxes, natural waxes and synthetic waxes.

3. A method according to claim 1 or claim 2, wherein the wax comprises at least one species of wax that has a melting temperature of ≥ 40° C, preferably ≥ 50° C, more preferably ≥ 70° C.

4. A method according to any one of claims 1 to 3, wherein the wax comprises at least one species of wax selected from carnauba wax, montan wax and paraffin wax or a mixture of two or more thereof.

5. A method according to any one of claims 1 to 4, wherein the plant seeds are selected from seeds from the group consisting of fodder and forage plant seeds, cereal seeds, cotton seeds, legume plant seeds, maize seeds and field crop plant seeds.

6. Use of a dry particulate free flowing formulation or composition in improving the flowability of seeds within a population of plant seeds, wherein the formulation or composition comprises at least a flowability enhancing agent that is made up of at least one species of electret particle selected from waxes, wherein the electret particles adhere more firmly to individual plant seeds than do particles that comprise a dry free flowing substance that is or includes a mineral earth component.

7. Use according to claim 6, wherein the electret particles are formed of at least one species of wax selected from mineral waxes, natural waxes and synthetic waxes.

8. Use according to claim 6 or claim 7, wherein the wax comprises at least one species of wax that has a melting temperature of ≥ 40° C, preferably ≥ 50° C, more preferably ≥ 70° C.

9. Use according to any one of claims 6 to 8, wherein the wax comprises at least one species of wax selected from carnauba wax, montan wax and paraffin wax or a mixture of two or more thereof.

10. Use according to any one of claims 6 to 9, wherein the plant seeds are selected from seeds from the group consisting of fodder and forage plant seeds, cereal seeds, cotton seeds,

legume plant seeds, maize seeds, and field crop plant seeds.

11. A method of controlling dust drift from a population of plant seeds by placing the plant seeds of a mass of seeds in contact with dry free flowing particles of a flowability enhancement agent made up of electret particles made of a wax that adheres more firmly to plant seeds than a dry particulate compound or composition that is a flowability enhancement agent that comprises a dry free flowing substance that is a mineral earth or includes a mineral earth component.

12. A method according to claim 11, wherein the wax comprises at least one species of wax selected from mineral waxes, natural waxes and synthetic waxes.

13. A method according to claim 11 or claim 12, wherein the wax comprises at least one species of wax that has a melting temperature of ≥ 40 ° C, preferably ≥ 50 ° C, more preferably ≥ 70 ° C.

14. A method according to any one of claims 11 to 13, wherein the wax comprises at least one species of wax selected from carnauba wax, montan wax and paraffin wax or a mixture of two or more thereof.

15. A method according to any one of claims 11 to 14, wherein the plant seeds are selected from seeds from the group consisting of fodder and forage plant seeds, cereal seeds, cotton seeds, legume plant seeds, maize seeds and field crop plant seeds.

16. Use of a particulate, free flowing formulation or composition in controlling dust drift, preferably in reducing the level or amount of dust drift, from a population of plant seeds, wherein the particulate free flowing formulation or composition comprises at least a flowability enhancing agent made up of dry electret particles made of wax that are able to adhere to individual plant seeds more firmly than a dry particulate compound or composition that is a free flowing flowability enhancing agent that comprises a substance that is a mineral earth or includes a mineral earth component.

17. Use according to claim 16, wherein the wax comprises at least one species of wax selected from mineral waxes, natural waxes and synthetic waxes.

18. Use according to claim 16 or claim 17, wherein the wax comprises at least one species of wax that has a melting temperature of ≥ 40 ° C, preferably ≥ 50 ° C, more preferably ≥ 70 ° C.

19. Use according to any one of claims 16 to 18, wherein the wax comprises at least one species of wax selected from carnauba wax, montan wax and paraffin wax or a mixture of two or more thereof.

20. Use according to any one of claims 16 to 19, wherein the plant seeds are selected from seeds from the group consisting of fodder and forage plant seeds, cereal seeds, cotton seeds, legume plant seeds, maize seeds and field crop plant seeds.

21. Use or method according to any one of the preceding claims, wherein the electret particles of wax have a volume mean diameter of any conventional size in the range from about 10 µm to 200 µm.

ABSTRACT OF THE INVENTION

METHODS AND USES FOR IMPROVED SOWING OF SEEDS

Methods and uses of controlling the flowability of a population of plant seeds and dust drift therefrom by placing individual seeds in contact with particles of a flowability enhancing agent that is made up of at least one species of wax that adheres more firmly to the said plant seeds than a compound or composition that comprises a substance that is or includes a mineral earth component.

- Fig. 1 -

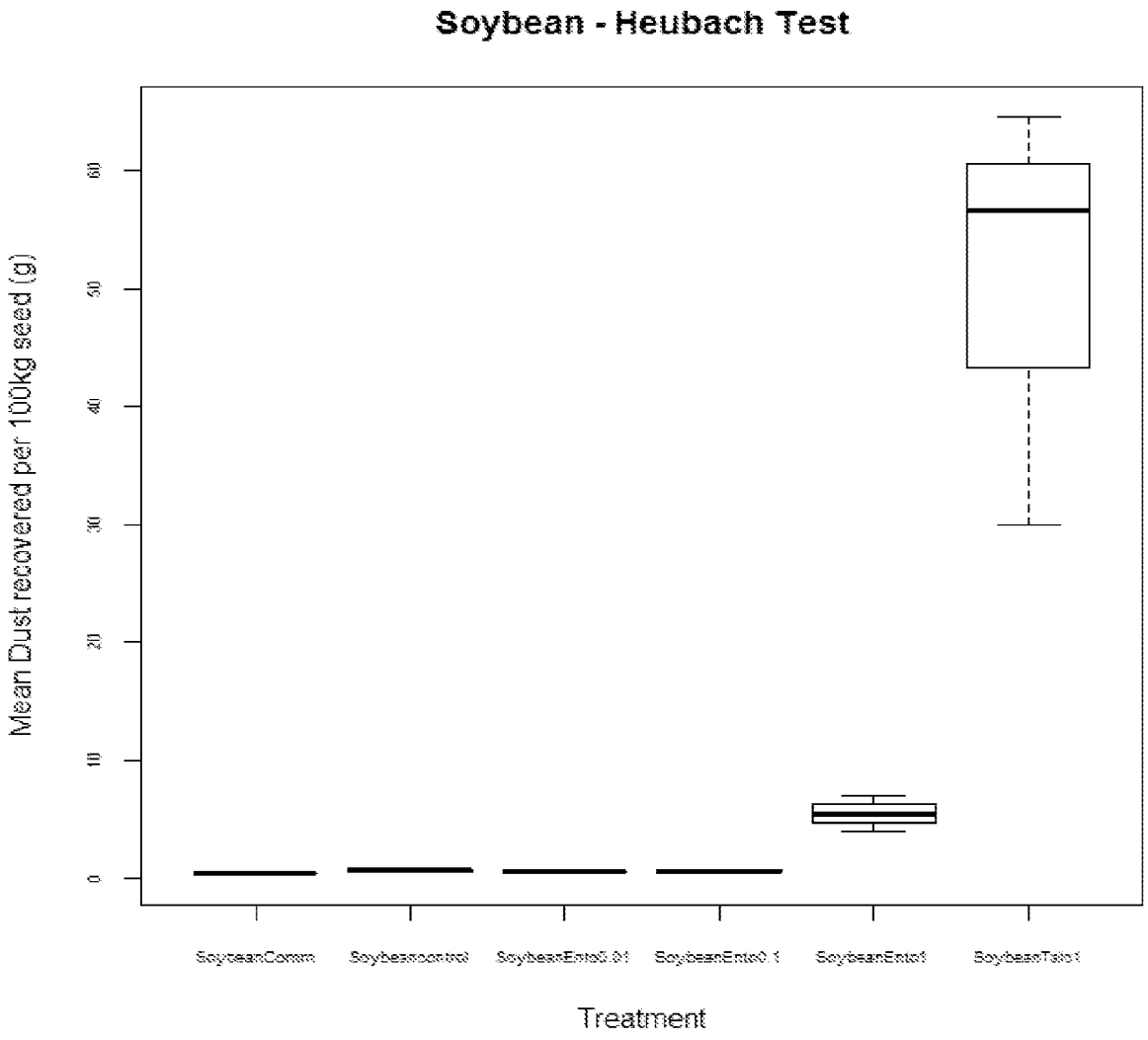
Soybean - Heubach Test
Mean Dust recovered per 100kg seed (g)
0
10
20
30
40
50
60
SoybeanComm
SoybeanEnto1
Treatment

Figure 1

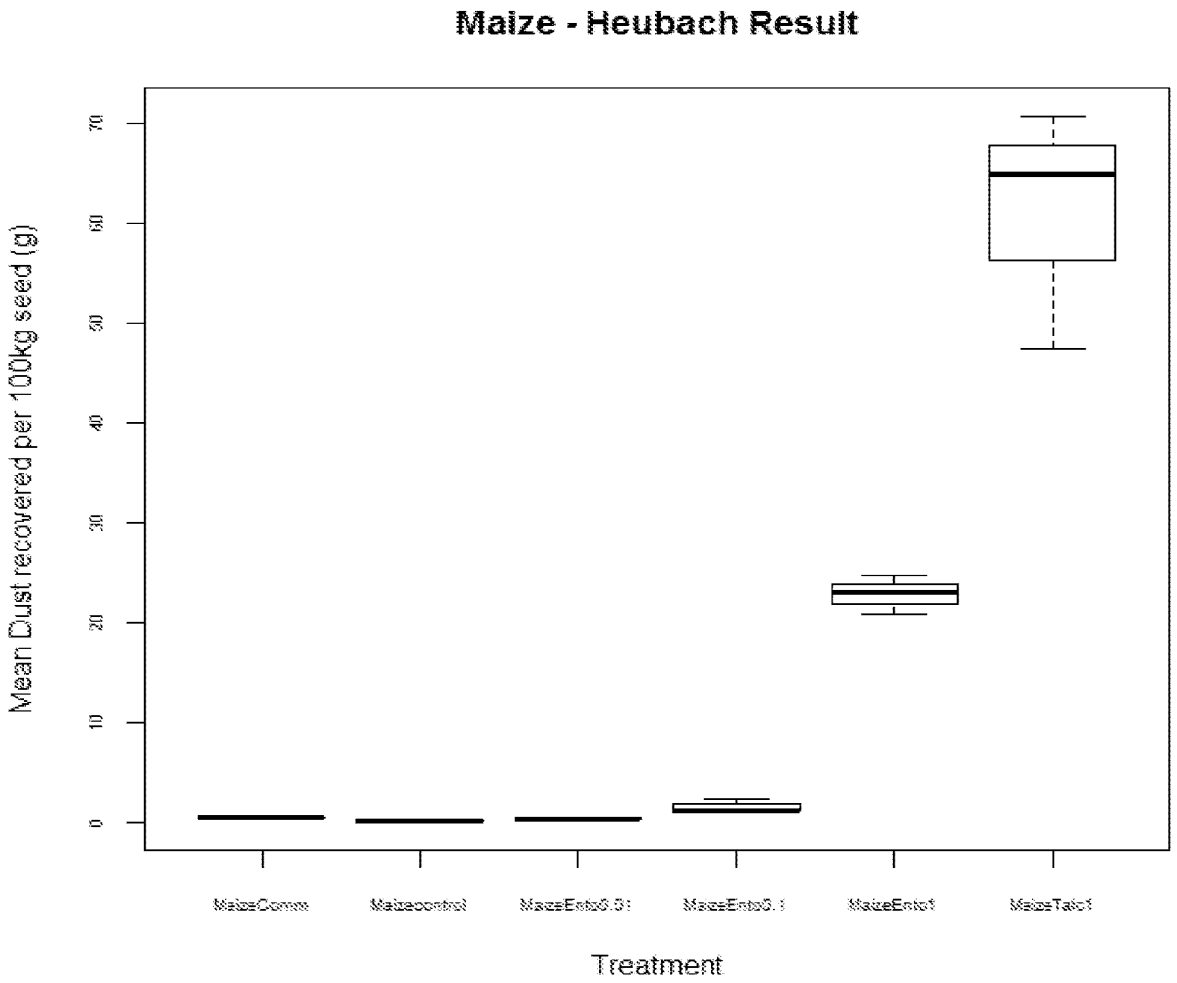
Maize - Heubach Result
Mean Dust recovered per 100kg seed (g)
0
10
20
30
40
50
60
70
MaizeComm
Maizecontrol
MaizeEnto0.5
MaizeEnto0.1
MaizeEnto1
MaizeTalc1
Treatment

Figure 2

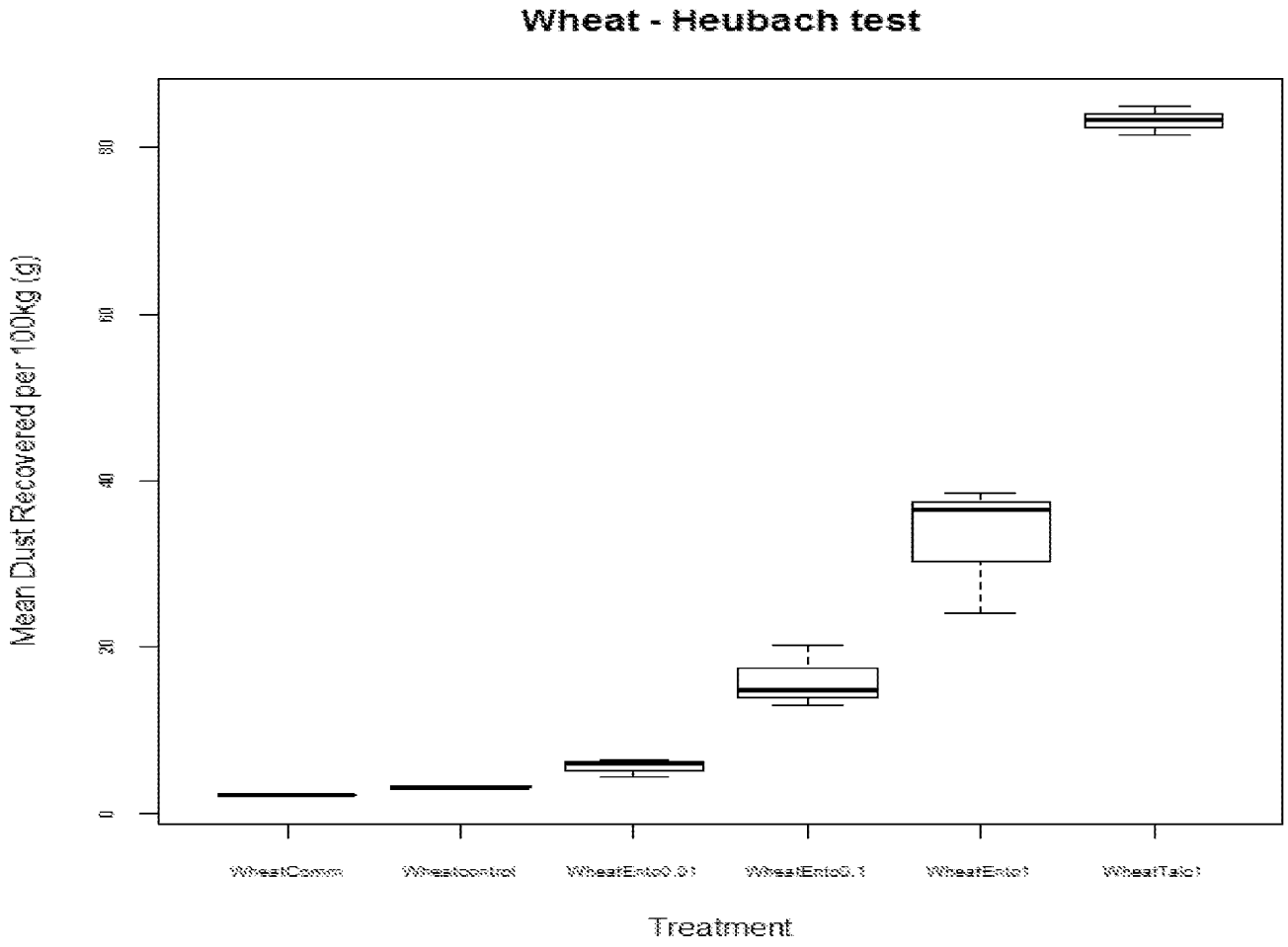
Wheat - Heubach test
Mean Dust Recovered per 100kg (g)
0
20
40
60
80
WheatComm
WheatControl
WheatEnto0.01
WheatEnto0.1
WheatEnto1
WheatTalc1
Treatment

