Animal and Plant Health Inspection Service
U.S. DEPARTMENT OF AGRICULTURE

Postentry Quarantine Manual

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When using pesticides, read and follow all label instructions.

New Edition Issued 2024

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Introduction

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Purpose

The *Postentry Quarantine* (*PEQ*) *Manual* enables State inspectors to perform the following tasks:

- Complete appropriate form for the Permit Unit (PPQ Form 546 only)
- Complete appropriate forms for the Postentry Quarantine Unit (PEQU)
- Conduct a survey of the growing site to determine whether to approve the site
- Inspect postentered plant material during the growing period for pests (primarily plant pathogens)

Users

The *Postentry Quarantine Manual* is written for use by State inspectors performing PEQ duties for Plant Protection and Quarantine (PPQ). The secondary users of this manual are PPQ Postentry Quarantine Liaison Officers (PEQLO) and Investigative and Enforcement Services (IES) Investigators.

Related Documents

The following documents are related to this manual:

- 7 CFR 319 Subpart—Plants for Planting (Postentry Quarantine Regulation 7 CFR 319.37-23) and associated manual part(s)
- Compendia of nursery diseases

Code of Federal Regulations

The Code of Federal Regulations (CFRs) provide the authority for the regulatory action taken and are enforced by CBP and PPQ. The restrictions and prohibitions listed in this manual are covered by 7 CFR 319.37-23.

Advisories

Advisories are used throughout the *Postentry Quarantine Manual* to bring important information to your attention. Please carefully review each advisory. The definitions coincide with American National Standards Institute (ANSI) and are in the format shown below.

⚠ CAUTION

The Caution message is used for tasks involving minor to moderate risk of injury.

⚠ DANGER

The Danger message is used in the event of imminent risk of death or serious injury.

NOTICE

The Notice message is used to alert a reader of important information or Agency policy.

SAFETY

The Safety message is used for general instructions or reminders related to safety.

⚠ WARNING

The Warning message is used in the event of possible risk of serious injury.

Postentry Quarantine Manual Contacts

Information Services and Manuals Unit (ISMU)

The PPQ Information Services and Manuals Unit (ISMU) issues and maintains manuals electronically on the APHIS Plant Protection and Quarantine Manuals webpage.

If you are unable to access the *Postentry Quarantine Manual* online or have a suggested edit (layout, spelling, etc.) please contact ISMU by email at PPQ.IRM.ISMU.Manuals.Feedback@usda.gov.

Revisions to the manual are announced via the APHIS Stakeholder Registry to anyone, government employees and external stakeholders, who have subscribed to receive *Postentry Quarantine Manual* updates. To subscribe, navigate to APHIS Stakeholder Registry, enter your email address, and select the relevant manuals under Plant Health Information – Manual Updates.

CBP Field Office Liaison

For CBP personnel—if information regarding a policy, procedure, or commodity admissibility appears incorrectly in the *Postentry Quarantine Manual* **or** you have an urgent situation requiring immediate response contact the CBP Field Office Liaison through the chain of command.

PPQ Import Services Customer Support

For PPQ personnel—if information regarding a policy, procedure, or commodity admissibility appears incorrectly in the *Postentry Quarantine Manual*, contact PPQ Import Services Customer Support at 301-851-2046 or 1-877-770-5990 with an explanation and recommended correction.

Postentry Quarantine Manual Liaison

For PPQ personnel—if you have an urgent situation requiring an immediate response regarding the *Postentry Quarantine Manual* contact the program specific liaison by email at postentry@usda.gov.

Chapter

2

Preparation

Contents

Orientation

Review the *PEQ Manual* prior to conducting a PEQ inspection for the first time.

If possible, have an experienced inspector accompany you on one or more inspections until you become familiar with the job.

Ask your PEQLO to assist you with routine or difficult problems. (The success of this program depends on cooperation between State and Federal professionals.)

Obtain clear directions to the inspection site: commercial nursery, greenhouse, or hobbyist's home garden.

Contact the grower to arrange for each PEQ inspection appointment. (This is particularly important when dealing with hobbyists. Access is obtained and travel time is saved. Make cold-call inspections only as needed relative to your knowledge of the grower, State guidelines, and pest risk.)

Having an inspection appointment may seem unnecessary or contrary to standard nursery inspection procedures, but an appointment may reduce the likelihood of violations. Tell importers to do the following:

- Assure that PEQ tags are in their proper places
- Read his or her Controlled Import Permit for Postentry Quarantine (CIP) and remember to separate PEQ material from non-PEQ material
- Take the time to tidy growing areas and place dead PEQ material in trash bags for your examination

If importers **do not** take corrective measures prior to your inspection appointment, report and document violations as appropriate. Act to correct all violations.

NOTICE

If your State Department of Agriculture's policy is to do inspections without appointment, please follow that policy for PEQ articles as well.

If you have reason to believe that correct PEQ compliance is **only** occurring prior to your announced visit, conduct cold-call inspections to determine the level of actual compliance. Report and document violations as appropriate. Act to correct all violations.

State and Federal Forms

Carry all necessary State and Federal forms.

State Nursery Inspection Forms

Depending on each State's standard operating procedures, State Nursery Inspection forms **may** be needed to report that contact was made with a specific grower, and any pests found and the treatments recommended.

State Quarantine Notice Forms

Depending on each State's standard operating procedures (SOPs), State Quarantine Notices may be needed to report detention of PEQ material due to infection or infestation.

PPQ Form 236, "Notice of Shipment and Report of Inspection of Imported Plants to be Grown Under Postentry Quarantine"

PPQ Form 236, Notice of Shipment and Report of Imported Plants to be Grown Under Postentry Quarantine is an official record of what was shipped to the importer and assists in verifying the following:

- Date they were received
- Kind and quantities of plants shipped
- Number of PEQ tags shipped by the PIS

- Permit and reference numbers
- Pests found and treated for at the PIS
- Requirements necessary to complete the release of the PEQ material

When the PEQ period ends, PPQ Form 236 is used to request release of the PEQ material.

State inspectors may report inspection findings directly on the back of this form throughout the PEQ period, or they may use State forms and transfer the information before sending to the Postentry Quarantine Unit.

PPQ Form 391, "Specimens for Determination"

PPQ Form 391, Specimens for Determination **must** be used when shipping insect or disease specimens to national identifiers.

PPQ Form 546, "Agreement for Postentry Quarantine—State Screening Notice (7 CFR 319 Subpart—Plants for Planting)

Read the agreement section of PPQ Form 546, Agreement for Postentry Quarantine—State Screening Notice to the grower (owner or manager) when a PEQ shipment is first received or during the first inspection. Each letter (a. through j.) should be initialed by the applicant. Review this form again with the grower if you observe violations. Tactfully reemphasize AGREEMENT sections a. through j. Stress that the person who signs this form is the "legally accountable" person, and, therefore, **must** abide by all PEQ rules.

NOTICE

Inform the grower/accountable person that according to Federal law, no PEQ material may be legally propagated or otherwise increased and no shipment or part of a shipment may be moved to another location on the importer's property or to any other importer's property without prior approval from the State inspection authorities and written permission of the National Coordinator, Postentry Quarantine Program.

Forward copies one and two of the application for postentry permits (PPQ Form 546) to:

Head, Permit Unit
USDA, APHIS, PPQ
4700 River Road, Unit 136 Riverdale, Maryland 20737

Copy three of the application form should be kept by the State and copy four given to the importer.

NOTICE

An applicant with a level-2 eAuthentication can apply online for a Postentry Permit. The application will go first to the Permit Unit to check for completeness and whether the applicant has a history with violations. The Permit Unit then forwards to the appropriate State Department of Agriculture. The site is inspected by a State Inspector and approved or disapproved. If approved, an ePermit will be issued. If disapproved, the applicant will be informed.

PPQ Form 7060, Official Warning Violation of Federal Regulations

APHIS Form 7060, Official Warning, Violation of Federal Regulations may be used to report first-time or minor violations of the PEQ permit. APHIS Form 7060 is a formal report, more formal than a warning letter, and is used for violations.

PPQ Form 569, Release From Postentry Quarantine

PPQ Form 569 Release from Postentry Quarantine is issued by the PEQ Unit in Beltsville, Maryland, and, for CNMI, Guam, and Hawaii, the Postentry Coordinator located in Honolulu, HI. This is the form that officially releases PEQ material from quarantine.

PPQ Form 587, Application for Permit to Import Plants or Plant Products

PPQ Form 587, Application for Permit to Import Plants or Plant Products is **not** used when applying to import PEQ material, but it is used for genera that are **not** Controlled Import Permit material. Keep a supply of blank forms available for issuance to potential importers.

Controlled Import Permit (CIP) for Postentry Quarantine

PPQ Controlled Import Permit for Postentry Quarantine is valid for 3 years **or** until the maximum quantity of plants listed on the permit has been met, **whichever comes first**. The maximum quantity listed on the CIP is for the life of the permit, **not** each shipment. **No** amendments will be made to existing permits. If changes are required, the importer will have to apply for a new permit.

Tools and Equipment

Following is a list of tools and equipment needed to inspect plants being grown under postentery quarantine:

- Copies of PPQ Form 391, Specimens for Determination
- Copies or originals of **all** forms specific to the PEQ inspection
- 1 hand lens
- 1 or 2 shoulder-type vials (containing 3% formaldehyde)—for nematodes
- 1 pair of pruning shears
- 1 pocketknife of similar cutting device
- *PEQ Manual*
- State quarantine tags, quarantine tape, or similar marking equipment for detaining infected PEQ material
- 3 or 4 plastic, heavy-duty trashbags for infected PEQ material disposal
- 3 or 4 resealable plastic bags (sandwich to 1-gallon size) for bud wood and large disease sample mailing to identifiers
- 3 of 4 shoulder-type vials (containing 70% alcohol)—for insects
- 3 or 4 shoulder-type vials (empty)—for dry specimen retention
- 3 or 4 small envelopes for shipping infected PEQ specimens to identifiers
- 2 or 3 paper towel sheets or similar blotter paper—for possible fungal diseases

Make arrangements with the importer if large quantities of plant material need to be destroyed.

Cautions and Warnings

Personal Warnings

Inspectors should always be cautious en route to and during PEQ inspections, but probably no more so than during any other work assignment.

Experienced inspectors know to look for guard dogs, pesticide residues on plants, low-hanging steam pipes, unguarded fans, and dangerous footing. But even experienced inspectors can have accidents. Therefore, take every precaution to minimize accidents, injury, and damage to self, property, and others.

Inspectional Warnings

Genera listed in 319.37-7(b) may be unfamiliar to you. You may wish to do a computer search for pictures. Your importer's confidence in your abilities is increased if you can identify the plant(s) you are to inspect.

You may not recognize many of the plant diseases that are PEQ significant. They either **do not** occur in the United States, are of limited distribution, or have symptoms that are similar to endemic diseases. Inspection is based on disease signs and symptoms and it is important to recognize them. Use the descriptions and the PEQ Circulars in the List of Circulars, to assist you during your inspections.

If you **cannot** identify what is causing a symptom on a PEQ plant, take a sample to your local specialist for identification. If this person **cannot** identify the specimen or suspects the disease is one of those listed as quarantine significant, contact the PEQ Coordinator.

Symptoms caused by fungi, bacteria, and nematodes include wilting, blotching, spotting, chlorosis, mottling, curling, cankers, gall, and die-back. Carefully inspect the host material for spores or fruiting bodies.

Symptoms of viral diseases include mottle, vein clearing, leaf curling, chlorosis, necrotic lesions, distortions, shortening of the internodes, stunting, enations, and color breaking in the bloom. Accurate field identifications are difficult because diagnosis is based on symptoms. Generally, there are **no** signs (such as fruiting bodies of fungal pathogens) produced by diseases caused by viruses. Additionally, symptoms can be confused with those caused by drought, poor drainage, malnutrition, or injury from spray materials. When virus diseases are found, examine any domestic plants of the same genus growing nearby for similar symptoms. Such comparisons will help determine if the suspected virus was introduced with the host or occurs locally.

Refer plant diseases that are not positively recognized as native or already established, or cannot be completely explained by environmental factors, insect injury, or nutritional troubles to the PEQU, Beltsville, Maryland. Pack specimens carefully before shipping to identifiers (refer to Pest Identification Procedures). Sent specimens **must** be characteristic of symptoms and variations observed on the PEQ plants and described in the List of Circulars.

In most cases, the quarantine period for PEQ material is two years (or two growing seasons). Exceptions do occur. Therefore, refer to PPQ Form 546, Agreement for Postentry Quarantine—State Screening Notice for specific information.

Special Note Regarding PIS Inspections

It is important to understand that intercepted plant pests are taxonomically identified to the lowest possible taxon (usually to the species level). However, PPQ acts **only** on those pests that are or are suspected of being quarantine significant. Nonquarantine plant pests are generally allowed entry due to PPQ's lack of authority to treat these pests. Importers who receive PEQ materials infested with nonquarantine significant plant pests may complain about this policy. PPQ management is **not** indifferent to importer concerns and is reviewing this loophole. Changes are being considered to require treatments for potential viral vectors such as aphids, whiteflies, or leafhoppers at the PIS. Until this review process is complete, please understand that PPQ will **only** take action on those pests that are, by Federal law, quarantine significant.

Chapter 3

Growing Site Inspections

Contents

Overview

Growing site inspections are conducted by State (and occasionally Federal) inspectors to preapprove the area(s) where PEQ material will be grown during the PEQ period. Growing site inspections also serve to evaluate the professional capability and intent of the grower.

Four primary conditions **must** be met for a site to be approved:

- Adequate buffer distance away from plants of the same genus and/or other genera of postentry plants
- Adequate space for the growth and maintenance of the total amount of PEQ material expected to be received (the amount of material is indicated on PPQ Form 546, Agreement for Postentry Quarantine—State Screening Notice
- Easily accessible for inspection and available during the State inspector's business hours
- Facility is in a location **not** prone to theft

Your Authority

The State Plant Regulatory Official (SPRO) or designee has final authority for approval or denial of any proposed site. Even though all primary conditions may be met, a decision to deny the approval of the site may be based on the grower's professional capability and intent or the environmental conditions that could cause exotic pests to be released into the environment.

For example, if plant theft is a local problem, this could be reason for disapproving the growing site. In this instance, the importer should be allowed to suggest and implement remedial safeguard measures that meet your satisfaction, such as fencing the property.

If a grower has habitually violated previous State quarantines or nursery treatment orders, this, too, could be grounds for disapproval. Information on habitual violations should, at minimum, accompany the application to the Permit Unit in Riverdale, Maryland.

PPQ Form 546

Complete PPQ Form 546, Agreement for Postentry Quarantine—State Screening Notice **only** under the following conditions:

- Accountable person who signed for a company is **no** longer with the company
- New importer/company wishes to obtain a Controlled Import Permit for Postentry Quarantine (CIP)
- Controlled Import Permit for Postentry Quarantine expired and needs to be renewed
- Permittee wants to change the growing site or add a growing site

Section A

Section A is completed by the grower/applicant. Please ask the person completing the form to print his or her name. After the form is completed, forward it to the appropriate State regulatory official.

If, after the Controlled Import Permit for Postentry Quarantine is issued, a request is made by the importer to add additional genera to the permit, the importer **must** apply for a **new** Controlled Import Permit for Postentry Quarantine.

During your site inspection read aloud and discuss the "Agreement" section of Section A and have the grower/importer initial all subsections (a. through j.) to:

- Answer all importer questions
- Ascertain that compliance is possible
- Ensure the grower understands the legal requirements

Growing Site

Item a. All plant material will be grown on premises supervised and controlled by me, located as specified in Item 5 above, and will **not** be moved or distributed without written permission of the appropriate State or Territory Official and (**except** Hawaii, Guam, and CNMI) the Coordinator, Postentry Quarantine Program.

Approval to move or distribute the plants must be sent to the Coordinator on State Department of Agriculture letterhead. For movement of PEQ plants to a grower in another State, both States will need to send approval to the Coordinator.

Access

Item b. Properly identified officers, either Federal and/or State, will be given access to the premises listed in Item 5 during the inspector's regular business hours.

Distribution

Item c. **No** increase of these plants by cuttings, grafting, suckers, flowers, seed or air layers will be made; there will be no distribution of the plants or increase; and no cutting of flowers for sale

will be made until the plants are released from postentry quarantine, or written permission of the (as in a. above).

Approval to increase the number of plants or cut flowers **must** be sent to the PEQ Coordinator on State Department of Agriculture letterhead.

Labelling

Item d. The plant material and all increase therefrom will be labeled by specific plant name, port accession number, and date of importation.

NOTICE

The tag should be placed on the first plant in a group of plants. Any additional tags for the same shipment can be placed anywhere within the group of plants. Labels should be removed by a State officer as soon as the release is received from the Postentry Quarantine Unit (PEQU).

Separation

Item e. The plant material will be separated from domestic stock of the same genus including such stock on adjoining premises, by no less that 3 meters (approximately 10 feet) and will be separated from other imported plants by the same distance.

NOTICE

Additional distance requirements should be indicated on PPQ Form 546 in the blank area of Section B-8.

Treatments

Item f. Any treatments prescribed by the officer, including destruction of the quarantined PEQ material or other plants growing on the premises, will be complied with to prevent the dissemination of a plant pest. (Special emphasis should be given to explain the need for control of aphids, whiteflies, leafhoppers, and other known viral vectors.)

Dead Plants

Item g. The appropriate State or Territory official will be notified in writing within 30 days when any abnormality is noticed in the plant material or if the plant material dies. Dead plants will be retained and collected by the State inspector for analysis. Follow disposal procedures described in the Disposal Procedures section of this manual.

Address Change

Item h. Notification of change of address will be sent to the appropriate State or Territorial official and (**except** Hawaii, Guam, and CNMI)) the Coordinator, Postentry Quarantine Program.

Special Requirements

Item i. Plants of *Rubus* spp. from Europe will be grown in a screen house (16 mesh per inch minimum); plants of *Chrysanthemum* spp. and *Dianthus* spp. will be grown in a greenhouse or other enclosed building.

Growing Requirements

Item j. The postentry requirements will be applied to *Chrysanthemum* spp. for 6 months after importation, to *Dianthus* spp. for 1 year after importation, and to all other genera for 2 years after importation.

The State official completes Section B, gives copy 4 to the applicant and retains the third copy. The rest is sent to the following address:

Head, Permit Unit
USDA, APHIS, PPQ
4700 River Road, Unit 136
Riverdale, Maryland 20737

Waiver of Growing Site Inspection

It is **not** critical that you conduct a growing site inspection when a specific importer is an experienced PEQ grower, and you are knowledgeable about the following:

- Professional capability and intent of the grower
- Proposed growing site
- Site has been specifically identified and delimited

In all other situations, inspect growing sites and hold discussions with the importer to assure compliance with the PEQ growing agreement. Taking these two steps will reduce the potential for violations and minimize the potential release of exotic pests into the environment.

Even with experienced PEQ importers, it is important to annually review PEQ growing requirements, especially when new genera are imported.

If PEQ material arrives at the PIS yet there has been no growing site inspection and approval, PIS officials will contact the PEQ Coordinator to discuss the matter. Usually, PEQ materials are allowed to proceed from the port of entry if a PPQ Form 546 completed by both the importer and signed by the state is faxed to the PIS, even though a Controlled Import Permit for Postentry Quarantine has **not** been issued.

Disposal Procedures

Instruct all importers, as often as necessary, of the proper disposal procedures outlined below:

- Any and all debris or waste derived from postentry plants or plant parts **must** be burned, autoclaved, or buried at least 1 ½ to 2 feet deep; following are a few examples of such material:
    - Debris remaining after pruning (refer to Table 5-1)
    - Debris that collects naturally (refer to Table 5-1)
    - Excess wood left from bud grafting
    - Undesirable plants the grower wants to eliminate
- Composting waste or debris from postentered plants or carrying waste or debris from postentered plants to a public landfill is prohibited

- Importers **must** notify, in writing, within 30 days, State (or Federal) inspectors for an inspection when PEQ material dies or appears infected or infested
- Importers **must** save all dead PEQ material in plastic trash bags (PEQ material may be beyond recognition when an inspection is later conducted, but safeguarding in plastic bags will reduce the likelihood of pest dissemination)
- Importers or growers **must never** dispose of any PEQ material (including waste or debris) without the prior approval of a State or Federal inspector (if the importer or grower sees dead plants or evidence of disease, that person **must** contact the State inspector immediately, moreover, if the importer or grower wants to eliminate undesirable plants, he or she should contact the State inspector prior to roguing out those undesirable plants)

Use Decision Table for Handling Plant Debris or Waste to decide whether you, as a State inspector, may allow a grower to leave plant debris or waste originating from PEQ material on the ground prior to disposing of it.

Table 3-1 Decision Table for Handling Plant Debris or Waste

If the material or waste is:	And the pathogen requiring the plant or material be grown under postentry:	Then:
A large quantity such that collection and disposal of the material would be burdensome	Is a bacterium or a fungus	Have the grower or importer collect the waste or debris and bag it prior to disposition
	Is a virus	Allow the grower or importer to leave the debris on the ground
A small quantity where collection and disposal would be reasonably easy	→	Have the grower or importer collect the waste or debris and bag it prior to disposition

EXAMPLE If a grower has planted 1,000 postentry hazel trees, you require that the grower collect and bag the debris because the pest of concern, *Anisogramma anomala* is a bacterium (Circular 10: Diseases of Corylus spp.). If, on the other hand, a grower plants 2,000 postentry hibiscus bushes (*Hibiscus* spp.), you could allow the grower to leave the plant debris on the ground because it would involve a large quantity of material, and the pest of concern is the Okra mosaic virus (Okra Mosaic Virus (Federal Quarantine Significant).

Refrain from contacting PPQ Headquarters offices **unless** specifically authorized by PEQLO or by PPQ Headquarters personnel.

Chapter

4

Inspecting Postentry Quarantine Material

Contents

Overview

Plant disease symptoms caused by viruses, bacteria, and fungi **do not** necessarily appear in the same season. Hence, inspecting PEQ material two or more times, if possible, during each growing season would be best. For example, the majority of leaf spots and leaf diseases are **not** well developed before summer. Virus diseases, in general, are more conspicuous in the spring. (Some virus symptoms are masked or tend to disappear in hot weather.) Cankers of woody plants are usually visible throughout the year. Thus, it is obvious that while late spring and early summer are most satisfactory for virus inspection, mid-summer to fall will give the best results for most fungus diseases.

The principle of seasonal occurrence holds for insects also. Leaf-feeding insects in larval and adult stages may appear in May and June and be entirely absent in mid-summer and later. Insects with a long season of hibernation (many sawflies, scarabs, weevils) spend a relatively short season on the aboveground portions of plants and may be missed **unless** two or more inspections are made. While plants are frequently fumigated when pests are intercepted at the port of entry, there is always a chance of insect pest introduction. For the first inspection following PIS inspection, submit any insect damage to PEQ material or insects **not** recognized for identification.

