

Operational Guidelines
Export of Fresh Blueberry Fruit from Oregon to Korea
Revised March 31, 2023

This document provides guidance on the operational aspects for the export to Korea of fresh blueberry fruit produced in the state of Oregon. It is to be used in conjunction with the “IMPORT PLANT QUARANTINE REQUIREMENTS FOR FRESH BLUEBERRY FRUIT FROM THE STATE OF OREGON, U.S.A.”, dated March 13, 2023.

Fresh fruit of blueberries (*Vaccinium corymbosum* and *V. virgatum*) commercially produced in the state of Oregon qualify to be exported to Korea under this protocol.

Shipments of blueberry fruit from the state of Oregon may be transported to Korea via ship or air cargo.

Quarantine Pests of Concern:

A. Quarantine pests of concern associated with fresh blueberries identified by Korea’s Animal and Plant Quarantine Agency (APQA) as requiring specific mitigation measures under this protocol include:

- Pathogens:
 - *Monilinia vaccinii-corymbosi* (Mummy Berry)
- Insects:
 - *Argyrotaenia citrana* (Orange Tortrix)
 - *Choristoneura rosaceana* (Oblique Banded Leafroller)
 - *Grapholita packardi* (Cherry Fruitworm)

B. Quarantine pest of concern associated with fresh blueberries for which Korea’s Animal and Plant Quarantine Agency (APQA) has not identified specific mitigation measures:

- Insects:
 - *Ericaphis fimbriata* (Blueberry aphid)
 - *Ericaphis scammelli* (Blueberry aphid)
 - *Hemiberlesia rapax* (Greedy scale)
 - *Leptocoris trivittatus* (Eastern Boxelder bug)

C. Quarantine pests of concern associated with fresh blueberries identified by Korea’s Animal and Plant Quarantine Agency (APQA) that are currently not known to occur in the state of Oregon include:

- Insects:
 - *Conotrachelus nenuphar* (Plum Curculio)
 - *Rhagoletis mendax* (Blueberry Maggot)
 - *Rhagoletis tabellaria* (White Banded Fruitfly)*
 - *Acrobasis vaccinii* (Cranberry Fruitworm)
 - *Epiphyas postvittana* (Light Brown Apple Moth)

**Note: Rhagoletis tabellaria (White banded fruitfly) has been found in Oregon, but is not found in areas of, or associated with, commercial blueberry production.*

Registration:

A. Packing Facilities:

- a. **Registration:** Packing facilities intending to participate in the program to export fresh blueberries from Oregon to Korea must be registered with USDA/APHIS; registration will be through the Oregon Blueberry Commission and will be coordinated with Oregon Department of Agriculture. Packing facility registration forms are available from the Oregon Blueberry Commission. Completed registration forms must be sent to the Oregon Department of Agriculture (ODA) by the posted deadline.
- b. **Compliance Agreement:** As part of the registration process, all packing facilities intending to participate in the program to export fresh blueberries from Oregon are also required to have a signed compliance agreement with the Oregon Department of Agriculture. Packing facility compliance agreement forms are available from the Oregon Blueberry Commission. Packing facilities must submit a signed compliance agreement, along with the completed registration form, to the Oregon Department of Agriculture by the posted deadline.
- c. **Registered Packing Facility List:** The Oregon Department of Agriculture will provide copies of the packing facility registration forms and signed compliance agreements to the Oregon Blueberry Commission after registration is closed. The Oregon Blueberry Commission will provide a list of registered packing facilities to USDA/APHIS and ODA at least forty five days prior to the first expected export shipments. USDA/APHIS will provide this list to APQA upon request.
- d. **Deadline:** The deadline for packing facilities to register is posted on the Oregon Blueberry Commission's website.

B. Growers and Production Fields:

- a. **Registration:** Growers intending to participate in the program to export fresh blueberries from Oregon to Korea must register production fields with USDA/APHIS; registration will be through the Oregon Blueberry Commission and will be coordinated with the Oregon Department of Agriculture. Production field registration forms are available from the Oregon Blueberry Commission. Completed registration forms should be sent to the Oregon Department of Agriculture by the posted deadline.
- b. **Compliance Agreement:** As part of the registration process, growers intending to participate in the program to export fresh blueberries from Oregon are also required to have a signed compliance agreement with the Oregon Department of Agriculture (ODA). Compliance agreement forms for growers are available from the Oregon Blueberry Commission. Growers must submit a signed compliance agreement, along with the completed registration form, to the Oregon Department of Agriculture by the posted deadline.
- c. **Field Identification Codes (Lot Numbers):** Each blueberry production field lot must be identified with a unique identification code (grower lot number) that is comprised of a grower code and a field number. Grower codes will be assigned by the Oregon Department of Agriculture; field

numbers will be assigned by the individual grower. Field numbers shall consist of three digits, or three alpha-numeric characters.

- d. Maps: Growers must provide a map of each registered production field as an attachment to the production field registration form. The map must show the physical location of the production field, and must be labeled with the grower's name, the name of the production field, and the lot number associated with that production field.
- e. Deadline: The deadline for growers to register production fields is posted on the Oregon Blueberry Commission's website.
- f. Registered Production Field List: The Oregon Department of Agriculture will provide copies of the grower registration form, map and signed compliance agreement for each production field to the Oregon Blueberry Commission after registration is closed. The Oregon Blueberry Commission will provide a list of registered production fields to USDA/APHIS and ODA at least forty five days prior to the first expected export shipments. USDA/APHIS will provide this list to APQA upon request.

C. Documentation:

- a. Copies of completed grower registration forms, maps and signed compliance agreements are to be provided to the packing facility (or facilities) that will pack fruit from that production field. These copies are to remain at the packing facility and are to be made available to USDA/APHIS, ODA and APQA upon request.
- b. Packing facilities will maintain a list of registered production fields for all grower lots that will be packed at their facility. This list will be provided upon request to the Oregon Blueberry Commission, USDA/APHIS and/or ODA.
- c. Packing facilities must designate a records coordinator who will be responsible for reviewing and maintaining records associated with the program.

D. Mandatory Training:

- a. All new program participants must attend APHIS/ODA training before being approved to participate in the Oregon blueberries to Korea export program.
- b. Training is also mandatory for all program participants with pest detections or other non-compliances identified during the previous season.