Figure 3

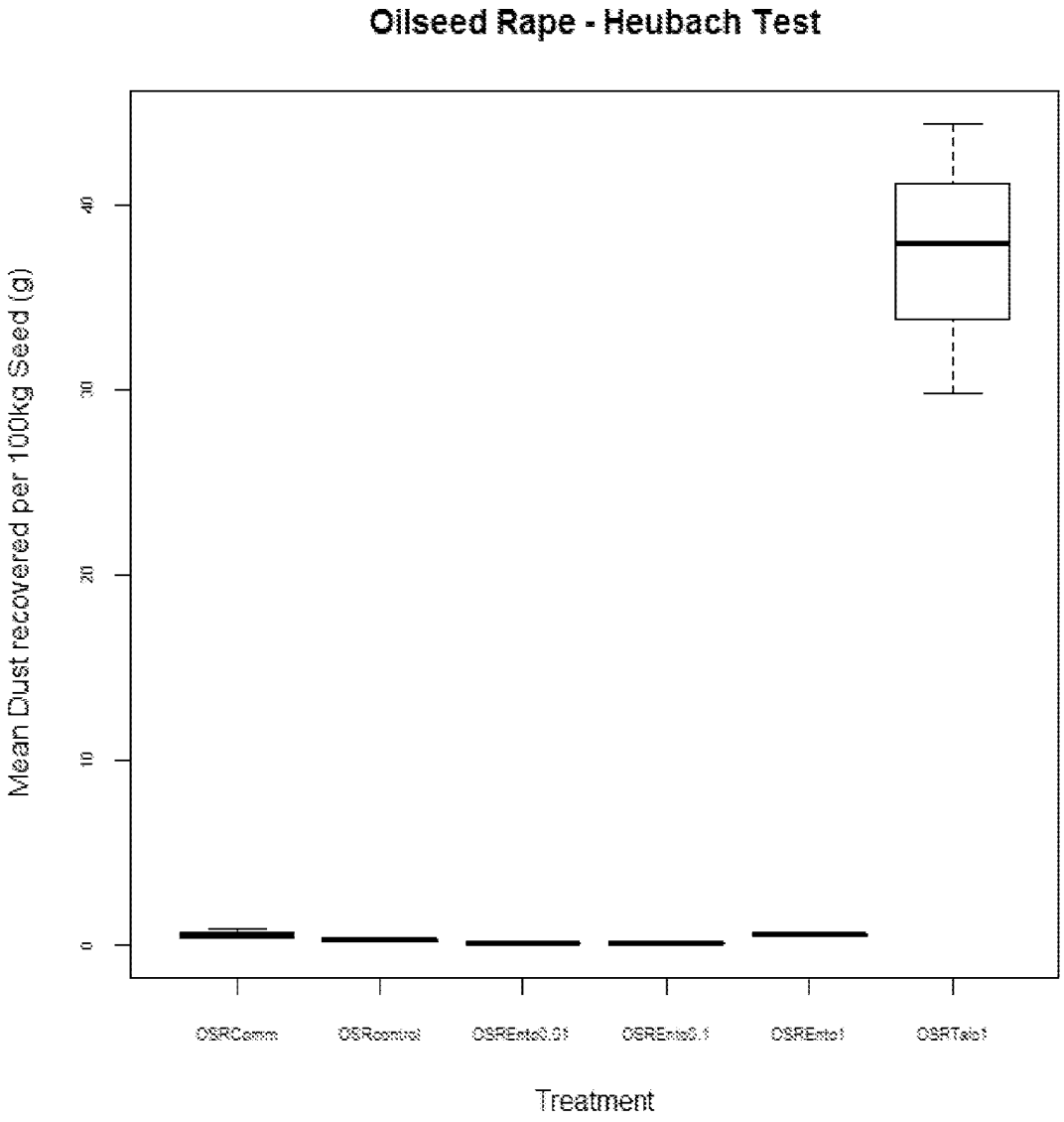
Oilseed Rape - Heubach Test
Mean Dust recovered per 100kg Seed (g)
0
10
20
30
40
OSRComm
OSRcontrol
OSREnto0.01
OSREnto0.1
OSREnto1
OSRTalc1
Treatment

Figure 4

PATENT APPLICATION

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of Docket No: Q213621

Nicholas JESSOP

Appln. No.: National Stage Entry of PCT/GB2013/000153

Confirmation No.: Not Yet Assigned Group Art Unit: Not Yet Assigned

Filed: July 29, 2014 Examiner: Not Yet Assigned

For: METHODS AND USES FOR IMPROVED SOWING OF SEEDS

PRELIMINARY AMENDMENT

MAIL STOP AMENDMENT
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

Prior to examination, please amend the above-identified application as follows on the accompanying pages.

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AMENDMENTS TO THE SPECIFICATION 2

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AMENDMENTS TO THE SPECIFICATION

Please add, on page 1, the following new paragraph after the title:

CROSS REFERENCE TO RELATED APPLICATIONS

This application is a National Stage of International Application No. PCT/GB2013/000153 filed April 3, 2013, claiming priority based on British Patent Application Nos. 1206139.6, 1206141.2, 1206142.0, 1206143.8, 1206144.6 and 1206138.8 filed April 4, 2012, the contents of all of which are incorporated herein by reference in their entirety.

AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions and listings of claims in the application:

LISTING OF CLAIMS:

1. (Original) A method of controlling the flowability of plant seeds by placing the plant seeds of a mass of seeds in contact with dry free flowing particles of a flowability enhancing agent that is made up of at least one species of electret particle made up of a wax, wherein the electret particle adheres more firmly to the plant seeds than do particles that comprise a dry free flowing substance that is or includes a mineral earth component.

2. (Original) A method according to claim 1, wherein the wax comprises at least one species of wax selected from mineral waxes, natural waxes and synthetic waxes.

3. (Currently Amended) A method according to claim 1~~ or claim 2~~, wherein the wax comprises at least one species of wax that has a melting temperature of ≥ 40° C~~, preferably ≥ 50° C, more preferably ≥ 70° C~~.

4. (Currently Amended) A method according to ~~any one of claims 1 to 3~~claim 2, wherein the wax comprises at least one species of wax selected from carnauba wax, montan wax, ~~and~~ paraffin wax ~~or~~and a mixture of two or more thereof.

5. (Currently Amended) A method according to ~~any one of claims 1 to 4~~claim 1, wherein the plant seeds are selected from seeds from the group consisting of fodder and forage plant seeds, cereal seeds, cotton seeds, legume plant seeds, maize seeds and field crop plant seeds.

6. (Original) Use of a dry particulate free flowing formulation or composition in improving the flowability of seeds within a population of plant seeds, wherein the formulation or composition comprises at least a flowability enhancing agent that is made up of at least one species of electret

particle selected from waxes, wherein the electret particles adhere more firmly to individual plant seeds than do particles that comprise a dry free flowing substance that is or includes a mineral earth component.

7. (Original) Use according to claim 6, wherein the electret particles are formed of at least one species of wax selected from mineral waxes, natural waxes and synthetic waxes.

8. (Currently Amended) Use according to claim 6 ~~or claim 7~~, wherein the wax comprises at least one species of wax that has a melting temperature of ≥ 40° C~~, preferably ≥ 50° C, more preferably ≥ 70° C~~.

9. (Currently Amended) Use according to ~~any one of claims 6 to 8~~claim 7, wherein the wax comprises at least one species of wax selected from carnauba wax, montan wax, ~~and~~ paraffin wax ~~or~~and a mixture of two or more thereof.

10. (Currently Amended) Use according to ~~any one of claims 6 to 9~~claim 6, wherein the plant seeds are selected from seeds from the group consisting of fodder and forage plant seeds, cereal seeds, cotton seeds, legume plant seeds, maize seeds[[,]] and field crop plant seeds.

11. (Original) A method of controlling dust drift from a population of plant seeds by placing the plant seeds of a mass of seeds in contact with dry free flowing particles of a flowability enhancement agent made up of electret particles made of a wax that adheres more firmly to plant seeds than a dry particulate compound or composition that is a flowability enhancement agent that comprises a dry free flowing substance that is a mineral earth or includes a mineral earth component.

12. (Original) A method according to claim 11, wherein the wax comprises at least one species of wax selected from mineral waxes, natural waxes and synthetic waxes.

13. (Currently Amended) A method according to claim 11 ~~or claim 12~~, wherein the wax

comprises at least one species of wax that has a melting temperature of ≥ 40° C~~, preferably ≥ 50° C, more preferably ≥ 70° C~~.

14. (Currently Amended) A method according to ~~any one of claims 11 to 13~~claim 12, wherein the wax comprises at least one species of wax selected from carnauba wax, montan wax, ~~and~~ paraffin wax ~~or~~and a mixture of two or more thereof.

15. (Currently Amended) A method according to ~~any one of claims 11 to 14~~claim 11, wherein the plant seeds are selected from seeds from the group consisting of fodder and forage plant seeds, cereal seeds, cotton seeds, legume plant seeds, maize seeds and field crop plant seeds.

16. (Original) Use of a particulate, free flowing formulation or composition in controlling dust drift, preferably in reducing the level or amount of dust drift, from a population of plant seeds, wherein the particulate free flowing formulation or composition comprises at least a flowability enhancing agent made up of dry electret particles made of wax that are able to adhere to individual plant seeds more firmly than a dry particulate compound or composition that is a free flowing flowability enhancing agent that comprises a substance that is a mineral earth or includes a mineral earth component.

17. (Original) Use according to claim 16, wherein the wax comprises at least one species of wax selected from mineral waxes, natural waxes and synthetic waxes.

18. (Currently Amended) Use according to claim 16 ~~or claim 17~~, wherein the wax comprises at least one species of wax that has a melting temperature of ≥ 40° C~~, preferably ≥ 50° C, more preferably ≥ 70° C~~.

19. (Currently Amended) Use according to ~~any one of claims 16 to 18~~claim 17, wherein the wax comprises at least one species of wax selected from carnauba wax, montan wax and paraffin wax or a mixture of two or more thereof.

20. (Currently Amended) Use according to ~~any one of claims 16 to 19~~claim 16, wherein the plant seeds are selected from seeds from the group consisting of fodder and forage plant seeds, cereal seeds, cotton seeds, legume plant seeds, maize seeds and field crop plant seeds.

21. (Currently Amended) ~~Use or method~~Method according to ~~any one of the preceding claims~~claim 1, wherein the electret particles of wax have a volume mean diameter of any conventional size in the range from ~~about~~ 10 µm to 200 µm.

22. (New) Use according to claim 6, wherein the electret particles of wax have a volume mean diameter of any conventional size in the range from 10 µm to 200 µm.

23. (New) Method according to claim 11, wherein the electret particles of wax have a volume mean diameter of any conventional size in the range from 10 µm to 200 µm.

24. (New) Use according to claim 16, wherein the electret particles of wax have a volume mean diameter of any conventional size in the range from 10 µm to 200 µm.

REMARKS

Entry and consideration of this Amendment are respectfully requested.

Respectfully submitted,

/Alan J. Kasper/

Alan J. Kasper
Registration No. 25,426

SUGHRUE MION, PLLC
Telephone: 202.293.7060
Facsimile: 202.293.7860

WASHINGTON OFFICE
23373
CUSTOMER NUMBER

Date: July 29, 2014

PATENT APPLICATION

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of Docket No: Q213621

Nicholas JESSOP

Appln. No.: National Stage Entry of PCT/GB2013/000153

Confirmation No.: Not Yet Assigned Group Art Unit: Not Yet Assigned

Filed: July 29, 2014 Examiner: Not Yet Assigned

For: METHODS AND USES FOR IMPROVED SOWING OF SEEDS

INFORMATION DISCLOSURE STATEMENT UNDER 37 C.F.R. §§ 1.97 and 1.98

MAIL STOP AMENDMENT
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

In accordance with the duty of disclosure under 37 C.F.R. § 1.56, Applicant hereby notifies the U.S. Patent and Trademark Office of the documents which are listed on the attached PTO/SB/08 (modified) form and/or listed herein and which the Examiner may deem material to patentability of the claims of the above-identified application.

One copy of each of the listed documents is submitted herewith, except for the following: U.S. patents and/or U.S. patent publications; and co-pending non-provisional U.S. applications filed after June 30, 2003.

In compliance with the concise explanation requirement under 37 C.F.R. § 1.98(a)(3) for foreign language documents, please see column "T" in the "Foreign Patent Documents" section of the attached PTO/SB/08 form.

The submission of the listed documents is not intended as an admission that any such document constitutes prior art against the claims of the present application. Applicant does not

waive any right to take any action that would be appropriate to antedate or otherwise remove any listed document as a competent reference against the claims of the present application.

The USPTO is directed and authorized to charge all required fees, except for the Issue Fee and the Publication Fee, to Deposit Account No. 19-4880. Please also credit any overpayments to said Deposit Account.

Respectfully submitted,

/Alan J. Kasper/

Alan J. Kasper
Registration No. 25,426

SUGHRUE MION, PLLC
Telephone: 202.293.7060
Facsimile: 202.293.7860

WASHINGTON OFFICE
23373
CUSTOMER NUMBER

Date: July 29, 2014

INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(Not for submission under 37 CFR 1.99)

Application Number	Not Yet Assigned
Confirmation Number	Not Yet Assigned
Filing Date	July 29, 2014
First Named Inventor	Nicholas JESSOP
Art Unit	Not Yet Assigned
Examiner Name	Not Yet Assigned
Attorney Docket Number	Q213621

U.S. PATENTS

Examiner Initials	Cite No	Patent Number	Kind Code	Issue Date	Name of Patentee or Applicant of cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
	1.	5,876,739	A	1999-03-02	TURNBLAD et al.	

U.S. PATENT APPLICATION PUBLICATIONS

Examiner Initials	Cite No	Publication Number	Kind Code	Publication Date	Name of Patentee or Applicant of cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
	2.	2007/0207927	A1	2007-09-06	ROSA et al.	

FOREIGN PATENT DOCUMENTS

Examiner Initials	Cite No	Foreign Document Number	Country Code	Kind Code	Publication Date	Name of Patentee or Applicant of cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear	T
	3.	2005/077169	WO	A1	2005-08-25	BASF AKTEINGESELLSCHAFT		Cited in Cites 7 and 8
	4.	2011/148144	WO	A1	2011-12-01	EXOSECT LIMITED		Cited in Cite 7
	5.	830 655	GB	A	1960-03-16	SHELL RES LTD.		Cited in Cite 7
	6.	417 501	GB	A	1934-09-28	TERNION		Cited in Cite 8

NON-PATENT LITERATURE DOCUMENTS

Examiner Initials	Cite No	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city, and/or country where published.	T
	7.	International Search Report for PCT/GB2013/000153 dated August 22, 2013	
	8.	Search Report for British Application 1306086.8 dated August 5, 2013	

EXAMINER SIGNATURE

Examiner Signature		Date Considered	

*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through a citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

1 See Kind Codes of USPTO Patent Documents at www.USPTO.GOV or MPEP 901.04. 2 Enter office that issued the document, by the two-letter code (WIPO Standard ST.3). 3 For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. 4 Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST.16 if possible. 5 Applicant is to place a check mark here if English language translation is attached.

PCT

REQUEST

The undersigned requests that the present international application be processed according to the Patent Cooperation Treaty.

For receiving Office use only

PCT/GB2013/000153
International Application No.

03/04/2013 03 MARCH 2013
International Filing Date

RO/GB
Name of receiving Office and "PCT International Application"

Applicant's or agent's file reference *(if desired) (12 characters maximum)* 13914

Box No. I TITLE OF INVENTION

Methods and uses for improved sowing of seeds

Box No. II APPLICANT ☐ This person is also inventor

Name and address: *(Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country. The country of the address indicated in this Box is the applicant's State (that is, country) of residence if no State of residence is indicated below.)*

Exosect Limited
Leylands Business Park
Colden Common
Winchester, Hampshire SO21 1TH
United Kingdom

Telephone No.

Facsimile No.

Applicant's registration No. with the Office

E-mail authorization: Marking one of the check-boxes below authorizes the receiving Office, the International Searching Authority, the International Bureau and the International Preliminary Examining Authority to use the e-mail address indicated in this Box to send, notifications issued in respect of this international application to that e-mail address if those offices are willing to do so.

☐ as advance copies followed by paper notifications; or ☐ exclusively in electronic form (no paper notifications will be sent).

E-mail address:

State *(that is, country)* of nationality:

State *(that is, country)* of residence: GB

This person is applicant for the purposes of: ☒ all designated States ☐ the States indicated in the Supplemental Box

Box No. III FURTHER APPLICANT(S) AND/OR (FURTHER) INVENTOR(S)

☒ Further applicants and/or (further) inventors are indicated on a continuation sheet.

Box No. IV AGENT OR COMMON REPRESENTATIVE; OR ADDRESS FOR CORRESPONDENCE

The person identified below is hereby/has been appointed to act on behalf of the applicant(s) before the competent International Authorities as: ☒ agent ☐ common representative

Name and address: *(Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country.)*

Dr Walther Wolff & Co
19 Catherine Place
London SW1E 6DX
United Kingdom

Telephone No.
0044 20 7828 1441

Facsimile No.
0044 20 7828 4124

Agent's registration No. with the Office

E-mail authorization: Marking one of the check-boxes below authorizes the receiving Office, the International Searching Authority, the International Bureau and the International Preliminary Examining Authority to use the e-mail address indicated in this Box to send, notifications issued in respect of this international application to that e-mail address if those offices are willing to do so.

☐ as advance copies followed by paper notifications; or ☐ exclusively in electronic form (no paper notifications will be sent).

E-mail address:

☐ **Address for correspondence:** Mark this check-box where no agent or common representative is/has been appointed and the space above is used instead to indicate a special address to which correspondence should be sent.

Box No. III FURTHER APPLICANT(S) AND/OR (FURTHER) INVENTOR(S)

If none of the following sub-boxes is used, this sheet should not be included in the request.

Name and address: *(Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country. The country of the address indicated in this Box is the applicant's State (that is, country) of residence if no State of residence is indicated below.)*

Jessop, Nicholas
Exosect Limited
Leylands Business Park, Colden Common
Winchester, Hampshire SO21 1TH
United Kingdom

This person is:

☐ applicant only
☐ applicant and inventor
☒ inventor only *(If this check-box is marked, do not fill in below.)*

Applicant's registration No. with the Office

State *(that is, country)* of nationality: United Kingdom

State *(that is, country)* of residence: United Kingdom

RO

This person is applicant for the purposes of: ☐ all designated States ☐ the States indicated in the Supplemental Box

Name and address: *(Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country. The country of the address indicated in this Box is the applicant's State (that is, country) of residence if no State of residence is indicated below.)*

This person is:

☐ applicant only
☐ applicant and inventor
☐ inventor only *(If this check-box is marked, do not fill in below.)*

Applicant's registration No. with the Office

State *(that is, country)* of nationality:

State *(that is, country)* of residence:

This person is applicant for the purposes of: ☐ all designated States ☐ the States indicated in the Supplemental Box

Name and address: *(Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country. The country of the address indicated in this Box is the applicant's State (that is, country) of residence if no State of residence is indicated below.)*

This person is:

☐ applicant only
☐ applicant and inventor
☐ inventor only *(If this check-box is marked, do not fill in below.)*

Applicant's registration No. with the Office

State *(that is, country)* of nationality:

State *(that is, country)* of residence:

This person is applicant for the purposes of: ☐ all designated States ☐ the States indicated in the Supplemental Box

Name and address: *(Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country. The country of the address indicated in this Box is the applicant's State (that is, country) of residence if no State of residence is indicated below.)*

This person is:

☐ applicant only
☐ applicant and inventor
☐ inventor only *(If this check-box is marked, do not fill in below.)*

Applicant's registration No. with the Office

State *(that is, country)* of nationality:

State *(that is, country)* of residence:

This person is applicant for the purposes of: ☐ all designated States ☐ the States indicated in the Supplemental Box

☐ Further applicants and/or (further) inventors are indicated on another continuation sheet.