When PEQ material is examined during the growing season, inspection timing is important. Conditions **must** be optimum for detecting the specific plant pest involved. (A portion of this manual indicates optimal inspection periods.)

Unfortunately, two scenarios are possible:

- Grower receives PEQ material through legal channels
- Grower receives PEQ material through the mail or by a courier service and avoids PIS inspection, recording, tagging, and any necessary treatments (fortunately in some of the later cases, regulatory officials are notified or in some way learn that this has occurred)

How Plants May Enter

If PEQ Material Arrives at an Inspection Station

A detailed inspection is **not** required when the PEQ material arrives at the grower/importer's location **unless** the State official so desires. If an inspection is done, report findings directly on the back of PPQ Form 236.

If PEQ Material Does NOT Arrive at an Inspection Station

Notify the PEQLO or State Plant Health Director (SPHD) immediately. The SPHD or Postentry Quarantine Liaison Officers (PEQLO) will ensure that the shipment is sent to the closest inspection station **no** matter the number of items. If the importer **does not** have a Controlled Import Permit for Postentry Quarantine, the application form (PPQ Form 546) **must** be completed, both parts A & B before the shipment can be released from the inspection station. Violation proceedings may or may **not** be justified and should be decided on a case-by-case basis.

NOTICE

Send all shipments to the closest inspection station. If this is **not** possible, e.g., the plants have been planted in the field, PPQ **must** issue an Emergency Action Notice (EAN) and destroy the shipment.

General Inspection Guidelines

Postentry Quarantine (PEQ) Plants Imported as Tissue Culture in Flasks

1. Postentry quarantine begins when the plants are removed from the flasks, planted in growing media, and placed in the field, greenhouse, or screenhouse.
2. Any plants **not** removed from the flasks **must** be destroyed by an approved method.
3. The **only** plants that will be released at the end of the PEQ are the ones that have been planted and inspected by the State and/or PPQ.

Inspection Requirements

Inspect plants for evidence of exotic pests **at least once** during the first year **and at least once** during the second year for plants required to be grown in postentry quarantine for 2 years. Inspect **at least once** for plants required to be grown in quarantine for **less than** 2 years (e.g., *Chrysanthemum* spp. for 6 months, *Hydrangea* spp. for 9 months, *Dianthus* spp. for 1 year).

Optional Inspection

When the postentry shipment first arrives at the growing site (optional), perform the following:

1. Compare the bill of sale or invoice with PPQ Form 236. If you find any discrepancy in the number of plants or their kinds, contact the PEQLO to resolve the discrepancy or to investigate the incident.
2. Inspect plants that will be growing in proximity to the postentered material. Look especially for vectors of viruses—aphids, leafhoppers, and whiteflies. If you find such vectors, have the grower control these pests quickly but when practical.
3. If you detected any violations during your inspection, get with your PEQLO to investigate and document the violation.

First Inspection

During The First Growing Season

It is best if you inspect the postentered material twice during the first growing season.

1. To prepare for your inspection, look up the scientific name of the postentered plant(s) in Plants Growing in Postentry Quarantine. Use the information under the appropriate columns to schedule your inspections and to know for what symptoms to be on the alert. Schedule your inspections according to your local climate and weather patterns. If **not** listed in Disease and Pathogenic Organism Circulars (fruits and nuts overall), generally inspect the plants for symptoms of diseases at different times of the growing season.
2. Enter the results of your inspection on the back of the PPQ Form 236—even if those results are negative.

Second Inspection

During The Second Growing Season

It is best if you inspect the postentered material twice during the second growing season.

1. To prepare for your inspection, look up the scientific name of the postentered plant(s) in Appendix H, Plants Growing in Postentry Quarantine. Use the information under the appropriate columns to schedule your inspections and to know for what symptoms to be on the alert. Schedule your inspections according to your local climate and weather patterns. If **no** specific symptom is listed in the symptom column in Appendix H, Plants Growing in Postentry Quarantine, generally inspect the plants for symptoms of diseases at different times during the growing season.
2. Enter the results of your inspection on the back of PPQ Form 236—even if those results are negative.
3. Based on the inclusive inspection results during the two growing seasons, recommend (or don't recommend) release of the postentered material. If you recommend release, sign the appropriate Block on the bottom of the back side of PPQ Form 236. Get your supervisor's concurrence and have him or her sign the form in the appropriate Blocks next to yours. If both you and your supervisor agree that the plants should **not** be released from detention, contact your PEQLO.
4. Count all the plants, if feasible, that are alive from the original shipment. Enter both numbers on the back of PPQ Form 236 as “23 plants alive out of the original 98."
5. Send the completed and signed PPQ Form 236 to your PEQLO. That person will review the form and send it to the PEQU. This Unit and the Postentry Coordinator for Hawaii, Guam, and CNMI are the **only** officials authorized to release the material to the grower or importer.

Detailed Inspection Procedures

Inspection of Existing Documents

1. Thoroughly inspect **all** documents to verify the amount and kind of plant material grown.
2. Review **all** permit conditions. Examples can be located in Figure F-1 through Figure F-10.
3. Have the importer explain and/or correct any discrepancies observed.
4. Replace lost documents by contacting the PEQ Coordinator. Additional tags, as needed, can also be obtained by contacting the Coordinator.

Inspection of Growing Site

1. Determine if the growing site is indeed the approved site as stipulated in the original request.
2. If the importer is in compliance, do nothing.
3. If the importer is **not** in compliance, have the importer correct the situation to your satisfaction.
4. Report any serious violations to the PEQLO.
5. If a new growing site is approved for an existing permit, the State PEQ should forward the new PPQ Form 546 to the Permit Unit in Riverdale, Maryland. Attach a note stating: “PPQ Form 546 is a revision to Permit Number [*fill in number*].”

Refer to Table 4-1 when inspecting PEQ plants or plants adjacent to PEQ plants.

Table 4-1 Pest Findings and Appropriate Action

If you find:	Then you [1]:
Vector insect (whiteflies, aphids, or leafhoppers)	INSTRUCT the owner to control the pest immediately. If he or she does not comply, issue a violation notice. Submit a sample of the pest to the State or University entomologist for identification.
Nonvector insect	Submit a sample of the pest to the State or University entomologist for identification
Symptoms or sign of PEQ disease or PEQ suspect disease (refer to Plants Growing in Postentry Quarantine)	
Symptoms or signs of non-PEQ disease	

PEQ Plant Inspection

1. Inspect the PEQ plants for insects and diseases. Count the plants.
2. If you find insects such as whiteflies, aphids, or leafhoppers, have the grower control them immediately since many are known vectors of viruses. Importer compliance is critical
3. Collect pest specimens for determination and submit to specialist identifiers (refer to Submitting Invertebrates Pests for Identification and Submitting Plant Diseases for Identification).
4. Report **all** of your findings on the back of PPQ Form 236. Record the general condition of the plants and the cause of death of any plants on PPQ Form 236.

NOTICE

If you determine the grower/importer can no longer continue growing PEQ material before the material is released, there are two options available to the grower: 1) dispose of all PEQ material using approved disposal methods and contact the PEQLO and Coordinator or Postentry Quarantine Program (PEQP); 2) sell or give the PEQ material to another approved PEQ material grower within the same State with State approval. Contact the Coordinator of PEQP to obtain written approval and PPQ Form 236 for the replacement grower.

Nearby Plants Inspection

1. Inspect nearby plants for insects and signs and symptoms of disease.
2. Report any findings to the importer and request treatments for pest elimination.
3. If you find insects such as whiteflies, aphids, or leafhoppers, have the grower control them immediately since many are known vectors of viruses. Importer compliance is critical.
4. Collect pest specimens for determination and submit to specialist identifiers (refer to Submitting Invertebrates Pests for Identification and Submitting Plant Diseases for Identification).
5. If the importer fails to control potential vector pests upon your request, document the violation. You may also quarantine surrounding areas if infested.
6. Dispose of dead and diseased PEQ material and any other plant material deemed infected/infested with quarantine-significant pests by applying the disposal procedures established in this manual.

[1] If the State or University entomologist or plant pathologist **does not** recognize the insect or the symptoms or signs of the disease to be something that has been reported in that State, immediately contact the National PEQ Coordinator.

NOTICE

The plant material will be separated from domestic stock of the same genus, **including** such stock on adjoining premises, by **no less than** 3 meters (approximately 10 feet) and will be separated from other imported plants by the same distance.

PEQ Tags Inspection

Look for PEQ tags. Replace lost or missing tags. The PEQLO can request replacement tags by contacting:

National Coordinator, Postentry Quarantine Program
USDA–APHIS–PPQ–Field Operations
Email: postentry@usda.gov

Confiscate and destroy any old PEQ tags that **no** longer label active PEQ material.

NOTICE

Lack of tag could be an indication the shipment was **not** inspected at an inspection station. If the State inspector **does not** have a PPQ Form 236 for this shipment and the grower **cannot** produce this document, a decision will need to be made. If the shipment has just arrived and can be sent to the closest inspection station, do so. If it has been planted on site, destroy it. Contact the SPHD for aid in doing an Emergency Action Notice (EAN).

Pest Identification Procedures

Approach each inspection with the question, "Does this importation carry any pest that is new or rare in the United States?" A new pest may be present in a single plant. It is your task to find it.

Take specimens you **cannot** identify to your local identifier specialists. PPQ Form 391, Specimens for Determination **must** be completed for any specimens they **cannot** identify and they **must** be sent by overnight mail. When suspect or actual pests are found, follow the guidelines below.

Submitting Invertebrates Pests for Identification

Use the following procedures for preparing specimens for identification. Treat or safeguard all host material to eliminate pest risk. Rearing intercepted specimens is prohibited without the proper authority. Never attempt to rear plant pests without authorization from the following:

Permits, Registration, Imports, and Manuals (PRIM) Staff
4700 River Road, Unit 133
Riverdale, Maryland 20737-1236

Arthropods

For guidance in preserving insects, refer to any of the following publications:

- USDA Miscellaneous Publication No. 1443, *Insects and Mites: Techniques for Collection and Preservation*, edited by G. C. Steyskal, W. L. Murphy, and E. M. Hoover, 1986
- *An Introduction to the Study of Insects*, Borror, Triplehorn, and Delong

Use Table 4-2 to determine how to preserve your specimens.

Table 4-2 Decision Table for Preserving Specimens

If specimen belongs to this order:	Then preserve specimen using this method:
• Acarina • Coleoptera • Dermaptera • Diptera • Heteroptera • Homoptera1F 2 • Hymenoptera • Isoptera • Lepidoptera (immatures) • Orthoptera (immatures) • Thysanoptera (adults) [3]	In alcohol Refer to Preserving Specimens in Alcohol
• *Homoptera* on host material (scale insects and immature psyllids) • *Lepidoptera* (adults) • *Orthoptera* (adults)	Dry mounting Refer to Preserving Dry Specimens

Preserving Specimens in Alcohol

Adults. Kill adults by placing in 70% alcohol.

Larvae. Use the following instructions to kill larvae:

1. Place larvae in water.
2. Slowly bring water to boiling point.
3. Allow specimen to cool down.
4. Place specimen in a vial with alcohol.

Select shoulder-type vials over shell vials because they are stronger and provide better protection for the specimens. Fill vials three-quarters full with alcohol and make sure the stoppers fit securely. Bleed air pressure when necessary. For delicate specimens, place wadded paper within the vials to minimize specimen movement. Use screw-cap vials for small specimens. Avoid using cork stoppers because they allow alcohol to evaporate and could result in specimen loss during extended storage.

Preserving Dry Specimens

Make sure **all** specimens are dead. Use one of the following killing agents or seek instructions from the Identifier for alternative killing measures:

- Cyanide
- Ethyl acetate
- Trichoroethylene

⚠ CAUTION

Label all killing bottles with the “POISON.” Use killing agents with care and follow the label directions.

Pin adult specimens of *Lepidoptera* and *Orthoptera* on pinning blocks before shipping. Pin the styrofoam blocks to the bottom of the pinning box. Use small pinning boxes and place these,

[2] **Except** whiteflies, scales, and immature psyllids on host material.
[3] Add a few drops of vinegar (acetic acid) to the alcohol in vial.

snugly padded, inside a shipping box. Seek instructions from the Identifier for additional information.

Partially dry host material with insects (e.g., scale insects and whiteflies) before placing in the container. **Unless** the host material is thoroughly dry, pack to permit drying after closure of container without damaging specimens.

Nematodes

Use the following instructions when preserving nematodes:

1. If you are forwarding nematode-infested host material, place material in a plastic bag to prevent the host material from drying.
2. Separate nematodes from infested material and place in a vial of water. Slowly apply heat until the nematodes stop moving. **Do not** overheat!
3. Prepare either of the fixatives 3% formaldehyde or TAF (refer to Table 4-3).

Table 4-3 Instructions for Preparing Fixatives

If preparing this fixative:	Follow this recipe:
3% formaldehyde	1 part formalin + 12 parts water
TAF	7 ml formalin + 2 ml triethanolomine + 91 ml water

4. Add to the vial containing the specimens a volume of double strength fixative equal to the volume of water in the vial.
5. Place cysts of *Globodera* spp., mature females of *Meloidogyne* spp., and other nonwormlike nematodes, directly into single strength fixative without heating.

Submitting Plant Diseases for Identification

Consider the following when examining plants.

Symptoms Caused by Fungi, Bacteria, and Nematodes

- Blotching
- Cankers
- Chlorosis
- Curling
- Die-Back
- Galls
- Mottling
- Spotting
- Wilting

Symptoms Caused by Viruses

- Bloom color breaking
- Chlorosis
- Distortions
- Enations

- Leaf curl
- Mottle
- Necrotic lettuce
- Shortening internodes
- Stunting
- Vein clearing

Virus symptoms are similar to:

- Drought
- Malnutrition
- Poor drainage
- Spray injury

Selecting Material

Because diseases have complex life cycles and specimens of different stages of the disease life cycle are helpful in making identifications, select material showing as many stages of disease life cycle as possible. Early stages of the disease may show important diagnostic signs and symptoms, while older material may have the perfect stage of a fungus. Send an ample amount of diseased material.

Since some diseases may be identified by symptoms, when possible, ship disease specimens in a natural state to the Identifier. If the host material becomes dried, molded, shriveled, or decayed, symptoms may be modified or destroyed. If the material is soft or pulpy, partially dry the material and pack between sheets of stiff, absorbent paper to keep the diseased area flat. **Do not** fold leaf specimens. Partially dry succulent leaves before shipping.

For virus suspects, prepare the sample as follows:

1. Remove a branch with leaves or whole plant showing symptoms. Leaves or whole plant should **not** be dry or brittle.
2. Place in a resealable, plastic bag (**no** wet paper towels). Remove as much of the air as possible and close tightly.
3. Forward as quickly as possible to your local virologist.

If there is **no** state virologist, forward the sample along with PPQ Form 391 by overnight express to:

Dr. Joseph Foster
USDA, APHIS, PPQ
Building 580 Powder Mill Rd.
Beltsville, MD 20705

Email a copy of PPQ Form 391 to the National Coordinator of Postentry Quarantine Programs:

National Coordinator, Postentry Quarantine Program
USDA, APHIS, PPQ, Field Operations
Email: postentry@usda.gov

PPQ Form 391, Specimens for Determination

Refer to PPQ Form 391, Specimens for Determination for an example.

NOTICE

PPQ Form 391 is the **only** form approved for use by the U.S. National Museum when submitting specimens for determination. **All** other forms may be rejected and may cause identification delays. Complete a second or third form if you submit two or three different pests for determination. (Each form and specimen may need to go to different identifiers working in different labs.)

Table 4-4 Instructions for PPQ Form 391

Block:	Instructions:
1. Collection Number	Use any numbering system that corresponds to your State's inspection and interception activities (optional).
2. Date	Enter as appropriate.
3. Submitting Agency	Enter as appropriate.
4. Name of sender	Enter as appropriate.
5. Address of submitter	Enter as appropriate
6. Type of property	Enter as appropriate.
7. Address of sender	Enter as appropriate.
8. Name and address of property	Enter as appropriate.
9. Reason for identification	• Mark box B or C (the one that best describes your reason for submitting this pest). • Mark box L and add the words "Postentry Material".
10. Explanation	If prompt or urgent identification is requested, please provide a brief explanation under Block 22—remarks.
11. Host Information	Give scientific name of the host material.
12. Quantity of host	• Write the exact number of plants that were received by the importer. • Write an estimated number of plants affected by the pest you are submitting for identification.
13. Plant distribution	Mark the box that best describes the amount of host material in the nursery, greenhouse, or immediate environment.
14. Plant parts affected	Mark the box or boxes that indicate where on the host you actually found the pest.
15. Pest distribution	Mark the box that best describes the amount of pest infestation.
16. Unnamed block—this block is **only** used for submission of insects, nematodes, or mollusks. Skip this block if you are submitting diseased specimens for determination.	• Mark the box that tells whether the pest is an insect, nematode, or mollusk. • Write in the appropriate life stage box how many alive or dead specimens were present at the time of your inspection.
17. Sampling method	Use words such as: • Berlese Funnel • Centrifuge • Dissection • Filtration • Hand Sampling

Block:	Instructions:
18. Type of trap and lure	**Do not** complete this block **unless** it specifically apples.
19. Trap number	**Do not** complete this block **unless** it specifically apples.
20. Plant pathology—plant symptoms	This block is **only** used for submission of plant pathology specimens. Mark the box that best describes what you observed during your inspection.
21. Weed density	**Do not** complete this block **unless** it specifically applies.
22. Weed growth stage	**Do not** complete this block **unless** it specifically applies.
23. Remarks	Write the PEQ permit number, reference number, country of origin, and any other location information here that would help you or others find the PEQ material at a later date. Place urgent shipping information here (from Block 9).
24. Travel determination	Write the scientific name of the pest. In the case of viruses or when you **do not** know the scientific name, the common name of the pest if acceptable. **Never** leave this block blank. At least indicate virus, fungus, disease, etc.
25. Determination and notes	**Do not** write in this area.

PPQ Form 236, Notice of Shipment and Repost of Inspection of Imported Plants to be Grown Under Postentry Quarantine

Recording Inspection Results

Refer to PPQ Form 236, Notice of Shipment and Report of Imported Plants to be Grown Under Postentry Quarantine.

Complete **only** the back of this form in the area titles "Inspection Report".

Table 4-5 Instructions for PPQ Form 236

Block	Instructions:
Plants imported	Write the genus and species of the host imported.
No.	Write the number of live plants received by the importer.
Date and findings	If at all possible, use one box for each inspection—record the following information: • Write any pests observed • Write any noticeable growth conditions observed • Write the inspection date • Write the number of live plants remaining When you require treatment for arthropods, including insects, provide a copy of the State inspection form to the PEQLO.
Recommend for release	**Do not** complete this section until after the final PEQ inspection—release procedures are covered in Description of Postentry Quarantine Material Release Procedures.
Released from detention	**Do not** write in this section of the report.

Chapter 5

Description of Postentry Quarantine Material Release Procedures

Overview

Use the following criteria when releasing healthy PEQ material from quarantine:

1. State inspector completes a final inspection (record on the back of PPQ Form 236, copies 4 and 5, the number of plants remaining).
2. Final inspection should report "no quarantine-significant pests found."
3. State inspector completes copies 4 and 5 of PPQ Form 236. Once the copies are completed, the State inspector gives the copies to his or her supervisor. The State supervisor reviews and signs both copies of the completed form. The State then forwards the completed and signed copies to the Postentry Quarantine Liaison Officers (PEQLO) (refer to PPQ Form 236, Notice of Shipment and Report of Imported Plants to be Grown Under Postentry Quarantine). If the State Department of Agriculture **does not** want to have a copy of the PPQ 236 signed by the Coordinator, Postentry Quarantine Program, one copy should be forwarded to the PEQLO and the other destroyed.
4. PEQLO reviews copies 4 and 5 of PPQ Form 236 received from the State. If the PEQLO concurs with the State, the officer recommends release and writes on or stamps copies 4, 5, and 6 (copy 6 **only** if the PEQLO accompanied the State Inspector on one or both of the inspections) with "Recommend Release" and signs all three copies. The three copies of the signed form (4, 5, and 6) are forwarded to the Postentry Quarantine Program (PEQP) (refer to PPQ Form 236, Notice of Shipment and Report of Imported Plants to be Grown Under Postentry Quarantine).
5. Completed PPQ Form 236 must be reviewed and signed by the Coordinator for the Postentry Quarantine Program. Email scanned copies to the following:

   National Coordinator, Postentry Quarantine Program
   USDA–APHIS–PPQ–Field Operations
   Email: postentry@usda.gov

NOTICE

It is very important that **all** copies of PPQ Form 236 be removed from both the State and PEQLO's files when a shipment is recommended for release.

6. Importer receives a formal release notice (PPQ Form 569) from the PEQP. (Copies are sent to State and PEQLO.)

NOTICE

PEQ material **must not** be sold until the release process is complete.

NOTICE

If State inspectors hold/quarantine PEQ material beyond the normal detention period for further observation or final treatments, etc., the PEQLO and the PEQP should be notified.

Chapter

6

Responsibilities of State and Federal Inspectors

Contents

Overview

The PEQ program is a cooperative Federal–State undertaking. By agreement, State inspectors who have specialized training do field inspections of PEQ material. (Generally, State inspectors are more knowledgeable about local growing conditions and circumstances and have a working relationship with the importers.) Federal officers provide support and administrative roles.