E. Contact Information:

Oregon Blueberry Commission: Bryan Ostlund - bryan@ostlund.com

- The Oregon Blueberry Commission maintains a website of information related to the export of fresh blueberries from Oregon to Korea. The website address is:
<http://www.oregonblueberry.com/korea>

Oregon Department of Agriculture:

- Kevin Bailey, District Manager, Salem District

Commodity Inspection Division, Oregon Department of Agriculture
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Production Field Monitoring and Trap Surveys:

Low pest prevalence or pest freedom for mummy berry (*Monilinia vaccinii-corymbosi*), Orange Tortrix (*Argyrotaenia citrana*), Oblique Banded Leafroller (*Choristoneura rosaceana*) and Cherry Fruitworm (*Grapholita packardii*) must be maintained in registered production fields in order for blueberry fruit from those fields to be eligible to pack for export to Korea.

All production fields registered to produce blueberries for export to Korea must comply with the field monitoring practices for the specific control of Mummy berry, Orange Tortrix, Oblique Banded Leafroller and Cherry Fruitworm as outlined below. Fruit from production fields which are determined to not be in compliance with these procedures will not be eligible to be exported to Korea for the current shipping season.

A. Monitoring requirements for the mummy berry pathogen (*Monilinia vaccinii-corymbosi*):

Commercial pest consultants, or similar persons who are qualified to identify symptoms of mummy berry, will monitor for mummy berry in each registered production field.

- a. Timing: Monitoring will be conducted during the growing season when fruit is beginning to size and prior to harvest. Intensified monitoring will be required in fields with a history of mummy berry infection.
- b. Records of monitoring results: Monitoring results for mummy berry will be recorded on the standard form developed by APHIS (see Attachment 2).
- c. Electronic records: Electronic records which mirror the data and format of the APHIS form may be used in lieu of the paper document. A fillable electronic version of the APHIS form is available from the Oregon Blueberry Commission or APHIS upon request. If a production field is selected for observation during the annual visit by APQA, a printed copy of the applicable mummy berry monitoring records must be available at the time of APQA's visit to the production field.

Production fields with history of mummy berry infection:

- a. Application of controls: Intensified preventive application regimes should be implemented in production fields that have been identified as having a history of mummy berry infection, as evidenced by the detection of infected fruit (fruit exhibits a characteristic shriveled, white appearance) during the previous growing season or harvest. A preventive spring fungicide application must be applied in these fields in accordance with Federal/State Cooperative Extension Service Integrated Pest Management (IPM) guidelines for blueberries. Controls applied for mummy berry must be specifically identified on pesticide usage records.

- b. **Intensified monitoring:** Once a field is identified as having mummy berry, more diligent scouting must be conducted. Scouting results must be documented on the standard APHIS monitoring form (see Attachment 2). Scouting protocols for fields identified with active infections include:
- **Identification of the infected sites:** When mummy berry is detected, identify and record the specific site locations of the infections. GPS coordinates are acceptable.
 - **Search for overwintering bodies:** In subsequent years, look for overwintering bodies at each of the specific site location(s) of the infections.
 - **Monitoring of spring growth:** Inspect the spring growth at each of the specific site location(s) for evidence of primary infections on vegetative and floral growth
 - Visit each of the sites identified as a location of infection during the previous season. At least three sites per registered field should be designated for inspection. If less than three sites were identified as a location of infection the previous year, additional sites (as needed) should be chosen for inspection to meet the minimum.
 - At each of the sites, inspect at least 10 bushes. These bushes should be spaced three to five plants apart and on both sides of the row, in order to cover a larger area at each site.
 - Inspect bushes for symptoms of shoot blight and browning along the major veins. Look for wilted, brown foliage and bent twig tips resembling a shepherd's crook. Look for grayish green tufts of fungus associated with wilted foliage and blackened stems.
 - **Fruit monitoring:** Monitor fruit as it sizes and immediately prior to harvest to determine whether there are still detectible, active infections and/or whether the infection level is increasing or decreasing.
 - Visit each of the sites identified as a location of infection during the previous season. At least three sites per registered field should be designated for inspection. If less than three sites were identified as a location of infection the previous year, additional sites (as needed) should be chosen for inspection to meet the minimum.
 - At each of the sites, inspect 10 bushes. These bushes should be spaced three to five plants apart and on both sides of the row, in order to cover a larger area at each site.
 - Inspect at least 10 fruit clusters for discolored, shriveled fruit or for any evidence of mummy berry infection (such as early coloring of fruit)
 - Search the ground underneath the bushes and gently shake the bushes to look for any evidence of mummy berry-infected fruit. Infected fruit shrivels and appears mummified as it develops; those "mummy berries" will drop to the soil.

Production fields with no history of mummy berry infection:

- a. **Application of controls:** Production fields which have not been identified as having a history of mummy berry infection may be treated with a preventive spring fungicide application in accordance with Federal/State Cooperative Extension Service Integrated Pest Management (IPM) guidelines for blueberries. Controls applied for mummy berry must be specifically identified on pesticide usage records.
- b. **Fruit Monitoring:** Monitor fruit as it sizes and immediately prior to harvest to determine whether there are mummy berry infections in the production field as follows:
- Designate three sites to visit in the production field; sites should be spaced throughout the field.

- At each of the three sites, inspect 10 bushes. These bushes should be spaced three to five plants apart and on both sides of the row, in order to cover a larger area at each site.
- Inspect at least 10 fruit clusters for discolored, shriveled fruit or for any evidence of mummy berry infection (such as early coloring of fruit)
- Search the ground underneath the bushes and gently shake the bushes to look for any evidence of mummy berry infected fruit. Infected fruit shrivels and appears mummified as it develops; those “mummy berries” will drop to the soil.

Detection of mummy berry infection in production fields during fruit monitoring:

- a. Estimate and record the level of infection: If mummy berry is detected during fruit monitoring in a production field, the level of infection must be estimated and documented on the scouting record for that field.
- b. Eligibility to pack for export: Blueberries are only eligible to pack for export to Korea from fields which are determined to be free of mummy berry or to have a low level of infection of the mummy berry disease. Blueberries from production fields that have infections of mummy berry at higher levels (higher than that which would be considered a “low” infection level) are not eligible to pack for export to Korea during the current shipping season.
- c. Additional requirements for fields with low levels of infection: If, as a result of fruit monitoring, a production field is identified as having a low level of mummy berry infection, the following protocol must be followed:
 - An intensified fruit inspection regimen must be implemented at the time of harvest to prevent the harvest of fruit with symptoms of mummy berry infection.
 - Responsible packing facility personnel must be notified of the detection of mummy berry infection in the production field.
 - The packing facility must take extra care in sorting fruit from production fields identified as having with low infections of mummy berry during the current growing season.
 - Air blowers and mechanical sorters will be adjusted to maximize removal of infected fruit.
 - Packing facility staff that conduct the hand sorting of fruit will be notified that the lot being packed has been found to have a low infection of mummy berry and will be cautioned to search for and remove any fruit exhibiting symptoms of mummy berry fruit (fruit which is defective, shriveled, too small or off color).