Supplemental Box *If the Supplemental Box is not used, this sheet should not be included in the request.*

1. *If, in any of the Boxes, except Boxes Nos. VIII(i) to (v) for which a special continuation box is provided,* ***the space is insufficient*** *to furnish all the information: in such case, write "Continuation of Box No...." (indicate the number of the Box) and furnish the information in the same manner as required according to the captions of the Box in which the space was insufficient, in particular:*

(i) ***if more than one person is to be indicated as applicant and/or inventor*** *and no "continuation sheet" is available: in such case, write "Continuation of Box No. III" and indicate for each additional person the same type of information as required in Box No. III. The country of the address indicated in this Box is the applicant's State (that is, country) of residence if no State of residence is indicated below;*

(ii) *if, in Box No. II or in any of the sub-boxes of Box No. III, the indication* ***"the States indicated in the Supplemental Box"*** *is checked: in such case, write "Continuation of Box No. II" or "Continuation of Box No. III" or "Continuation of Boxes No. II and No. III" (as the case may be), indicate the name of the applicant(s) involved and, next to (each) such name, the State(s) (and/or, where applicable, ARIPO, Eurasian, European or OAPI patent) for the purposes of which the named person is applicant;*

(iii) *if, in Box No. II or in any of the sub-boxes of Box No. III,* ***the inventor or the inventor/applicant is not inventor for the purposes of all designated States****: in such case, write "Continuation of Box No. II" or "Continuation of Box No. III" or "Continuation of Boxes No. II and No. III" (as the case may be), indicate the name of the inventor(s) and, next to (each) such name, the State(s) (and/or, where applicable, ARIPO, Eurasian, European or OAPI patent) for the purposes of which the named person is inventor;*

(iv) *if, in addition to the agent(s) indicated in Box No. IV, there are* ***further agents****: in such case, write "Continuation of Box No. IV" and indicate for each further agent the same type of information as required in Box No. IV;*

(v) *if, in Box No. VI, there are* ***more than three earlier applications whose priority is claimed****: in such case, write "Continuation of Box No. VI" and indicate for each additional earlier application the same type of information as required in Box No. VI.*

2. *If the applicant intends to make an indication of the wish that the international application be treated, in certain designated States, as an application for a patent of addition, certificate of addition, inventor's certificate of addition or utility certificate of addition: in such case, write the name or two-letter code of each designated State concerned and the indication "****patent of addition,****" "****certificate of addition,****" "****inventor's certificate of addition****" or "****utility certificate of addition,****" the number of the parent application or parent patent or other parent grant and the date of grant of the parent patent or other parent grant or the date of filing of the parent application (Rules 4.11(a)(i) and 49bis.1(a) or (b)).*

3. *If the applicant intends to make an indication of the wish that the international application be treated, in the United States of America, as a continuation or continuation-in-part of an earlier application: in such case, write "United States of America" or "US" and the indication "****continuation****" or "****continuation-in-part****" and the number and the filing date of the parent application (Rules 4.11(a)(ii) and 49bis.1(d)).*

Continuation of Box VI

4 April 2012	12 06 143.8	United Kingdom
4 April 2012	12 06 144.6	United Kingdom
4 April 2012	12 06 138.8	United Kingdom

Box No. V DESIGNATIONS

The filing of this request **constitutes under Rule 4.9(a) the designation** of all Contracting States bound by the PCT on the international filing date, for the grant of every kind of protection available and, where applicable, for the grant of both regional and national patents.

However,

☐ DE Germany **is not designated** for any kind of national protection

☐ JP Japan **is not designated** for any kind of national protection

☐ KR Republic of Korea **is not designated** for any kind of national protection

(The check-boxes above may only be used to exclude (irrevocably) the designations concerned if, at the time of filing or subsequently under Rule 26bis.1, the international application contains in Box No. VI a priority claim to an earlier national application filed in the particular State concerned, in order to avoid the ceasing of the effect, under the national law, of this earlier national application.)

Box No. VI PRIORITY CLAIM AND DOCUMENT

The priority of the following earlier application(s) is hereby claimed:

Filing date of earlier application *(day/month/year)*	Number of earlier application	Where earlier application is:		
		national application: country or Member of WTO	regional application: regional Office	international application: receiving Office
item (1) 4 April 2012	12 06 139.6	United Kingdom		
item (2) 4 April 2012	12 06 141.2	United Kingdom		
item (3) 4 April 2012	12 06 142.0	United Kingdom		

☒ Further priority claims are indicated in the Supplemental Box.

Furnishing the priority document(s):

☒ The **receiving Office** is requested to prepare and transmit to the International Bureau a certified copy of the earlier application(s) *(only if the earlier application(s) was filed with the receiving Office which, for the purposes of this international application, is the receiving Office)* identified above as:

☒ all items ☐ item (1) ☐ item (2) ☐ item (3) ☐ other, see Supplemental Box

☐ The **International Bureau** is requested to obtain from a digital library a certified copy of the earlier application(s) identified above, using, where applicable, the access code(s) indicated below *(if the earlier application(s) is available to it from a digital library)*:

☐ item (1) access code _____ ☐ item (2) access code _____ ☐ item (3) access code _____ ☐ other, see Supplemental Box

Restore the right of priority: the receiving Office is requested to restore the right of priority for the earlier application(s) identified above or in the Supplemental Box as item(s) (_____). *(See also the Notes to Box No. VI; further information must be provided to support a request to restore the right of priority.)*

Incorporation by reference: where an element of the international application referred to in Article 11(1)(iii)(d) or (e) or a part of the description, claims or drawings referred to in Rule 20.5(a) is not otherwise contained in this international application but is completely contained in an earlier application whose priority is claimed on the date on which one or more elements referred to in Article 11(1)(iii) were first received by the receiving Office, that element or part is, subject to confirmation under Rule 20.6, incorporated by reference in this international application for the purposes of Rule 20.6.

Box No. VII INTERNATIONAL SEARCHING AUTHORITY

Choice of International Searching Authority (ISA) *(if more than one International Searching Authority is competent to carry out the international search, indicate the Authority chosen; the two-letter code may be used)*:

ISA/ European Patent Office

Continuation of Box No. VII **USE OF RESULTS OF EARLIER SEARCH, REFERENCE TO THAT SEARCH**

☐ The ISA indicated in Box No. VII is requested to take into account the results of the earlier search(es) indicated below (*see also Notes to Box VII; use of results of more than one earlier search*).

Filing date *(day/month/year)*	Application Number	Country *(or regional Office)*

☐ **Statement (Rule 4.12(ii))**: this international application is the same, or substantially the same, as the application in respect of which the earlier search was carried out except, where applicable, that it is filed in a different language.

☐ **Availability of documents**: the following documents are available to the ISA in a form and manner acceptable to it and therefore do not need to be submitted by the applicant to the ISA (Rule 12*bis*.1(f)):

- ☐ a copy of the results of the earlier search,*
- ☐ a copy of the earlier application,
- ☐ a translation of the earlier application into a language which is accepted by the ISA,
- ☐ a translation of the results of the earlier search into a language which is accepted by the ISA,
- ☐ a copy of any document cited in the results of the earlier search. *(If known, please indicate below the document(s) available to the ISA):*

☐ **Transmit copy of results of earlier search and other documents** *(where the earlier search **was not** carried out by the ISA indicated above but by the same Office as that which is acting as the receiving Office)*: the **receiving Office** is requested to prepare and transmit to the ISA (Rule 12*bis*.1(c)):

- ☐ a copy of the results of the earlier search,*
- ☐ a copy of the earlier application,
- ☐ a copy of any document cited in the results of the earlier search.

* Where the results of the earlier search are neither available from a digital library nor transmitted by the receiving Office, the applicant is required to submit them to the receiving Office (Rule 12*bis*.1(a)) (*See item 11. in the check-list and also Notes to Box No. VII*).

Filing date *(day/month/year)*	Application Number	Country *(or regional Office)*

☐ **Statement (Rule 4.12(ii))**: this international application is the same, or substantially the same, as the application in respect of which the earlier search was carried out except, where applicable, that it is filed in a different language.

☐ **Availability of documents**: the following documents are available to the ISA in a form and manner acceptable to it and therefore do not need to be submitted by the applicant to the ISA (Rule 12*bis*.1(f)):

- ☐ a copy of the results of the earlier search,*
- ☐ a copy of the earlier application,
- ☐ a translation of the earlier application into a language which is accepted by the ISA,
- ☐ a translation of the results of the earlier search into a language which is accepted by the ISA,
- ☐ a copy of any document cited in the results of the earlier search. *(If known, please indicate below the document(s) available to the ISA):*

☐ **Transmit copy of results of earlier search and other documents** *(where the earlier search **was not** carried out by the ISA indicated above but by the same Office as that which is acting as the receiving Office)*: the **receiving Office** is requested to prepare and transmit to the ISA (Rule 12*bis*.1(c)):

- ☐ a copy of the results of the earlier search,*
- ☐ a copy of the earlier application,
- ☐ a copy of any document cited in the results of the earlier search.

* Where the results of the earlier search are neither available from a digital library nor transmitted by the receiving Office, the applicant is required to submit them to the receiving Office (Rule 12*bis*.1(a)) (*See item 11. in the check-list and also Notes to Box No. VII*).

☐ Further earlier searches are indicated on a continuation sheet.

Box No. VIII DECLARATIONS

The following **declarations** are contained in Boxes Nos. VIII (i) to (v) *(mark the applicable check-boxes below and indicate in the right column the number of each type of declaration)*:			Number of declarations
☐	Box No. VIII (i)	Declaration as to the identity of the inventor :	
☐	Box No. VIII (ii)	Declaration as to the applicant's entitlement, as at the international filing date, to apply for and be granted a patent :	
☐	Box No. VIII (iii)	Declaration as to the applicant's entitlement, as at the international filing date, to claim the priority of the earlier application :	
☐	Box No. VIII (iv)	Declaration of inventorship (only for the purposes of the designation of the United States of America) :	1
☐	Box No. VIII (v)	Declaration as to non-prejudicial disclosures or exceptions to lack of novelty :	

Box No. IX CHECK LIST for PAPER filings – this sheet is only to be used when filing an international application on **PAPER**

This international application **contains the following**:	Number of sheets
(a) request form PCT/RO/101 (including any declarations and supplemental sheets) :	6
(b) description (excluding any sequence listing part of the description, see (f), below) :	36
(c) claims :	3
(d) abstract :	1
(e) drawings (if any) :	4
(f) sequence listing part of the description (if any) :	
Total number of sheets :	50

This international application is **accompanied by** the following item(s) *(mark the applicable check-boxes below and indicate in right column the number of each item)*:	Number of items
1. ☐ fee calculation sheet :	
2. ☐ original separate power of attorney :	
3. ☐ original general power of attorney :	
4. ☐ copy of general power of attorney; reference number: :	
5. ☐ priority document(s) identified in Box No. VI as item(s) :	
6. ☐ Translation of international application into *(language)*: :	
7. ☐ separate indications concerning deposited microorganism or other biological material :	
8. ☐ copy in electronic form (Annex C/ST.25 text file) on physical data carrier(s) of the sequence listing, not forming part of the international application, which is **furnished only for the purposes of international search** under Rule 13*ter* *(type and number of physical data carriers)* :	
9. ☐ a statement confirming that "the information recorded in electronic form submitted under Rule 13*ter* is identical to the sequence listing as contained in the international application" as filed on paper :	
10. ☐ copy of results of earlier search(es) (Rule 12*bis*.1(a)) :	
11. ☐ other *(specify)*: :	

Figure of the drawings which should accompany the abstract:	1	**Language of filing** of the international application:	English

Box No. X SIGNATURE OF APPLICANT, AGENT OR COMMON REPRESENTATIVE

Next to each signature, indicate the name of the person signing and the capacity in which the person signs (if such capacity is not obvious from reading the request).

EXOSECT LIMITED
by its Agent
DR WALTHER WOLFF & CO

(David Neville PETERS)

For receiving Office use only

1. Date of actual receipt of the purported international application:	03/04/2013	03 MARCH 2013
3. Corrected date of actual receipt due to later but timely received papers or drawings completing the purported international application:		
4. Date of timely receipt of the required corrections under PCT Article 11(2):		
5. International Searching Authority (if two or more are competent):	ISA /	
6. ☑ Transmittal of search copy delayed until search fee is paid		

2. Drawings:
☑ received:
☐ not received:

For International Bureau use only

Date of receipt of the record copy by the International Bureau:

(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property Organization
International Bureau

(43) International Publication Date
10 October 2013 (10.10.2013)

WIPO | PCT

(10) International Publication Number
WO 2013/150261 A1

(51) **International Patent Classification**:
A01C 1/06 (2006.01)

(21) **International Application Number**:
PCT/GB2013/000153

(22) **International Filing Date**:
3 April 2013 (03.04.2013)

(25) **Filing Language**: English

(26) **Publication Language**: English

(30) **Priority Data**:

1206139.6	4 April 2012 (04.04.2012)	GB
1206141.2	4 April 2012 (04.04.2012)	GB
1206142.0	4 April 2012 (04.04.2012)	GB
1206143.8	4 April 2012 (04.04.2012)	GB
1206144.6	4 April 2012 (04.04.2012)	GB
1206138.8	4 April 2012 (04.04.2012)	GB

(71) **Applicant**: **EXOSECT LIMITED** [GB/GB]; Leylands Business Park, Cold Common, Winchester, Hants SO21 1TH (GB).

(72) **Inventor**: **JESSOP, Nicholas**; Exosect Limited, Leylands Business Park, Colden Common, Winchester, Hampshire SO21 1TH (GB).

(74) **Agent**: **DR WALTHER WOLFF & CO**; 19 Catherine Place, London SW1E 6DX (GB).

(81) **Designated States** *(unless otherwise indicated, for every kind of national protection available)*: AE, AG, AL, AM, AO, AT, AU, AZ, BA, BB, BG, BH, BN, BR, BW, BY, BZ, CA, CH, CL, CN, CO, CR, CU, CZ, DE, DK, DM, DO, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT, HN, HR, HU, ID, IL, IN, IS, JP, KE, KG, KM, KN, KP, KR, KZ, LA, LC, LK, LR, LS, LT, LU, LY, MA, MD, ME, MG, MK, MN, MW, MX, MY, MZ, NA, NG, NI, NO, NZ, OM, PA, PE, PG, PH, PL, PT, QA, RO, RS, RU, RW, SC, SD, SE, SG, SK, SL, SM, ST, SV, SY, TH, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, ZA, ZM, ZW.

(84) **Designated States** *(unless otherwise indicated, for every kind of regional protection available)*: ARIPO (BW, GH, GM, KE, LR, LS, MW, MZ, NA, RW, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, RU, TJ, TM), European (AL, AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HR, HU, IE, IS, IT, LT, LU, LV, MC, MK, MT, NL, NO, PL, PT, RO, RS, SE, SI, SK, SM, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

[Continued on next page]

(54) **Title**: METHODS AND USES FOR IMPROVED SOWING OF SEEDS

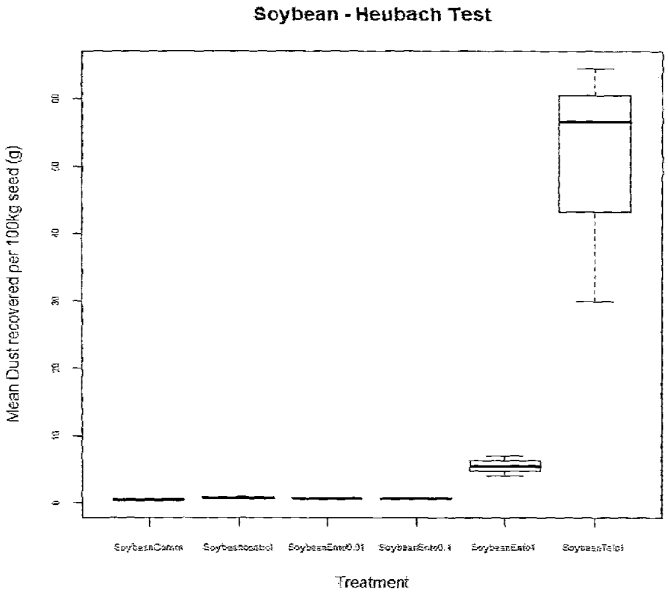

FIGURE 1

(57) **Abstract**: Methods and uses of controlling the flowability of a population of plant seeds and dust drift therefrom by placing individual seeds in contact with particles of a flowability enhancing agent that is made up of at least one species of wax that adheres more firmly to the said plant seeds than a compound or composition that comprises a substance that is or includes a mineral earth component.

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METHODS AND USES FOR IMPROVED SOWING OF SEEDS

The present invention relates to improvements in methods of controlling seed flowability and dust drift, uses of formulations or compositions for controlling flowability and dust drift, and improved methods of sowing seed. In particular, the present invention relates to improvements in methods of enhancing seed flowability and controlling dust drift, uses of formulations or compositions for enhancing flowability and controlling dust drift and improved methods of sowing seed wherein dust drift is decreased.

There exist problems associated with the sowing of seed using conventional sowing equipment, such as dust drift and seed flowability. 'Dust drift' is a term of the art and relates to *inter alia* frictional erosion between seeds causing the loss of elements of the seed coat *per se* through the rubbing together of seeds during haulage and storage movement which results in a dust made up *inter alia* of very small parts of the seed coat. The damage caused by friction to the seeds causes a loss of viability to a significant fraction of the seeds in any one batch which in turn leads to agronomic losses. The generated dust is lost to the environment through wind dispersal when seeds are loaded into seed planters and during planting operations from commercial planting machinery, and the like. Other forms of dust making up dust drift occur when prior-coated or prior-pelleted seed is subject to haulage and storage where again, damage caused by frictional erosion within seed masses leads to the formation of dust that gets into the environment. Coated or pelleted seed generally includes active agents such as pesticides and/or fertilisers and in these forms dust loaded with such active agents gets into the environment and can be spread far and wide. Indeed, it is known that dust drift that contains pesticides is responsible for harming and killing social insect populations beneficial to man, such as domesticated bee populations. Dust drift is also thought to be responsible *inter alia* for the rise in the number of cases of asthma and other respiratory diseases in humans and is suspected of contributing to a rise in incidence of certain cancers.