Liaison Officer Responsibilities

- Assist State inspectors in difficult matters especially with regard to inspections, interceptions, PEQ material disposal, and violations
- Assist State inspectors with inspections of PEQ material when State inspectors are sporadically unable to perform this function
- Assist State inspectors when extending quarantine periods due to signs, symptoms, or pest infestations found during final inspections
- Concur or deny requests for PEQ releases sent by State inspectors on behalf of importers; send approved requests to the Postentry Quarantine Unit (PEQU) (inaccurate or incomplete PPQ Form 236s **must** be returned to the State officials for correction or completion)
- Maintain a file on all released PEQ material for a period of time established by the PEQU (the period is generally 2 years)
- Review all PEQ documents prepared by State and Headquarters Units and process according to established procedures
- Train and assist State inspectors in proper PEQ inspection procedures, distribute PEQ information and new manual parts to State inspectors, and maintain an active file on all material currently under PEQ quarantine

When delays in receiving permits occur, contact the following:

Head, Permit Unit
USDA, APHIS, PPQ
4700 River Road, Unit 136
Riverdale, Maryland 20737

When delays occur with regard to inspections or other difficulties, contact the following:

National Coordinator, Postentry Quarantine Program
USDA–APHIS–PPQ–Field Operations
Cell: 512-592-8500
Email: postentry@usda.gov

State Inspector Responsibilities

- Conduct all PEQ inspections according to established guidelines, guidelines are found in this manual and in M 319.37-19, and is also available from the Postentry Quarantine Liaison Officers (PEQLO) and PPQ
- Conduct the PEQ site inspection; if a new growing site is approved for an existing permit, the State PEQ official should forward the new PPQ Form 546 to the Permit Unit in Riverdale, Maryland, however, attach a note stating that PPQ Form 546 is revising the former permit—include the permit number
- Document and report importer violations to PEQLO
- Extend quarantine periods according to PPQ direction when signs, symptoms, or pests are present during the final PEQ inspection or when a shipment is commingled with a later-arriving shipment
- Forward PPQ forms to the State supervisor who will send the forms to the PEQLO for final review and processing, this includes denials of requests for growing sites
- If you receive an improperly completed PPQ Form 236 from the PIS, contact the PEQ Coordinator
- Instruct all importers in proper PEQ material handling procedures
- Maintain an active file on all material currently under PEQ quarantine
- Seek assistance and training from PEQLO especially in difficult matters dealing with inspections, interceptions, PEQ material disposal, and violations
- Submit unidentifiable pest specimens and disease samples to local identifier authorities. If the local identifier is unable to identify the specimen submitted, forward the specimen to the PEQU for identification

Chapter 7

List of Circulars

Contents

Introduction

Use this chapter as well as chapters 8, 9, and 10 as job aides to identify plant diseases. Disease and Pathogenic Organism Circulars describes diseases that are either common, quarantine significant, or both. Additional circulars will be added to this manual periodically. Refer to the Alphabetical List of Diseases for an alphabetized list of diseases and refer to Disease and Pathogens of Concern for a list of diseases **not** included in chapter 10.

Circulars

Circular 1: Diseases of *Abelmoschus* spp., *Althaea* spp., and *Hibiscus* spp.

- Bhendi Yellow Vein-Mosaic Agent (Federal Quarantine Significant)
- Cotton Anthocyanosis Agent (Federal Quarantine Significant)
- Cotton
- Cotton Leaf Curl Agent (Federal Quarantine Significant)
- Hibiscus Leaf Curl Agent on Hibiscus (Federal Quarantine Significant)
- Okra Mosaic Virus (Federal Quarantine Significant)
- Okra Yellow Leaf Curl Agent (Federal Quarantine Significant)

Circular 2: Diseases of *Acacia* spp.

- *Acacia* Rust (Federal Quarantine Significant)

Circular 3: Diseases of *Acer* spp.

- Maple (Acer) Leaf Spot (Federal Quarantine Significant)
- Maple (Acer) Variegation Agent (Federal Quarantine Significant)
- Xanthomonas acernea (Federal Quarantine Significant)

Circular 4: Diseases of *Anacardium* spp.

- Xanthomonas campestris pv. mangiferaeindicae

Circular 5: Diseases of *Berberis* spp., × *Mahoberberis* spp., and *Mahonia* spp.

- Black Stem Rust (Federal Quarantine Significant)

Circular 6: Diseases of *Blighia* spp.

- Okra Mosaic Virus (Federal Quarantine Significant)

Circular 7: Diseases of *Bromeliaceae* spp.

- Bromeliaceae

Circular 8: Diseases of *Brugmansia* spp. and *Datura* spp.

- Colombian Datura Virus (Federal Quarantine Significant)
- Datura Shoestring Virus

Circular 9: Diseases of *Chrysanthemum* spp. (Dendranthema), *Leucanthemella serotina*, and *Nipponanthemum nipponicum*

- Chrysanthemum White Rust (Federal Quarantine Significant)

Circular 10: Diseases of *Corylus* spp.

- Apple Proliferation Phytoplasma (Federal Quarantine Significant)
- Filbert (Corylus) Blight

Circular 11: Diseases of *Crocosmia* spp.

- Gladiolus Rust (Federal Quarantine Significant)
- Uredo gladioli-buettneri (Federal Quarantine Significant)

Circular 12: Diseases of *Dianthus* spp.

- Carnation Wilt
- Dianthus Virus Diseases
- Leaf Rot of Carnation

Circular 13: Diseases of *Eucalyptus* spp.

- Pestalotia disseminata (Federal Quarantine Significant) and Leaf Chlorosis Virus

Circular 14: Diseases of *Gladiolus* spp.

- Gladiolus Rust (Federal Quarantine Significant)
- Puccinia gladioli [Castagne] (Federal Quarantine Significant)
- Puccinia mccleanii [Doidge] (Federal Quarantine Significant)
- Uromyces nyikensis [Syd. & P. Syd.] (Federal Quarantine Significant)

Circular 15: Diseases of *Hydrangea* spp.

- Hydrangea Rust (Federal Quarantine Significant)

Circular 16: Diseases of *Juniperus* spp.

- Douglas Fir Canker (Federal Quarantine Significant)

- Juniper Pear Rust (Federal Quarantine Significant)
- Juniper Rust
- Needlecast Disease (Federal Quarantine Significant)

Circular 17: Diseases of *Malus* spp.

- Apple Branch Canker
- Apple Canker
- Apple Mosaic Virus
- Apple Proliferation Phytoplasma (Federal Quarantine Significant)
- Chlorotic Leafspot Virus
- Rough Bark (Phomopsis Canker) (Federal Quarantine Significant)
- Rubbery Wood Phytoplasma (Federal Quarantine Significant)
- Valsa ceratosperma (V. Mali) (Federal Quarantine Significant)

Circular 18: Diseases of *Passiflora* spp.

- Cucumber Mosaic Virus
- Passion Fruit (Passiflora) Mosaic Virus
- Passion Fruit (Passiflora) Woodiness Virus

Circular 19: Diseases of *Pinus* spp.

- Douglas Fir Canker (Federal Quarantine Significant)
- Hemicycliophora dhanachandi (Hemicycliophoridae)
- Scotch Pine Blister Rust (Federal Quarantine Significant)

Circular 20: Diseases of *Prunus* spp.

- Apple Proliferation Phytoplasma (Federal Quarantine Significant)
- European Rusty Mottle of Cherry (Federal Quarantine Significant)
- Plum Pox Virus (Federal Quarantine Significant)

Circular 21: Diseases of *Psuedostuga* spp.

- Douglas Fir Canker (Federal Quarantine Significant)
- Circular 22: Diseases of *Rosa* spp.Cytospora *rosarum* (Sordariomycetes: Diaporthales)
- Rose Wilt Agent (Federal Quarantine Significant)

Circular 23: Diseases of *Rubus* spp.

- Raspberry Leaf Blotch Virus (RLVB)
- *Rubus* Stunt Phytoplasma (Federal Quarantine Significant)

Circular 24: Diseases of *Vaccinium* spp.

- Diaporthe australafricana (Sordariomycetes: Diaporthales)

Circular 25: Diseases of *Watsonia* spp.

- Gladiolus Rust (Federal Quarantine Significant)
- Puccinia mccleanii [Doidge] (Federal Quarantine Significant)
- Uredo gladioli-buettneri (Federal Quarantine Significant)

- Uromyces gladioli [Henn.] (Federal Quarantine Significant)

Chapter 8

Alphabetical List of Diseases

- *Acacia* Rust (Federal Quarantine Significant)
- Apple Branch Canker
- Apple Canker page
- Apple Mosaic Virus
- Apple Proliferation Phytoplasma (Federal Quarantine Significant)
- Bhendi Yellow Vein-Mosaic Agent (Federal Quarantine Significant)
- Black Stem Rust (Federal Quarantine Significant)
- Bromeliaceae
- Carnation Wilt
- Chlorotic Leafspot Virus
- *Chrysanthemum* White Rust (Federal Quarantine Significant)
- Columbian *Datura* Virus (Federal Quarantine Significant)
- Cotton Curliness on Hibiscus
- Cotton Leaf Curl Agent (Federal Quarantine Significant)
- Cucumber Mosaic Virus
- *Cytospora rosarum* (Sordariomycetes: Diaporthales
- *Datura* Shoestring Virus
- *Dianthus* Virus Diseases
- *Diaporthe australafricana* (Sordariomycetes: Diaporthales)
- Douglas Fir Canker (Federal Quarantine Significant)
- European Rusty Mottle of Cherry (Federal Quarantine Significant)
- Filbert (*Corylus*) Blight
- Gladiolus Rust (Federal Quarantine Significant)
- *Hemicycliophora dhanachandi*
- Hibiscus Leaf Curl Agent on Hibiscus (Federal Quarantine Significant)
- Hydrangea Rust (Federal Quarantine Significant)
- Juniper Pear Rust (Federal Quarantine Significant)
- Juniper Rust
- Leaf Rot of Carnation
- Maple (*Acer*) Leaf Spot (Federal Quarantine Significant)
- Maple (*Acer*) Variegation Agent (Federal Quarantine Significant)
- Needlecast Disease (Federal Quarantine Significant)
- Okra Mosaic Virus (Federal Quarantine Significant)
- Okra Yellow Leaf Curl Agent (Federal Quarantine Significant)

- Passion Fruit (*Passiflora*) Mosaic Virus
- Passion Fruit (*Passiflora*) Woodiness Virus
- *Pestalotia disseminata (*Federal Quarantine Significant) and Leaf Chlorosis Virus
- Plum Pox Virus (Federal Quarantine Significant)
- *Puccinia gladioli* [Castagne] (Federal Quarantine Significant)
- *Puccinia mccleanii* [Doidge] (Federal Quarantine Significant)
- Raspberry Leaf Blotch Virus (RLBV)
- Rose Wilt Agent (Federal Quarantine Significant)
- Rough Bark (Phomopsis Canker) (Federal Quarantine Significant)
- Rubbery Wood Phytoplasma (Federal Quarantine Significant)
- *Rubus* Stunt Phytoplasma (Federal Quarantine Significant)
- Scotch Pine Blister Rust (Federal Quarantine Significant)
- *Uredo gladioli-buettneri* (Federal Quarantine Significant)
- *Uromyces gladioli* [Henn.] (Federal Quarantine Significant)
- *Uromyces nyikensis* [Syd. & P. Syd.] (Federal Quarantine Significant)
- *Valsa ceratosperma* (V. Mali) (Federal Quarantine Significant)
- *Xanthomonas acernea* (Federal Quarantine Significant)
- *Xanthomonas campestris* pv. *mangiferaeindicae*

Chapter 9

Disease and Pathogens of Concern

On Postentry Genera With No Circulars

Contents

Introduction

The following list of hosts and plant pathogenic organisms includes those for which there are **no** circulars.

Abelmoschus spp. (okra)

- Cotton anthocyanosis agent
- Okra mosaic virus
- Okra yellow leaf curl agent

Blighia

- Okra mosaic virus

Bromeliaceae

- *Puccinia pitcairniae* Lagh.
- *P. tillandsiae* Cummins & Pollack—in Florida
- *Uredo nidularii* P. Henn
- *Ustilago tillandsiae* Patterson

NOTICE

The family Bromeliceae is on the list as postentry for Hawaii **only**.

Crocosmia spp.

- *Uredo gladioli-buettneri* Bub.
- *Uromyces nyikensis* Syd. & P. Syd.

Gladiolus spp.

- *Uredo gladioli-buettneri* Bub.
- *Uromyces nyikensis* Syd. & P. Syd.

Hibiscus spp.

- Cotton anthocyanosis agent
- Hibiscus leaf curl agent

Malus spp.

- Apple ring spot agent
- Apple chlorotic leaf spot virus (= plum bark split strain of apple chlorotic leaf spot virus)
- Apple green crinkle agent
- Apple chat fruit agent

Pinus spp.

- *Cronartium ribicola* J.C. Fischer

Prunus spp.

- Arabis mosaic virus
- Cherry leaf roll virus
- European stone fruit yellows phytoplasma
- Plum bark split strain of apple chlorotic leaf spot virus (= apple chlorotic leaf spot virus)
- Raspberry ringspot virus
- Strawberry latent ringspot virus

- Tomato blackring virus

Watsonia spp.

- *Uredo gladioli-buettneri* Bub.
- *Uromyces nyikensis* Syd. & P. Syd.

Chapter

10

Disease and Pathogenic Organism Circulars

Contents

Circular 1: Diseases of *Abelmoschus* spp., *Althaea* spp., and *Hibiscus* spp.

Bhendi Yellow Vein-Mosaic Agent (Federal Quarantine Significant)

Revised Oct. 1987; restructured 1996

Synonyms

Ochrovena hibiscae Capoor, Hibiscus yellow vein-mosaic virus

Hosts

Althaea rosea L. Cav., *Abelmoschus esculentus* (L.) Moench. *A. moschantus* Medic., *Hibiscus moscheutos* L., *H. tetraphyllus* Roxb.

Distribution

Bangladesh, India, and Sri Lanka

Alcea rosea. There is faint vein-clearing of the young leaves followed by swelling of the veins at several points of the undersides of the leaves. The vein swelling gradually extends to nearly all veins which become thickened and gnarled as the leaf grows. The thickened veins are a deep green in color and appear opaque when seen against the light.

A description of the symptoms on shrubby forms of Hibiscus has **not** been found. They would probably be, in part, similar to those on okra (*Abelmoschus esculentus*) which follows.

Abelmoschus esculentus

The first symptom is clearing of the small veins, and then of the larger ones, the ill-defined, yellowish-green to pale yellow areas later extending into the mesophyll. In severely diseased plants, the young leaves develop generalized chlorosis rather than a mosaic pattern. All growth produced after infection is stunted. The leaves are undersized and the petioles are short. Flowering is sparse and few fruits are formed. Most of the leaves on a diseased plant develop thickening of the veins on the lower side but no foliar growths or enations are formed.

Transmission

The white fly, *Bemisia tabaci* Genn. (*B. gossypiperda* Misra and Lamba); by grafting.

Figure 10-1 Example of virus-infected *Hibiscus* spp.; NOT yellow-vein virus, but when this is found, it should be submitted for identification

References

1. Anonymous. 1942. Agricultural Research. N. Pathology Rep, Imp. Coun. Agric. Res. (New Delhi) 36.
2. Anonymous. 1943. Rep. Imp. Coun. Agric. Res. (New Delhi) 3-39.

3. Capoor, S.P. and P.M. Varma. 1950. Yellow vein-mosaic of Hibiscus esculentus L. Indian J. Agric. Sci. 20:217-30. (A summary can be found in Smith, K. 1957. Textbook of plant virus diseases. 2d ed.).
4. CFR 319.37§2.

Cotton Anthocyanosis Agent (Federal Quarantine Significant)

Synonyms

Gossypium virus 2

Hosts

Gossypium hirsutum L., *G. maritima*, *G. vitifolium* Lam. and probably other *Gossypium* species., *Hibiscus cannabinus* L., and *Solanum dulcamara* L.

Vectors

Aphis gossypii, *A. laburni*, *Epitretranychus althaea*, and *Myzus persicae*

Distribution

Azerbaijan and Russia (Siberia

Symptoms

The symptoms are similar to those of cotton leaf curl, **except** in the following particulars:

- Enations are absent
- Hosts include *S. dulcamara*, a plant outside the family Malvaceae
- Reduced vein thickening
- Varieties showing resistance are **not** the same
- Vectors are different

References

1. Moskovetz, S.N. 1940. Plant virus diseases and their control. Transcript of the conference on plant virus diseases, Moscow-Leningrad Acad. Sci.; Nov. 4-7 (Moscow). Published in Abst. Rev. Appl. Mycol. 23:211-13.
2. Tarr, S.A.J. 1949. Leaf curl disease of cotton. London:Publisher 9.

Cotton Leaf Curl Agent (Federal Quarantine Significant)

Synonyms

Gossypium virus 1 and *Ruga gossypii* Holmes

Hosts

Abelmoschus esculentus (L.) Moench (Hibiscus esculentus L.), *Althaea rosea* L. Cav., (Althaea rosea Cav.), *Gossypium barbadense* L. (G. vitifolium), *G. barbadense* L. (*G. peruvianum* Cav. & *G. vitifolium* Lam.), *G. somalense* (Gürke) J. B. Hutch., *Hibiscus cannabinus* L., *H. sabdariffa* L. and *Malvaviscus arboreus* Cav. There is evidence that *Sida alba* L. and *S. cordifolia* L. may also be hosts.

Vectors

The white flies, *Bemisia tabaci* (Gennadius) (*B. gossypiperda* M. & L.) and *B. goldingi*.

Distribution

Africa

Symptoms

Gossypium. On *G. barbadense*, which includes Sea Island cotton and Egyptian cotton including Sakel, the disease is most severe and takes somewhat different forms than on *G. hirsutum*, commonly called American cotton.

Severely infected Sakel plants exhibit a characteristic twisted appearance, particularly in the petioles and fruiting branches. The plants tend to become abnormally tall with elongated and irregularly curved internodes. In extreme cases there may be practically no lateral growth on the upper parts, accompanied with bud shedding. Occasionally, however, severe infection gives rise to stunting rather than elongation of the plant. Curiously, this stunted expression of the disease is characteristic of its expression on certain varieties of American cotton. These show shortened internodes and a bunchy-top type of growth.

Sterility may be caused in infected plants as a result of suppression of the buds or their death soon after formation.

American cotton is somewhat resistant to leaf curl and shows more variety in its symptoms. Some varieties develop a typical leaf curling with or without small enations, others a leaf mosaic, and yet others both types of symptoms.

The mosaic type of cotton leaf curl begins as a clearing of the veins. The chlorotic areas increase in size and frequently appear all over the leaf surface with a tendency to concentrate along the main veins, or they may be few and concentrated in certain areas of the leaf. They are most prominent on the upper surface and vary in color from pale green to light yellow to nearly white. In some instances, the whole leaf may appear yellow with puckered margins. The uneven distribution may result in asymmetrical growth and distortion.

Leaf curl and crinkle symptoms (on *G. barbadense*) first appear as isolated local thickenings of the veins, which are darker green or more opaque than normal veins. This symptom is best seen on the underside of the leaf viewed by transmitted light. As more and more of the veins are involved, they become thickened and appear gnarled and abnormally prominent. The margins of the leaf then curl upward or, less frequently, downward. In extreme cases enations develop on the veins on the lower surface of the leaf. These are cup-like or expanded pads of tissue that may attain a diameter up to one half of an inch.

The upper side of the leaf departs less from the norm. It may show a wrinkled appearance due to a slight sinking of the veins, and of course, it is affected by any curling of the margins. Similar symptoms may appear on the bracts and, in a reduced form, on the corolla.

Alcea rosea plants often have strongly thickened veins and curl considerably in the later stages.

Hibiscus esculentus plants have leaves showing conspicuous net-vein thickening with small inconspicuous enations. Curling may or may **not** be present.

The disease does little damage to *Malvaviscus arboreus* plants. A small amount of vein thickening and leaf curling occurs.

On *Sida* there may be a slight amount of thickening (presumably of the veins). Occasionally there is leaf curling.

Most of the information presented is taken from Tarr's monograph.

NOTICE

Laird and Dickson report the disease, leaf crumple virus, of cotton described in California is very similar to cotton leaf curl virus and may prove to be a strain of this disease

References

1. Anson, R.R. 1934. Leaf curl disease of cotton in Fiji. Rept. 2nd Conf. Cotton Growing Problems. London:Empire Cotton Growing Corp. 195-96.
2. Bailey, M.A. 1934. Leaf curl disease of cotton in the Sudan. Empire Cot. Rev. 11:280.
3. Boughey, A.S. 1947. The causes of variation in the incidence of cotton leaf curl in the Sudan Gezira. Mycol. Pap. Mycol. Inst. 22:9.
4. Camas, J.S. 1935. Annual report of the director of plant industry from the fiscal year ending December 31, 1935. pp.76-80. (Rev. Appl. Mycol, 14:80).
5. Holmes, F.O. 1939. A handbook of phytopathogenic viruses. Minneapolis. MN:Burgee Publishing Co. 51; 52; 112-13.
6. Kirkpatrick, T.W. 1931. Further studies on leaf curl of cotton in the Sudan. Bull. Entom. Res. 33:323-63.
7. Laird, E.F. and R.C. Dickson. 1959. Insect transmission of the leaf-crumple virus of cotton. Phytopath. 49:324-27.
8. Moskovetz, S.N. 1940. Plant virus diseases and their control. Transcript of the conference on plant virus diseases, Moscow-Leningrad Acad. Sci.; Nov. 4-7 (Moscow). Published in Abst. Rev. Appl. Mycol. 23:211-13.
9. Russo, G. 1935. Cotton leaf curl or crinkle in Italian Somaliland. (trans.) Agricultura Colon. 29:78-95; 133-43; 188-99.
10. Tarr, S.A.J. 1949. Leaf curl disease of cotton. London:Publisher 9.
11. CFR 319.37§2.

Hibiscus Leaf Curl Agent on Hibiscus (Federal Quarantine Significant)

In progress.

Okra Mosaic Virus (Federal Quarantine Significant)

In progress.

Okra Yellow Leaf Curl Agent (Federal Quarantine Significant)

In progress.

- Circular 2: Diseases of *Acacia* spp.Acacia Rust (Federal Quarantine Significant)
  Acacia Rust (Federal Quarantine Significant)

August 2005

Causal Organism

Uromycladium tepperianum (Sacc.) McAlpine

Synonyms

Uromyces tepperianus Sacc.

Hosts

Acacia spp., *Albizia* spp., and *Racosperma* spp.

Distribution

Australia, Java, New Caledonia, New Zealand, Papua New Guinea, and South Africa

Symptoms

Spermogonia. Spermogonia are minute, brownish becoming black, globose and 150 µm in diameter.

Telia. Telia develop on galls on leaves, branches, inflorescences and fruits. Infection causes swollen distorted galls up to 18 x 6 cm and witches' brooms of different shapes and sizes. The telia are cinnamon to chocolate brown in color and powdery in appearance.

Description

Spermatia. Spermatia are hyaline and ellipsoid.

Teliospores. Teliospores are composed of a cluster of three probasidial cells at the top of a single pedicel, depressed globose to globose. They are cinnamon brown in color, thickly vertically striate, margin is crenulate with the wall 2 to 3 µm at the apex. They are 14 to 22 µm high and 18 to 25 µm wide with one apical germ pore. The pedicel is hyaline, septate, and deciduous.

Notes

Aecia and uredinia are unknown.

References

Hernandex, J.R. Invasive fungi. *Uromycladium tepperianum*. Systematic Botany & Mycology Lab., ARS, USDA.

Circular 3: Diseases of *Acer* spp.

Maple (*Acer*) Leaf Spot (Federal Quarantine Significant)

Revised Sept. 1987; restructured Feb. 1996

Causal Organism

Xanthomonas acernea Owaga Burk

Synonym

Pseudomonas acernea Owaga

Hosts

Acer buergeranum (*Acer trifidum*) Hook & Arn. (and by inoculation 13 other *Acer* spp., & *Aesculus turbinata* Blume, and *Koelreuteria paniculata* Laxm)

Distribution

Japan

Symptoms

The leaves show irregular, water soaked, later pale gray or black spotting, and finally turn black and shrivel.