Regulatory monitoring:

USDA/APHIS and or Oregon Department of Agriculture officials may review pesticide application records and monitoring records for registered production fields for the current and previous season to confirm the presence of a responsible/effective mummy berry prevention program. USDA/APHIS and or Oregon Department of Agriculture officials may inspect any registered blueberry production field to confirm that low pest prevalence or pest freedom for mummy berry is maintained.

Federal/State Cooperative Extension Service IPM guidelines for blueberries may be found at:

- <http://whatcom.wsu.edu/ipm/blue/index.html> and
- <http://plant-disease.ippc.orst.edu/ShowDisease.aspx?RecordID=182>
- <http://blueberries.msu.edu/uploads/files/Mummy%20berry.pdf>

B. Monitoring requirements for Orange tortrix (*Argyrotaenia citrana*), Oblique banded leafroller (*Choristoneura rosaceana*) and Cherry fruitworm (*Grapholita packardii*):

Each registered blueberry production field will be monitored for the presence of Orange Tortrix (OT), Oblique Banded Leafroller (OBLR) and Cherry Fruitworm (CFW) during the growing season by the use of trap surveys and visual inspection (scouting).

Trap Surveys (See Attachment 3)

- a. Trap type: Trap surveys will be conducted using Delta or standard wing-type traps with standard pheromone lures as recommended by the commercial pest consultant (PC).
- b. Replacement Intervals: Pheromone lures will be replaced at least every 30 days. Trap bottoms will be replaced when the effectiveness of the adhesive is compromised or at minimum, the trap bottoms will be replaced at least every 30 days when the pheromone lure is replaced.
- c. Pheromone Lures: It is recognized that the pheromone attractant in the lure used for OT also attracts OBLR. Traps using the pheromone lure for OT may also be used to survey for OBLR in lieu of placing separate traps for those two insects. CFW is not attracted to the pheromone lure used for OT and traps using a pheromone lure specific for CFW must be placed separately for that insect.
- d. Timing for Surveys: Traps must be in place in registered production fields beginning at petal fall and continuing until conclusion of harvest. For production fields with more than one variety and varieties with multiple harvest dates, traps will be monitored until the final harvest of fruit of the latest maturing variety in that production field. In the event that one or more of the traps is located in a variety that is harvested earlier than the remainder of the varieties, traps should not be repositioned into those later varieties.
- e. Trap Density: A minimum of two traps each using pheromone lures for OT/OBLR and CFW shall be placed in each registered production field. If a production field contains multiple varieties registered under a single grower lot number, the trap density shall be calculated using the total size of the registered production field. If the size of the production field is equal to or exceeds 10 acres, one additional trap of each type shall be placed for each additional 10 acres or fraction thereof.
- f. Trap Placement: Traps shall be placed in the upper third of the bush. Trap openings must be free of obstructions.
 - OT/OBLR traps shall be placed in the production field as recommended by the commercial pest consultant.
 - CFW traps should be placed in the production field near edges that border woods or tree-lines, if applicable.
- g. Flagging Trap Locations: It is recommended that the trap locations be flagged at the end of the row to facilitate monitoring of the traps. In the event that a production field is selected for

observation during the annual visit by APQA, trap locations must be flagged at the end of the row prior to the time of the visit.

- h. Maps: A map that indicates the location of each trap in the production field will be provided to regulatory officials upon request. In the event that a production field is selected for observation during the annual visit by APQA, a map showing the trap locations must be provided to USDA/APHIS and/or ODA prior to the time of the visit.
- i. Trap Labeling: Each trap will be numbered, and that number, along with the placement date, will be recorded on the trap body. As applicable, the trap number will contain a code “OT/OBLR” to identify the trap as targeting Orange Tortrix and Oblique Banded Leafroller or “CFW” to identify traps targeting Cherry Fruitworm.
- j. Servicing Records: Each servicing visit must be recorded on the trap body. When the trap bottoms and/or the lures are replaced, that information should also be recorded on the trap body. If the trap body is replaced, the trap number and date of re-placement must be noted on the new trap body. In the event that a trap must be replaced for some reason, it is not necessary to retain the old trap.
- k. Responsibility for Trap Monitoring: Trap monitoring will be conducted by commercial pest consultants. If a commercial pest consultant has personnel working under their supervision who are qualified to identify OT, OBLR, and CFW moth adults, as well as other moths, such as Carnation Tortrix (*Cacoecimorpha pronubana*), which might be attracted to the lures, then those personnel may service the traps under this program. The responsibility for the trap monitoring and documentation of the results remains with the supervising pest consultant. Growers who are also commercial pest consultants may not monitor traps in their own production fields. Upon request, ODA will also conduct trap monitoring under a fee based service.
- l. Trap Monitoring Interval: Traps will be monitored weekly from the time of placement until the last harvest of the latest maturing variety in the registered production field. Ideally, traps will be checked every 7 days, however, a trap check conducted one day before or after that will also be considered acceptable. Trap checks conducted at an interval of 6 days, 7 days or 8 days after the last servicing check will meet the requirement for weekly servicing. When an application of pesticides prevents entry to the field to check the traps within the 6, 7 or 8 day serving interval as required under the APHIS operating guidelines, the PCA servicing the field should indicate on the trap record that an application of pesticide prevented entry to the field. That would be done by entering a letter code “PA” on the trapping record on the date that the trap check was scheduled to occur. The PCA should check the traps in that field as soon as possible in accordance with the re-entry period indicated on the pesticide label and record the trap counts on that day. The pesticide application record would service as support that the field could not be entered on the scheduled service date. Any other timing for trap servicing will not be acceptable and the lot will not qualify to pack for export to Korea.
- m. Recording Trap Catches: Trap catches will be recorded on the standard form developed by APHIS (see Attachment 2). Forms must be filled out clearly and completely; the grower lot

number recorded must correspond to the number as registered for that production field under this program. One form is to be used per month; the month is to be recorded on the top of the form and trap servicing information is to be recorded in the column corresponding to the appropriate day. Trap catches for OT/OBLR traps must distinguish between numbers of OT and numbers of OBLR; those numbers are to be recorded separately.