For the purposes of the present invention, "Seed flowability" relates to the ability of individual seeds in a seed population to flow or slide past each other. The ease of seed flowability is important in many situations such as in the use of conventional seed sowing equipment and in the use of seed storage equipment. The greater the degree of ease of flowability of seed means that seed flow can be controlled better and so germination losses due to damage to the seed coat or due to seed clumping causing blockages in conventional sowing equipment can be minimised. Conventional crop seed typically uses a mineral earth component such as talc, diatomaceous earth or kaolin as a drying agent which also acts as a flowability agent, however, such mineral earth components tend to detach from plant seeds over time.

Furthermore, such drying agents tend to cause clumping of seeds within the seed mass and as a result the clumping of seed gives rise to blockages in sowing equipment, making the sowing process less efficient. Furthermore, plant seed coating compositions tend to be added to plant seeds in the form of wet slurry which then requires drying either through the application of heat and/or the addition of further mineral earth components such as talc, kaolin or diatomaceous earth. Either way, the finished coated seed product is subjected to frictional forces during haulage, storage and sowing which results in the added seed coatings being damaged and so contributes to clumping of the seeds and concomitant losses in germination efficiency.

Commercial preparations of coated seeds such as Poncho® (Bayer) comprising pesticides are available that are alleged to be free flowing but such preparations tend to have complex coatings that *inter alia* make use of several polymer layers and other components that are expensive to produce.

There exists a need to provide seeds for planting that have improved flowability and improved dust drift control over conventional seeds.

According to the present invention, there is provided a method of controlling the flowability of plant seeds by placing the plant seeds of a mass of seeds in contact with dry free flowing particles of a flowability enhancing agent that is made up of at least one species of electret particle made up of a wax, wherein the electret particle adheres more firmly to the plant seeds than do particles that comprise a dry free flowing substance that is or includes a mineral earth component.

Typically, the control of flowability of a population of plant seeds is enhanced, that is to say, the seeds are more free-flowing than conventional plant seed populations, and exhibit reduced clumping of seeds within the seed mass than conventional plant seed populations.

The plant seeds, whether pre-coated or coated with other polymers or uncoated, are placed in contact with a the flowability enhancing agent in powdered form. The flowability enhancing agent is made up of electret particles made up of a wax material as herein defined, and does not contain other flowability agents such as particles comprising inorganic materials such as mineral earths, such as kaolin, diatomaceous earth, talc and the like.

Reference to "seed" and "seeds" is used interchangeably herein and means plant seeds selected from fodder and forage plant seeds, cereal seeds, cotton seeds, legume plant seeds, maize seeds, and field crop plant seeds, typically such seeds are viable seeds, to which compositions of use in the invention may be applied. Plant seed as provided herein means

seeds that are capable of germinating to at least conventional levels of germination typical of the relevant plant species under consideration. Thus, a plant seed of use in a method or use of the invention is one that may be grown for industrial purposes, human and/or domesticated farm animal consumption.

Thus, for the purposes of the present invention it is to be understood that the term "seed" or "seeds" herein refers to seeds produced from plants that are of commercial importance.

Cereal seeds suitable for coating with compositions of use in the invention include seeds of rice (*Oryza sativa*), wheat (Triticum spp. such as *T. aestivum*) including species such as spelt (*T. spelta*), einkorn (*T. monococcum*), emmer (*T. dicoccum*) and durum (*T. durum*), barley (*Hordeum vulgare*) including two row and six row barley, sorghum (*Sorghum bicolor*), millet species such as pearl millet (*Pennisetum glaucum*), foxtail millet (*Setaria italica*), proso millet (*Panicum miliaceum*) and finger millet (*Eleusine coracana*), oats (*Avena sativa*), rye (*Secale cereale*), Triticale (*x Triticosecale*), buckwheat (*Fagopyrum esculentum*).

For the purposes of the present invention it is to be understood that the term "cotton plant seed" refers to commercially used seeds of the family Malvaceae, typically *Gossypium* seeds which are collectively referred to herein as "cotton plant seeds" unless context demands otherwise. Cotton seeds suitable for coating with compositions of use in the invention include cotton seeds of the family Malvaceae and include representative species such as *Gossypium hirsutum* (90% of world cotton production), *Gossypium barbadense* (8% of world cotton production), and *Gossypium arboreum* (2% of world cotton production).

For the purposes of the present invention it is to be understood that the term "legume plant seed" refers to seeds of leguminous plants. Legume plant seeds suitable for coating with compositions of use in the invention include seeds of legume species of the family Fabaceae that includes species such as Alfalfa (*Medicago sativa*), Austrian winter pea (*Pisum sativum*), Berseem clover (*Trifolium alexandrinum*), Black medic (*Medicago lupulina*), Chickling vetch/pea (*Lathyrus sativus*) Cowpea (*Vigna unguiculata*), Crimson clover (*Trifolium incarnatum*), Field peas (*Pisum sativum subsp. arvense*), Hairy vetch (*Vicia villosa*), Horse beans (*Vicia faba*), Kura clover (*Trifolium ambiguum*), Mung beans (*Vigna radiate*), Red clover (*Trifolium pratense*), Soya beans (*Glycine max*), Subterranean clover (*Trifolium subterraneum*), Sunn hemp (*Crotalaria juncea L*), White clover (*Trifolium repens*), White sweet clover (*Melilotus alba*), Woolypod vetch (*Vicia villosa ssp. dasycarpa*), Yellow sweet clover (*Melilotus officinalis*), Adzuki bean, (Vigna angularis, syn.: *Phaseolus angularis*), Broad bean (*V. faba* var. major), field bean (*Vicia faba*), Vetch (*Vicia sativa*), Common beans (*Phaseolus vulgaris*), including green beans, runner beans, haricot beans and the like, Chick pea (*Cicer arietinum*), Guar bean (*Cyamopsis tetragonoloba*), Hyacinth bean (*Dolichos lablab*), Lentil

(*Lens culinaris*), Lima bean (*Phaseolus lunatus*), Lupin (*Lupinus* spp.), Mung bean (*Vigna radiata*, syn.: *Phaseolus aureus*), Pea (*Pisum sativum*), Peanut (*Arachis hypogaea*), Pigeon pea (*Cajanus cajan*), Tepary bean (*Phaseolus acutifolius*) and the like.

For the purposes of the present invention it is to be understood that the term "maize seed" refers to any kind of maize seed from a *Zea mays* plant that is for food-related production or other industrial purpose such as starch production, bio-fuel manufacture, typically ethanol manufacture, animal fodder production and the like. Examples of Zea mays varieties used in industry include flour corn (*Zea mays* var. *Amylacea*); popcorn used as a food and in packaging materials (*Zea mays* var. *Evert*); flint corn used for hominy production (*Zea mays* var. *Indurata*); sweet corn used as a food (*Zea mays* var. *saccharata* and *Zea mays* var. *Rugosa*); Waxy corn used in producing food thickening agents, in the preparation of certain frozen foods, and in the adhesive industry (*Zea mays* var. *Ceratina*); Amylomaize maiz used in the production of biodegradeable plastics (*Zea mays*); and striped maize used as an ornamental (*Zea mays* var. *Japonica*).

Maize is also known as "corn" and these two terms may be used interchangeably unless context demands otherwise.

For the purposes of the present invention it is to be understood that the term "field crop plant seed" refers to "oilseeds" and "vegetable seeds" which are collectively referred to herein as "field crop plant seeds" unless context demands otherwise.

Field crop plant seeds suitable for coating with compositions of use in the invention include oil seeds of the Crucifer family such as canola (*B. campestris*) and oilseed rape (*B. napus*); seeds of other Crucifer plant species including those of plants of the *B. oleraceae* such as seeds of types of cabbages, broccolis, cauliflowers, kales, Brussels sprouts, and kohlrabis; seeds of alliums including onion, leek and garlic. Other field crop plant seeds suitable for coating with compositions of use in methods of, and in uses of the invention include capsicums, tomatoes, cucurbits such as cucumbers, cantaloupes, summer squashes, pumpkins, butternut squashes, tropical pumpkins, calabazas, winter squashes, watermelons, lettuces, zucchinis (courgettes), aubergines, carrots, parsnips, swedes, turnips, sugar beet, celeriacs, Jerusalem artichokes, artichokes, bok choi, celery, Chinese cabbage, horse radish, musk melons, parsley, radish, spinach, beetroot for table consumption, linseed, sunflower, safflower, sesame, carob, coriander, mustard, grape, flax, dika, hemp, okra, poppy, castor, jojoba and the like.

Fodder crop plant seed of use in a method or use of the invention is seed that may be grown as a stock feed for further processing such as in bio-fuel production, processed animal feed

production, field planting for farm animal consumption and the like.

For the purposes of the present invention it is to be understood that the term "fodder crop plant seed" refers to fodder crop plant seeds suitable for coating with compositions of use in the invention and includes species of the Poaceae, including *Lolium spp* such as Italian Ryegrass, Hybrid Ryegrass, and rye grasses such as perennial ryegrass (*Lolium perenne*); Festuca species such as red fescue, fescue, meadow fescue, Tall fescue, Lucerne Fescue, and the forage herbs such as chicory, Sheep's Burnett, Ribgrass (aka Robwort Plantain), Sainfoin, Yarrow, Sheep's Parsley and the like.

A flowability enhancing agent is made up of electret particles and is one that reduces the level of clumping in a seed population, such as a batch of seeds that is destined for sowing. Suitable flowability enhancement agents of use in the invention are waxes selected from natural, synthetic and mineral waxes. Typically, waxes of use as flowability enhancing agents in the invention have a melting temperature of ≥40°C, depending on design. Preferably, waxes of use in the invention include waxes having a melting point of preferably ≥50°C, and most preferably are made up of so-called hard waxes having a melting point of ≥70°C. Examples of natural waxes of use in the present invention include carnauba wax, beeswax, Chinese wax, shellac wax, spermaceti wax, myricyl palmitate, cetyl palmitate, candelilla wax, castor wax, ouricury wax, wool wax, sugar cane wax, retamo wax, rice bran wax and the like.

Synthetic waxes of use as flowability enhancing agents in the present invention include suitable waxes selected from paraffin wax, microcrystalline wax, Polyethylene waxes, Fischer-Tropsch waxes, substituted amide waxes, polymerized α-olefins and the like.

Mineral waxes of use as flowability enhancing agents in the invention include montan wax (e.g. Lumax® Bayer) ceresin wax, ozocerite, peat wax and the like. More preferably, the wax of use in the method of the invention comprises at least one species of wax selected from carnauba wax, montan wax, and paraffin wax or a mixture of two or more thereof.

The particles of flowability enhancing agent are added as a powder to plant seeds as a formulation of dry particles, preferably of an appropriate known volume mean diameter for the seed type to which the formulation is being added. The plant seeds may comprise pre-coated seed, partially coated seed or untreated seed, that is to say, naked seed to which a coating formulation or coating composition has not been applied prior to the addition of the flowability enhancing agent. Preferably, the flowability enhancing agent is added to a mass of plant seeds that is made up of untreated seed. The flowability enhancing agent in the form of dry particulates is simply admixed into the mass of seeds which is then gently agitated or stirred until the mixing is complete and the seeds are observed to be free flowing. The size of the particles of flowability enhancing agent typically have a volume mean diameter of any

conventional size, such as up to 200μm, preferably from 10 – 100 μm, and most preferably from 10-50μm depending on the type and size of plant seed that the particles are being applied to. Generally, the particles of use in the invention possess a volume mean diameter of ≥10μm, such as in the range of from ≥10μm to 200μm, for example from ≥10μm to 100μm; or from ≥10μm to 40μm; or from ≥10μm to 30μm or any desired volume mean diameter value in between. Preferably, dry powder formulations or compositions of the invention comprise particles having a volume mean diameter of ≥10μm, for example of 10μm, 11μm, 12μm, 13μm, 14μm, 15μm and the like up to any volume mean diameter of choice, such as up to 200μm or any volume mean diameter in between for example 40μm or 30μm. In one preferment, compositions of the invention comprise electret particles having a volume mean diameter of from about 12μm to 200μm. One advantage of such formulations or compositions of the invention is that they are observed to limit dust drift from the seeds. A further advantage is that are also considered to be less of a thoracic hazard to humans and are not thought to be allergenic.

Preferably still, the flowability enhancing agent typically does not include added further components such as added UV blockers or added antioxidants or the like. The flowability enhancing agent of use in the present invention may be made up of a mixture of one or more waxes of use in the invention in dry powder form that have a melting point at or above 40° Centigrade as herein described. Suitable mixtures of waxes may include any combination of two or more waxees selected from natural, synthetic, and mineral waxes, such as, carnauba wax and montan wax; montan wax and paraffin wax; carnauba wax and montan wax;and the like. Alternatively, the particles of wax used as flowability enhancing agents of use in the invention may be made out of two or more waxes through melting and then mixing together in the molten state. Once the molten state cools down and solidifies, the resulting composite block may be broken up and kibbled and comminuted to size conventionally as outlined herein below. In a further alternative, particles of use in the invention may be made by compressing two or more sets of particles or sheets of flowability enhancing agents together, forming a composite structure or block that may then be broken up and kibbled and comminuted to size before being applied to a seed mass. Thus, flowability enhancing agents of use in the invention may be applied as a coating composition to plant seeds by

i) obtaining organic material as a dry powder formulation of separate particles of a pre-determined VMD; and

ii) applying the said population of particles to plant seeds.

The skilled addressee will also appreciate that the pre-determined VMD will be appropriate to the plant seed to which the coating is to be applied.

The skilled addressee will appreciate that a method of coating a plant seed with a coating composition that comprises a flowability enhancing agent of use in the invention, typically comprises

i) obtaining at least one flowability enhancing agent suitable for coating plant seeds;

ii) heating the flowability enhancing agent so as to form a liquid phase or a gaseous phase;

iii) cooling the liquid phase or gaseous phase of ii) to below the melting point of the flowability enhancing agent, forming a solid;

iv) machining the solid flowability enhancing agent of step iii) into particles of a pre-determined VMD as herein defined; and

v) applying the particles of iv) to plant seeds.

"Plant seeds" and "plant seed" is used interchangeably herein and means plant seeds selected from fodder and forage plant seeds, cereal seeds, cotton seeds, legume plant seeds, maize seeds, and field crop plant seeds, typically such seeds are viable seeds, to which formulations or compositions of use in the invention may be applied. Depending on design, the plant seeds may be viable (e.g. for planting purposes), or not viable (for example, after washing for use in beer or lager production; for milling into flour, or as feedstock for other industrial processes). Preferably, plant seed as provided herein means seeds that are capable of germinating to at least conventional levels of germination typical of the relevant plant species under consideration. Thus, a plant seed of use in a method or use of the invention is one that may be grown for industrial purposes, including seed production, human and/or domesticated farm animal consumption.

Thus, for the purposes of the present invention it is to be understood that the term "seed" or "seeds" herein refers to seeds produced from plants that are of commercial importance.

Cereal seeds suitable for coating with compositions of use in the invention include seeds of rice (*Oryza sativa*), wheat (Triticum spp. such as *T. aestivum*) including species such as spelt (*T. spelta*), einkorn (*T. monococcum*), emmer (*T. dicoccum*) and durum (*T. durum*), barley (*Hordeum vulgare*) including two row and six row barley, sorghum (*Sorghum bicolor*), millet species such as pearl millet (*Pennisetum glaucum*), foxtail millet (*Setaria italica*), proso millet (*Panicum miliaceum*) and finger millet (*Eleusine coracana*), oats (*Avena sativa*), rye (*Secale cereale*), Triticale (*x Triticosecale*), buckwheat (*Fagopyrum esculentum*).

For the purposes of the present invention it is to be understood that the term "cotton plant seed" refers to commercially used seeds of the family Malvaceae, typically *Gossypium* seeds

which are collectively referred to herein as "cotton plant seeds" unless context demands otherwise. Cotton seeds suitable for coating with compositions of use in the invention include cotton seeds of the family Malvaceae and include representative *Gossypium spp.*, such as *Gossypium hirsutum* (90% of world cotton production), *Gossypium barbadense* (8% of world cotton production), and *Gossypium arboreum* (2% of world cotton production).

For the purposes of the present invention it is to be understood that the term "legume plant seed" refers to seeds of leguminous plants. Legume plant seeds suitable for coating with compositions of use in the invention include seeds of legume species of the family Fabaceae that includes species such as Alfalfa (*Medicago sativa*), Austrian winter pea (*Pisum sativum*), Berseem clover (*Trifolium alexandrinum*), Black medic (*Medicago lupulina*), Chickling vetch/pea (*Lathyrus sativus*) Cowpea (*Vigna unguiculata*), Crimson clover (*Trifolium incarnatum*), Field peas (*Pisum sativum subsp. arvense*), Hairy vetch (*Vicia villosa*), Horse beans (*Vicia faba*), Kura clover (*Trifolium ambiguum*), Mung beans (*Vigna radiate*), Red clover (*Trifolium pratense*), Soya beans (*Glycine max*), Subterranean clover (*Trifolium subterraneum*), Sunn hemp (*Crotalaria juncea L*), White clover (*Trifolium repens*), White sweet clover (*Melilotus alba*), Woolypod vetch (*Vicia villosa ssp. dasycarpa*), Yellow sweet clover (*Melilotus officinalis*), Adzuki bean, (Vigna angularis, syn.: *Phaseolus angularis*), Broad bean (*V. faba* var. major), field bean (*Vicia faba*), Vetch (*Vicia sativa*), Common beans (*Phaseolus vulgaris*), including green beans, runner beans, haricot beans and the like, Chick pea (*Cicer arietinum*), Guar bean (*Cyamopsis tetragonoloba*), Hyacinth bean (*Dolichos lablab*), Lentil (*Lens culinaris*), Lima bean (*Phaseolus lunatus*), Lupin (*Lupinus* spp.), Mung bean (*Vigna radiata*, syn.: *Phaseolus aureus*), Pea (*Pisum sativum*), Peanut (*Arachis hypogaea*), Pigeon pea (*Cajanus cajan*), Tepary bean (*Phaseolus acutifolius*) and the like.

For the purposes of the present invention it is to be understood that the term "maize seed" refers to any kind of maize seed from a *Zea mays* plant that is for food-related production or other industrial purpose such as starch production, bio-fuel manufacture, typically ethanol manufacture, animal fodder production and the like. Examples of *Zea mays* varieties used in industry include flour corn (*Zea mays* var. *Amylacea*); popcorn used as a food and in packaging materials (*Zea mays* var. *Evert*); flint corn used for hominy production (*Zea mays* var. *Indurata*); sweet corn used as a food (*Zea mays* var. *saccharata* and *Zea mays* var. *Rugosa*); Waxy corn used in producing food thickening agents, in the preparation of certain frozen foods, and in the adhesive industry (*Zea mays* var. *Ceratina*); Amylomaize maiz used in the production of biodegradeable plastics (*Zea mays*); and striped maize used as an ornamental (*Zea mays* var. *Japonica*).