Characters

Nonspore forming rod, 0.5 to 1 x 2-.6 µm (.8 x.4), and aerobic, uniflagellate, gram and aniline positive (?), liquefying gelatin, clearing milk **not** coagulating it, producing some acid, no gas from six sugars and glycerine, reducing nitrates and forming Hs. Colonies first round smooth, white, margin entire turning citron yellow in 2 days at 32 °C. Thermal death point 59 °C.

References

Phytopath. Soc. Jap. VII, 2, 125-34, 4 fig. 1937. (Rev. Appl. Myc. 17:356, 1938).

Maple (*Acer*) Variegation Agent (Federal Quarantine Significant)

Hosts

Acer negundo L. *A. pseudoplatanus* L. *A. rufinerve* Sieb. & Zucc.

Distribution

Europe and Japan

A similar disease from Italy was reported by Goldanich (1954) affecting a number of *Acer negundo* trees. The leaf mottling varied from small dots to star-shaped spots that at times became confluent.

There is also a report from Czechia by Smolak that mosaic and leaf deformation of *Acer pseudoplatanus* and *A. negundo* is present in a park in Podebrady.

Symptoms

“Yellow variegation of the leaves” (Brierley 1944). “Characterized by mottled leaves, peppered with very small, more or less round, light green spots. On some plants the spots were smaller than 1.5 mm in diameter and so numerous that they were difficult to distinguish and give a chlorotic appearance to the plants. On other plants at least some of the spots attain approximately 3 mm in diameter.” (Atanasoff 1935).

NOTICE

A disease of *Acer rubrum* caused by the peach rosette virus was reported in Georgia in 1960 (Knight, K.G. P.D.R. 44:220). Thirty infected trees were noted in 1953 and by 1959, all had died. The trees were characterized by being stunted, having dense green foliage in the spring that turned reddish in the summer and yellowish before the tree’s death.

Transmission

By budding and grafting

Properties

Not determined

References

1. Atanasoff, D. 1935. Old and new virus diseases of trees and shrubs. Phytopath. Zeitschr. 8(2):212; 197-223.
2. Brierley, P. 1944. Viruses described primarily on ornamental or miscellaneous plants. P.D.R. Suppl. 150:145; 150; 184-85; 414; 436-37; 437; 448-49; 475.
3. Goldanich, G. 1954. Unusual incidence of disease affecting economic plants in northern Italy. F.A.O. Pl. Prot. Bul. 3(1):4-7.
4. Smolak, J. 1949. Virove choroby a listy. Ochr. Rost. 22(5-6):173-203. (1951. Rev. Appl. Myc. 30(l):13-14).
5. CFR 319.37§2.

Xanthomonas acernea (Federal Quarantine Significant)

In progress.

Circular 4: Diseases of *Anacardium* spp.

Xanthomonas campestris pv. *mangiferaeindicae*

June 2011

Causal Organism

Xanthomonas campestris pv. *mangeiferaeindicae* (Gammaproteobacteria: Xanthomonadales)

Synonyms

X. citri pv. *Mangiferaeindicae*

Host

Mangifera indica (mango) and *Anacardium occidentale* (cashew)

Notes

Xanthomonas campestris pv. *mangeiferaeindicae* is an economically important pathogen of mango and *Anacardium occidentale* (cashew) and is reportable in the PEST ID database.

Symptoms

Raised, angular, black lesions

Distribution

Africa, Asia, Australia, Brazil, Burkina Faso, and New Zealand

References

1. Pruvost, O, C Boyer, K. Vital, C Verniere, L Gagnevin, and I Somda. 2011. First report in Burkina Faso of Xanthomonas citri pv. mangiferaeindicae causing bacterial canker on Mangiera indica. Plant Disease 95(10):1

Circular 5: Diseases of *Berberis* spp., × *Mahoberberis* spp. and *Mahonia* spp.

Black Stem Rust (Federal Quarantine Significant)

Jan. 14, 1966; restructured Feb. 1996

Causal Organism

Puccinia graminis Pers.

The black stem rust quarantine requires that nurseries that ship immune or resistant species of Berberis, Mahonia, or Mahoberberis into protected states **must** contain **no** susceptible species of these genera. The postentry detention of *Berberis*, *Mahonia*, and *Mahoberberis* is to facilitate determining whether introduced plants are true to name and immune or resistant to *P. graminis*.

We are concerned with enforcing postentry regulations on black stem rust at the pycnial and aecial stages of the rust organism, which is its only expression on *Berberis*, *Mahonia*, and *Mahoberberis*. Discussion of the uredial and telial stages is, therefore, omitted. Descriptions of these may be found in any general text on plant diseases or the rust fungi.

Synonyms

(Listed by Arthur (1934); others may be found in Sydow *Lycoperdon poculiforme* Jacq., *L. lineare* Schr., *Aecidium berberidis* Pers., *Puccinia linearis* Rohl., *P. poculiformis* Wettst., *Diacoma poculiforme* Ktze.

Hosts

Pycnial and aecial stages are on Berberis spp. (**except** *B. thunbergii* and its varieties) and *Mahonia*.

Uredial and telial stages, according to Arthur (1934), are on at least 108 species of Gramineae including wheat, rye, and barley.

Distribution

Cosmopolitan following the distribution of its host plants.

The pycnial and aecial stages are very rare in the southern states. Stakman et al. (1918) have shown that this is due to the lack of viable teliospores in the spring.

Symptoms

On *Berberis*, *Mahonia*, and Mahoberberis (after Heald with amendments from Arthur (1920))

Pycnial. The rust appears first on *the* upper surface of the leaf as a small, circular, yellowish spot that increases in size to 2 to 5 mm or slightly larger. The affected tissue is swollen, becomes marginated with a brighter yellow or reddish-purple color, and shows a central cluster of minute, honey-colored pustules on the upper surface (later turning brownish or nearly black) from which droplets of pycnial nectar ooze. The pustules (pycnia) are 90 to 110 µm in diameter and bear ostiolar filaments 30 to 60 µm long.

Aecial. (After Arthur (1920)) Aecidia on leaves, stems, and fruits, on the underside of the leaves in crowded, circular groups 1 to 6 mm across, on discolored, slightly thickened spots, cupulate or

cylindric 0.2 to 0.3 mm in diameter, sometimes 2 mm long, but usually much shorter, wall colorless, the margin erose (toothed) slightly recurved; peridial cells oblong 16 to 23 x 19 to 26 µm, the outer wall thick 10 to 12 µm, smooth and transversely striate, the inner wall 2 to 4 µm thick, moderately verrucose, squarely abutted; aeciospores angular, globose or oblong 15 to 19 x 16 to 23 µm; wall colorless, 1 to 1.5 µm thick, considerably thicker above, 5 to 9 µm, finely and closely verrucose appearing smooth when wet.

Figure 10-2 *Puccinia graminis* on *Berberis* spp.; aecial stage on underside of leaf; may attack stems and fruit

References

1. Arthur, J.C. 1934. Manual of the rusts in the United States and Canada. Lafayette, IN:Purdue Research Foundation. 173; 270; 366-67.
2. Arthur, J.C. 1920. North American flora. 7:295.
3. Heald, F.D. 1933. Manual of plant diseases. New York:McGraw Hill 778.
4. Murrill, W.A. 1921. Notes. (On a paper read at the Chicago meetings of the Phytopath. Soc'y. Dec. 1920 by Stakman, E.C., R.S. Kirby, and A.F. Thiel) Mycologia 13:124.
5. Stakman, E.C. 1918. The black stem rust and the barberry. Yearbook separate #769, U.S. Dept Agr.
6. Sydow, P. and H. Sydow. 1904. Monographia Uredinearum seu specierum omnium ad hunc usque diem cognitarum descriptio et adumbratio systematica. Vol. I. Leipzig, Germany:Borntraeger Bros. 3:560-63.

Circular 6: Diseases of *Blighia* spp.

- Okra Mosaic Virus (Federal Quarantine Significant)

Circular 7: Diseases of *Bromeliaceae* spp.

Bromeliaceae

The restriction on Bromeliads applies **only** to Hawaii. It is a precautionary measure to protect Hawaii from the possible introduction of injurious pests of Bromeliads, particularly, *Ananas sativus* Schult., the pineapple. The latter is a major crop of the islands.

Circular 8: Diseases of *Brugmansia* spp.

Colombian *Datura* Virus (Federal Quarantine Significant)

May 6, 1974; restructured Mar. 1996

Brugmansia is a reservoir for many viruses that attack plants belonging to the family Solanaceae. Some of the viruses may be latent, while others will show a wide range of symptoms in leaves such as chlorosis, mosaic, twisting, vein-clearing, curling, rugosity, and necrosis. There may also be various other abnormalities as shoot proliferation, stunted flowers, and stunted plants. Consequently, it might be difficult to associate a virus-like symptom with a virus common name without considerable testing.

Synonyms

None

Hosts

Brugmansia X candida Pers. (*D. candida*) & var. *'Culebra'*, *B. sanguinea* (Ruiz & Pav.) D. Don (*D. sanguinea*), and probably other species of arborescent Datura. Virus symptoms were experimentally produced on several indicator plants.

Distribution

Colombia

Symptoms

Kahn and Bartels (1968) report that Datura plants show vein-banding or chlorotic flecking on expanded leaves followed by mottling. Either the leaves become rugose and slightly distorted or the plants recover. When the plants recover, symptoms often reappear on new growth.

Description

The virus particle is a flexuous rod in the Potato virus Y group, around 720 mille microns.

Transmission

The virus is transmitted mechanically, i.e., plants touching one another or a person touching an infected plant and then a noninfected one.

Vector

The green peach aphid, *Myzus persicae* Sulzer.

Reference

1. Kahn, R.P. and R. Bartels, R. 1968. The Colombian Datura Virus—a new virus in the Potato Y group. Phytopath. 58:587-92.
2. CFR 319.37§2 (Jan. 2005).

Datura Shoestring Virus

May 6, 1974; restructured Mar. 1996

Brugmansia is a reservoir for many viruses that attack plants belonging to the family Solanaceae. Some of the viruses may be latent, while others will show a wide range of symptoms in leaves such as chlorosis, mosaic, twisting, vein-clearing, curling, rugosity, and necrosis. There may also be various other abnormalities as shoot proliferation, stunted flowers, and stunted plants. Consequently, it might be difficult to associate a virus-like symptom with a virus common name without considerable testing.

Synonyms

None

Hosts

Datura metel L., *Nicotiana tabacum* L. 'White Burley,' *N. glutinosa* L., *N. rustica* L., and *Solanum jasminoides* Paxt.

Distribution

India

Symptoms

According to the report by Giri and Agrawal (1971), Datura leaves develop mosaic and severe blistering, while new leaves show distortion and deformation and are reduced to shoestring-like structures. The plants become severely stunted.

The symptoms on *Nicotiana glutinosa* are similar to Datura, but less severe. When the leaves of *N. tabacum* white burley are inoculated with the virus, they develop local chlorotic lesions, that spread and become necrotic; and the plants die within 3 to 5 days. The inoculated leaves of *N. rustica* show veinal necrosis, mottle, and necrotic spots; the stems become necrotic and the leaves start falling and the plant collapses.

Transmission

Mechanically transmissible

References

1. Giri, L. and H.O. Agrawal. 1971. Datura shoestring virus, a new virus, isolated from Solanum jasminoides. Phytopath Z. 70(1):81-83.

Circular 9: Diseases of *Chrysanthemum* spp. (Dendranthema), *Leucanthemella serotina*, and *Nipponanthemum nipponicum*

Chrysanthemum White Rust (Federal Quarantine Significant)

Revised and restructured Feb. 1996

Causal Organism

Puccinia horiana P. Henn

Hosts

Chrysanthemum spp. (*Dendranthema*), *Leucanthemella serotina* (L.) Tzvelev, and *Nipponantheum nipponicum* (Franch. ex. Maxim) Matsuma

Distribution

Argentina, Brazil, Canary Islands, Chile, Colombia, Europe, Republic of South Africa, Uruguay, Venezuela, and all countries, territories, and possessions of countries located in part or entirely between 90° and 180° east longitude.

Symptoms

P. horiana produces large, white waxy spots on the undersurface of chrysanthemum leaves. It is much more dangerous to the chrysanthemum industry than *P. chrysanthemi*, the common chrysanthemum rust found in the United States, because it attacks new shoots early in the spring and the climatic factors favorable to the rapid spread of the organism are prevalent at this time of the year. (Kusano)

Description

The telial stage of the rust is the one encountered. Aecia and uredia are unknown. The disease spreads from plant to plant by means of sporidia produced by the teliospores.

According to Saccardo (1888) the teliospores are oblong-clavate with a broadened or obtuse to obtuse-pointed apex; base cuneate to applanate; slightly constricted at the septum, hyaline to yellowish, smooth. Spores range from 30 to 45 x 13 to 17 µm with a persistent, pale pedicel up to 40 µm long. Tai and Wei (1933), however, give teliospore sizes as 34 to 57 x 13 to 19 µm.

Figure 10-3 *Puccinia chrysanthemi* on *Chrysanthemum* spp.; orange to brown spots on lower leaf surface; common disease; submit specimens

Figure 10-4 *Puccinia horiana* on *Chrysanthemum* spp.; white, waxy spots on lower surface of leaf

Table 10-1 may serve as an aid in distinguishing between the common chrysanthemum rust and chrysanthemum white rust.

Table 10-1 Comparison of Chrysanthemum Rust and Chrysanthemum White Rust

Symptom:	**For *Puccinia horiana*:**	**For *Puccinia chrysanthemi*:**
Sori color	White to yellow	Chocolate Brown
Uredospores	None	Commonly found
Teliospore size	34 to 57 x 13 to 19	34 to 57 x 18 to 28
NOTE:	For signs refer to Figure 17-4	For signs refer to Figure 17-3

NOTICE

Puccinia horiana is relatively fast moving and, under ideal greenhouse conditions, should appear, if present, within a few weeks. Hence, we believe that greenhouse-grown chrysanthemums regardless of the time of year, may be released after 6 months, if inspection at the end of that time reveals **no** sign of the rust. Greenhouse growing is required for postentry chrysanthemum growing (refer to Figure F-9).

Puccinia horiana is favored by short day conditions and spreads rapidly under moist, overcrowded conditions. Investigations of the epidemiology of the disease in Japan showed that the optimum temperature for teliospore germination is between 13 °C to 22 °C. The incubation period of the disease is 10 days.

References

1. Anonymous. 1965. A new threat to Chrysanthemum; white rust disease. N.Z. Pl. Gdns. 6(3):120-21.
2. Arthur, J.C. 1934. Manual of the rusts in the United States and Canada. Lafayette, IN:Purdue Research Foundation. 173; 270; 366-67.
3. Hiratsuka, N. 1957. Three species of Chrysanthemum rusts in Japan and its neighboring districts. Beih. 1:34-44.
4. Kusano, S. 1908. Biology of the chrysanthemum rust. Ann. Myc. 6:306-12.
5. Punithalingam, E. 1968. Puccinia horiana. in: CMI descriptions of pathogenic fungi & bacteria #176. CAB/CMI; Kew, Surrey, England.
6. Saccardo, P.A. 1888. Sylloge Fungorum. 1:470; 7:598; 7:739; 24:754; 25:713-14; 25:762. Ann Arbor, MI: V.W. Edwards (reprinted 1944).
7. Tai, F.L. and C.T. Wei. 1933. Notes on Chinese fungi. Sinensia 4(5):112- 13.
8. CFR 319.37§2.

Circular 10: Diseases of *Corylus* spp.

Apple Proliferation Phytoplasma (Federal Quarantine Significant)

Synonym

Witches' broom, rozet (rosette), brooming

Time of Year to Inspect

Anytime while in leaf

Hosts

Catharanthus roseus, *Corylus* spp., *Cynodon dactylon*, *Malus domestica*, *Prunus avium*, *P. armeniaca*, *P. domestica* (these *Prunus* species are possible hosts of apple proliferation—further testing to confirm is necessary), and *Vitis vinifera*

Symptoms

Plant. Buds set in August and September start growing in the fall. Infected branches leave trunk at a more acute angle than do healthy branches. For symptoms of this possible infection of the apple proliferation phytoplasma on *Prunus* refer to Figure 17-5 and Figure 17-6.

Figure 10-5 Cherry wilt (possibly caused by apple proliferation phytoplasma)

Figure 10-6 Progress toward death of the tree (possibly caused by apple proliferation phytoplasma)

Leaf. Infected leaves are smaller, stipules enlarged. Color is usually yellowish-green or reddish. For the classic symptoms of enlarged stipules on *Malus* spp., refer to Figure 10-7 and Figure 17-8.

Figure 10-7 Enlarged stipules of infected *Malus* plant

Figure 10-8 Enlarged stipules of an infected Malus plant (left) compared to the regular-sized stipules on an uninfected plant (right)

Branch/Trunk. Clusters of bushy shoots. Infectious agent stimulates axillary buds on young shoots. Short internodes are produced. For this disease on Prunus, refer to Figure 10-9 and Figure 10-10.

Photo reprinted with the permission of Dr. Natasa Nehle of the National Institute of Biology, Ljubljama, Slovenia.

Figure 10-9 Necrosis on cross-section of cherry branches (possibly caused by apple proliferation phytoplasma)

Figure 10-10 Necrosis on cross-section of cherry tree trunk (possibly caused by apple proliferation phytoplasma)

Fruits. Reduced in size.

Flowers. Produced later in the season than on healthy plants. For this disease on Prunus flowers, refer to Figure 10-11.

Photo reprinted with the permission of Dr. Natasa Nehle of the National Institute of Biology, Ljubljama, Slovenia.

Figure 10-11 Floral necrosis of cherry (possibly caused by apple proliferation phytoplasma)

Transmission

Grafting, root fusion, and the psyllids Cacopsylla melanoneura (Forster), & *Cacopsylla costalis* (Forster), and the leafhopper *Fieberiella florii* (Stal). Only the leafhopper occurs in North America.

Discussion

This disease reduces the production of marketable fruit by as much as 95% in Europe. Rosetting and shortening of internodes may also be caused by aphid or leaf hopper injury. The causal agent of this disease is not a virus, but a phytoplasma. Evidence of several different strains has been shown.

Distribution

Throughout Europe and in Turkey

References

1. Blumer, S., and R. Bovey. 1957. Uber den virosen besenwuchs an apfelbaumen. Phytopath. Z. 30(30):237-58.
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Filbert (*Corylus*) Blight

Revised and restructured Feb. 1996

Causal Organism

Anisogramma anomala (Peck) E. Muller

Synonyms

Apioporthe anomala (Peck) Hoehn., *Cryptosporella anomala* (Peck) Sacc. *Diatrype anomala* Peck

Hosts

Corylus americana Marsh. (Hazelnut), *Corylus avellana* L. (Filbert)

Distribution

Eastern United States and Pacific Northwest

Symptoms

Humphrey's (1893) description of the disease appears to be the most complete. "It appears in the form of protuberances with elliptical bases that burst the bark and arise rather thickly from the affected portion of the branch, which is sunk below the surface of the healthy part." A section shows that the protuberances (stroma) "contain numerous black flask-like structures, whose tips reach the surface of the protuberance." "It is very noticeable that in the part of the branch

occupied by the fungus, the inner bark (elsewhere a distinct band of tissue) is shrunken to a narrow black line between the wood and the bark. This reduction in the thickness of the inner bark explains at once why the surface of the affected parts is sunken below the rest of the surface and shows that the chief seat of vegetative activity of the fungus is in the rich growing conductive tissues" (Cambium).

According to Barss (1921) the ends of the branches are killed by girdling, the smaller twigs are attacked first and 2 or 3 years pass before the top is completely killed. He also states that the blight does not occur on *Corylus rostrata* Ait. or *C. californica* Rose.

Description

A specimen collected by G.P. Clinton, at Westerville, CT in 1902 was examined at the New York Botanical Gardens herbarium. This specimen showed large, oval stroma, 4 mm long by 3 mm wide and about 1 mm high. The stroma were wart-like and arranged more or less in two parallel rows usually on one side of the stem, but on one stem the two rows were nearly opposite. The torn epidermis stood up around the base of the stroma. The top or disc was roughened by the ostioles, (the exposed upper extremities of the beaks of the perithecia). The ostioles may have been scattered irregularly over the disc or been in an oval arrangement.

Pustules prominent, subrotund or elliptic, erumpent, 2 to 5 mm in diameter, wood subsunken, surrounded by a black layer, disc convex or slightly depressed, rough, brownish or blackish, powdery white at last; perithecia crowded, immersed in the stroma, now and then elongate; ostiole stalked and loose, often radiately sulcate, black; asci short, thick, soon disappearing; spores hya-line, elliptic, continuous, 7 to 9 mu long.

References

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Circular 11: Diseases of *Crocosmia* spp.

Gladiolus Rust (Federal Quarantine Significant)

August 2005

Causal Organism

Uromyces transversalis (Thum.) (G. Winter)

Synonyms

Uredo transversalis Thum., *Uromyces watsoniae* P. Syd & Syd

Hosts

Crocosmia spp., *Gladiolus* spp., *Tritonia* spp., and *Watsonia* spp.

Distribution

This rust is apparently indigenous to eastern and southern Africa. It has also been reported from Morocco, southern Europe (questionably from France and Spain, possibly established in Italy, Malta and Portugal) South America (Argentina and Brazil), Martinique, Australia, and New Zealand. It was recently intercepted from Mexico.

Symptoms

Uredinia are round to oblong or irregular and transverse on the leaf surface. They may be found on the upper or lower leaf surface. The uredinia are 0.5 to 1.5 mm long and 0.5 to 2 mm broad. At first they are covered by the blistered epidermis that splits. They are yellowish-orange in color.

Telia. Telia are minute, black and remain covered by the epidermis and grouped (small to larger groups). The groups may be scattered, in cavities on the leaf surface and are separated by golden-brown, palisade-like paraphyses (sterile upward growing, basally attached hyphal elements). The paraphyses are 50 to 112.5 µm in diameter and 55 to 75 µm deep with spores in 3 to 4 closely packed rows.

Description

Urediniospores are variable in form and size. They may be ovate, ellipsoidal or oblong and are 14 to 26 x 13 to 25 µm. The cell wall is hyaline and typically 1.5 to 2 µm thick and closely and minutely verruculose. There are germ pores, but they are obscure and 6 to 8 in number and scattered.