- n. **Electronic Trapping Records:** Electronic records that mirror the data and format of the APHIS form may be used in lieu of the paper document. A fillable electronic version of the APHIS form is available from the Oregon Blueberry Commission or APHIS upon request. If a production field is selected for observation during the annual visit by APQA, a printed copy of the applicable trap records must be available at the time of APQA's visit to the production field.
- o. **Trap Catch Thresholds:**
 - OT = 20 moths caught in any trap during any single week of the trapping survey
 - OBLR = 20 moths caught in any trap during any single week of the trapping survey
 - CFW = 2 moths caught in any trap during any single week of the trapping survey

Response to Trap Catches Above the Threshold:

- a. During the initial month of trapping:

A non-aerial application of a control targeting the relevant pest must be applied as soon as possible after petal fall (defined as when all the petals have dropped and the bees have been removed from the field) if the trap catch threshold for OT or CFW is exceeded:

 - i. For two consecutive weeks OR
 - ii. In two or more traps during any week
- b. After the initial lure replacement (required at the 4th trap check), if the trap catch in any individual trap exceeds the trap threshold for OT or CFW, then an intensified visual inspection must be conducted.

Intensified Visual Inspection: In addition to inspecting for OT, OBLR and CFW during any routine scouting conducted in the production fields, intensified visual inspection for OT, OBLR and CFW must be conducted in accordance with the following guidelines:

- a. Intensified Visual Inspection for OT and OBLR in response to trap catches above the threshold (20 moths/trap/week): If the trap threshold for OT or OBLR is exceeded in any trap after the time of the first lure replacement (at the 4th trap check), then the following intensified visual inspection protocol must be implemented:
 - The intensified visual inspection must be conducted 6-8 days after the date that the threshold was exceeded. If the grower wishes to harvest prior to the time of the visual inspection, then a non-aerial application of a control must be applied.
 - An area will be designated for a visual search for larvae within the area of the relevant trap site (10 acre maximum area to be searched per trap site).
 - Within the designated area, three separate sites shall be selected.
 - At each selected site, 10 bushes will be inspected. The bushes selected for inspection should be spaced three to five plants apart and be located on both sides of the row, in order to maximize the area covered at each site.

- Ten (10) leaf tips and/or fruit clusters shall be closely examined for the presence of Lepidoptera larvae. If any larvae are found, the larvae must be identified at the time of detection or be collected and labeled for follow-up identification. The identification of the larvae, along with the number of larvae and location of the detection(s) must be recorded. Intensified visual inspections may be recorded on standard scouting records or on the form provided upon request from APHIS.
- b. **Intensified Visual Inspection for CFW in response to trap catches above the threshold (2 moths/trap/week):** If the trap threshold for CFW is exceeded in any trap after the time of the first lure replacement (at the 4th trap check), then the following intensified visual inspection protocol must be implemented:
- The intensified visual inspection must be conducted 6-8 days after the date that the threshold was exceeded. If the grower wishes to harvest prior to that time of the visual inspection, then a non-aerial application of a control must be applied.
 - An area will be designated for a visual search for CFW eggs and larvae within the area of positive CFW trap site (s) (10 acre maximum area to be searched per trap site).
 - Within the designated area, three separate sites shall be selected.
 - At each selected site, 10 bushes will be inspected. The bushes selected for inspection should be spaced three to five plants apart and be located on both sides of the row, in order to maximize the area covered at each site.
 - Ten (10) fruit clusters per bush shall be closely examined for the presence of CFW eggs or larvae. Inspection for CFW eggs and early season larvae should target the calyx cups, later in the season larvae may be indicated by the presence of webbing or frass.
 - If any eggs or larvae are found, the eggs and/or larvae must be identified at the time of detection or be collected and labeled for follow-up identification. The identification of the eggs and larvae, along with the number of larvae and location of the detection(s) must be recorded. Intensified visual inspections may be recorded on standard scouting records or on the form provided upon request from APHIS.
- c. **Application of Controls:** If OT, OBLR larvae, or CFW eggs or larvae are detected during the above visual inspection, appropriate controls must be applied as recommended in IPM guidelines or pesticide labeling. Controls applied for OT, OBLR or CFW must be specifically identified on pesticide usage records. Aerial application of controls is not recommended.
- d. **Detection of feeding damage but no OT, OBLR or CFW larvae:** If no larvae are detected during the visual inspection, but evidence of OT, OBLR or CFW larval feeding damage is present:
- The intensified visual inspection must be expanded to include an inspection of at least ten (10) additional leaf tip and fruit bud clusters on the bush where feeding evidence was present, as well as being expanded to include an intensified visual inspection of all bushes immediately adjacent to the bush where feeding damage was found.
 - If OT, OBLR larvae, or CFW eggs or larvae are detected during that additional inspection or if feeding damage is found on multiple bushes, appropriate controls must be applied as recommended in IPM guidelines or pesticide labeling.
 - In lieu of the additional intensified visual inspection appropriate controls may be applied as recommended in IPM guidelines or pesticide labeling.

- Controls applied for OT, OBLR or CFW must be specifically identified on pesticide usage records.
- e. Regulatory Monitoring: USDA/APHIS and or Oregon Department of Agriculture officials may inspect any registered blueberry production field to confirm that low pest prevalence or pest freedom for OT, OBLR and CFW is maintained.