Maize is also known as "corn" and these two terms may be used interchangeably unless

context demands otherwise.

For the purposes of the present invention it is to be understood that the term "field crop plant seed" refers to "oilseeds" and "vegetable seeds" which are collectively referred to herein as "field crop plant seeds" unless context demands otherwise.

Field crop plant seeds suitable for coating with compositions of use in the invention include oil seeds of the Crucifer family such as canola (*B. campestris*) and oilseed rape (*B. napus*); seeds of other Crucifer plant species including those of plants of the *B. oleraceae* such as seeds of types of cabbages, broccolis, cauliflowers, kales, Brussels sprouts, and kohlrabis; seeds of alliums including onion, leek and garlic. Other field crop plant seeds suitable for coating with compositions of use in methods of, and in uses of the invention include capsicums, tomatoes, cucurbits such as cucumbers, cantaloupes, summer squashes, pumpkins, butternut squashes, tropical pumpkins, calabazas, winter squashes, watermelons, lettuces, zucchinis (courgettes), aubergines, carrots, parsnips, swedes, turnips, sugar beet, celeriacs, Jerusalem artichokes, artichokes, bok choi, celery, Chinese cabbage, horse radish, musk melons, parsley, radish, spinach, beetroot for table consumption, linseed, sunflower, safflower, sesame, carob, coriander, mustard, grape, flax, dika, hemp, okra, poppy, castor, jojoba and the like.

Fodder crop plant seed of use in a method or use of the invention is seed that may be grown as a stock feed for further processing such as in bio-fuel production, processed animal feed production, field planting for farm animal consumption and the like.

For the purposes of the present invention it is to be understood that the term "fodder crop plant seed" refers to fodder crop plant seeds suitable for coating with compositions of use in the invention and includes species of the Poaceae, including *Lolium spp* such as Italian Ryegrass, Hybrid Ryegrass, and rye grasses such as perennial ryegrass (*Lolium perenne*); *Festuca spp.* such as red fescue, fescue, meadow fescue, Tall fescue, Lucerne Fescue, and the forage herbs such as chicory, Sheep's Burnett, Ribgrass (aka Robwort Plantain), Sainfoin, Yarrow, Sheep's Parsley and the like.

The flowability enhancing agent is made up of electret particles and is one that reduces the level of clumping in a seed population, such as a batch of seeds that is destined for sowing. Suitable flowability enhancement agents of use in the invention are waxes selected from natural, synthetic and mineral waxes. Typically, waxes of use as flowability enhancing agents in the invention have a melting temperature of ≥40°C, depending on design. Preferably, waxes of use in the invention include waxes having a melting point of preferably ≥50°C, and most preferably are made up of so-called hard waxes having a melting point of ≥70°C. Examples of

natural waxes of use in the present invention include carnauba wax, beeswax, Chinese wax, shellac wax, spermaceti wax, myricyl palmitate, cetyl palmitate, candelilla wax, castor wax, ouricury wax, wool wax, sugar cane wax, retamo wax, rice bran wax and the like.

Synthetic waxes of use as flowability enhancing agents in the present invention include suitable waxes selected from paraffin wax, microcrystalline wax, Polyethylene waxes, Fischer-Tropsch waxes, substituted amide waxes, polymerized α-olefins and the like.

Mineral waxes of use as flowability enhancing agents in the invention include montan wax (e.g. Luwax® Bayer) ceresin wax, ozocerite, peat wax and the like.

The flowability enhancing agent of use in the invention may comprise one or more waxes as herein defined. Preferably, the wax is selected from montan wax, paraffin wax and carnauba wax. Most preferably the wax of choice is carnauba wax. Where two or more waxes of use in the invention are employed as the flowability enhancing agent in a seed coating composition of use in the invention they may be heated together so as to form a liquid phase or a gaseous phase during which phases the waxes may be mixed, if required. Once the waxes are mixed they may be cooled to below the melting point of the wax possessing the lowest melting point in the liquid phase (where a gas phase is employed, this will be cooled to a liquid phase), forming a solid which may then be machined, such as by comminution, into particles of a pre-determined VMD as herein defined using conventional procedures. Once the wax is in the form of particles of a known VMD, the particles may be applied to plant seeds via conventional means.

The flowability enhancement agent of use in the invention is applied to plant seeds in dry particulate form. The flowability enhancing agent may be selected from organic materials selected from organic waxes having a melting point of ≥40, ≥50°C, more preferably of ≥60°C, and most preferably are made up of hard waxes having a melting point of ≥70°C. Suitable waxes for use in the invention include mineral waxes, synthetic waxes and natural waxes as hereinbefore defined. Examples of waxes of use in the invention include carnauba wax, beeswax, Chinese wax, shellac wax, spermaceti wax, myricyl palmitate, cetyl palmitate, candelilla wax, castor wax, ouricury wax, wool wax, sugar cane wax, retamo wax, rice bran wax or a mixture of two or more thereof. Preferably, the flowability enhancement agent includes a substantial proportion of carnauba wax up to 100%, for example 1%, 5%, 10%, 20%, 30%, 40%, 50%, 60%, 70%, 80%, 90% or any proportion thereinbetween, the rest being made up of at least one other flowability enhancement agent as herein defined. Preferably, the selected flowability enhancement agent is a wax selected from mineral waxes and natural waxes or a mixture of two or more thereof such as carnauba wax, montan wax, paraffin wax or a mixture of two or more thereof. Preferably the flowability enhancement agent

is one of or a mixture of carnauba wax and montan wax. Most preferably, the flowability enhancement agent is carnauba wax.

The skilled addressee will appreciate that the waxes of use in the invention may be applied simply as flowability enhancement agents *per se*, and in that form do not carry or contain an active agent such as a pesticide, a growth enhancing agent or other agents such as a fertiliser. Furthermore, the skilled addressee will appreciate that flowability enhancement agents of use in the invention may be added to seed coats (testa) of uncoated or non-pelleted seed typically in the form of dry particles. The skilled addressee will also appreciate that flowability enhancement agents of use in the invention may be added as an external layer on a conventional dry, pelleted seed or on a conventional dry, coated seed in the form of dry, free flowing particles. In any context of addition of flowability enhancement agents to coated, pelleted or uncoated plant seeds, the skilled addressee will appreciate that the flowability enhancing agent should be added to plant seeds in a dry particulate formulation or a powder formulation and not in a semi-liquid or a liquid form because it is envisaged that in either form, the flowability enhancing properties of such added agents are thought likely to be compromised. Naturally, the skilled addressee will appreciate that the viability of the plant seeds should not be significantly adversely affected by the addition of flowability enhancing agent.

The skilled addressee will also appreciate that where active agents may be added to flowability enhancing agents of use in the invention, effective amounts of active agent may be encapsulated or carried by the flowability enhancing agent but the level of such active agents should not significantly interfere with the ability of the flowability enhancing agent to adhere to plant seeds or of the ability of the flowability enhancing agent to control dust drift. Flowability enhancing agents of the invention may include active agents that may make up to 20% by mass of the particles, preferably up to about 10% by mass of the particles, and most preferably from about 5%-8% by mass of the particles. The choice of active agent that may be carried or encapsulated by a flowability enhancing particle of use in the invention is selected by design. Suitable active agents that may be carried by particles of use in the invention may be selected from pesticides, fertilizers, growth enhancing agents and the like.

In a further aspect of the invention there is provided use of a dry particulate free flowing formulation or composition in improving the flowability of seeds within a population of plant seeds, wherein the formulation or composition comprises at least a flowability enhancing agent that is made up of at least one species of electret particle selected from waxes, wherein the electret particles adhere more firmly to individual plant seeds than do particles that comprise a dry free flowing substance that is or includes a mineral earth component. The particles of wax of use in the invention comprise at least one species of wax selected from

mineral waxes, natural waxes and synthetic waxes as defined herein above. The selected wax comprises at least one species of wax that has a melting temperature of ≥40°C, preferably a melting temperature of ≥50°C, and most preferably a melting temperature of ≥70°C. In a preferment, the wax comprises at least one species of wax selected from carnauba wax, montan wax, and paraffin wax or a mixture of two or more thereof.

In a further aspect of the invention there is provided use of a particulate, free flowing formulation or composition in controlling dust drift, preferably in reducing the level or amount of dust drift, from a population of plant seeds, wherein the particulate free flowing formulation or composition comprises at least a flowability enhancing agent made up of dry electret particles made of wax as herein defined that are able to adhere to individual plant seeds more firmly than a dry particulate compound or composition that is a free flowing flowability enhancing agent that comprises a substance that is a mineral earth or includes a mineral earth component.

The particles of wax of use in controlling dust drift are selected from at least one species of wax selected from mineral waxes, natural waxes and synthetic waxes as defined herein above. The selected wax comprises at least one species of wax that has a melting temperature of ≥40°C, preferably a melting temperature of ≥50°C, and most preferably a melting temperature of ≥70°C. In a preferment, the wax comprises at least one species of wax selected from carnauba wax, montan wax, and paraffin wax or a mixture of two or more thereof. Most preferably, the wax is carnauba wax.

The size of the particles used in controlling dust drift typically have a volume mean diameter of any conventional size, such as up to 200μm, preferably from 10 – 100 μm, and most preferably from 10-50μm depending on the type and size of plant seed that the particles are being applied to. Generally, the particles of use in the invention possess a volume mean diameter of ≥10μm, such as in the range of from ≥10μm to 200μm, for example from ≥10μm to 100μm; or from ≥10μm to 40μm; or from ≥10μm to 30μm or any desired volume mean diameter value in between. Preferably, dry powder formulations or compositions of the invention comprise particles having a volume mean diameter of ≥10μm, for example of 10μm, 11μm, 12μm, 13μm, 14μm, 15μm and the like up to any volume mean diameter of choice, such as up to 200μm or any volume mean diameter in between for example 40μm or 30μm. In one preferment, compositions of the invention comprise electret particles having a volume mean diameter of from about 12μm to 200μm. One advantage of such formulations or compositions of the invention is that they are observed to limit dust drift from the seeds.

In a further aspect of the invention there is provided a method of controlling dust drift from a population of plant seeds by placing the plant seeds of a mass of seeds in contact with dry

free flowing particles of a flowability enhancement agent made up of electret particles made of a wax that adheres more firmly to plant seeds than a dry particulate compound or composition that is a flowability enhancement agent that comprises a substance that is a mineral earth or includes a mineral earth component.

In this aspect of the invention, the wax comprises at least one species of wax selected from mineral waxes, natural waxes and synthetic waxes. Preferably, the at least one species of wax is a wax that has a melting temperature of ≥40°C. More preferably, the species of wax is at least one species of wax that has a melting temperature of ≥50°C. More preferably still, the at least one species of wax has a melting temperature of ≥70°C. Most preferably, the species of wax comprises at least one species of wax selected from carnauba wax, montan wax, and paraffin wax or a mixture of two or more thereof.

Again, the size of the particles used in the method of controlling dust drift typically have a volume mean diameter of any conventional size, such as up to 200µm, preferably from 10 – 100 µm, and most preferably from 10-50µm depending on the type and size of plant seed that the particles are being applied to. Generally, the particles of use in the invention possess a volume mean diameter of ≥10µm, such as in the range of from ≥10µm to 200µm, for example from ≥10µm to 100µm; or from ≥10µm to 40µm; or from ≥10µm to 30µm or any desired volume mean diameter value in between. Preferably, dry powder formulations or compositions of the invention comprise particles having a volume mean diameter of ≥10µm, for example of 10µm, 11µm, 12µm, 13µm, 14µm, 15µm and the like up to any volume mean diameter of choice, such as up to 200µm or any volume mean diameter in between for example 40µm or 30µm. In one preferment, compositions of the invention comprise electret particles having a volume mean diameter of from about 12µm to 200µm. One advantage of such formulations or compositions of the invention is that they are observed to limit dust drift from the seeds.

There now follow examples and figures that illustrate the invention. It is to be understood that the examples are not to be construed as limiting the invention in any way.

Figure 1: (Soya bean) Boxplot of Heubach Test Results

Figure 2: (maize) Boxplot of Heubach Test results

Figure 3: (wheat) Boxplot of Heubach Test Results (n=3)

Figure 4: (oilseed rape) Boxplot of Heubach Test Results

Examples Section:

1. Soya Bean

Objective: to assess the adhesion properties for carnauba wax (Entostat™) at a range of loadings using soya bean seed (*Glycine max*)

STUDY OUTLINE

The purpose of the study was two-fold: firstly, to assess the ability of carnauba wax particles to adhere to seed in a situation designed to replicate a commercial seed sowing environment, and, secondly, to determine a relationship between seed type, loading and adhesion. It is intended that the resulting data is applicable to a number of individual elements of the seed treatment project. Information regarding optimum loading can be combined with enumeration studies using microbial control agents to indicate the potential for carnauba wax as a simple 'dust-on" application method for biofungicides. It will also provide insight as to the possibility of a role for carnauba wax in reformulation of existing chemical seed treatments, with special emphasis on the reduction of dust-drift. Recent studies [Krupke, C.H. et al. Multiple Routes of Pesticide Exposure for Honey Bees Living Near Agricultural Fields. *PLoS ONE* **7**, e29268 (2012); Pistorius J. et al Bee Poisoning Incidents in Germany in Spring 2008 Caused by Abrasion of Active Substance from Treated Seeds During Sowing of Maize. *Julius-Kühn-Archiv* **423**, (2009)] have identified that the drift of material from treated seeds during sowing is responsible for large scale bee mortality.

The described method is intended to assess the amount of free floating dust and abrasion particles of treated seeds under defined mechanical stress conditions.

Treated seeds are mechanically stressed inside a rotating drum. A vacuum pump creates an air flow through the rotating drum, the connected glass cylinder and the attached filter unit. By the air flow, abraded dust particles are transported out of the rotating drum through the glass cylinder and subsequently through the filter unit. Coarse non-floating particles are separated and collected in the glass cylinder while floating dust particles are deposited onto a filter. The amount of floating dust collected on the filter is determined gravimetrically.

TEST ITEM DETAILS

Steps in Air Milling in Boyes Micronisation Process (for carnauba wax particles having a VMD of approx. 10µm)

1. 2kg carnauba wax blocks are first kibbled into approximately 4 to 6mm pieces in a KT Handling Ltd Model 04 kibbler (serial no. 729/C) following the manufacturer's instructions.

2. The kibbled pieces are then passed through a Apex Construction Ltd Model 314.2 Comminuting Mill (serial no. A21306) and reduced further in size to a range of 250 to 300um.

3. The comminuted particles are then passed through a Hosokawa Micron Ltd Alpine 100AFG jet mill (serial no. 168092) following the manufacturer's instructions, setting the mill at a speed of 12500rpm, with a positive system pressure of 0.03bar.

4. The grinding air is to be kept to 6 bar, the system rinsing air flow and Classifying Wheel gap rinsing air are both to be set at a minimum of 0.5 bar and no more than 0.75bar, the cleaning air filter is to register a delta of no more than 5bar to achieve a final particle size with a VMD of 9.58um.

Carnauba wax was combined with soya bean seed at three loadings (see below).

Soya bean seed (Pripyat), supplied by Soya UK (West End, Hampshire).

REFERENCE ITEM DETAILS

- Soya bean pre-treated with Thiraflo (Chemtura, Laurenceville, USA)
- Talc – Simple Talc, Unscented, Johnsons

TREATMENTS

1. Soybean treated with 0.01% carnauba wax (by mass)
2. Soybean treated with 0.1% carnauba wax (by mass)
3. Soybean treated with 1% carnauba (by mass)
4. Soybean treated with 1% Talc (by mass)
5. Soybean, untreated

All treatments were replicated three times

TEST SYSTEM

Apparatus: An analytical balance (accuracy 0.1 mg). As the last digit of a scale carries a larger error it is recommended to use a 5-decimal scale to achieve an accurate reading of the 4th decimal.

Heubach Dustmeter device (Heubach GmbH, Heubachstrasse 7, 38685 Langelsheim, Germany)

- Metal rotating drum
- Glass cylinder
- Non-electrostatic filter housing with conditioned glassfibre filter disc (Whatman GF 92 or Macherey Nagel Type MN 85/70 BF, or equivalent specification)
- Drive & control unit with touchscreen control panel

Constant climate chamber (e.g. Binder, KBF 720)

Paper bags (not airtight)

Air ionizer (e.g. Sartorius, STAT-FAN YIB-01, or PRX U field ionizer from Haug GmbH, Germany, or equivalent)

Seed Counter (e.g. Pfeuffer, Contador or GTA Sensorik, Marvin, or equivalent)

SAMPLE

A sample must consist of at least 500 g +/- 5% of seeds. The thousand grain weight (TGW) of the seeds is listed below:

Seed Type	**Thousand Grain Weight g (TGW)**
Soya bean	161

Samples were prepared in block bottom bags (1.4kg)150x32x310mm. 250g of seed were added, followed by the appropriate quantity of the required treatment, before the final 250g of seed were added. The bags were then agitated for 20 seconds to ensure an even distribution of treatment throughout the seed sample. The bags were then labelled and sealed and sent to the test site at INCOTEC Analytical Lab Europe BV, Graanmarkt 3a,1681 PA Zwaagdijk-Oost, The Netherlands.

Sample Schedule

sample number	**Crop**	**Treatment**	**%age**	**by mass (g)**	**Replicate**
1	Soybean	untreated control	n/a	n/a	1
2	Soybean	untreated control	n/a	n/a	2
3	Soybean	untreated control	n/a	n/a	3
4	Soybean	Entostat™	0.01	0.05	1
5	Soybean	Entostat™	0.01	0.05	2
6	Soybean	Entostat™	0.01	0.05	3
7	Soybean	Entostat™	0.1	0.5	1
8	Soybean	Entostat™	0.1	0.5	2
9	Soybean	Entostat™	0.1	0.5	3
10	Soybean	Entostat™	1.0	5	1
11	Soybean	Entostat™	1.0	5	2
12	Soybean	Entostat™	1.0	5	3
13	Soybean	Commercial	n/a	n/a	1
14	Soybean	Commercial	n/a	n/a	2
15	Soybean	Commercial	n/a	n/a	3
16	Soybean	Talc	1.0	5	1

17	Soybean	Talc	1.0	5	2
18	Soybean	Talc	1.0	5	3

Commercial Seed Treatments used:

Soybean Thiraflo

Procedure: use guidelines defined by European Seed Association STAT Dust Working Group,(Version 1.0, 23.03.2011).