Teliospores. Teliospores are ovate, ellipsoid or pyriform, and less frequently globose often irregular or angular through mutual pressure. They are light brown, darker (often chestnut brown) near the apex. The apex of the teliospores is rounded, truncate or broadly conical, base usually attenuate, less frequently rounded. They are (17.5 to) 20 to 25 (to 34) x (14 to) 15 to 17.5 (to 21) µm with the cell wall smooth, usually 2 µm thick, 4 to 6 (to 8) µm at the apex. The pedicel is semi-persistent, hyaline, or tinted at the apex and is 45 µm long and 2 µm thick.

Source: USDA-ARS

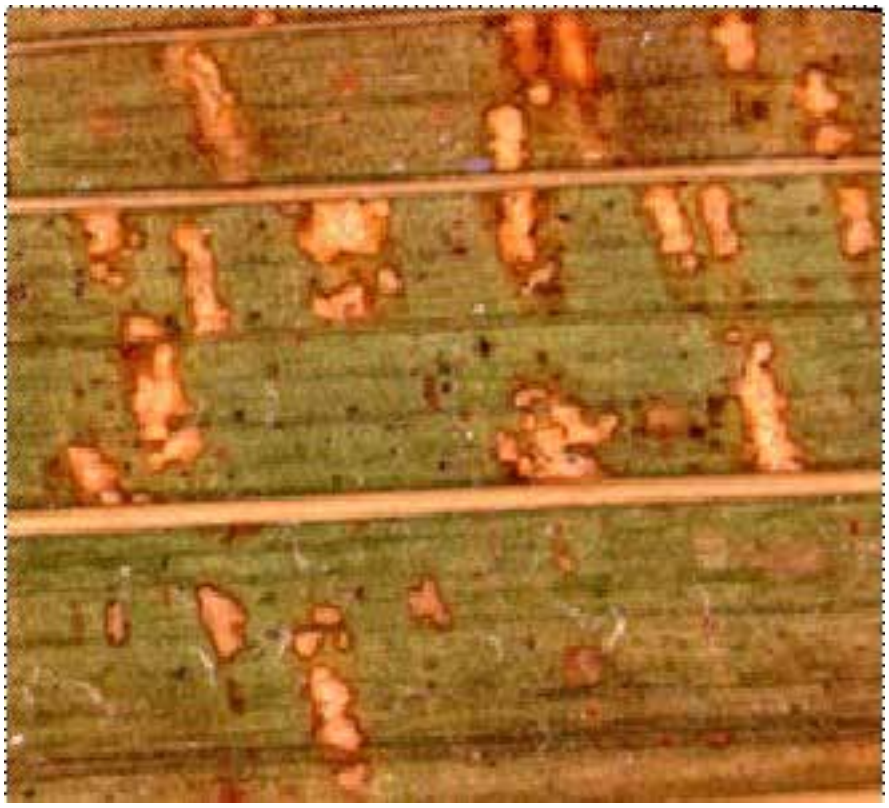
Figure 10-12 Uredinia of *Uromyces transversalis*

Source: USDA-ARS

Figure 10-13 Uredinia across the width of the leaf and telium (dark) of *Uromyces transversalis*

Source: USDA-ARS

Figure 10-14 Uredinia erumpent across the width of a *Uromyces transversalis* leaf



Source: USDA-ARS

Figure 10-15 Uredinia across the width of a *Uromyces transversalis* leaf

Source: USDA-ARS

Figure 10-16 Uredinia (yellowish) and telia (dark) of *Uromyces transversalis*

Notes

Spermogonia and aecia are unknown.

References

1. Hernandez, J.R. Invasive fungi. *Uromyces transversalis*. Systematic Botany & Mycology Lab., ARS, USDA (accessed August 24, 2005).

Uredo gladioli-buettneri (Federal Quarantine Significant)

In progress.

Circular 12: Diseases of *Dianthus* spp.

Carnation Wilt

Causal Organism

Phialophora cinerescens (Wollenw.) Van Beyma

Synonym

Verticillium cinerescens Wollenw.

Hosts

Dianthus spp. *Dianthus chinensis* L. (Chinese Pink), and *D. barbatus* L (Sweet William) are said to be very susceptible, *D. caryophyllus* L. (Carnation) highly resistant, and *D. deltoides* L. immune. *D. nardiformis*, *D. balbisii*, *D*. (*hyssopifolius*) *monspessulanus*, and *D. cinitus* also reported as hosts (RAM 43:760). Hosts in other genera include: *Silene latifilia* spp. *alba* (Mill.) Greuter and Burdet (*Melandrium album*) (RAM 38:290) and *Saponaria officinalis* L., *Petrocoptis grandifloria,* A. Braun ex Endl., *Viscaria sartorii* and *Silene compacta* Fisch. Ex Hornem. (RAM 43:760). Distribution Bulgaria (RPP 61:627); Denmark (RAM 38:389); France (RAM 38:368); Italy (RAM 40:226); Poland - one farm (RAM 45:2860); Netherlands (RAM 38:118); Romania (RPP 63:165); United Kingdom of Great Britain and Northern Ireland (RAM 38:480, 42:26); (RAM 43:2360); Russia (RPP 58:3320); and Germany (RAM 41:230).

NOTICE

Review of Applied Mycology (RAM); Review of Plant Pathology (RPP).

Symptoms

The leaves of infected plants are wilted, wrinkled and chlorotic. Cross-sections of the stem show brown discoloration of the vascular ring. The foregoing symptoms are similar to those caused by *Fusarium dianthi* Prill. and Del., but the leaf chlorosis caused by *Phialophora cinerescens* is less marked and there is a tendency for localization of the vascular discoloration in the tracheids and vessels. No extensive rotting of the pith and cortex is found. The stems may develop kinks at the nodes and the internodes may be somewhat shortened.

As there are other wilts of *Dianthus* caused by several species of Fusarium, a key devised by Wickens (1935) for separating those diseases follows.

Key to Wilt and Desiccation of Leaves and Shoots.

1. Vascular discoloration throughout the collar and wilting shoots—Go to 2.

   No extensive vascular discoloration—Go to 3.

2. Vascular discoloration followed by a dry “sheddy” rot of affected wood and cortex—*Fusarium* wilt (*F. dianthi*) No later development of tissue rotting—*Phialophora* wilt (*P. cinerescens*)
3. Indiscriminate rotting of the collar stem rot—(*Fusarium* spp., *F. culmorum*, *F. herbarum*)

   Not as above—other diseases or disorders
   Note—invasion is through the roots from the soil. In experiments, inoculated plants remained apparently healthy for as long as 13 weeks.

References

1. White, H.L. 1936. On Verticillium wilt of the perpetual flowering carnation. J. Pomol. 14: 214-26.

2. Wickens, G.M. 1935. Wilt and stem rot of the perpetual flowering carnation. Ann. Appl. Biol. 22:630-883.

Dianthus Virus Diseases

Hosts

Dianthus caryophyllus L. (Carnation) and *D. barbatus* L. (Sweet William)

Etched Ring. Whitish etched necrotic flecks and rings, usually oval or dumbbell shaped, resembling ringspot. May be small irregular rings and streaks on flowers and axillary stems. Some varieties show conspicuous necrotic blotches of irregular shape, usually pale fawn in color with darker brown, maroon edges on the leaves; sphere shaped; worldwide.

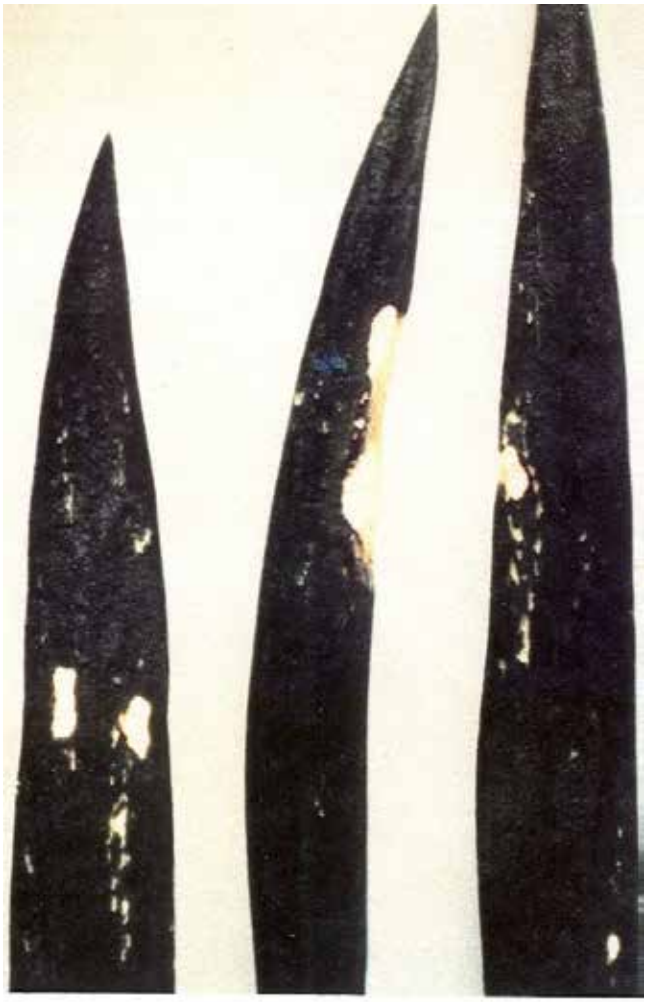


Figure 10-17 Carnation etched ring virus on *Dianthus* spp.; atypical; note white lines in first and third leaves

Figure 10-18 Carnation etched ring virus on Dianthus spp.; note typical symptoms showing etched rings in first leaf

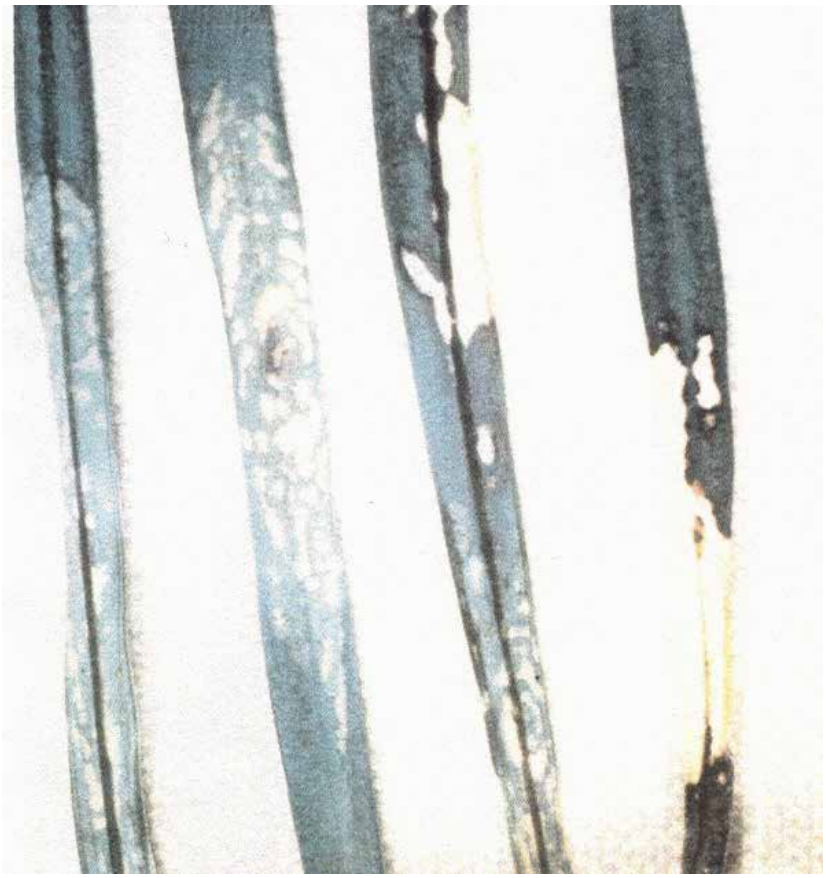


Figure 10-19 Carnation etched ring virus on *Dianthus* spp.; severe symptoms

Latent. No symptoms

Mosaic. Yellowish to gray brown leaf mottle, coalescence of several spots may be followed by necrosis of centers; plants are stunted and flowers may be striped or spotted.

Mottle. Mild mottling or no symptoms; may cause flower breaking in some varieties; sphere shaped; world wide.

Necrotic Fleck. 1400 to 1700 nm long; in Japan 1973.

Ringspot. Gray rings or irregular chlorotic spots, may be several concentric rings, streaking, reddening, and leaf distortion; sphere shaped; world wide.

Streak. Yellowish or reddish spots and streaks, parallel to veins; lower leaves may be heavily spotted and turn yellow.

Vein Mottle. Vein clearing in young leaves that may develop into chlorotic spots that follow veins; 790 nm long; world wide.

Yellows. Caused by a combination of streak and mosaic viruses; affected plants show both the mottling and spotting characteristics of the two viruses.

NOTICE

There is still some confusion about the identity, nomenclature, distribution, and symptomatology of these viruses. Combinations of viruses are commonly found in a single plant. The symptoms produced in such cases may **not** be clear cut. Carnation ringspot virus, vein mottle virus, and mottle virus (event when latent) significantly reduce the yield and quality of flowers in the variety “William Sim.”

Available evidence indicates that some of these viruses, especially etched ring and ringspot, are **not** widely distributed in the United States.

Most carnation viruses are sap transmissible and indexing techniques can make positive determination. This procedure, however, is **not** practical for postentry quarantine control.

References

1. Brierly, P. and F.F. Smith. 1957. Carnation viruses in the United States. Phytopath. 47(12):714-21.
2. Chamberlain, E.E. 1954. Plant virus diseases in New Zealand. Bul. 108. N.Z. Dept. Sci. and Industrial Res. 196-98.
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Leaf Rot of Carnation

Causal Organism

Heteropatella valtellinensis (Trav.) Wr.

Synonyms

Excipulina valtellinensis Trav., *Heteropatella dianthi* Budd & Wakef., and *Pseudodiscosia dianthi* Host & Laub.

Hosts

Dianthus caryophyllus L. (carnation)

Distribution

United Kingdom of Great Britain and Northern Ireland, The Netherlands, Germany, Italy, Canada (British Columbia), and the United States (Washington state)

Symptoms

Both surfaces of the leaves show large, discolored patches that are soft and brown, or when dry, bright whitish-gray. The patches occur either as transverse bands or extended over the whole terminal part of the leaf, which as a result, becomes withered and cracked. Similarly discolored spots occur frequently on the stems, flower stalks, bracts, and sepals. Very small, round, rather dark gray spots are present in large numbers on both sides of the diseased part of the leaves. These spots are, for the most part, so indistinct as to be hardly recognizable. They are more

easily seen if the leaf is held up to the light. They then appear as rather closely grouped circular areas, transparent, and like a spot of grease lying in the leaf, nearly one-half a millimeter in diameter with a more or less distinct point in the middle. This point is frequently covered by a tiny, waxy, whitish or yellowish-gray, wart-shaped or conical granule. When the diseased leaves are placed in a moist chamber, this granule, viewed with a hand lens, is often seen to resemble a longer or shorter tendril-like string of sausages.

Due to the rotting leaves, affected plants have an unhealthy appearance, but healthy leaves are often present scattered about among the decaying ones. The decaying leaves may appear soft and wet, or dry and firm depending on the atmospheric humidity. The infected leaves often crack near the base and may fall off if the plant is lifted or shaken. The youngest leaves, while still clasped together, may present a pure white color for a considerable length down the leaf. This white color later changes to gray.

References

1. Salmon, E.S. and W.M. Ware. 1927. Gardeners Chronicle. 81:196.

Circular 13: Diseases of *Eucalyptus* spp.

Pestalotia disseminata (Federal Quarantine Significant) and Leaf Chlorosis Virus

Two diseases of eucalyptus are leaf chlorosis virus and *Pestalotia disseminata* Thum. *P. disseminata* is said to cause leaf dropping or blight of infected trees. Any virus disease or any spotting or blight of eucalyptus leaves with which a *P. disseminata* is associated should be investigated and called to the attention of the Postentry Quarantine Unit.

Circular 14: Diseases of *Gladiolus* spp.

Puccinia gladioli [Castagne] (Federal Quarantine Significant)

August 2005

Synonyms

Aecidium valerianellae Biv., *Uredo gladioli* (Duby)

Hosts

Gladiolus spp. and *Valerianella* spp.

Distribution

Reported on *Gladiolus* from Europe and Asia. Although telia of *Puccinia gladioli* on *Gladiolus* have **not** been reported from the U.S., the aecial state (*Aecidium valerianellae*) on *Valerianella* has been reported from the western U.S. as well as Europe and Asia.

Symptoms

Telia. Are on reddish spots, sometimes limited by the veins, minute, rounded, and densely crowded to actually running together to form a crust up to 1 cm. long. They can be found on the upper or lower surface of the leaf. They often cover much of the leaf surface and are compact and chestnut brown to black in color. The paraphyses (sterile, upward-growing basally attached, hyphal elements) are cylindric to slightly club shaped, brown, and up to 80 µm long.

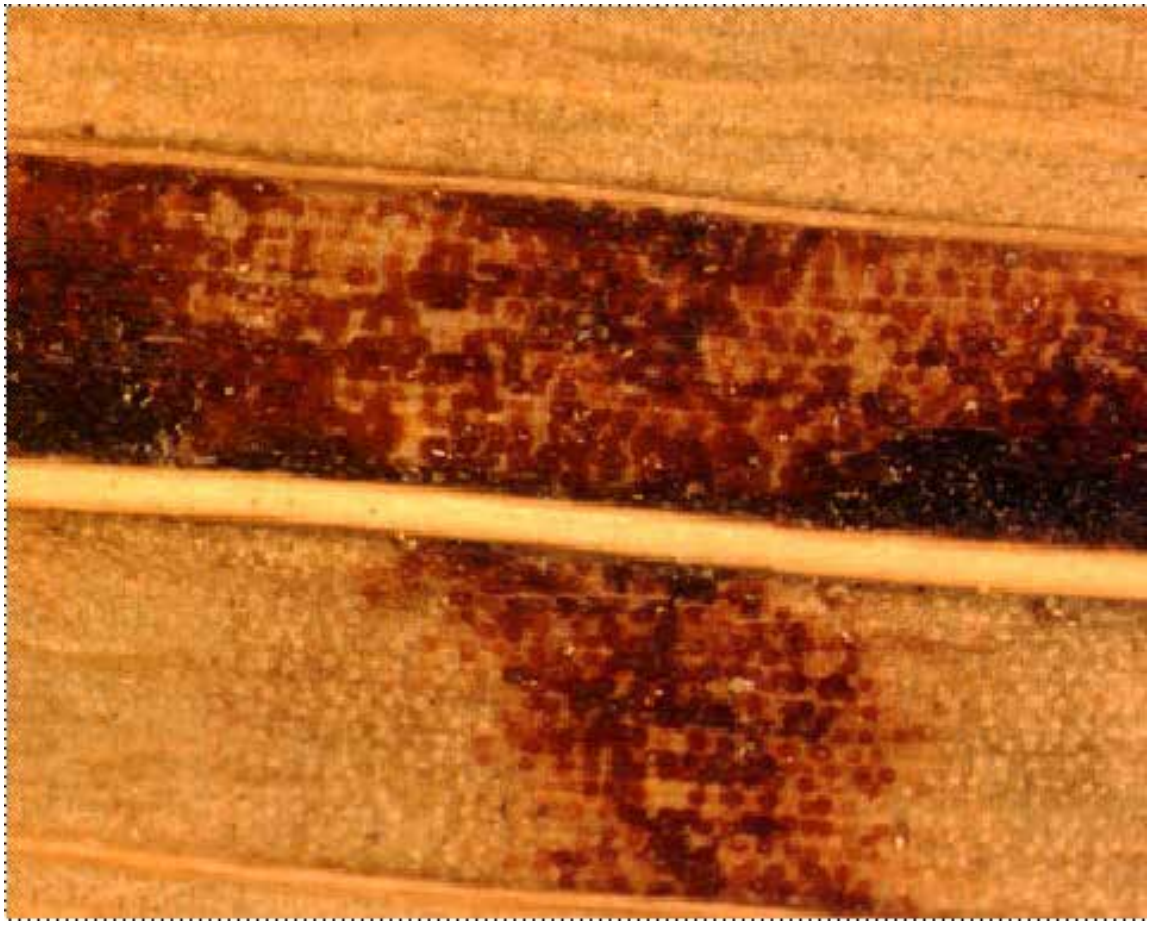

Figure 10-20 *Puccinia gladioli* telia

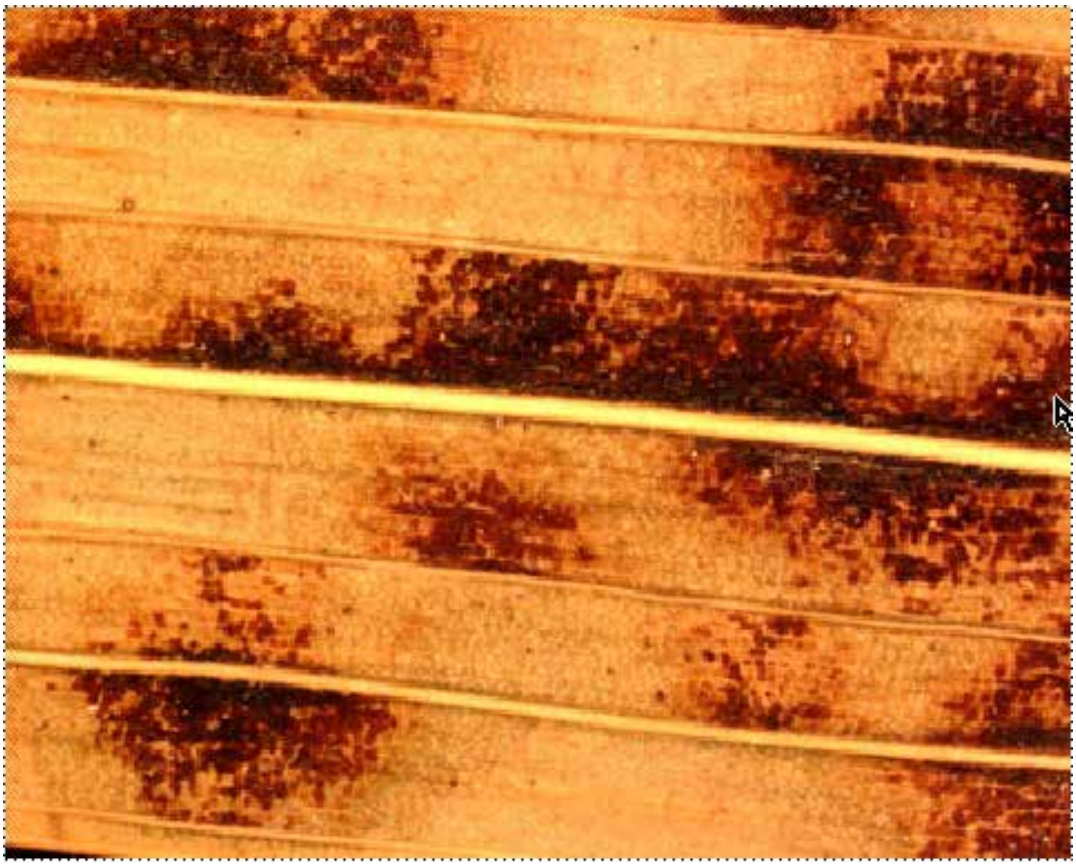

Figure 10-21 *Puccinia gladioli* telia

Description

Teliospores. Teliospores are ellipsoid to clavate, apex round to acute, slightly constricted at the septum and gradually narrowing below the septum. They are 36 to 60 x 16 to 27 µm. The cell wall is smooth pale brown in color, 2 to 3 µm thick and up to 10 µm at the apex. Sometimes mesospores are present 24 to 40 x 17 to 17 µm. The pedicel is hyaline, persistent, and 10 to 60 µm long.