C. Monitoring, Trap Survey, Scouting and Pesticide Application Records:

- a. Records of Monitoring Activities: Records documenting the results of monitoring for Mummy Berry, trap surveys for OT, OBLR and CFW, and if applicable, the results of follow up visual inspections for OT, OBLR and CFW, must be submitted to the packing facility before the first blueberries from the production field are delivered to the packing facility, or upon arrival of the first blueberries at the packing facility. In the event that additional trap monitoring or visual inspections have been conducted between the time that initial trap data was submitted for a lot and subsequent harvest dates, updated records will be provided to the packing facility prior to or at the time of arrival of fruit from those subsequent harvest dates. Note: Trap survey records must reflect the trap monitoring information conducted no more than 8 days prior to harvest. Trap servicing must be conducted at 6, 7 or 8 day intervals. Any other interval is not acceptable, unless an application of pesticides prevented entry to the field to check the traps within the 6, 7 or 8 day serving interval as required under the APHIS operating guidelines, and the PCA servicing the field indicated on the trap record that an application of pesticide prevented entry to the field.
- b. Records of Controls Applied: In the event that controls were applied for Mummy Berry, OT, OBLR or CFW, copies of the pesticide usage records for the production field with relevant controls specifically identified must be submitted to the packing facility at the time that the monitoring records for that production field are submitted.
- c. Submission of Records: The grower will be responsible for submitting the completed records to the packing facility, prior to, or at the time of delivery of the lot to the packing facility. The packing facility will be responsible for submitting the completed records to the APHIS Cooperator, prior to, or at the time of delivery of the lot to the packing facility.
- d. Review of Records: Designated packing facility personnel will review records submitted by the grower and document that those records have been verified as being in compliance with the requirements for maintaining low pest prevalence or pest freedom for Mummy Berry, OT, OBLR and CFW by completing the Record Verification Checklist developed by APHIS. Only lots with records that are in compliance with those requirements will be submitted to ODA for phytosanitary certification. The results of testing upon arrival at the packing facility must also confirm that lots for export to Korea have been found free of OT, OBLR and CFW larvae.
- e. Non-Compliance: Failure to comply with the requirements for maintaining low pest prevalence or pest freedom for Mummy Berry, OT, OBLR and CFW or failure to provide records documenting compliance will result in the disqualification of the registered production field from export to Korea for the current shipping season.

D. Packing Facilities:

- a. Packing facilities and cold storage areas should be kept clean.
- b. Packing facilities and cold storage areas should be equipped with pest exclusion devices such as insect screens, air curtains, rubber curtains, plastic curtains or automatic closing doors.
- c. USDA/APHIS and/or ODA will verify that export packing facilities meet the above requirements each year before export to Korea begins.
- d. Packing facilities that will be ship fresh blueberries to Korea via air freight must provide USDA/APHIS with the name of any freight forwarder(s) that they will use prior to the shipping season.
- e. Visual aids showing symptoms of insect damage to blueberries must be posted in appropriate areas of the packing facility (i.e. sorting tables, QC stations).
- f. Packing facilities must have a designated area for fruit testing with good lighting and appropriate equipment and materials.

Sorting and Packing:

- a. Upon arrival at the packing facility, each load of fruit will be sampled and tested, using salt water (or sugar water) flotation method, to confirm freedom from OT, OBLR, and CFW larvae as follows (note - this procedure is the same as used to inspect for *Drosophila suzukii* (SWD) larvae):
 - i. The testing must be conducted by trained facility staff, and is subject to oversight/monitoring by regulatory officials.
 - ii. A representative sample of fruit (about one quart or 1.5 lbs) will be collected randomly from each load of fruit arriving at the packing facility.
 - iii. Each fruit sample will be subjected to either a salt or brown sugar water flotation test to confirm freedom from OT, OBLR and CFW larvae. Examples of solution composition follow:
 - Salt solution: Dissolve 1 cup of salt in one gallon of water.
 - Sugar solution: Dissolve 2.5 cups (650 gms) of brown sugar in one gallon of water. The resulting solution should have a brix reading of at least 15.
 - iv. The solution must be carefully inspected for larvae. An example of the inspection process (used for SWD) may be found in “*A Detailed Guide for Testing Fruit for the Presence of Spotted Winged Drosophila (SWD) Larvae*” located at:
<https://catalog.extension.oregonstate.edu/em9096>
 - v. Any larvae detected must collected and provided to an APHIS approved regulatory official for identification, or confirmation of identification.
 - vi. The results of each fruit sample inspection must be documented on the form provided by APHIS (an equivalent document may be used if approved by APHIS).
 - vii. If any larvae of OT, OBLR or CFW is detected during this fruit sampling, fruit from that

lot will not be eligible to pack for export to Korea.

- viii. A copy of the inspection results confirming that all lots in the consignment were found to be free of larvae of OT, OBLR and CFW must be provided to ODA with the request for phytosanitary inspection.
- b. Fruit for export to Korea must be kept separate from fruit that is not eligible to pack for export to Korea; it may not be sorted or commingled with fruit that is not eligible for export to Korea.
- c. If blueberries not eligible for export to Korea are packed in the same packing room, before any lots qualified for Korea are packed, a general cleaning shall be conducted and the packing facility must verify that the packing lines are clear of any loose blueberries or debris.
- d. Fruit that is shrunken, shriveled, scarred, discolored, deformed, over-ripe or otherwise of poor quality will be removed manually by packing facility sorting personnel during the normal sorting process.
- e. Shipments of fruit destined to Korea must be free of contaminants such as leaves, branches and soil.

Packaging and Labeling:

- a. Each clamshell will be labeled with information to identify the production field.
- b. Each packed carton or pallet for export to Korea shall be clearly marked with the name of the packing facility.
- c. Each packed carton or pallet for export to Korea shall be clearly marked with the designation “For Korea”. Either upper or lower case font size is acceptable for carton markings, the pallet identification label will use upper case font.
- d. If the name of the blueberry packing facility and the words “For Korea” are marked on each carton, then cartons of fruit should be stacked on pallet in a manner that will ensure that those markings face out from the center of each pallet and are visible from all sides of each pallet.
- e. Shipments for export to Korea will be handled in a manner to prevent insect infestation during storage and transportation.

E. Phytosanitary Export Inspection:

- a. Prior to conducting the export inspection for the submitted lot(s) the certifying official will review records to confirm that lots submitted for export inspection meet the conditions of this protocol and document that those records have been verified as being in compliance with the requirements for maintaining low pest prevalence or pest freedom for Mummy Berry, OT, OBLR and CFW by completing the Record Verification Checklist developed by APHIS. Any lots not in compliance with the conditions of this protocol will not be eligible for export to

Korea. The results of testing upon arrival at the packing facility must also confirm that submitted lots have been found free of OT, OBLR and CFW larvae.