Laboratory Conditions

The test has to be performed in a laboratory (separated from the treating area) at 20°C to 25°C and 30% to 70% relative humidity which is free of free floating dust particles. Any other testing which could interfere with the analytical scales (electrostatics, vibrations etc.) should be avoided.

Calibration

No calibration is necessary before measurement. It is recommended that the air flow rate, time of measurements and rotational settings are checked on a routine basis (every 2-3 years) by the technical service of the manufacturer or an equivalent qualified technical service.

Apparatus preparation

During initial installation of the Heubach equipment make sure that the same is horizontally levelled.

After disconnecting the vacuum tube from the filter unit, the Heubach device is stepwise disassembled: the filter unit is removed and opened, the glass cylinder removed and finally the metal drum removed and opened.

Make sure that all components which are in contact with seed or dust (i.e. rotating drum, glass cylinder, and filter unit including rubber O-ring) have been thoroughly cleaned. Cleaning is routinely done using a vacuum cleaner with a pointed nozzle.

Note: If the drum is either used for the first time in this test or has been cleaned with alcohol there is a need to run 2 cycles with treated seeds before starting the actual measurements on your samples. This ensures a constant occupancy of the pores in the metal surface.

Switch on the main power of the Heubach device min. 30 minutes before starting any measurement in order to allow proper warm-up of the flow meter. For setting the parameters on the control panel choose the program "User Method" in which the parameters are manually set to the values below. It is recommended to set the parameters after full assembly of the device.

Parameter settings

Rotation speed	=	30 [rpm]
Rotation time	=	120 s
Airflow rate	=	20 [litres per minute]

Sample Preparation

Prior to testing, seed samples are stored in a constant climate chamber for at least 48 hours (2 days) at 20°C ± 2°C and at 50% ± 10% relative humidity. To allow equilibration, seeds must be kept in paper bags (not airtight) when entering the climate chamber.

For obtaining a working sample a gentle method should be used to reduce the submitted sample in size to the size needed for the test. This to avoid damage to the treated seed which could lead to artificially enhanced dust levels. Examples of gentle methods are the modified halving method, the spoon method and the hand halving method described in the ISTA Rules.

Measurement

Carefully transfer (avoid dust) 100 ± 1 grams of the conditioned seeds (weight seeds w_S [g]; accuracy: 0.01 gram) into the metal drum of the Heubach device, then correctly close and reassemble the drum and connect the glass cylinder. The system has to be levelled perfectly horizontally and no obstruction of the rotating parts and of the internal or external airflow must take place.

The time for transferring and analysing the sample is to be kept as short as possible in order to avoid a change in its relative humidity. A contamination with non-seed dust particles must be excluded.

Place a glassfibre filter disc (Whatman GF 92 or similar specification) in the filter unit according to the description in the manual. For equilibration with the laboratory conditions, the filter discs will be stored in an open box next to the Heubach device. In order to prevent effects resulting from electrostatic charging, the use of a non-electrostatic filter-housing offered by HEUBACH is compulsory to use. The filter unit including the filter disc is weighed (weight filter assembly w0 [g]; accuracy: 0.1 mg), placed on the glass cylinder and connected to the vacuum tube.

On the control panel pre-select the "time" option. Start the rotation cycle by pressing "I" on the control panel. After completion of the run, the rotation must have fully stopped before any parts of the apparatus may be disassembled. Remove the filter unit including the filter disc carefully from the glass cylinder and weigh it in the same manner as described before (weight filter assembly w1 [g]; accuracy: 0.1 mg).

If significant amounts of dust have passed *through* the filter disc (by visible inspection), the test must be stopped immediately and the filter unit checked for incorrect assembly or damages. If necessary, it has to be replaced and the test has to be repeated.

The test has to be performed twice. After each measurement, the apparatus must be cleaned.

If the rotation speed (rpm) displayed on the control panel during the measurement deviates more than ±10 % from the pre-set value or if the total air volume sampled during the measurement deviates more than ±10 % from the expected volume of 40 L (20 L/min for 2 min) the measurement has to be redone.

As a back-up control for the air volume a separate flow-meter [e.g. DFM Typ SVB (Uniflux ¼") from VAF-Fluid-Technik GmbH, Germany; www.vaf-fluidtechnik.de] can be inserted in the plastic air hose.

Evaluation and Calculation of Results

The Heubach dust value is expressed in g / 100 kg of treated seeds. Depending on requirements and seed type tested, the result can be also expressed in g / 100,000 kernels, taking into account the Thousand Seed Weight (TSW) of the tested sample.

Use the following formula to convert the measured result to the Heubach dust value:

$$\text{Heubach dust value} = \frac{(W_1 - W_0) \times 100{,}000}{W_S} \text{ [g / 100 kg]}$$

or alternatively expressed in g / 100,000 kernels :

$$\text{Heubach dust value} = \frac{(W_1 - W_0) \times 100 \times TGW}{W_S} \text{ [g / 100,000 kernels]}$$

wherein:

W_1	=	weight of the loaded filter unit incl. filter disc [g]
W_0	=	weight of the empty filter unit incl. filter disc [g]
W_S	=	weight of the treated seeds [g]
100,000	=	conversion factor a [ ]
100	=	conversion factor b [ ]
TGW	=	Thousand Grain Weight [g / 1000 kernels]

The final result is the mean of the two measurements. If a threshold value is defined the test must be repeated if one test result is higher than 50% of the threshold value and if the two test results differ more than 20% from each other. In case of experimental or voluntarily purposes without a mandated threshold value (e.g. small seeded crops) the test must be repeated if the

two test results differ more than 20% and at least one test result exceeds 1 g/100 kg. If both test results are below 1 g/100 kg and the two results differ more than 0.2 g the test must be repeated.

Simultaneous Tests for General Linear Hypotheses

Source	DF	SS	MS	F	P
Treatment	5	6018.0	1203.6	21.78	>0.0001
Error	12	663.2	55.3		
Total	17	6681.2			

Multiple Comparisons of Means: Tukey Contrasts

Grouping Information Using Tukey Method

Treatment	N	Mean	Grouping
Soya beanTalc1	3	50.370	A
Soya beanEnto1	3	5.495	B
Soya beancontrol	3	0.668	B
Soya beanEnt0.1	3	0.590	B
Soya beanEnt0.01	3	0.536	B
Soya beanComm	3	0.442	B

Means that do not share a letter are significantly different.

Fit: aov(formula = MeanDust ~ Crop, data = Soybean)

Linear Hypotheses:

	Estimate	Std. Error	t value	Pr(>|t|)
Soyacontrol–SoyaComm	0.22633	6.06997	0.037	1.000
SoyaEnt0.01-SoyaComm	0.09433	6.06997	0.016	1.000
SoyaEnt0.1-SoyaComm	0.14800	6.06997	0.024	1.000
SoyaEnto1-SoyaComm	5.05333	6.06997	0.833	0.955
SoyaTalc1-SoyaComm	49.92833	6.06997	8.225	<1e-04 ***
SoyaEnt0.01-Soyac'trl	0.13200	6.06997	-0.022	1.000
SoyaEnt0.1–Soyac'trl	0.07833	6.06997	-0.013	1.000

SoyaEnt1–Soyac'trl	4.82700	6.06997	0.795	0.963
SoyaTalc1–Soyac'trl	49.70200	6.06997	8.188	<1e-04 ***
SoyaEnt0.1-SoyaEnt0.01	0.05367	6.06997	0.009	1.000
SoyaEnto1-SoyaEnt0.01	4.95900	6.06997	0.817	0.959
SoyaTalc1-SoyaEnt0.01	49.83400	6.06997	8.210	<1e-04 ***
SoyaEnt1-SoyaEnt0.1	4.90533	6.06997	0.808	0.960
SoyaTalc1-SoyaEnt0.1	49.78033	6.06997	8.201	<1e-04 ***
SoyaTalc1-SoyaEnto1	44.87500	6.06997	7.393	<1e-04 ***

Signif. codes: 0 '***'

Results are shown in Figure 1

METHOD FOR ASSESSING FLOWABILITY/PLANTABILITY

Seed treatments are assessed to measure their impact on the plantability and flowability of the treated seed. "Plantability" relates to a measurement of sowing inaccuracies, such as, seed dropping failures and double seed drops occurring within a predetermined distance or area. "Flowability" refers to the treated seeds ability to flow or move through a typical planting process using conventional sowing equipment. Clogging and clumping of seeds that may occur through the sowing process is a factor that affects the efficiency of flowability of seed. If clumping and clogging occurs it can lead to an uneven stand of crops. Internal friction angles and the flowability index (the ratio of the highest consolidation stress and unconfined yield strength) of the material are measured.

The coefficient of uniformity for the Entostat treated seed is compared to that of untreated and commercially treated seed (polymer-coated and talc).

SGS Crop and Seed Services (Geneva, Switzerland) provide a testing service for the determination of flowability/plantability of seed to the public in accordance with standardised protocols that are widely acceptable to the seed industry.

Results

Differences in flowability/plantability from the treated soya bean seed are observed relative to controls.

2. Perennial Rye Grass

Objective: to assess the adhesion properties for carnauba wax (Entostat™) at a range of loadings using seeds of perennial rye grass (*Lolium perenne*).

STUDY OUTLINE

Same as for example 1 (soya bean).

TEST ITEM DETAILS

Steps in air milling are the same as for soya bean (above) with the exception that carnauba wax was combined with perennial rye grass seed at three loadings (see below).

Perennial rye grass seed was supplied by Herbiseeds Ltd. (Twyford, UK)

REFERENCE ITEM DETAILS

- Perennial rye grass seed pre-treated with Advance, thiazole (Chemtura Agrosolutions)
- Talc - Simple Talc, unscented, Johnsons

TREATMENTS

1. Rye grass seed treated with 0.01% carnauba wax (by mass)
2. Rye grass seed treated with 0.1% carnauba wax (by mass)
3. Rye grass seed treated with 1% carnauba wax (by mass)
4. Rye grass seed treated with 1% Talc (by mass)
5. Rye grass seed, untreated

All treatments were replicated three times

TEST SYSTEM

Apparatus: same as for soya bean example 1.

SAMPLE

A sample must consist of at least 500 g +/- 5% of seeds. The thousand grain weight (TGW) of the seeds is listed below:

Seed Type	Thousand Grain Weight g (TGW)
Rye grass seed	1.5

Samples are prepared in block bottom bags (1.4kg) 150x32x310mm. 250g of seed is added, followed by the appropriate quantity of the required treatment, before the final 250g of seed is added. The bags are then agitated for 20 seconds to ensure an even distribution of treatment throughout the seed sample. The bags are then labelled and sealed and are sent to the test site.

Sample Schedule

Sample No.	Crop	Treatment	%	by mass	Replicate
1	Rye	untreated control	n/a	n/a	1
2	Rye	untreated control	n/a	n/a	2
3	Rye	untreated control	n/a	n/a	3
4	Rye	Entostat™	0.01	0.05	1
5	Rye	Entostat™	0.01	0.05	2
6	Rye	Entostat™	0.01	0.05	3
7	Rye	Entostat™	0.1	0.5	1
8	Rye	Entostat™	0.1	0.5	2
9	Rye	Entostat™	0.1	0.5	3
10	Rye	Entostat™	1.0	5	1
11	Rye	Entostat™	1.0	5	2
12	Rye	Entostat™	1.0	5	3
13	Rye	Commercial	n/a	n/a	1
14	Rye	Commercial	n/a	n/a	2
15	Rye	Commercial	n/a	n/a	3
16	Rye	Talc	1.0	5	1
17	Rye	Talc	1.0	5	2
18	Rye	Talc	1.0	5	3

Commercial Seed Treatments

Rye grass Advance, thiazole

PROCEDURE: see guidelines defined by European Seed Association STAT Dust Working Group, (Version 1.0, 23.03.2011)

Laboratory Conditions

The test is performed in a laboratory (separated from the treating area) at 20°C to 25°C and 30% to 70% relative humidity, free of free floating dust particles.

Calibration

No calibration is necessary before measurement. It is recommended that the air flow rate, time of measurements and rotational settings are checked on a routine basis (every 2-3 years) by the technical service of the manufacturer or an equivalent qualified technical service.

Apparatus preparation

Same as for example 1 (soya bean).

Parameter settings

Same as for example 1 (soya bean).

Sample Preparation

Same as for example 1.

Measurement

Same as for example 1.

Evaluation and Calculation of Results

Same as for example 1.

METHOD FOR ASSESSING FLOWABILITY/PLANTABILITY

Same as for example 1.

Results

Differences in flowability/plantability from the treated rye grass seed are observed relative to controls.

3. Cotton

Objective: to assess the adhesion properties for Entostat™ at a range of loadings using seed types: cotton (*Gossypium hirsutum*).

STUDY OUTLINE

Same as for example 1.

TEST ITEM DETAILS

Steps in air milling are the same as for soya bean (above) with the exception that carnauba wax (Entostat™) was combined with cotton seed at three loadings (see below).

Cotton seed (MRC 270, non-GMO) was supplied by MRC Seeds (Houston, TX, USA).

REFERENCE ITEM DETAILS

- Cotton seed pre-treated with Headline – F500 (BASF Agro, Germany), supplied by MRC seeds, Houston, TX, USA
- Talc - simple talc, unscented, Johnsons

TREATMENTS

1. Cotton seed treated with 0.01% carnauba wax (by mass)
2. Cotton seed treated with 0.1% carnauba wax (by mass)
3. Cotton Seed treated with 1% carnauba wax (by mass)
4. Cotton Seed treated with 1% Talc (by mass)
5. Cotton Seed, untreated

All treatments were replicated three times

TEST SYSTEM

Apparatus: same as for example 1.

SAMPLE

A sample must consist of at least 500 g +/- 5% of seeds. The thousand grain weight (TGW) of

the seeds is listed below:

Seed Type	Thousand Grain Weight g (TGW)
Cotton	125

Samples are prepared as in example 1.

Sample Schedule

sample number	Crop	Treatment	%age	by mass	Replicate
1	Cotton	untreated control	n/a	n/a	1
2	Cotton	untreated control	n/a	n/a	2
3	Cotton	untreated control	n/a	n/a	3
4	Cotton	Entostat™	0.01	0.05	1
5	Cotton	Entostat™	0.01	0.05	2
6	Cotton	Entostat™	0.01	0.05	3
7	Cotton	Entostat™	0.1	0.5	1
8	Cotton	Entostat™	0.1	0.5	2
9	Cotton	Entostat™	0.1	0.5	3
10	Cotton	Entostat™	1.0	5	1
11	Cotton	Entostat™	1.0	5	2
12	Cotton	Entostat™	1.0	5	3
13	Cotton	Commercial	n/a	n/a	1
14	Cotton	Commercial	n/a	n/a	2
15	Cotton	Commercial	n/a	n/a	3
16	Cotton	Talc	1.0	5	1
17	Cotton	Talc	1.0	5	2
18	Cotton	Talc	1.0	5	3

Commercial Seed Treatments

Cotton Headline – F500

Procedure: see guidelines defined by European Seed Association STAT Dust Working Group, (Version 1.0, 23.03.2011)

Laboratory Conditions

The test is performed in a laboratory (separated from the treating area) at 20°C to 25°C and 30% to 70% relative humidity which is free of free floating dust particles.

Calibration

Same as for example 1.

Apparatus preparation

Same as for example 1.

Parameter settings

Same as for example 1.

Sample Preparation

Same as for example 1.

Measurement

Same as for example 1.

Evaluation and Calculation of Results

Same as for example 1.

METHOD FOR ASSESSING FLOWABILITY/PLANTABILITY

Same as for example 1.

Results

Differences in flowability/plantability from treated cotton seed are observed relative to controls.

4. Maize

Objective: to assess the adhesion properties of Entostat® (Exosect Limited) at a range of loadings using maize (*Zea mays*) seed.

STUDY OUTLINE

The same as that for example 1.

TEST ITEM DETAILS

Steps in Air Milling are the same as for example 1 except that Entostat™ was combined with maize seed at three loadings (see below).

Maize seed (DUO maize) was supplied by Bright Seeds Ltd. (Burcombe, Wiltshire)

REFERENCE ITEM DETAILS

- Maize seed pre-treated with Poncho, (Bayer CropScience AG, Monheim am Rhein, Germany)
- Talc – Simple Talc, Unscented, Johnsons

TREATMENTS

1. Maize treated with 0.01% Entostat™ (by mass)
2. Maize treated with 0.1% Entostat™ (by mass)
3. Maize treated with 1% Entostat™ (by mass)
4. Maize treated with 1% Talc (by mass)
5. Maize, untreated

All treatments were replicated three times

TEST SYSTEM

Apparatus: same as that used in example 1.

SAMPLE

A sample must consist of at least 500 g +/- 5% of seeds. The thousand grain weight (TGW) of the seeds is listed below:

Seed Type	**Thousand Grain Weight g (TGW)**
Maize	380

Samples were prepared in block bottom bags as in example 1, and sent off to The Netherlands for testing.

Sample Schedule

sample number	**Crop**	**Treatment**	**%age**	**by mass**	**Replicate**
1	Maize	untreated control	n/a	n/a	1
2	Maize	untreated control	n/a	n/a	2
3	Maize	untreated control	n/a	n/a	3
4	Maize	Entostat™	0.01	0.05	1
5	Maize	Entostat™	0.01	0.05	2
6	Maize	Entostat™	0.01	0.05	3
7	Maize	Entostat™	0.1	0.5	1
8	Maize	Entostat™	0.1	0.5	2
9	Maize	Entostat™	0.1	0.5	3
10	Maize	Entostat™	1.0	5	1
11	Maize	Entostat™	1.0	5	2
12	Maize	Entostat™	1.0	5	3
13	Maize	Commercial	n/a	n/a	1
14	Maize	Commercial	n/a	n/a	2
15	Maize	Commercial	n/a	n/a	3
16	Maize	Talc	1.0	5	1
17	Maize	Talc	1.0	5	2
18	Maize	Talc	1.0	5	3

Commercial Seed Treatments Used

Maize Poncho

Procedure: use guidelines defined by European Seed Association STAT Dust Working

Group(Version 1.0, 23.03.2011).