Notes

Uredinia are unknown on *Gladiolus* spp., spermogonia and aecia are found on *Valerianella* spp.

At this time this rust is **not** listed in CFR 319.37-2 as a federal quarantine significant disease on *Gladiolus*. If this rust is added to that the list, the genus *Valerianella* spp. will also be regulated from Europe and Asia.

References

1. Hernandez, J.R. Invasive fungi. Puccinia gladioli. Systematic Botany & Mycology Lab., ARS, USDA (accessed August 24, 2005).

Puccinia mccleanii [Doidge] (Federal Quarantine Significant)

August 2005

Synonyms

None

Hosts

Gladiolus ludwigii (Hook)

Distribution

South Africa

Symptoms

Telia. Can be scattered or grouped, rounded to oblong, and sub-epidermal with the teliospores bursting through and surrounded by the epidermis thus presenting a powdery appearance. They can be on the upper or lower leaf surface. The telia are located between and sometimes transverse to the veins. When the telia are scattered, each can be up to 0.5 mm long and, when grouped, cover up to 1 cm of leaf surface. They are chestnut brown in color and are without paraphyses (a sterile, upward-growing, basally attached hyphal element).

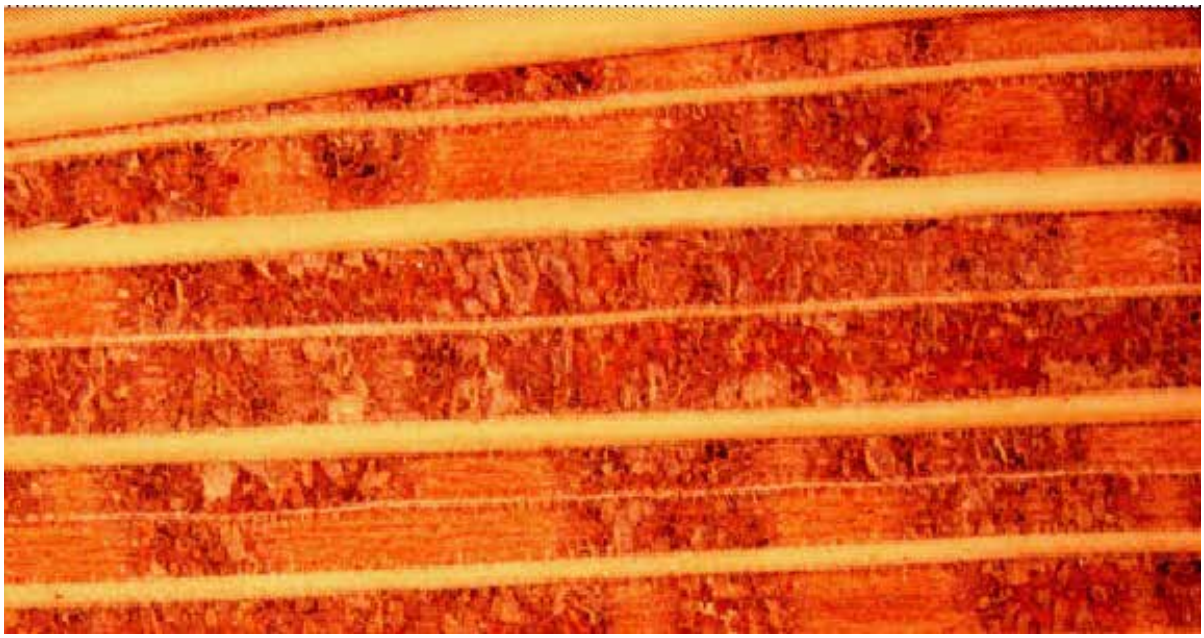

Figure 10-22 *Puccinia mccleanii* telia on leaf

Figure 10-23 *Puccinia mccleanii* telia on leaf

Description

Teliospores are oblong-clavate to oblong, sometimes constricted at the septum. The upper cell of the teliospores is rounded truncate, attenuated or oblique attenuated at apex, and the lower probasicial cell frequently narrower, cinnamon brown, lighter cinnamon brown in color at the base of the spore. The spores are (35 to) 50 to 60 (to 70) x (12.5 to) 14 to 17 (to 20) µm. The cell wall is 1 to 2 µm thick with the apex sometimes thicker at 4 (to 7) µm. The pedicel is up to 45 µm long, easily broken, and light cinnamon in color.

Notes

Spermogonia, aecia, and uredinia are unknown.

References

1. Hernandez, J.R. Invasive fungi. Puccinia mccleanii. Systematic Botany & Mycology Lab., ARS, USDA (accessed on August 24, 2005).

Uromyces gladioli [Henn.] (Federal Quarantine Significant)

August 2005

Synonyms

Uromyces geissorhizae Henn., *U. babianae* (Doidge), *U. romouleae* (Van der Byl and Werderm), *U. romuleae* (Doidge)

Hosts

Babiana spp., *Gladiolus* spp., *Geissorhiza* spp., *Moraea* spp., and *Romulea* spp.

Distribution

Central and Southern Africa

Symptoms

Uredinia. Can be scattered or in grouped, irregularly round to oblong, often running together measuring up to 0.5 mm in length. They can be on the upper or lower leaf surface. The uredinia are sub-epidermal with the spores bursting through the epidermis and are yellow in color.

Telia. Can be scattered or in linear groups, oval or oblong, often irregular, and up to 1 mm in length. They can be on the upper or lower leaf surface. The telia are sub-epidermal and compact with the spores covered by the epidermis, dark brown to black in color and are without paraphyses (a sterile, upward-growing, basally attached hyphal element).

Description

Urediniospores. Are globose, subglobose or ovate, and subhyaline to pale golden brown in color. These spores are 20 to 25 x 15 to 23 µm. The cell wall is hyaline and 2 to 3.5 µm thick, minutely verrucose with scattered germ pores 6 to 9 (obscure).

Teliospores. Are chestnut brown in color, globose, subglobose, ellipsoid, ovoid, or angular through mutual pressure. The apex is usually rounded, sometimes truncate or conical. The base is round or attenuate. The spores are 20 to 37 (to 40) x 18 to 26 µm. The cell wall is smooth, 2 to 3.5 µm thick, 5 to 9 µm thick at the apex. The pedicel is persistent, brown in color near the apex, and 5 to 7 mm wide up to 75 µm long.

Notes

Spermogonia and aecia are unknown.

References

1. Hernandez, J.R. Invasive fungi. Uromyces gladioli. Systematic Botany & Mycology Lab., ARS, USDA (accessed August 24, 2005).

Uromyces nyikensis [Syd. & P. Syd.] (Federal Quarantine Significant)

In progress.

Circular 15: Diseases of *Hydrangea* spp.

Hydrangea Rust (Federal Quarantine Significant)

August 2005

Causal organism

Puccinia glyceriae S. Ito

Synonyms

Aecidium hydrangeae-paniculatae (Dietel)

Hosts

Hydrangea paniculata (Siebold) and *Glyceria* spp.

Distribution

Japan

Symptoms

Spermogonia located mostly on the upper surface of the leaf and located in orange-yellow lesions.

Aecia located mostly on the lower surface of the leaf are cup shaped and pale yellow in color. The cells of the wall of an aecium are 24 to 32 x 16.5 to 22 µm. The outer wall has a pronounced warty appearance and the inner wall is much less so.

Description

Spermatia are yellow to brown in color, sub-epidermal, and flask shaped.

Aeciospores are globose to broadly ellipsoid. They are 19 to 26.5 x 15 to 22 µm with walls 0.7 to 1.2 µm thick and are hyaline and finely verrucose.

Notes

The uredinial and telial stages of this rust are found on species of *Glyceria* (Poaceae).

Figure 10-24 *Puccinia glyceria*

Figure 10-25 *Puccinia glyceriae* close up

References

1. Hernandez, J.R. Invasive fungi. Puccinia glyceriae. Systematic Botany & Mycology Lab., ARS. USDA.

Circular 16: Diseases of *Juniperus* spp.

Douglas Fir Canker (Federal Quarantine Significant)

Revised June 1967; restructured Dec. 1995

Causal Organism

Phacidiopycnis pseudotsugae M. Wilson G. Hahn imp. stage *Phomopsis pseudotsugae* M. Wilson

Synonyms

Phacidiella coniferarum Hahn, *Phomopsis strobi* Syd., *Ligniella pinicola* Naum., *Discula pinicola* var. *mammosa* Lager., Lundberg and Melin

Hosts

Abies alba Mill., *A. balsamea* (L.) Mill., *A. procera* Rehd., *Cedrus atlantica* (Endl.) Manetti ex. Carriere, *C. deodara* (D. Don) G. Don., C. libani A. Richl, *Larix decidua* Mill., *L. keaempferi* (Lamb.) Carriere, (*L. leptolepis*) *L. sibirica* Ledeb., *Picea abies* (L.) Karst., *Pinus canariensis* Sweet ex K. Spreng., P. contorta Dougl., ex Loud., P. mugo Turr., *P. muricata* D. Don., *P. radiata*

D. Don, *P. strobus* L., *P. sylvestris* L., *Pseudotsuga menziesii* (Mirb.) Franco, P. *menziesii* var. *glauca* Buchh. (*Sequoia gigantea*) and *Tsuga heterophylla* (Raf.) Sarg.

Distribution

Belgium, Czechia, Denmark, France, Germany, United Kingdom of Great Britain and Northern Ireland, Ireland, Italy, Netherlands, New Zealand, Norway, Slovakia, Sweden, Russia, and U.S. (Pacific Northwest)

Wicker recently reported finding *P. pseudotsugae* cankers on *Larix occidentalis* in the intermountain region of the Pacific Northwest.

Symptoms

Three distinct forms of injury have been recorded:

Blighting of Terminal Shoots. Terminal shoots blighting has been recorded on seedlings and young plants. The tips of the trunk and the branches are the usual points of invasion and these die back for a length of 10 to 16 in. The needles on the invaded parts first turn brownish-yellow, then become dry and fall. In the tender young tissues, invasion is direct, no wound is necessary. The fungus invades the cortex and cambium but **does not** penetrate the wood. With the death of the cambium, growth of the infected part ceases, and as a result, there is, at the margin of the diseased tissue, a strong thickening of the cork cells. (For an illustration of this effect refer to Phytopath 19:986). Pycnidia develop abundantly especially near the base of the diseased part. The seedlings may wither away at once, or adventitious buds may commence growth only to be killed in turn. The disease tends to be concentrated in certain parts of the seed bed or nursery.

Girdling of Branches and Trunks. Girdling occurs at some intermediate point on the branch or trunk. The girdle seldom reaches a length of 6 inches. Above and below, the tissues continue to grow for a time, and especially above, develop a characteristic swelling. In the end, the parts above the girdled area die from lack of nourishment.

Cankers of Larger Trunks and Branches. Cankers may develop on the larger trunks and branches. On hosts that develop cankers, **except** *Larix*, these cankers may attain a size 6 x 7.5 in., but on *Larix* they reach 6.5 x 13.5 in. in area. If the cankers are numerous and fairly large, the tree may be killed. Isolated cankers may be healed over as the fungus is **not** perennial in the bark.

The above symptoms are those shown by *Pseudotsuga*. Boudru states that other hosts react somewhat differently to the disease: *Abies* show trunks and branches girdling; *Tsuga* show young leader withering; *Cedrus* show trunks and branches girdling and terminal bud blighting; and on *Larix*, **only** cankers are found usually following wounds caused by pruning or rodents. *Larix* cankers often exude an abundance of resin.

Wilson (1930) states that it is improbable that *P. pseudotsugae* will be found on imported *Cedrus* as it so far has **not** been found on trees under 20 years old.

Description

Phacidiopycnis pseudotsugae. Apothecia frequently associated with pycnidial locules, innate in the stroma, developing under, but **not** concrete with, the periderm, one or more ascocarpic areas in a stromata that become erumpent and occur in colonies on discolored areas of the trunk or branch, ascocarps discoid, black, carbonous, 0.25 to 1.0 mm in diameter, at first covered by a pulverulent, olibaceous, stromatic layer that becomes loosened in irregular lobes above the

sporulating tissue and finally torn away. At maturity, the darkened hymenium is fully exposed; asci cylindric-club shaped, elongatestalked, thin-walled, 8-spored, 80 to 135 x 8 to 12 µm; ascospores irregularly uniseriate, continuous, occasionally one or two septate, hyaline, guttulate, elliptic or elliptic-fusiform, ends obtuse or subacute, 10 to 18.8 x 2.8 to 6 µm; producing bud spores in the ascus, these are short, elliptic, or rod-shaped, continuous, hyaline, 3.4-4.8 x 1.0-1.6 µm; paraphyses very numerous, filamentous, septate, tips slightly swollen, simple or occasional branched near the apex, outranking the asci, greenish in mass, tips uniting forming a pale olivaceous epithecium; hypothecium shallow; free unbranched hyphae within the dark, pseudo-parenchymatous excipulum producing microspores comparable in size and shape to those in the asci, spores formed singly from individual hyphal cells on fine isthmi.

Phomopsis pseudotsugae. Pycnidia black, globose, solitary or in groups of 2 or 3, the cavity is divided into more or less completely formed locules and is from 100 to 500 µm in diameter. At maturity, they become erumpent through small cracks in the bark. The conidia are hyaline, elliptical, fusoid, obtuse at both ends and measure 5.5 to 8.5 x 2.5 to 4 µm. They are extruded in whitish, often coiled cirrhi (threads).

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Juniper Pear Rust (Federal Quarantine Significant)

Revised and restructured Feb. 1996

Causal Organism

Gymnosporangium asiaticum (Miyabe ex Yamada)

Synonyms

G. chinense Long, *G. haraeanum* Syd., *G. koreaense* Jackson, *G. spiniferum* Syd., *Roestelia koreaensis* P. Henn.

Hosts

Telial. *Juniperus chinensis*. L.

Aecial and Pycnial. *Cydonia oblonga* Mill., *Chaenomeles sinensis* Thouin, *Chaenomeles japonica* (Thunb.) Lindl. ex Spach., *Malus* (*Pyrus*) *sieboldii* (Regel) Rehd., *Pyrus communis* L., *P. pyrifolia* var. *Culta* (Makino) Naka. (*P. serotina* var. *culta*), *P. ussuriensis* Maxim (*P. sinensis*) *Photinia* spp.

Distribution

Eastern Asia and United States (East and West coasts)

Symptoms

Pycnial. On the upper surface of the leaves, on spots, first small, punctiform and orange-yellow in color, gregarious in groups 2.5 mm in diameter, few in number, pycnospores small fusoid.

Aecial. On the underside of the leaf opposite the pycnia on thickened, well-developed, brown spots having a beautiful, yellowish-red margin, very slender, 3 to 6 mm high, cinereous; peridium tubular, **not** recurved in dehiscence, irregularly torn at the end, liberating reddish-brown aeciospores.

Telial. On the leaves (needles) of Juniperus, forming reddish-brown, gelatinous masses, dark chestnut when dry, pulvinate. It may be added that the telia are small when dry measuring about 2 mm high and 1 mm thick, but when wet, they are swollen to about 15 to 20 mm in length and proportionate width. Good illustrations may be found in Jackson's (1916) paper.

Description

Aeciospores. Globose to broadly ellipsoid, often slightly angular 17 to 25 µm in diameter, the wall is yellow, finely and densely verrucose, 1.5 to 2.5 µm thick, and about 6 to 8 pores, slightly thickened.

Teliospores. Broadly to narrowly ellipsoid, 2 celled, slightly constricted, 32 to 47 x 15 to 25 µm. The wall is yellow to cinnamon in color, 1 to 1.5 µm thick, pores 2 per cell by the septum.

Figure 10-26 *Gymnosporangium asiaticum* on *Juniperus*; telial spores

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Juniper Rust

December 13, 1965; restructured Feb. 1996

Causal Organism

Gymnosporangium japonicum Syd.

Synonyms

Gymnosporangium photiniae (Kern), *Roestelia photiniae* P. Henn., *R. pourthiaeae*

Hosts

Telial. *Juniperus chinensis* L., *J. chinensis* var. *pfitzeriana*, Spaeth. Possibly others

Aecial and Pycnial. *Heteromeles* (Photinia) *arbutifolia* M. Roem., *P. villosa* (Thunb.) D.C. (Possibly) *Pyrus pyrifolia* (Burm.f.) Nakai (*P. serotina*)

Distribution

China, France, Holland, Japan, Korea, Republic of, Siberia, United States (coastal areas)

Symptoms

Aecial. Described from herbarium material; no published description found. They appear on the upper surface of the leaf as reddish-yellow spots with a darker center. The darkening is caused by the presence of the tiny black pycnia that erupt through the epidermis. The spots are round with an indefinite margin, and measure 2 to 3 mm in diameter. On the lower surface the spots are yellowish to cinnamon-brown in color and are much swollen in the center; the swollen area is occupied by the aecia that are clustered there and appear to the eye as slender, light-colored hairs projecting down and outward. On the specimen examined, they are about 2 mm long.

Telial. The telia are born on the stems and twigs of *Juniperus* on fusiform swelling or galls. Dried telia are cinnamon-brown in color and appear villous or felty due to the telial horns.

Figure 10-27 *Gymnosporangium japonicum* on *Juniperus* spp.; sori on branches

Description

Aecia hypophyllous, in crowded or somewhat annular groups on thickened discolored spots, cylindric,.4 to.5 mm in diameter by 2 to 3 mm high, peridium soon becoming irregularly lacerate and cancellate often to base, erect or slightly spreading; peridial cells seen in both face and side views, broadly lanceolate or oval in face view, 29 to 32 x 64 to 90 µm, oblong in side view, 23 to 32 µm thick, coarsely rugose on both inner and side walls, the ridges becoming much higher on the side walls and extending clear across. Outer wall 1.5 to 2 µm thick, inner and side wall 5 to 7 µm; aeciospores, 18 to 21 x 19 to 23 µm, wall pale cinnamon-brown in color, 1.5 to 2 µm thick, and very finely verrucose.

Telia caulicolous, appearing on gradual fusiform enlargements scattered irregularly wedge-shaped, often incised at apex and lacunose below, 3 to 5 µm high, cinnamon-brown in color, teliospores 2-celled ellipsoid, 18 to 22 by 57 to 66 µm, **not** or very slightly constricted, usually narrowed above and below, wall pale cinnamon-brown, rather thin, 1 to 1.5 µm; pores 2 in each cell, near the septum.

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Needlecast Disease (Federal Quarantine Significant)

Revised and restructured Feb. 1996

Causal Organism

Stigmina deflectens Karst Ellis

Synonyms

Exosporium deflectens Karst.

Hosts

Juniperus spp.

Distribution

Austria, Finland, Romania, United States (South Dakota)

Symptoms

Minute brownish fruiting bodies of the fungus are arranged along the sides of the median veins of the upper side of the needles, but these fruiting bodies do **not** appear until the leaves have begun to turn brown.

As both the leaves of Juniperus and the fruiting bodies are very small, and because many other rather similar fungi may also be present on the leaves, it is unlikely the disease can be recognized by the macroscopic symptoms. If there is reason to suspect S. defectens is present, submit for microscopic examination any twigs showing dead brown leaves and needle shedding to the Postentry Quarantine Unit.

Description

Stomata up to 200 µm wide, and dark brown in color. Conidiophores are 6 to 15 x 2.5 to 4 µm with up to 4 annellations. Conidia are brown in color, verruculose, 2 to 3 septate, 11 to 19 x 4 to 5.5 µm.

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Circular 17: Diseases of *Malus* spp.

Apple Branch Canker

Revised and restructured Feb. 1996

Causal Organism

Valsa ceratosperma (Tode ex Fr.) Maire (perfect state), *Cytospora sacculus* (Schwein.) *Gvritischvili* (imperfect state)

Synonyms

Valsa mali (Miyabe and Yamada)

Hosts

Malus pumila Mill., M. X. zumi Mats. Rehd. (*Populus nigra* Linn., *Salix sachalinensis* Friedr. Schmidt., *Prunus serrulata* Lindl., and *P. yedoensis* Mats. have been inoculated successfully, but infection died out within one year.)

Distribution

Japan, China, and Korea, Republic of

Symptoms

In the early spring, the bark presents a swollen, water-soaked appearance especially when wet. The spots are brownish in color, irregular or nearly oblong in circumference, with gradual drying, the somewhat elevated canker becomes slightly sunken, more or less darkened, and cracked on the surface. Cankers are usually found on the upper side of large limbs of older trees. A large number of small, black pycnidia appear in late May on recent lesions, and spore horns are visible approximately one month later. A girdling type of injury has also been observed on weakened branches and small twigs. Girdling is rare in the first year of infection.

Description

Pycnidia and perithecia of the pathogen occur in a stroma in the bark, punctiform or wart-like, of various sizes (in culture 1 to 3 mm in diameter), junction with the sound tissue indefinite, black; pycnidia deeply immersed in the stroma, divided into many irregular chambers (Togashi 1924)

flask-shaped (Tanaka 1919), opening by a slender, canal-like neck, 80 to 200 µm in diameter; conidia cylindrical or allantoid, obtuse at both ends, 4 to 10 x.8 to 1.7 µm (Togashi 1924), expelled in yellow (Togashi 1924), buff (Tanaka 1919) cirrhi; perithecia circinate surrounding the pycnidial cavity, flash-shaped, longnecked, with black walls, the necks thickened above and slightly protruding, 100 to 250 µm in diameter; asci numerous, clavate, often pedicellate, 24 to 42 x 5.5 to 15 µm hyaline, 8-spored, aparaphysate; ascospores cylindrical, slightly curved continuous, hyaline, 7 to 10 x 1.4 to 2.1 µm.