- b. APHIS Cooperators shall take a random sample of at least 2 percent of the fruits to inspect for each shipment. The selection of samples should be representative of all the lots in the shipment.
- c. Phytosanitary inspections should especially be targeted for detection of *Monilinia vaccinii-corymbosi* (Mummy Berry), *Argyrotaenia citrana* (Orange Tortrix), *Choristoneura rosaceana* (Oblique Banded Leaf Roller), *Grapholita packardi* (Cherry Fruitworm), and *Epiphyas postvittana* (Light brown apple moth).
 - i. Upon detection of a live *Epiphyas postvittana* (light brown apple moth) during export inspection, blueberries in the consignment originating from the affected grower lot will be rejected and the exporting orchard will be suspended for the remainder of the current export season.
- d. Shipments must be free of pests of concern to Korea.
- e. The Authorized Certifying Official will sign and issue the phytosanitary certificate for each qualifying shipment. The phytosanitary certificate will contain the following additional declaration:
 - “Fruits in this consignment are not infested with *Monilinia vaccinii-corymbosi*, *Argyrotaenia citrana*, *Choristoneura rosaceana*, *Grapholita packardi*, and *Epiphyas postvittana*.”
- f. The name of the packing facility must be shown on the phytosanitary certificate.

F. Sealing Requirement:

- a. Ocean Freight: After loading the shipment into the shipping container, the container will be sealed by the packing facility. The number of the industry applied seal will be included on the shipping documents.
- b. Air Freight:
 - Before placing the first layer of individual cartons on the pallets, a solid sheet of cardboard (no holes or openings), plastic, screening (1.6 mm or smaller mesh size) or other insect proof material must be placed on the pallet surface to provide a barrier to exclude the movement of insects onto the cartons of fruit through the open areas of the pallet.
 - Each pallet of fruit shall be wrapped with screening (1.6 mm or smaller mesh size), plastic, or other materials such as “Cool-Guard” to completely enclose all cartons on the pallet.
 - The wrapping material will then be sealed to itself and to the pallet and/or barrier covering the pallet surface with USDA/APHIS/ official tape (see Attachment 4 for an image of the tape).
 - Air freight shipments that will be subjected to TSA screening must be handled by a freight forwarding facility that is under compliance with USDA/APHIS to handle shipments of fresh blueberries from Oregon for export to Korea.

G. Record Retention:

- a. All records pertaining to the program shall be retained for a minimum of one year.

H. APQA On-Site Survey:

- a. APQA will conduct an on-site survey biennially (every other year) to verify the overall implementation of Korea's import requirements for blueberries from Oregon.
- b. All expenses associated with the on-site survey will be paid by the Oregon blueberry industry.
- c. APQA must receive an invitation from APHIS to conduct the on-site survey at least 30 days prior to the requested date of travel.
- d. The Oregon Blueberry Commission must send a request for APQA to conduct the on-site survey, along with a draft itinerary, to APHIS a minimum of 45 days prior to the requested date of the site visit.
- e. The need for the on-site survey will be reviewed.

Attachment 1- Trapping protocol for Blueberry Production Fields Registered for Export to Korea

Target name	Name code for trap	Trap type	Set by date	Lure change interval	Lure Type	Removal	Trap Density	Threshold level
Orange tortrix: <i>Argyrotaenia citrana</i>	OT	Delta or standard winged trap	Petal Fall	30 days	OT pheromone lure is attractive to OT and OBLR. One trap may be used to attract both Species. Record trap catches separately.	After harvest of the latest variety in the production field	Minimum of two traps for production fields of less than 10 acres; if 10 acres or more, add one trap for each additional 10 acres or fraction thereof.	<u>Before the 4th trap check</u> (i.e. during the initial month of the trap survey), if the trap catch in any individual trap is >20 during two consecutive weeks, or if the trap catch is >20 in 2 or more traps during any week, then a non-aerial application of a control is required <u>After the 4th trap check</u> , >20 moths per trap per week
Oblique banded leaf roller: <i>Choristoneura rosaceana</i>	OBLR							

								triggers follow up using visual inspection protocol
Cherry fruitworm: <i>Grapholita packardii</i>	CFW	Delta or standard winged trap	Petal Fall	30 days	CFW specific pheromone lure	After harvest of the latest variety in the production field	Minimum of two traps for production fields of less than 10 acres; if 10 acres or more, add one trap for each additional 10 acres or fraction thereof.	<u>After the 4th trap check</u> , >2 moths per trap per week triggers follow up using visual inspection protocol

ATTACHMENT 2- APHIS MONITORING RECORD FOR MUMMYBERRY

OREGON BLUEBERRIES TO KOREA SCOUTING RECORD FOR MUMMYBERRY

GROWER NAME:		DATE:	
GROWER CODE:	FIELD LOCATION:		
DOES FIELD HAS HISTORY OF MUMMYBERRY INFECTION:			
MONITORING OF SPRING GROWTH FOR MUMMYBERRY			
<p>Inspect the spring growth at each of the specific site location(s) for evidence of primary infections on vegetative and floral growth • Within the designated area visit three sites. • At each of the three sites, inspect 10 bushes. These bushes should be spaced 3-5 plants apart and on both sides of the row, in order to cover a larger area at each site. • Inspect bushes for symptoms of shoot blight and browning along the major veins. Look for wilted, brown foliage and bent twig tips resembling shepherd's crook. Look for grayish green tufts of fungus associated with wilted foliage and blackened stems. Record number of infected shoots on each bush.</p>			
Number of bush	Site 1 - Number of Infected shoots	Site 2 - Number of Infected shoots	Site 3 - Number of Infected shoots
Bush 1			
Bush 2			
Bush 3			
Bush 4			
Bush 5			
Bush 6			
Bush 7			
Bush 8			
Bush 9			
Bush 10			
FRUIT MONITORING FOR MUMMYBERRY AFTER FRUIT HAS SIZED AND PRE-HARVEST			
SCOUTING AFTER FRUIT HAS SIZED:	YES	NO	SCOUTING AT PRE-HARVEST:
			YES
			NO
<p>Monitor fruit as it sizes and immediately prior to harvest to determine whether there are mummyberry infections in the production field • Within the designated area visit three sites. • At each of the three sites, inspect 10 bushes. These bushes should be spaced 3-5 plants apart and on both sides of the row, in order to cover a larger area at each site. • Inspect at least 10 fruit clusters for discolored, shriveled fruit or for any evidence of mummyberry infection (such as early coloring of fruit) • Search the ground underneath the bushes and gently shake the bushes to look for any evidence of mummyberry infected fruit. Infected fruit shrivels and appears mummified as it develops; those "mummyberries" will drop to the soil. Record the number of fruit clusters with infected fruit (IFC) and/or bushes with dropped fruit (DF).</p>			
Number of bush	Site 1-IFC	Site 1-DF	Site 2-IFC
Bush 1			
Bush 2			
Bush 3			
Bush 4			
Bush 5			
Bush 6			
Bush 7			
Bush 8			
Bush 9			
Bush 10			
<p>Estimated level of field infection (if any) (None) (Very Low) (Low) (Medium) (Medium High) (High) :</p>			