Laboratory Conditions

Same as for example 1.

Calibration

Same as for example 1.

Apparatus preparation

Same as for example 1.

Parameter settings

Same as for example 1.

Sample Preparation

Same as for example 1.

Measurement

Same as for example 1.

Evaluation and Calculation of Results

Same as for example 1.

Results are shown in Figure 2

Simultaneous Tests for General Linear Hypotheses

Source	DF	SS	MS	F	P
Crop	5	9001.2	1800.2	71.73	>0.0001
Error	12	301.2	25.1		
Total	17	9302.4			

Multiple Comparisons of Means: Tukey Contrasts

Grouping Information Using Tukey Method

Crop	N	Mean	Grouping
MaizeTalc1	3	61.014	A
MaizeEnt1	3	22.872	B
MaizeEnt0.1	3	1.620	C
MaizeComm	3	0.537	C
MaizeEnt0.01	3	0.386	C
Maizecontrol	3	0.121	C

Means that do not share a letter are significantly different.

Linear Hypotheses:

	Estimate	Std.Error	t value	Pr(>|t|)
Maizecont – MaizeComm	0.416	4.090	0.102	1.000
MaizeEnt0.01 – MaizeComm	0.151	4.090	0.037	1.000
MaizeEnt0.1 – MaizeComm	1.083	4.090	0.265	0.999
MaizeEnt1 – MaizeComm	22.335	4.090	5.460	0.001**
MaizeTalc1 – MaizeComm	60.476	4.090	14.785	<0.001***
MaizeEnt0.01 – Maizecont	0.265	4.090	0.065	1.000
MaizeEnt0.1 – Maizecont	1.499	4.090	0.367	0.998
MaizeEnt1 – Maizecont	22.751	4.090	5.562	0.001**
MaizeTalc1 – Maizecont	60.893	4.090	14.887	<0.001***
MaizeEnt0.1 - MaizeEnt0.01	1.234	4.090	0.302	0.999
MaizeEnt1 - MaizeEnt0.01	22.486	4.090	5.497	0.001**
MaizeTalc1 - MaizeEnt0.01	60.628	4.090	14.822	<0.001***
MaizeEnt1 - MaizeEnt0.1	21.252	4.090	5.196	0.002**
MaizeTalc1 - MaizeEnt0.1	59.393	4.090	14.520	<0.001***
MaizeTalc1 - MaizeEnt1	38.141	4.090	9.325	<0.001***

*Statistical significance codes: 0 '***' 0.001 '**'*

METHOD FOR ASSESSING FLOWABILITY/PLANTABILITY

Same as that used in example 1.

Results

Differences in flowability/plantability from the treated maize seed are observed relative to controls.

5. Wheat

Objective: to assess the adhesion properties for carnauba wax (Entostat™, Exosect Ltd) at a range of loadings using wheat seed (*Triticum aestivum*).

STUDY OUTLINE

The same as that described in example 1.

TEST ITEM DETAILS

Steps in Air Milling are the same as those used in example 1 except that Entostat™ was combined with wheat seed at three loadings (see below). Wheat seed was supplied by a local farmer.

REFERENCE ITEM DETAILS

- Wheat pre-treated with Kinto (BASF SE, Limburgerhof, Germany)
- Talc – Simple Talc, Unscented, Johnsons

TREATMENTS

1. Wheat treated with 0.01% Entostat™ (by mass)
2. Wheat treated with 0.1% Entostat™ (by mass)
3. Wheat treated with 1% Entostat™ (by mass)
4. Wheat treated with 1% Talc (by mass)
5. Wheat, untreated

All treatments were replicated three times

TEST SYSTEM

Apparatus: same as that used in example 1.

SAMPLE

A sample must consist of at least 500 g +/- 5% of seeds. The thousand grain weight (TGW) of the seeds is listed below:

Seed Type	**Thousand Grain Weight g (TGW)**
Wheat	50

Samples were prepared as in example 1 and sent for testing in The Netherlands (see example 1).

Sample Schedule

sample number	**Crop**	**Treatment**	**%age**	**by mass**	**Replicate**
1	Wheat	untreated control	n/a	n/a	1
2	Wheat	untreated control	n/a	n/a	2
3	Wheat	untreated control	n/a	n/a	3
4	Wheat	Entostat™	0.01	0.05	1
5	Wheat	Entostat™	0.01	0.05	2
6	Wheat	Entostat™	0.01	0.05	3

7	Wheat	Entostat™	0.1	0.5	1
8	Wheat	Entostat™	0.1	0.5	2
9	Wheat	Entostat™	0.1	0.5	3
10	Wheat	Entostat™	1.0	5	1
11	Wheat	Entostat™	1.0	5	2
12	Wheat	Entostat™	1.0	5	3
13	Wheat	Commercial	n/a	n/a	1
14	Wheat	Commercial	n/a	n/a	2
15	Wheat	Commercial	n/a	n/a	3
16	Wheat	Talc	1.0	5	1
17	Wheat	Talc	1.0	5	2
18	Wheat	Talc	1.0	5	3

Commercial Seed Treatments Used

Wheat Kinto

Procedure: see guidelines defined by European Seed Association STAT Dust Working Group, (Version 1.0, 23.03.2011)

Laboratory Conditions

The test is performed in a laboratory (separated from the treating area) at 20°C to 25°C and 30% to 70% relative humidity which is free of free floating dust particles. Any other testing which could interfere with the analytical scales (electrostatics, vibrations etc.) should be avoided.

Calibration

Same as for example 1.

Apparatus preparation

Same as for example 1.

Parameter settings

Same as for example 1.

Sample Preparation

Same as for example 1.

Measurement

Same as for example 1.

Evaluation and Calculation of Results

Same as for example 1.

Results are shown in Figure 3.

Simultaneous Tests for General Linear Hypotheses

Source	DF	SS	MS	F	P
Treatment	5	14705.2	2941.0	223.74	>0.0001
Error	12	157.7	13.1		
Total	17	14862.9			

Multiple Comparisons of Means: Tukey Contrasts

Grouping Information Using Tukey Method

Treatment	N	Mean	Grouping
WheatTalc1	3	83.299	A
WheatEnt1	3	33.020	B
WheatEnt0.1	3	16.002	C
WheatEnt0.01	3	5.651	D
Wheatcontrol	3	3.229	D
WheatComm	3	2.276	D

Means that do not share a letter are significantly different.

Linear Hypotheses:

	Estimate	**Std. Error**	**t value**	**Pr(>|t|)**
Wheatcontrol – WheatComm	0.953	2.960	0.322	0.999
WheatEnt0.01 – WheatComm	3.375	2.960	1.140	0.855
WheatEnt0.1 – WheatComm	13.726	2.960	4.637	0.005 **
WheatEnt1 – WheatComm	30.744	2.960	10.385	<0.001***
WheatTalc1 – WheatComm	81.023	2.960	27.370	<0.001***
WheatEnt0.01 – Wheatcont	2.422	2.960	0.818	0.958
WheatEnt0.1 – Wheatcont	12.773	2.960	4.315	0.009 **
WheatEnt1 – Wheatcont	29.791	2.960	10.063	<0.001***
WheatTalc1 – Wheatcont	80.070	2.960	27.048	<0.001***
WheatEnt0.1 – WheatEnt0.01	10.351	2.960	3.497	0.039 *
WheatEnt1 - WheatEnt0.01	27.369	2.960	9.245	<0.001***
WheatTalc1 - WheatEnt0.01	77.648	2.960	26.230	<0.001 ***
WheatEnt1 - WheatEnt0.1	17.018	2.960	5.749	<0.001***
WheatTalc1 - WheatEnt0.1	67.297	2.960	22.733	<0.001 ***
WheatTalc1 - WheatEnt1	50.279	2.960	16.984	<0.001 ***

*Statistical significance codes: 0 '***' 0.001 '**' 0.01 '*'*

METHOD FOR ASSESSING FLOWABILITY/PLANTABILITY

Same as for example 1.

Results

Differences in flowability/plantability from the treated wheat seed are observed relative to controls.

6. Oilseed rape (OSR)

Objective: to assess the adhesion properties for Entostat at a range of loadings using oilseed rape (*Brassica napus*).

STUDY OUTLINE

Same as for example 1.

TEST ITEM DETAILS

Steps in Air Milling are the same as for example 1 with the exception that Entostat was combined with oilseed rape seed at three loadings (see below). Oilseed Rape seed (Sesame, LS Plant Breeding) was supplied by Ebbage Seeds Ltd. (Downham Market, Norfolk)

REFERENCE ITEM DETAILS

- Oilseed Rape (Sesame, LS Plant Breeding) pre-treated with Modesto (Bayer CropScience AG, Monheim am Rhein, Germany)
- Talc – Simple Talc, Unscented, Johnsons

TREATMENTS

1. Oilseed Rape treated with 0.01% Entostat (by mass)
2. Oilseed Rape treated with 0.1% Entostat (by mass)
3. Oilseed Rape treated with 1% Entostat (by mass)
4. Oilseed Rape treated with 1% Talc (by mass)
5. Oilseed Rape, untreated

All treatments were replicated three times

TEST SYSTEM

Apparatus: same as that used in example 1.

SAMPLE

A sample must consist of at least 500 g +/- 5% of seeds. The thousand grain weight (TGW) of

the seeds is listed below:

Seed Type	Thousand Grain Weight g (TGW)
Oilseed Rape	2.9

Samples were prepared in block bottom bags as described in example 1, and tested in The Netherlands.

Sample Schedule

sample number	Crop	Treatment	%age	by mass	Replicate
1	OSR	untreated control	n/a	n/a	1
2	OSR	untreated control	n/a	n/a	2
3	OSR	untreated control	n/a	n/a	3
4	OSR	Entostat™	0.01	0.05	1
5	OSR	Entostat™	0.01	0.05	2
6	OSR	Entostat™	0.01	0.05	3
7	OSR	Entostat™	0.1	0.5	1
8	OSR	Entostat™	0.1	0.5	2
9	OSR	Entostat™	0.1	0.5	3
10	OSR	Entostat™	1.0	5	1
11	OSR	Entostat™	1.0	5	2
12	OSR	Entostat™	1.0	5	3
13	OSR	Commercial	n/a	n/a	1
14	OSR	Commercial	n/a	n/a	2
15	OSR	Commercial	n/a	n/a	3
16	OSR	Talc	1.0	5	1
17	OSR	Talc	1.0	5	2
18	OSR	Talc	1.0	5	3

Commercial Seed Treatments Used: Modesto on oilseed rape

Procedure: see the guidelines defined by European Seed Association STAT Dust Working Group, (Version 1.0, 23.03.2011).

Laboratory Conditions

The test was performed in a laboratory (separated from the treating area) at 20°C to 25°C and 30% to 70% relative humidity free of free floating dust particles.

Calibration

No calibration is necessary before measurement. Air flow rate, time of measurements and rotational settings are checked on a routine basis (every 2-3 years) by the technical service of the manufacturer or an equivalent qualified technical service.

Apparatus preparation

Same as for example 1.

Parameter settings

Same as for example 1.

Sample Preparation

Same as for example 1.

Measurement

Same as for example 1.

Evaluation and Calculation of Results

Same as for example 1.

Results are shown in Figure 4.

Simultaneous Tests for General Linear Hypotheses

Source	DF	SS	MS	F	P
Treatment	5	3426.83	685.37	76.66	>0.0001
Error	12	107.28	8.94		
Total	17	3534.11			

Multiple Comparisons of Means: Tukey Contrasts

Grouping Information Using Tukey Method

Treatment	N	Mean	Grouping
OSRTalc1	3	37.339	A
OSREnto1	3	0.589	B
OSRComm	3	0.576	B
OSRcontrol	3	0.260	B
OSREnto0.1	3	0.088	B
OSREnto0.01	3	0.083	B

Means that do not share a letter are significantly different.

Linear Hypotheses:

	Estimate	**Std.Error**	**t value**	**Pr(>|t|)**
OSRcont – OSRComm	0.316	2.441	0.130	1.000

OSREnt0.01 - OSRComm	0.493	2.441	0.202	1.000
OSREnt0.1 – OSRComm	0.488	2.441	0.200	1.000
OSREnt1 – OSRComm	0.013	2.441	0.005	1.000
OSRTalc1 – OSRComm	36.762	2.441	15.059	<1e-06***
OSREnt0.01 – OSRcont	0.176	2.441	0.072	1.000
OSREnt0.1 – OSRcont	0.172	2.441	0.071	1.000
OSREnt1 – OSRcont	0.329	2.441	0.135	1.000
OSRTalc1 – OSRcont	37.078	2.441	15.188	<1e-06***
OSREnt0.1-OSREnt0.01	0.004	2.441	0.002	1.000
OSREnt1-OSREnt0.01	0.506	2.441	0.207	1.000
OSRTalc1-OSREnt0.01	37.255	2.441	15.261	<1e-06***
OSREnt1 - OSREnt0.1	0.501	2.441	0.205	1.000
OSRTalc1-OSREnt0.1	37.251	2.441	15.259	<1e-06***
OSRTalc1 - OSREnt1	36.749	2.441	15.053	<1e-06***

Statistical significance code: 0 '***'

Ent = Entostat® Trade mark of Exosect Limited for carnauba wax particles

OSRCOmm = commercial oilseed rape seed

OSRcont = oilseed rape control

METHOD FOR ASSESSING FLOWABILITY/PLANTABILITY

Same as that for example 1.

Results

Differences in flowability/plantability from treated oilseed rape seed are observed relative to controls.

CLAIMS

1. A method of controlling the flowability of plant seeds by placing the plant seeds of a mass of seeds in contact with dry free flowing particles of a flowability enhancing agent that is made up of at least one species of electret particle made up of a wax, wherein the electret particle adheres more firmly to the plant seeds than do particles that comprise a dry free flowing substance that is or includes a mineral earth component.

2. A method according to claim 1, wherein the wax comprises at least one species of wax selected from mineral waxes, natural waxes and synthetic waxes.

3. A method according to claim 1 or claim 2, wherein the wax comprises at least one species of wax that has a melting temperature of ≥ 40° C, preferably ≥ 50° C, more preferably ≥ 70° C.

4. A method according to any one of claims 1 to 3, wherein the wax comprises at least one species of wax selected from carnauba wax, montan wax and paraffin wax or a mixture of two or more thereof.

5. A method according to any one of claims 1 to 4, wherein the plant seeds are selected from seeds from the group consisting of fodder and forage plant seeds, cereal seeds, cotton seeds, legume plant seeds, maize seeds and field crop plant seeds.

6. Use of a dry particulate free flowing formulation or composition in improving the flowability of seeds within a population of plant seeds, wherein the formulation or composition comprises at least a flowability enhancing agent that is made up of at least one species of electret particle selected from waxes, wherein the electret particles adhere more firmly to individual plant seeds than do particles that comprise a dry free flowing substance that is or includes a mineral earth component.

7. Use according to claim 6, wherein the electret particles are formed of at least one species of wax selected from mineral waxes, natural waxes and synthetic waxes.

8. Use according to claim 6 or claim 7, wherein the wax comprises at least one species of wax that has a melting temperature of ≥ 40° C, preferably ≥ 50° C, more preferably ≥ 70° C.

9. Use according to any one of claims 6 to 8, wherein the wax comprises at least one species of wax selected from carnauba wax, montan wax and paraffin wax or a mixture of two or more thereof.

10. Use according to any one of claims 6 to 9, wherein the plant seeds are selected from seeds from the group consisting of fodder and forage plant seeds, cereal seeds, cotton seeds,

legume plant seeds, maize seeds, and field crop plant seeds.

11. A method of controlling dust drift from a population of plant seeds by placing the plant seeds of a mass of seeds in contact with dry free flowing particles of a flowability enhancement agent made up of electret particles made of a wax that adheres more firmly to plant seeds than a dry particulate compound or composition that is a flowability enhancement agent that comprises a dry free flowing substance that is a mineral earth or includes a mineral earth component.

12. A method according to claim 11, wherein the wax comprises at least one species of wax selected from mineral waxes, natural waxes and synthetic waxes.

13. A method according to claim 11 or claim 12, wherein the wax comprises at least one species of wax that has a melting temperature of ≥ 40° C, preferably ≥ 50° C, more preferably ≥ 70° C.

14. A method according to any one of claims 11 to 13, wherein the wax comprises at least one species of wax selected from carnauba wax, montan wax and paraffin wax or a mixture of two or more thereof.

15. A method according to any one of claims 11 to 14, wherein the plant seeds are selected from seeds from the group consisting of fodder and forage plant seeds, cereal seeds, cotton seeds, legume plant seeds, maize seeds and field crop plant seeds.

16. Use of a particulate, free flowing formulation or composition in controlling dust drift, preferably in reducing the level or amount of dust drift, from a population of plant seeds, wherein the particulate free flowing formulation or composition comprises at least a flowability enhancing agent made up of dry electret particles made of wax that are able to adhere to individual plant seeds more firmly than a dry particulate compound or composition that is a free flowing flowability enhancing agent that comprises a substance that is a mineral earth or includes a mineral earth component.

17. Use according to claim 16, wherein the wax comprises at least one species of wax selected from mineral waxes, natural waxes and synthetic waxes.

18. Use according to claim 16 or claim 17, wherein the wax comprises at least one species of wax that has a melting temperature of ≥ 40° C, preferably ≥ 50° C, more preferably ≥ 70° C.

19. Use according to any one of claims 16 to 18, wherein the wax comprises at least one species of wax selected from carnauba wax, montan wax and paraffin wax or a mixture of two or more thereof.

20. Use according to any one of claims 16 to 19, wherein the plant seeds are selected from seeds from the group consisting of fodder and forage plant seeds, cereal seeds, cotton seeds, legume plant seeds, maize seeds and field crop plant seeds.

21. Use or method according to any one of the preceding claims, wherein the electret particles of wax have a volume mean diameter of any conventional size in the range from about 10 μm to 200 μm.