Notes

The disease is reported to have seriously damaged a large number of apple trees in Japan, where it is said to have appeared following the introduction of American apple varieties. Its appearance at that time might be explained either by the introduction of the disease on the American varieties, or by increased virulence of a Japanese fungus on an introduced host. Suggesting the first of these explanations, Togashi (1924) states the *Valsa mali* corresponds better to the description of the disease described by Leonian (1921) in New Mexico than does *V. leucostoma* (Pers.) Fr. to which Leonian (1921) attributed it. This statement apparently applies **only** to the disease caused by the fungus and its visible symptoms as Leonian (1921) did **not** give the characters of the organism, *V. leucostoma*, in his paper. The description of the latter fungus (Saccardo 1888) shows differences in the shape of the asci, and in the size of the ascospores.

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Apple Canker

Revised Oct. 1965; restructured Mar. 1996

Causal Organism

Perfect State. *Physalospora piricola* Nose

Imperfect State. *Macrophoma kuwetsukai* Hara

Hosts

Malus sylvestris Mill. (apple) *Pyrus communis* L. (pear)

Symptoms

On Trunks and Branches. Lesions are nearly circular to elliptical **except** when, by coalescence, they become irregular in shape. Separated from the sound tissue by a crack or crevice around the

margin, and slightly depressed, brown to gray in color, many fruiting bodies on the surface, which is raised at the center and, at the last, broken open.

On Leaves. Brown to dark brown spots are formed that are rather round or elliptical surrounded by a ring, but when the spots become confluent, they take irregular shapes.

Description

(after Nose 1933) Perithecia, ostiolate, carbonous, black, spherical or semispherical, 230 to 300 µm high by 130 to 280 µm wide (average 245 x 229 µm); asci 8-spored, several of different ages, develop on the base, long clavate wall rather thin **except** at the apex, inner wall grooved, 93 to 121.3 x 20.3 to 23.2 µm (average 114.4 x 22.2 µm); ascospores distichous, elliptical, hyaline or greenish-blue in color, continuous, 21.7 to 22.6 x 10.4 to 12.2 µm (average 22.2 x 11.4 µm) **no** gelatinous sheath; paraphyses many, hyaline, simple, 2.9 to 6.1 µm thick.

Pycnidia submerged, ostiole short, carbonous, dark brown nearly spherical, 170 to 250 high x 200 to 250 µm wide (average 184 to 204 µm); conidiophores lining the whole wall, clavate, hyaline, continuous, simple, 11.6 to 31.9 x 2.9 to 4.4 µm (average 20.30 x 3.19 µm); pseudoparaphyses hyaline, nonseptate unbranched 34.8 to 63.8 x 2 to 3.5 µm (average 47 x 2.9 µm); conidia fusoid or long elliptic, hyaline, continuous, 21.8 to 31.9 x 6.7 to 8.7 µm (average 26.5 x 7.5 µm).

Perithecia and pycnidia may be intermixed on the same lesion.

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Apple Mosaic Virus

Synonyms

Infectious variegation, line patter, mottle leaf, mosaic chlorosis, pear ring patter mosaic, *Pyrus* virus 2

Time of Year to Inspect

Within 6 weeks after leaves are fully out

Symptoms

Plant. Somewhat stunted compared to healthy plants of the same age.

Leaf. Has many forms of mottling. Small irregular yellow-to-cream spots that stand out vividly against the dark green of normal tissue. Spots turn brown and become necrotic as the season progresses. Bands of yellow may develop along the larger veins.

Stems. None

Fruit. None

Flowers. None

Transmission

Mechanical and grafting

Discussion

There are several strains of apple mosaic virus. In New Zealand tests, severely infected trees, after several years of production, yielded **only** 33% of the fruit of healthy trees grown under similar situations.

Distribution

Argentina, Australia, Austria, Belgium, Brazil, British Isles, Bulgaria, Canada, Chile, China, Czechia, Denmark, Finland, France, Germany, Holland, India, Italy, Japan, Kenya, Latvia, New Zealand, Norway, Poland, Rhodesia, Romania, South Africa, Sweden, Switzerland, Turkey, United States, Russia, and Serbia (formerly Yugoslavia).

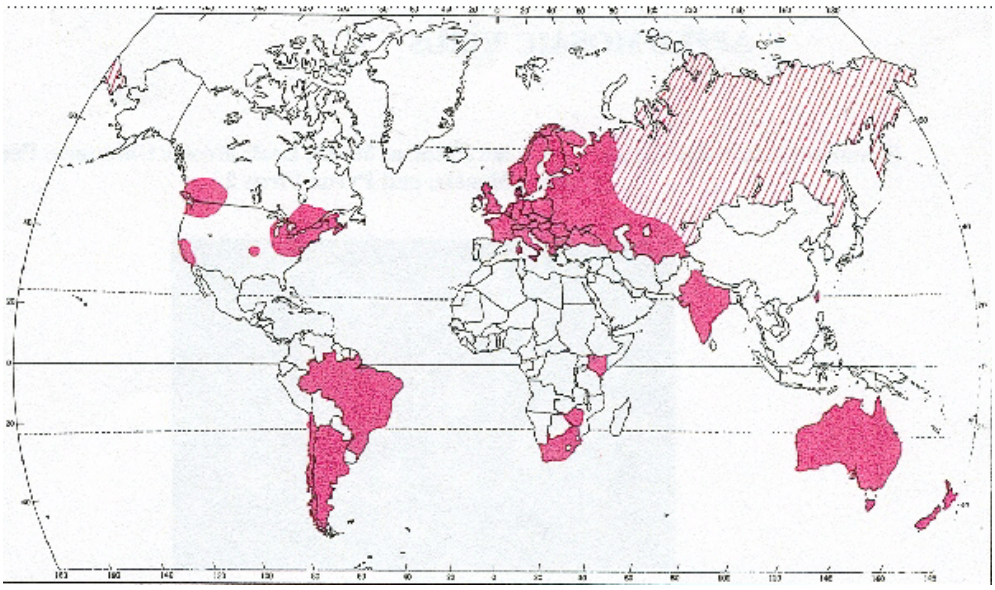

Figure 10-28 Distribution of apple mosaic virus

Figure 10-29 Bark cankers (right) on second-year *Pyrus* variety "Winter Nelis" wood caused by pear blister canker viroid

Figure 10-30 Roughening, brown mottling and blistering (right) of second-year *Pyrus* spp. wood; symptoms caused by pear blister canker viroid

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Apple Proliferation Phytoplasma (Federal Quarantine Significant)

Causal Organism

Candidatus Phytoplasma mali (Seemuller & Schneider) (federal quarantine significant)

Host

Corylus avellana

Symptoms

Yellowing, sparse foliage, stunting, dieback, and general decline

For further information, refer to Apple Proliferation Phytoplasma (Federal Quarantine Significant).

Chlorotic Leafspot Virus

Hosts

Malus spp.

Distribution

Canada and United States

Symptoms

This is a virus disease of apple that might be confused with apple mosaic. In this disease the patterns are quite similar to the line pattern and flecking expressions of apple mosaic but the color does not progress to yellow or white. In fresh leaves the lines and flecks are a faint grayish-white in color.

According to Welsh and Keane (1961) “Leaves of infected trees have chlorotic flecks associated with veins and veinlets. These are usually accompanied by leaf puckering and dwarfing. Symptoms are most severe on the leaves that develop early in the season.” Chlorotic leafspot symptoms have also been associated with stem pitting symptoms.

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Rough Bark (Phomopsis Canker) (Federal Quarantine Significant)

Revised and restructured Mar. 1996

Causal Organism

Perfect state. *Diaportle perniciosa* Em. Marchal

Imperfect state. *Phomopsis mali* Roberts

Synonyms

D. eres Nitschke and *D. mali* Miura

Hosts

Malus spp. and *Pyrus* spp.

Distribution

Japan, Europe, and North America

Symptoms

Pale, discolored spots are produced on the leaves measuring 1 to 2 cm in diameter. Spotted leaves become curled, and finally fall before their time.

NOTICE

Phomopsis rough bark refers to distinctive symptoms produced on the apple cultivar “Yellow Newton.” The first symptom is sunken areas in the bar. These later enlarge, blacken, and crack open at the margins, giving the tree a rough bark appearance (Rosenberger 1990).

On the fruits, mature spots measure 2 to 8 mm in diameter. They are round, solitary, or irregularly coalescent, more or less sunken, usually deeper in color than the surrounding tissue. The underlying tissue is brown to dark-brown in color, of spongy texture, and has a slightly bitter taste.

Description

D. perniciosa. Produces perithecia on twigs that are spheroid or oblate spheroidal, 300 to 450 µm in diameter, outer wall intensely black, inner wall light brown, beaks long, conspicuously hairy near the end; asci fusoid, obtuse above, somewhat pedicellate below, 45 to 52 x 5 to 10 µm, 8-spored; ascospores biseriate, fusoid, both ends obtuse, 1-septate, constricted, 2- nucleate in each cell (guttulate) hyaline, 11 to 13 x 3.5 to 4.5 µm.

Phomopsis. *Pycnidia* of the Phomopsis state on decayed fruit, numerous, irregular, scattered or in concentric zones, later covered by white or olivaceous-white, cottony hyphae, semi-spherical, 70 to 220 x 70 to 130 µm, conidia issuing in a pinkish-brown cirrhus or mass, of two kinds A-spores ellipsoidal, acute at both ends, continuous, hyaline, guttulate at both ends, 7 to 9 x 3 to 4 µm; B-spores filiform, slightly curved, or may be hooked near the end cylindrospores are also produced. Chlamydospores in chains, cinereous or greenish, thick-walled, granulate, 10 to 14 x 5 to 8 µm; cylindrospores straight or curved, tapering towards the apex, pale pinkish-brown in mass,

colorless or greenish when alone, 2 to 7 septate, occasionally constricted at the septum, 38 to 80 x 3 to 4 µm.

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Rubbery Wood Phytoplasma (Federal Quarantine Significant)

Hosts

Malus spp.

Distribution

Australia, Canada (British Columbia), Denmark, England, Italy, New Zealand, Norway, Sweden, Switzerland, The Netherlands, and United States (experimental plantings only)

Symptoms

(after Brase and Gilmer 1959) Affected trees are slightly stunted and their branches and trunks are very definitely rubbery when touched or bent. In each case the side branches developing from the trunk showed the characteristic “bottle-neck” growth habit associated with rubbery wood; that is, thickening at a point near the origin with an abrupt and pronounced taper of the growth from there outward.

Smith (1972) stated that “affected maiden trees frequently develop a vigorous side branch from a point a few inches above ground level and this branch may outstrip the leader.” The wood is not fully lignified as can be seen when a branch is cut across and properly stained. No diagnostic fruit or leaf symptoms have been recognized.

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Valsa ceratosperma (V. Mali) (Federal Quarantine Significant)

In progress.

Circular 18: Diseases of *Passiflora* spp.

- Passion Fruit (Passiflora) Woodiness Virus

Cucumber Mosaic Virus

Synonyms

Marmor passiflorae Holmes., passion fruit woodiness virus, *Passiflora* virus 1 (Noble) K.M. Smith, passion fruit bullet disease virus

Hosts

Passiflora caerulea L., *P. edulis* Sims., alba Link and Otto., *P. foetida* L., *P. suberosa* L. and *P. subpeltata* Ort. (P. Alba)

Distribution

On *Passiflora* in Australia (New South Wales and Victoria), Kenya, New Zealand, and United States (California). The distribution on other hosts is very widespread.

Symptoms

The symptoms are most pronounced in the cooler months, sometimes disappearing in the summer. The whole plant or only individual branches may be affected. The first symptom is downward curling of the terminal leaves. This is followed by light-colored spotting or vein clearing of the young leaves. Cleared areas along the veins increase in width until leaves or portions of them become chlorotic. Small, irregular or circular islands of dark-green are sometimes present on such leaves. In subsequent years, symptoms are **not** so conspicuous, but young leaves show distortion and savoying. Scattered light-colored areas or vein clearing may also be present. Older leaves are crinkled, misshapen, and smaller than normal. Plants are stunted. According to Smith (1972), the stems, particularly in the region of the terminal shoots, may develop mottled dark-green areas that strongly contrast with the normal green of the stems.

The fruits of infected plants are smaller than normal, malformed, and the surface may be roughened and cracked. In contrast to the somewhat ovate normal fruit, they tend to be spherical, hence the name, bullet disease. They are hard when cut and sections of the rind are found to be thickened and woody. The contents are either dry or the pulp is reduced and insipid.

It is unlikely that fruits will be found on the plants in detention; therefore, the stem and leaf symptoms will be the most useful.

NOTICE

Although cucumber mosaic virus is present in California on *Passiflora* and on other hosts in other States, its destructive nature on *Passiflora* would destroy the usefulness of infected plants for all ordinary purposes.

References

1. Chamberlain, E.E. 1954. Plant virus diseases in New Zealand. Bul. 108. N.Z. Dept. Sci. and Industrial Res. 196-98.
2. Noble, R.J. 1939. Aphid vectors of the virus of woodiness or bullet disease in passion-fruit (Passiflora edulis Timns). Proc. Roy. Soc. N.S.W. 72:293- 317.
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4. Teakle, D.S. et al. 1963. Cucumber mosaic virus in Passiflora in California. P.D.R. Suppl. 47:677-78.

Passion Fruit (*Passiflora*) Mosaic Virus

NOTICE

This disease is **not** known to be present in the United States.

Synonyms

None. However, this disease was confused with passion fruit woodiness virus and discussed under that name by workers in Queensland, Australia.

Hosts

Systemic hosts: *Passiflora edulis* fsp. *flavicarpa* O. Deg., *P. incarnata* L., *P. mollissima* (HBK) Bailey

Local lesion hosts: *Beta vulgaris* L., *Chenopodium album* L., *C. amaranticolor* Coste & Reyn., *Vigna* (*sinensis*) *unguiculata* (L.) Walp.

Distribution

Nigeria and Australia (Queensland)

Symptoms

The symptoms are similar to those of cucumber mosaic virus on *Passiflora* spp. Martini (1962) states that leaf mottling is the **only** reliable symptom. This seems to overlook the fruit symptoms.

Notes

The two diseases can be distinguished, according to Martini (1962), by indexing to various host plants. Passion fruit mosaic virus is systemic **only** in *Passiflora*, and also by the size and shape of the purified virus particles. **Neither** of these tests can be used in the field. Therefore, the practice should be to destroy plants if found showing these symptoms. If plants imported for scientific purposes should be involved, the case should be referred to the Postentry Quarantine Unit for consideration.

NOTICE

Although cucumber mosaic virus is present in California on *Passiflora* and on other hosts in other States, its destructive nature on *Passiflora* would destroy the usefulness of infected plants for all ordinary purposes.

References

1. Martini, C.K. 1962. Some properties of the virus causing “woodiness” of passion fruit in Western Nigeria. Ann. Appl. Biol. 50:163-68.

Passion Fruit (*Passiflora*) Woodiness Virus

Revised and restructured Feb. 1996

Hosts

Passiflora edulis Sims., *P. edulis* fsp. *flavicarpa* O. Deg., *P. suberosa* L., *Arachis hypogea* L., *Centrosema pubescens* Benth., *Crotalaria* (*usaramoensis*), *Zanzibarica* Benth., *Glycine max* (L.) Merr. and Macroptilium (*Phaseolus*) *atropurpureus* (Mocino & Sesse ex DC.) Urban

Distribution

Australia (Queensland, New South Wales, and Western Australia) and Suriname

Symptoms

Causes mosaic, ringspots, rugosity and leaf distortion of *P. edulis*. The fruits are frequently distorted and the pericarp hard and thick. The productive life of the plants is greatly decreased. P. *suberosa* is a much more tolerant host.

Description

Virus particles are flexuous rods about 750 x 12 nm.

Transmission

By sap and grafting.

Vectors

In a nonpersistent manner by the aphids *Myzus persicae* (Taylor) and *Aphis gossypii* (Greber).

Notes

Both passion fruit woodiness virus and cucumber mosaic virus (description following) cause leaf mosaic and woody fruit symptoms. Electron microscopy can differentiate between the two since passion fruit woodiness virus is a flexuous rod and cucumber mosaic virus is a spherical particle. However, infection by both can occur. To determine if this has happened, inoculating and reading the resulting symptoms on diagnostic hosts can confirm or deny this occurrence.

References

1. Taylor, R.H. and R.S. Greber. 1973. Passion fruit woodiness virus. CMI descriptions of plant viruses #122. CAB/CMI, Kew, Surrey, England.

Circular 19: Diseases of *Pinus* spp.

Hemicycliophora dhanachandi (Hemicycliophoridae)

December 2010

Species

Nematode

Synonym

H. dhanachandi

Host

Pinus roxburghii (chir pine); but little information is currently available regarding further host range

Distribution

India; but little information is currently known about further distribution

Notes

New nematode species isolated from soil around the roots of *Pinus roxburghii* (chir pine) plants in India. Nematodes in the genus *Hemicycliophora* feed on a wide range of plant species, damaging roots, and reducing plant growth. It is listed as reportable in the PEST ID database.

References

1. Victoria, LN, N Mohilal, and RK Gambhir. 2010. A new species of Hemicycliophora (nematoda: Tylenchida) from pine forest of Manipur, India. *Indian Journal of Nematology* 40(2):162-166.

Scotch Pine Blister Rust (Federal Quarantine Significant)

Revised and restructured Feb. 1996

Causal Organism

Cronartium flaccidum (Alb. & Schw.) Wint.

Synonyms

Cronartium asclepiadeum (Willd.) Fries[4], *Peridermium cornui* Rostr. & Kleb. *P. pini* var. *carticola*., *Aecidium paeoniae* Wallr., *Uredo paeoniae* Cast

Hosts

Aecial. *Pinus sylvestris* L., *P. mugo* Turra., *P. pinaster* Ait., *P. tabuliformis* var. *Yunnanesis*

Imported uredial and telial hosts of this rust are **not** considered as a likely means of introducing the disease since this particular species of *Cronartium* is **not** systemic on these hosts. Furthermore, these plants, when brought into this country, usually arrive as seeds or nonfoliated dormant plant parts, and for that reason, represent a negligible risk. However, those same plants, when growing in this country, could serve as indicators of the presence of the rust that might have been introduced on pines by accident. For that reason, it is suggested that inspectors look for rusts on the following genera on the chance that the genera might sometime collect *C. flaccidum*.

Uredial and Telial. *Blumenbachia*, *Cynanchum*, *Impatiens*, *Loasa*, *Melampyrum*, *Nemesia*, *Paeonia*, *Pedicularis*, *Ruellia*, *Schizanthus*, *Scyphanthus*, *Tropaeolum*, *Verbena*, *Vincetoxicum* (esp. *V. officinale*)

Distribution

Europe and Asia

[4] Klebahn (1938) maintains that the meager original description of *C. flaccidum* then becomes the valid binomial. Many European mycologists follow this reasoning. Approximately 25 names have been applied to this rust. Those **not** listed above can be found in Sydow's Monographia Uredinearum 3:560-63.

Symptoms

The following quotation is from Massee (1910). “The aecidia appear on bark of Scots fir, Pinus sylvestris, late in the spring, bursting through the outer dead cortex as irregular, inflated, pale yellow sacs, which open by an irregular crack and liberate the powdery, orange spores.” These “sacs” are from 2 to 6 mm long by 2 to 3 mm wide and high and are usually loosely aggregated on the branch, but may be evenly scattered. Description of the pathogen*, Cronartium flaccidum* (Alb. & Schwein.) Wint. (after Sydow).

Description

Pycnia irregular, yellow in color; aecia on branches, erumpent, large, 2 to 6 mm long by 2 to 3 mm wide and high, mostly loosely aggregated, but may be rather evenly scattered over a large part of a branch, peridium white of 2 or 3 layers of cells, the outer layer of small cells, the inner layers of large warty cells, mostly without rigid hairs; peridial cells rhomboid-ellipsoid up to 80 µm long by 18 to 38 µm wide, warty, membrane 4 to 6 µm thick; aeciospores globose-ellipsoid or polyhedrical, verrucose, 22 to 36 x 16 to 24 µm; wall hyaline, 3 to 4 µm thick.

On uredial and telial hosts the uredial sori sparse or aggregated, punctiform .15 to .25 mm in diameter, at last opening by a round pore, wall thin composed of cells up to 25 µm long by 15 µm wide, membrane cellular of almost uniform thickness (2 to 3 µm); uredospores ovate or ellipsoidal, loosely short echinulate, 18 to 30 x 14 to 20 µm, wall hyaline, 1.5 to 2.5 µm thick. The telial *sori hypophyllous*, sparse or aggregated, cylindrical, straight or curved, 1 to 2 µm long by 50 to 120 µm wide, yellowish-brown or reddish-brown in color; teliospores ellipsoid to oblong, smooth yellowish or yellowish-brown 20 to 60 x 10 to 16 µm, wall hyaline to golden, 1 1/2 µm thick, at the apex, slightly thicker.

References

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4. Liese, J. 1928. Die Rostpilzerkrankungen der Waldbaume. Mitt. Deutsch. Dendrol. Gesellsch. 40:158-75.
5. Massee, G. 1910. Diseases of cultivated plants and trees. London:Duckworth 320-21.
6. Mordue, J.E.M. and I.A.S. Gibson. 1978. Cronartium flaccidum. in: CMI descriptions of pathogenic fungi & bacteria #580. CAB/CMI. Kew, Surrey England.
7. Pape, H. 1938. Der Filzrost der Paonie. Blumenu. PflBau ver. Gartenwelt 42:269-70. (RAM 17:752).
8. Rennerfelt, E. 1943. On our present knowledge of the resin top fungus (peridermium) and its mode of dissemination and growth. Svenska Skogsvardsforen. Tidskr. 41:305-24. (RAM 25:373).
9. Saccardo, P.A. 1888. *Sylloge Fungorum*. 1:470; 7:598; 7:739; 24:754; 25:713-14; 25:762. Ann Arbor, MI: V.W. Edwards (reprinted 1944).
10. Sydow, P. and H. Sydow. 1904. *Monographia Uredinearum* seu specierum omnium ad hunc usque diem cognitarum descriptio et adumbratio systematica. Vol. I. Leipzig, Germany:Borntraeger Bros. 3:560-63.)

NOTICE

The description of *Melampsora pinitorqua* originally appearing in this circular has been deleted. It is now known that *M. pinitorqua* **does not** occur in Canada and the reports of its occurrence in British Columbia were based on collections of *M. medusae* (*M. albhertensis*). *M. medusae* occurs in the Northwestern United States on *Pseudotsuga menziesii* and *Populus tremujloides*.

Circular 20: Diseases of *Prunus* spp.

European Rusty Mottle of Cherry (Federal Quarantine Significant)

June 3, 1963; restructured Mar. 1996

Synonyms

None

Hosts

Prunus spp. (cherry **only**)

Distribution

England, and probably other European countries

Symptoms

Symptoms first appear in July in England when groups of fine veins, tertiary or smaller, of mature leaves become yellow. The leaves gradually assume a dull green color in contrast to the bright green of the healthy leaves, and by the end of August, they have a yellowish-green appearance. Rusty red pigment develops on the leaf surface during August, usually, but **not** invariably, associated with the yellow veinlets. The amount of red coloration varies with the strain of the virus. **Neither** ring pattern, premature autumn yellowing, **nor** leaf-fall occurs. The shedding of yellowish-green mottled leaves with green rings in early summer, so characteristic of rusty mottle and mild rusty mottle in North America, **does not** occur.