APHIS 04-04-12

ATTACHMENT 3- APHIS TRAP SERVICING RECORD

MONTH:	OREGON BLUEBERRIES TO KOREA - APHIS TRAP SERVICING RECORD																														YEAR:	
GROWER NAME :	GROWER CODE:										FIELD LOCATION:										GROWER FIELD ID #:											
INITIAL LURE PLACEMENT DATE:	BLUEBERRY VARIETY(S):										ACRES:										# OF TRAP SETS:											
TRAP LABELLING CODES: OT = ORANGE TORTRIX (<i>Argyrotaenia citrana</i>) OBLR = OBLIQUE BANDED LEAFROLLER (<i>Choristoneura rosaceana</i>) CFW = CHERRY FRUIT WORM (<i>Grapholita packardii</i>) Note: One trap with OT lure may be used for both OT and OBLR but each moth type must be recorded separately																																
TRAP NO.	DAYS OF THE MONTH																															
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	
OT-1	B	P	B	P	B	P	B	P	B	P	B	P	B	P	B	P	B	P	B	P	B	P	B	P	B	P	B	P	B	P	B	P
OBLR-1	B	P	B	P	B	P	B	P	B	P	B	P	B	P	B	P	B	P	B	P	B	P	B	P	B	P	B	P	B	P	B	P
CFW-1	B	P	B	P	B	P	B	P	B	P	B	P	B	P	B	P	B	P	B	P	B	P	B	P	B	P	B	P	B	P	B	P
OT-2	B	P	B	P	B	P	B	P	B	P	B	P	B	P	B	P	B	P	B	P	B	P	B	P	B	P	B	P	B	P	B	P
OBLR-2	B	P	B	P	B	P	B	P	B	P	B	P	B	P	B	P	B	P	B	P	B	P	B	P	B	P	B	P	B	P	B	P
CFW-2	B	P	B	P	B	P	B	P	B	P	B	P	B	P	B	P	B	P	B	P	B	P	B	P	B	P	B	P	B	P	B	P
OT-3	B	P	B	P	B	P	B	P	B	P	B	P	B	P	B	P	B	P	B	P	B	P	B	P	B	P	B	P	B	P	B	P
OBLR-3	B	P	B	P	B	P	B	P	B	P	B	P	B	P	B	P	B	P	B	P	B	P	B	P	B	P	B	P	B	P	B	P
CFW-3	B	P	B	P	B	P	B	P	B	P	B	P	B	P	B	P	B	P	B	P	B	P	B	P	B	P	B	P	B	P	B	P
OT-4	B	P	B	P	B	P	B	P	B	P	B	P	B	P	B	P	B	P	B	P	B	P	B	P	B	P	B	P	B	P	B	P
OBLR-4	B	P	B	P	B	P	B	P	B	P	B	P	B	P	B	P	B	P	B	P	B	P	B	P	B	P	B	P	B	P	B	P
CFW-4	B	P	B	P	B	P	B	P	B	P	B	P	B	P	B	P	B	P	B	P	B	P	B	P	B	P	B	P	B	P	B	P
Initials																																

INSTRUCTIONS: Put the number of moths found in the trap under the appropriate day of the month.
 If you change the trap bottom, put a "X" in the "B" box on the date you made the change.
 If you change the pheromone, put an "X" in the "P" box on the date you made the change.
 When you have completed harvest of your orchard, draw a vertical line through the next column.
 If fewer than four sets of traps are placed, draw a line through any unused trap numbers or delete unused trap numbers.

TRAP DENSITY: Minimum of two traps of each type for less than 10 acres; for 10 acres or more, add one trap for every additional 10 acres or fraction thereof
 NOTE: TRAP RECORDS ARE TO BE SUBMITTED TO APHIS AND APHIS COOPERATORS UPON REQUEST. COMPLETED RECORDS MUST BE PROVIDED TO THE PACKING FACILITY PRIOR TO PACKING.
 Updated March 26, 2012

ATTACHMENT 4 – OFFICIAL TAPE

U.S. EXPORT TO KOREA

Tampering With Shipment Is Prohibited While in Transit

- Text will be in green letters on two inch wide clear tape
 - The words “U.S. EXPORT TO KOREA” will be in one-inch high letters. “Tampering With Shipment Is Prohibited While In Transit” will be in as large a type size as possible not to exceed one-half inch tall letters and will be centered below the words “U.S. EXPORT TO KOREA”.
 - The blocks of text will repeat continuously at a spacing of one-half inch.
-

U.S. EXPORT TO KOREA

Tampering With Shipment Is Prohibited While in Transit

ATTACHMENT 5 – RECORD VERIFICATION CHECKLIST

RECORD VERIFICATION CHECKLIST FOR THE EXPORT OF OREGON BLUEBERRIES TO KOREA

REGISTERED GROWER LOT NUMBER: _____ HARVEST DATE: _____

NAME OF REGISTERED PACKING FACILITY: _____

NAME OF REVIEWER: _____ DATE: _____

CHECK (✓) IF YOU ARE THE :