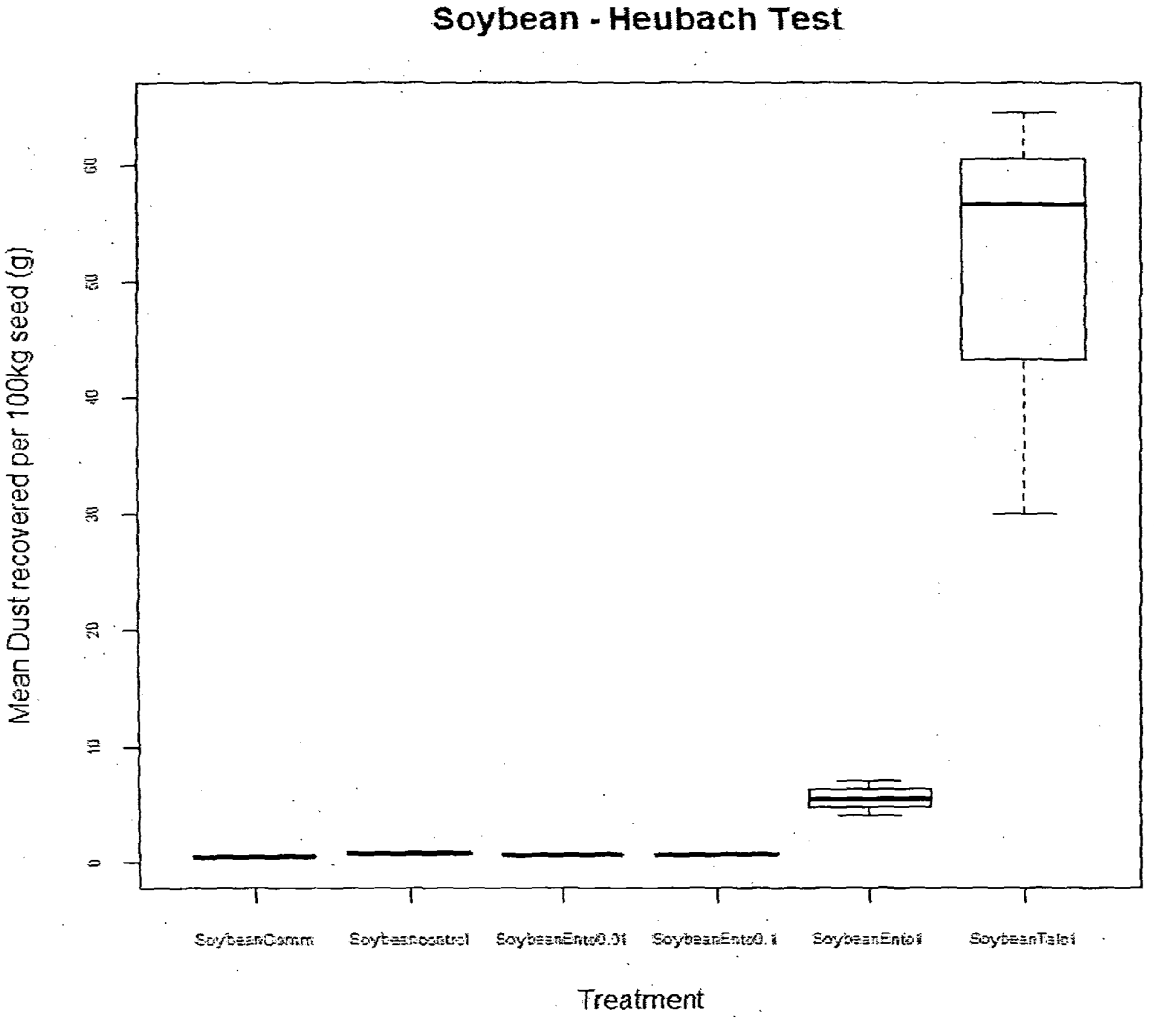
Soybean - Heubach Test
Mean Dust recovered per 100kg seed (g)
0
10
20
30
40
50
60
SoybeanComm
Soybeancontrol
SoybeanEnto0.3i
SoybeanEnto0.1
SoybeanEnto1
SoybeanTalc1
Treatment

FIGURE 1

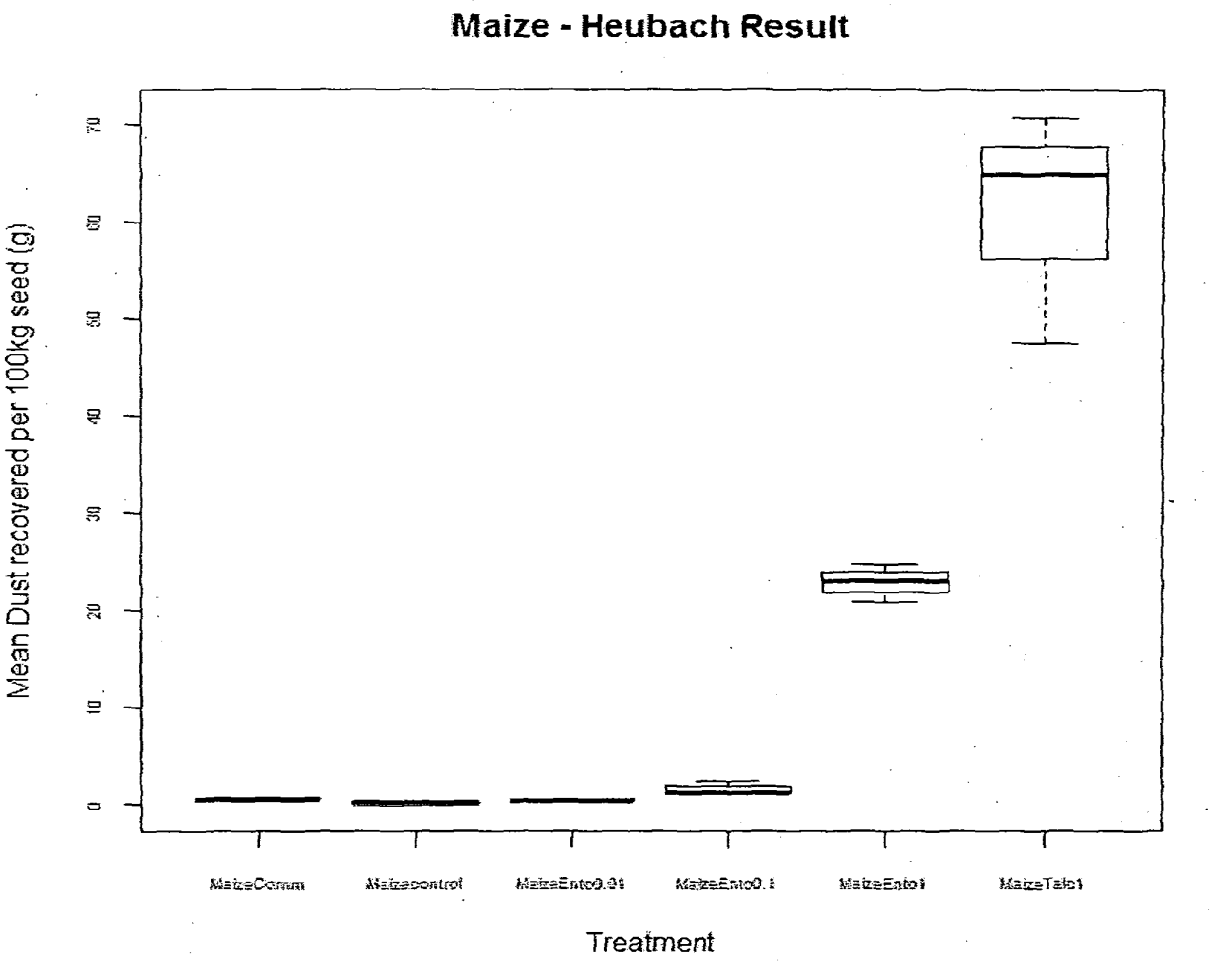
Maize - Heubach Result
Mean Dust recovered per 100kg seed (g)
0
10
20
30
40
50
60
70
MaizeComm
Maizecontrol
MaizeEnto0.01
MaizeEnto0.1
MaizeEnto1
MaizeTalc1
Treatment

FIGURE 2

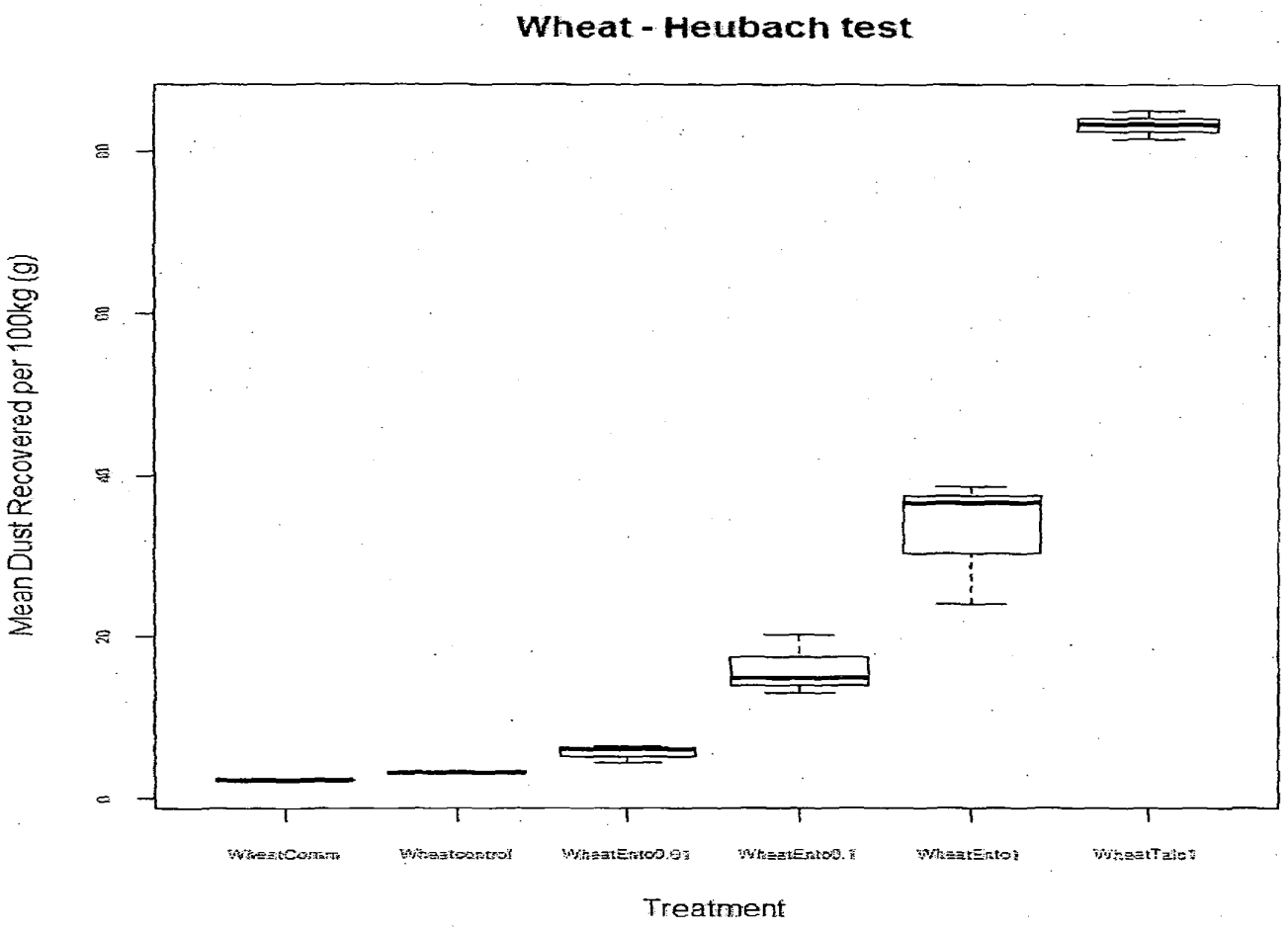
Wheat - Heubach test
Mean Dust Recovered per 100kg (g)
0
20
40
60
80
WheatComm
Wheatcontrol
WheatEnto0.01
WheatEnto0.1
WheatEnto1
WheatTalc1
Treatment

FIGURE 3

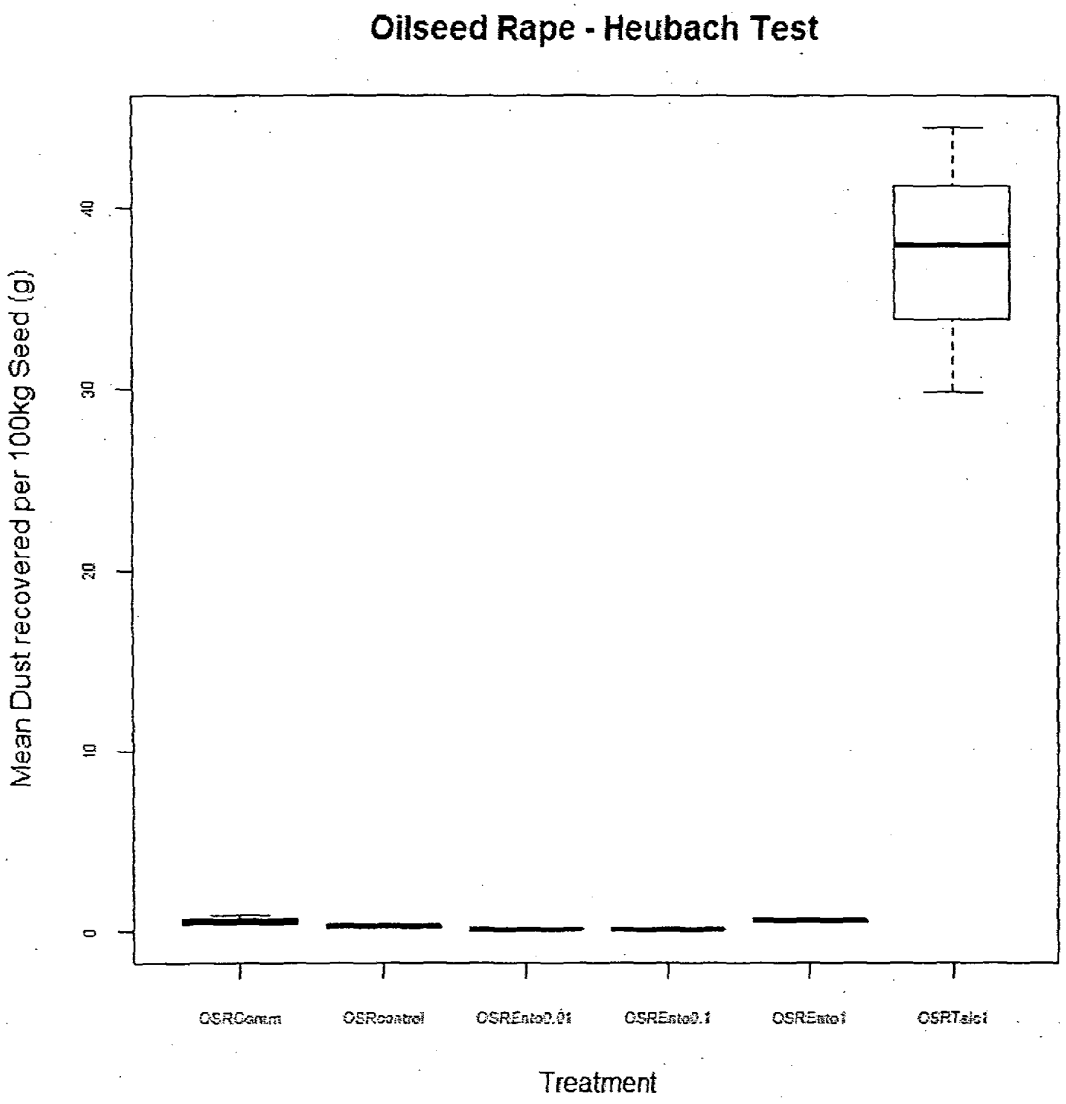
Oilseed Rape - Heubach Test
Mean Dust recovered per 100kg Seed (g)
0
10
20
30
40
OSRComm
OSRcontrol
OSREnto0.01
OSREnto0.1
OSREnto1
OSRTalc1
Treatment

FIGURE 4

PTO/SB/06 (09-11)
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U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

PATENT APPLICATION FEE DETERMINATION RECORD Substitute for Form PTO-875	Application or Docket Number 14/375,361	Filing Date 07/29/2014	☐ To be Mailed

ENTITY: ☒ LARGE ☐ SMALL ☐ MICRO

APPLICATION AS FILED – PART I

FOR	(Column 1) NUMBER FILED	(Column 2) NUMBER EXTRA	RATE ($)	FEE ($)
☐ BASIC FEE (37 CFR 1.16(a), (b), or (c))	N/A	N/A	N/A	
☐ SEARCH FEE (37 CFR 1.16(k), (i), or (m))	N/A	N/A	N/A	
☐ EXAMINATION FEE (37 CFR 1.16(o), (p), or (q))	N/A	N/A	N/A	
TOTAL CLAIMS (37 CFR 1.16(i))	24 minus 20 =	* 4	x $80 =	**320**
INDEPENDENT CLAIMS (37 CFR 1.16(h))	4 minus 3 =	* 1	x $420 =	**420**
☐ APPLICATION SIZE FEE (37 CFR 1.16(s))	If the specification and drawings exceed 100 sheets of paper, the application size fee due is $310 ($155 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR 1.16(s).			
☐ MULTIPLE DEPENDENT CLAIM PRESENT (37 CFR 1.16(j))				
* If the difference in column 1 is less than zero, enter "0" in column 2.			TOTAL	**740**

APPLICATION AS AMENDED – PART II

AMENDMENT **07/29/2014**

	(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA	RATE ($)	ADDITIONAL FEE ($)
Total (37 CFR 1.16(i))	*	Minus	**	=	x $ =	
Independent (37 CFR 1.16(h))	*	Minus	***	=	x $ =	
☐ Application Size Fee (37 CFR 1.16(s))						
☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))						
					TOTAL ADD'L FEE	

AMENDMENT

	(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA	RATE ($)	ADDITIONAL FEE ($)
Total (37 CFR 1.16(i))	*	Minus	**	=	x $ =	
Independent (37 CFR 1.16(h))	*	Minus	***	=	x $ =	
☐ Application Size Fee (37 CFR 1.16(s))						
☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))						
					TOTAL ADD'L FEE	

* If the entry in column 1 is less than the entry in column 2, write "0" in column 3.

** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20".

*** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3".

The "Highest Number Previously Paid For" (Total or Independent) is the highest number found in the appropriate box in column 1.

LDRC
/PRASAD JANDHYALA/