PACKING FACILITY RECORDS COORDINATOR: _____ ODA CERTIFYING OFFICIAL: _____

A. VERIFICATION OF MONITORING FOR MUMMY BERRY		✓ applicable column below for each entry	
1	RECORDS FOR THE REGISTERED LOT CONFIRM THAT:	YES	NO
	a. Mummy berry monitoring was conducted in the production field as fruit was beginning to size		
	b. Mummy berry monitoring was conducted in the production field pre-harvest		
	c. Mummy berry is absent from the production field or present only at a low infection level*		
*Note: Extra care must be taken when harvesting and sorting lots of fruit with low infection levels of mummy berry			
B. VERIFICATION OF MONITORING FOR ORANGE TORTRIX (OT), OBLIQUEBANDED LEAFROLLER (OBLR), AND CHERRY FRUITWORM (CFW)			
1	TRAP SURVEY RECORDS FOR THE REGISTERED LOT CONFIRM THAT:	YES	NO
	a. Traps were in place from petal fall through harvest		
	b. A minimum of 2 traps were placed for OT/OBLR and a minimum of 2 traps were placed for CFW; with an additional trap of each type for every additional 10 acres		
	c. Pheromone lures were replaced at least every 30 days		
	d. All trap checks were conducted at 6, 7 or 8 day intervals unless no entry was allowed during the scheduled trap check due to pesticide applications as noted on trap survey record		
	e. Intensified visual inspections were conducted each time that a trap threshold* was exceeded		
* Note: The trap threshold for OT and OBLR is 20 moths per trap per week; for CFW it is 2 moths per trap per week.			
2	INTENSIFIED VISUAL INSPECTION RECORDS FOR THE REGISTERED LOT CONFIRM THAT: (Note: Enter "N/A" if not applicable)	YES	NO
	a. Three sites were inspected in the area of each trap where the threshold was exceeded		
	b. A minimum of 10 bushes per site were inspected		
	c. There were no detections of eggs or larvae of OT, OBLR or CFW or appropriate controls were applied if eggs or larvae of OT, OBLR or CFW were detected - see below		
C. VERIFICATION OF CONTROLS APPLIED FOR MUMMY BERRY, OT, OBLR AND/OR CFW			
1	PESTICIDE APPLICATION RECORDS FOR THE REGISTERED LOT CONFIRM THAT : (Note: Enter "N/A" if not applicable)	YES	NO
	a. Preventative controls were applied if the production field has a history of mummy berry infection		
	b. Appropriate controls were applied if OT, OBLR or CFW eggs or larvae were detected during intensified visual inspections		
D. VERIFICATION OF LAST TRAP SURVEY DATE VS. DATE OF PACKING		YES	NO
	a. Is the date of harvest 8 days or less after the last trap survey record?		
E. VERIFICATION OF PACKING FACILITY ARRIVAL INSPECTION RESULTS		YES	NO
	Did all of the packing facility arrival inspections confirm freedom from OT, OBLR and CFW?		

IF "NO" IS CHECKED IN ANY COLUMN ABOVE - STOP - THIS LOT IS NOT ELIGIBLE TO PACK FOR KOREA !

THIS LOT QUALIFIES TO BE PACKED AND INSPECTED FOR EXPORT TO KOREA (circle yes or no) **YES** **NO**

APHIS March 27, 2019

ATTACHMENT 6 – RECORD OF INTENSIFIED VISUAL INSPECTION

Oregon Blueberries to Korea- Record of Intensified Visual Inspection -Trap Count Instigated Larvae Search													
Grower Name:						Grower Code:			Field Code:				
Name of Pest Consultant:													
Date Threshold Exceeded and Intensified Inspection Triggered:									Inspection Date:				
Trap Set Number that exceeded 20 Orange Tortrix , 20 Oblique Banded Leafrollers or 2 Cherry Fruitworms:									Initials:				
Site 1	OT	OBLR	CFW		Site 2	OT	OBLR	CFW		Site 3	OT	OBLR	CFW
bush 1					bush 1					bush 1			
bush 2					bush 2					bush 2			
bush 3					bush 3					bush 3			
bush 4					bush 4					bush 4			
bush 5					bush 5					bush 5			
bush 6					bush 6					bush 6			
bush 7					bush 7					bush 7			
bush 8					bush 8					bush 8			
bush 9					bush 9					bush 9			
bush 10					bush 10					bush 10			
Location Notes (Grid Location if Applicable):					Location Notes (Grid Location if Applicable):					Location Notes (Grid Location if Applicable):			
Trap Set Number that exceeded 20 Orange Tortrix , 20 Oblique Banded Leafrollers or 2 Cherry Fruitworms:									Initials:				
Site 1	OT	OBLR	CFW		Site 2	OT	OBLR	CFW		Site 3	OT	OBLR	CFW
bush 1					bush 1					bush 1			
bush 2					bush 2					bush 2			
bush 3					bush 3					bush 3			
bush 4					bush 4					bush 4			
bush 5					bush 5					bush 5			
bush 6					bush 6					bush 6			
bush 7					bush 7					bush 7			
bush 8					bush 8					bush 8			
bush 9					bush 9					bush 9			
bush 10					bush 10					bush 10			
Location Notes (Grid Location if Applicable):					Location Notes (Grid Location if Applicable):					Location Notes (Grid Location if Applicable):			

Note: Indicate in location notes section if feeding damage is detected at a site, but no larva or eggs are detected. Feeding damage triggers additional actions - either expanded additional visual inspection or application of controls. Refer to the operational guidelines for details.

March 27, 2019

ATTACHMENT 7 –PACKING FACILITY ARRIVAL INSPECTION RECORD

Oregon Blueberries to Korea Systems Approach

**PACKING FACILITY ARRIVAL INSPECTION RECORD - RESULTS OF SALT WATER OR SUGAR WATER SOLUTION
FRUIT EXTRACTION TESTS**

PACKING FACILITY NAME: _____ **DATE:** _____

NAME & SIGNATURE OF RESPONSIBLE PACKING FACILITY PERSON:

<p>Note: Each delivery of fruit to the packing facility from a qualifying production field must be sampled at a minimum 1 liter sample size at the time of delivery to the packing facility. The fruit sample must be subjected to a fruit extraction test using a salt water solution (preferred) or sugar water solution (also acceptable).</p>					
KOREA GROWER LOT NUMBER (grower code + field code)	NUMBER OF TRAYS OR BINS	EXTRACTION TESTING METHOD (Check appropriate column)		INITIALS OF PERSON CONDUCTING INSPECTION*	NUMBER OF AND IDENTIFICATION OF ANY LARVAE FOUND (Name and signature of regulatory official confirming ID must be provided below)
		SALT SOLUTION	SUGAR SOLUTION		

*Inspections must be conducted by trained facility staff and are subject to oversight/monitoring by regulatory officials. The identity of any live larvae detected must be determined, or confirmed, by a qualified regulatory official and the identification recorded. Only lots free of quarantine pests will be allowed to pack for export to Korea.

NAME AND SIGNATURE OF REGULATORY OFFICIAL (must be included if any larvae are detected)

APHIS - April 4, 2019