Some virus strains have induced conspicuous dark red spotting and vein banding similar to red mottle in pear, while others have induced mainly yellow or pale rust colored pigmentation.

References

1. Posnette, A.F and R. Cropley. 1961. European rusty mottle disease of sweet cherry. Ann. Rept. East Malling Res. Sta. 85-86.

Plum Pox Virus (Federal Quarantine Significant)

Feb. 2000 Synonyms Sharka

Hosts

All species of *Prunus* (almond, apricot, cherry, nectarine, peach, and plum) are natural hosts. *P. spinosum* is an important natural source of infection in Europe. Almost all the known apricot,

peach, and plum cultivars are susceptible, but some remain symptomless when infected. There are six known strains of plum pox virus (PPV).

Sixty additional host species in eight plant families were found to be possible hosts when experimentally inoculated.

Distribution

Most European countries, Chile, Egypt, India, Syria, and Turkey Recently reported in the United States (Pennsylvania, Michigan, and New York)

Symptoms—Leaves

Apricot. Chlorotic, pale green lines, rings or spots develop on the leaves during the spring and can be observed until summer (Figure 17-32).

Peach. Some chlorotic lines and small areas can develop on the leaves along the secondary and tertiary veins. These symptoms may be difficult to observe in the field (Figure 17-31, Figure 17-34, and Figure 17-35).

Plum. Diffuse, pale green rings, lines or areas develop on the leaves in spring in some cultivars, they disappear in summer (Figure 17-33).

This virus infects some wild and ornamental Prunus without symptoms. Symptoms on cherry are **not** common. Some varieties may flower during the quarantine period. Fruit symptoms are variable and since postentry plants should be released before fruit is produced, will not be discussed in this circular.

Transmission

Transmission occurs by grafting with infected budwood, and by 10 aphid species in a nonpersistent manner. The most efficient vectors are *Myzus persicae*, *Brachycaudus helichrysi*, *B. cardui*, and *Phorodon humuli*. Seed transmission has been reported for some strains of PPV in some hosts.

Figure 10-31 Peach leaves with plum pox virus (PPV) showing vein clearing

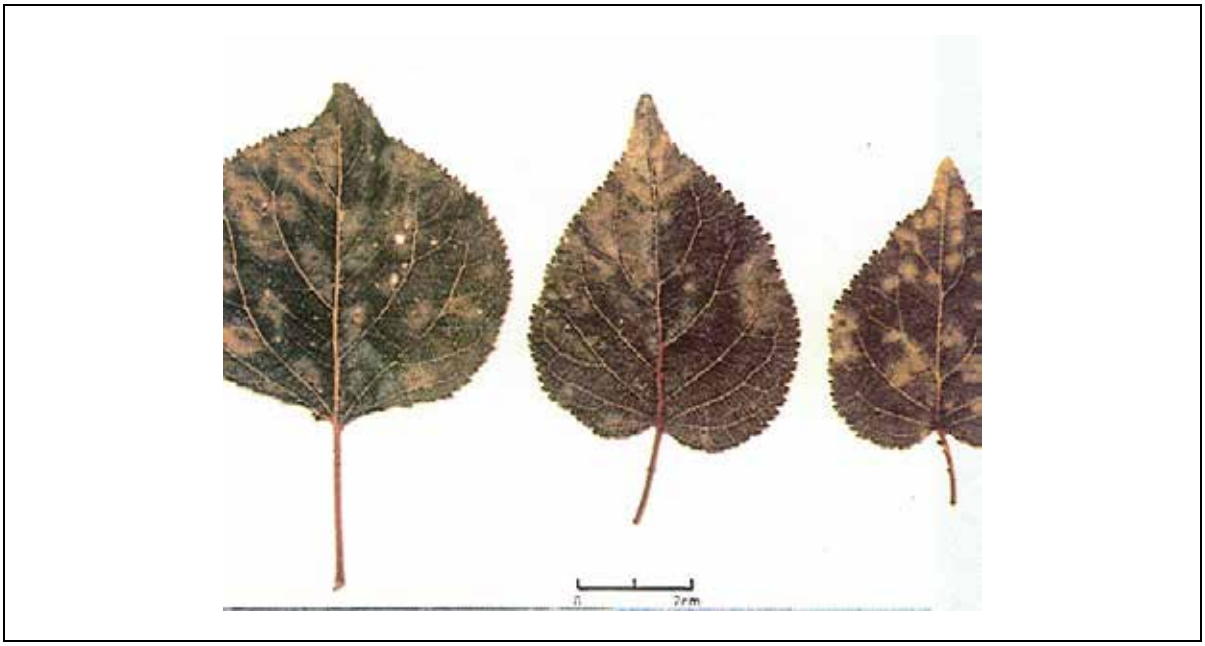


Figure 10-32 Apricot *Prunus* spp. with plum pox virus (PPV)

Figure 10-33 Schematic drawing of plum pox virus (PPV) symptoms on plum leaves and fruit

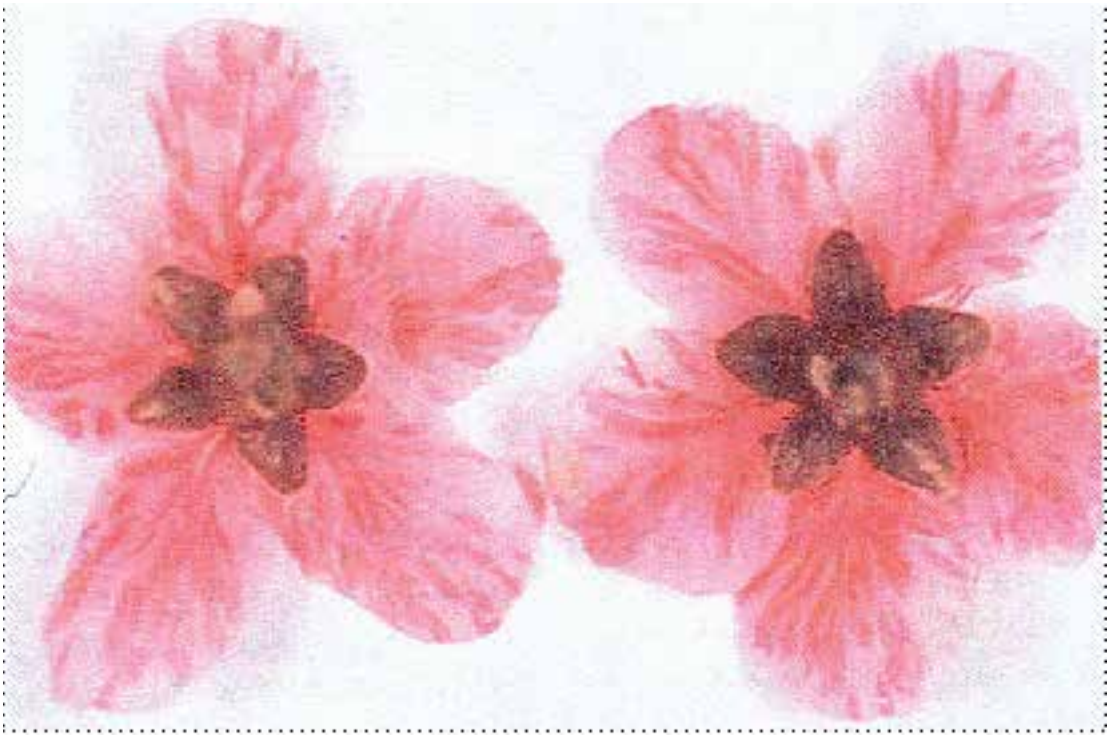


Figure 10-34 Example of plum pox virus (PPV)-induced color breaking (pink flecks) in certain peach cultivars

Figure 10-35 Example of plum pox virus (PPV)-induced color breaking (pink flecks) in certain peach cultivars

References

1. Desvignes, J.C. 1999. Virus diseases of fruit trees. Ctifl, France 202.
2. Diekmann, M. and C.A. Putter. 1996. Stone fruits. FAO technical guideline for safe movement of germplasm. No. 16 (with color photographs).
3. Dunez, J. 1987. Plum pox disease of stone-fruit trees. FAO bulletin. 1/ R8080/mult/1.87/1/10000.
4. Kegler, H. and C. Schade. 1971. Plum pox virus. CMI Descriptions of Viruses. #70.
5. Nemeth, M. 1986. Virus, mycoplasma & rickettsia diseases of fruit trees. Boston:Martinus Nijhoff Publ. 840.
6. CFR 319.37.

Circular 21: Diseases of *Pseudostuga* spp.

- Douglas Fir Canker (Federal Quarantine Significant)
- Circular 22: Diseases of *Rosa* spp.Cytospora *rosarum* (Sordariomycetes: Diaporthales)
- Rose Wilt Agent (Federal Quarantine Significant)

Cytospora rosarum (Sordariomycetes: Diaporthales)

December 01, 2011

Causal Agent

Cytospora rosarum (Sordariomycetes: Diaporthales)

Host

Rosa spp.

Symptoms

Twig, branch, and bark necrosis

Distribution

Armenia; Greece; India; Iran; Pakistan; Poland; Turkey; Ukraine; and United Kingdom of Great Britain and Northern Ireland

Notes

Cytospora rosarum (Sordariomycetes: Diaporthales) is **not** known to occur in the United States. The genera *Cytospora* and *Valsa* are listed as reportable in the PEST ID database.

Reference

1. Lyange, ER, C Eken, AD Spanbayev, & T Genc. 2011. First report of Cytospora rosarum on Rosa canina in Turkey. Journal of Plant Pathology 93(4S):4.80.

Rose Wilt Agent (Federal Quarantine Significant)

Synonym

Marmor flaccumfaciens

Time of Year to Inspect

Spring; up to 6 weeks after leaves are fully out

Symptoms

Plant. Is wilted. Dieback of young shoots can be seen. Young plants produce pinched, yellowish-green shoots. There may be proliferation of stems from a single bud producing a witches' broom effect. The shoots usually die during the year.

Leaf. Young petioles curve downward (epinasty), leaves are brittle and easily detached by wind or brushing with the hand. They often turn pale green or yellow in color before falling.

Stem. Dieback occurs in the stem. Some mature, but still soft stems may develop purple blotches that are often ring shaped. Scions are broad at the base and rapidly taper toward the tip.

Flowers. None

Transmission

Transmission occurs by grafting, mechanical, and/or insect (*Macrosiphum rosae*, *Aphidae*, in Australia).

Discussion

The rootstock of *Rosa multiflora* symptomless carrier of rose wilt agent, consequently the varieties grafted on this rootstock should be inspected for rose wilt agent symptoms. A disease named rose leaf curl and similar to rose wilt agent has been found in California. The agent is

latent in antique roses and, therefore, such plants are symptomless. However, it incites symptoms in tea rose hybrids. As of this writing, there is no conclusive evidence that these diseases are caused by the same agent. For quarantine purposes, we presently consider them as distinct.

Distribution

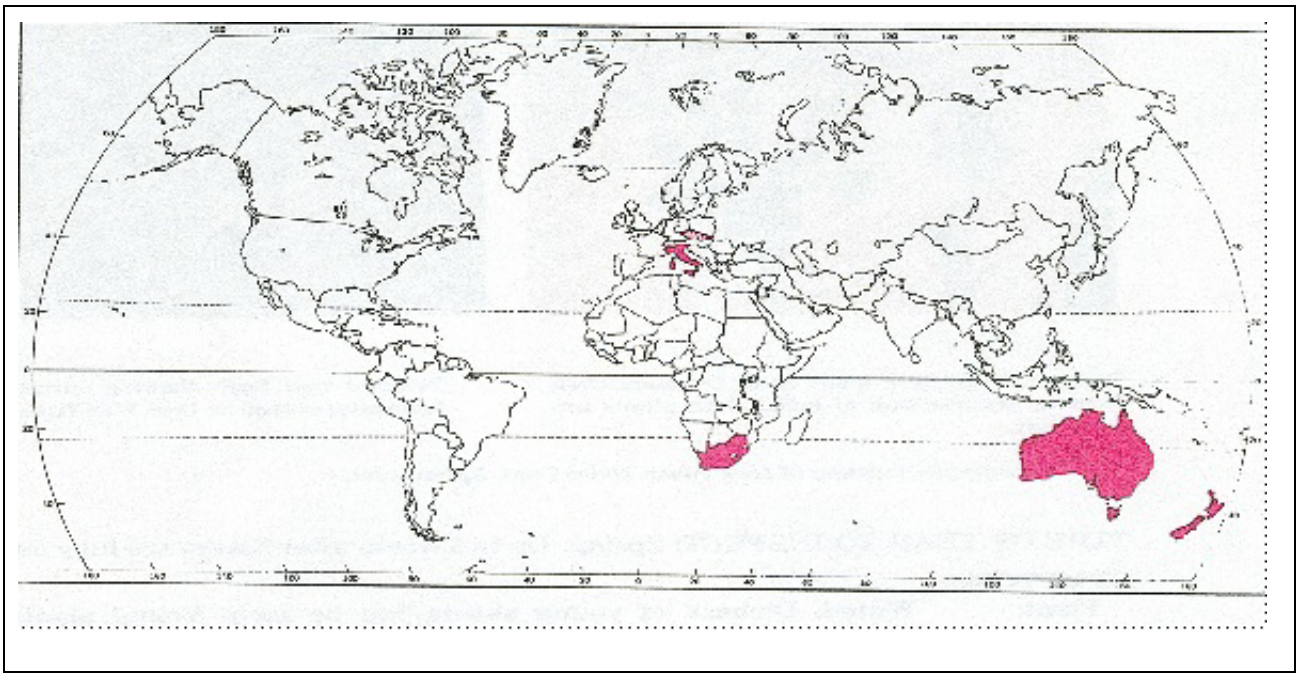


Figure 10-36 Distribution of rose wilt agent; Australia (including Tasmania), New Zealand, South Africa; a similar disease occurs in Italy. For quarantine purposes, roses are prohibited from these countries

References

1. Anonymous. 1969. Diseases of rose. N.S.W. Dept. Agric. Pl. Dis. Bull. 109:10-13
2. Anonymous. 1958. Rose wilt. Agric. Gaz. N.S.W. 69(11):592-94.
3. Fry, P.R. and K.R.W. Hammet. 1971. Rose wilt virus in New Zealand. N.Z.J. Agr. Res. 14(3):735-43.
4. Gigante, R. 1936. Una nuova virosi della rose in Italia. Boll. Staz. Pat. veg. Roma, N.S. 16:76-94.
5. Grieve, B.J. 1931. Rose wilt and dieback. A virus disease of roses occurring in Australia. Austral. J. Exp. Biol. & Med. Sci., 8:107-21.
6. Wade, G.C. 1955. Rose diseases in taxmania. Tasm. J. Agric. 26:135-41.

Circular 23: Diseases of *Rubus* spp.

Raspberry Leaf Blotch Virus (RLVB)

May 2012

Causal Agent

Emaravirus raspberry leaf blotch virus (RLBV)

Hosts

Rubus idaeus cv. glen ample (red raspberry) plants

Symptoms

Yellow leaf blotches and reduced yield

Vectors

Raspberry leaf and bud mite, *Phyllocoptes gracilis* (Acari: Eriophyidae)

Distribution

Finland, United Kingdom of Great Britain and Northern Ireland, and Serbia

References

1. Bi, Y., K Artola, T Kurokura, T Hytönen, & PT Valkonen. 2012. First report of raspberry leaf blotch virus in raspberries in Finland. Plant Disease DOI: 10.1094/PDIS-04-12-0368-PDN.

Rubus Stunt Phytoplasma (Federal Quarantine Significant)

Revised July 1991; restructured Mar. 1996

Synonyms

Witches' broom, Heksenbezem, Dwergziekt, *Rubus Stauche*, Verzwergungs-Krankheit, ved "miny," dvergsjuke, Sheaf

Hosts

Rubus spp. This agent has been found in all the principal European raspberry varieties, and in many wild blackberry species. It can be experimentally transmitted to *Fragaria vesca* L. and several commercial strawberry varieties.

Distribution

Bulgaria, Czechia, Denmark, England, Germany, Netherlands, Norway, Poland, Slovakia, and Russia

Symptoms

The disease is of great economic importance because of the severe crop losses that may occur when the disease becomes epidemic.

According to F.A. van der Meer and H.J. de Fluiter (1970) who studied the diseases in the Netherlands, the symptoms are basically alike in all species and varieties. Prentice (1950) states, however, that in raspberry, the symptoms depend to some extent on the variety infected.

Generally there are numerous small, thin, weak canes and excessive lateral branching of the whole plant, together with phyllody and proliferation of the flowers.

Prentice (1950) reports that in the season following the observance of weak canes, they generally fail to flower or produce very few flowers. Some varieties of raspberry have a tendency to produce a proportion of abnormal flowers. Sometimes the sepals are slightly longer than normal

or the tips more leafy. According to Prentice (1950) and Putz (1969), in extreme cases, the sepals and carpels develop into leaves.

Prentice (1950) states that fruiting canes tend to have shortened internodes and often more than one bud develops at each node. Sometimes the development of axillary buds near the base of the cane help accentuate the bushy appearance of the plant. In early summer, leaves on infected canes are usually paler in color than normal.

In France, Putz (1969) reported symptoms of virescence on floral parts of "Malling Promise" similar to those of Rubus stunt phytoplasma, however, the virus has **not** yet been determined.

According to van der Meer and de Fluiter (1970), the variety "Malling Promise" is tolerant to some extent and on which phyllody is very rare. Other raspberry and blackberry varieties may regenerate to a high degree, consequently such regenerated plants generally **do not** show flower deformation.

Raspberry plants that are already badly affected by other viruses, such as mosaic diseases, are more sensitive to Rubus stunt phytoplasma, and often die within a few years of infection.

Among the great number of shoots formed, some become larger than others and bear normal but small fruits that are difficult to harvest. Fruiting laterals of infected plants are always shorter than those of healthy plants.

In cultivated plantations, many diseased plants die in the shock stage of infection, because they are overgrown by healthy ones. However, raspberry plants grown from diseased root cuttings and planted distant from each other seldom die and may show a certain degree of regeneration.

On *Fragaria* vesca and commercial strawberry varieties, the virus causes witches' broom, phyllody of flowers, and severe growth reduction. Infected strawberry plants usually die within 2 or 3 years.

Transmission

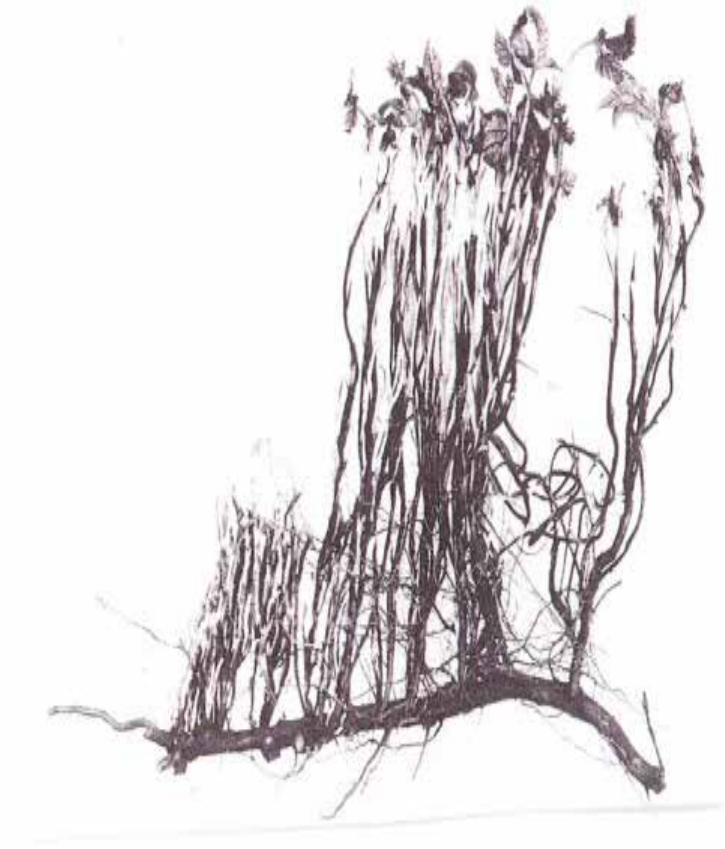
The virus is transmitted by grafting. The incubation time for the virus to manifest itself is between 4 to 11 months depending on the season during which the plants are infected.

Vector

The vector is the leaf hopper, *Macropsis fuscula* Zett.

The vector has been reported from several European countries extending from Italy to Norway, Northern Russia, Canada (British Columbia), and United States (State of Washington, several counties).

There are two other probable vectors of the virus within the genus *Macropsis*: *M. brabantica* and *M. scotti*.



Source: USDA Handbook No. 631

Figure 10-37 First symptoms of *Rubus* stunt in red raspberry; numerous weak and erect shoots develop from the root buds

Figure 10-38 Floricane of *Rubus* stunt-infected blackberry cv. "thornless evergreen," showing witches' broom growth and yellowing

Source: USDA Handbook No. 631

Figure 10-39 Phyllody of flowers of red raspberry cv. “Norfolk giant” sepals, petals, and pistils become leaflike structures; stamens usually remain normal

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9. van der Meer, F.A. and H.J. de Fluiter. 1970. Rubus stunt virus, University of California, Div. Agri. Sci., Berkeley, Cal. (handbook).

Circular 24: Diseases of *Vaccinium* spp.

Diaporthe australafricana (Sordariomycetes: Diaporthales)

March 7, 2012

Causal Agent

Diaporthe australafricana (Sordariomycetes: Diaporthales)

Hosts

Vaccinium corymbosum (blueberry) plants; *Vitis vinifera* (grape) plants

Symptoms

Exhibit brown to reddish necrotic stem cankers and shoot necrosis.

Distribution

Chile; South Africa; and Australia

Notes

Diaporthe australafricana (Sordariomycetes: Diaporthales) has been observed in Chile since 2006. It is **not** known to occur in the United States. The genus *Diaporthe* is listed as reportable in the PEST ID database.

References

1. Latorre, BA, E Elfar, JG Espinoza, R Torres, & GA Diaz. First report of *Diaporthe australafricana* associated with stem canker on blueberry symptoms in Chile. Plant Disease DOI: 10.1094/PDIS-12-11-1025-PDN.

Circular 25: Diseases of *Watsonia* spp.

Appendix A Directory of PPQ Postentry Quarantine Liaison Officers

Contents

Introduction

The following list includes contact information for the PPQ Postentry Quarantine Liaison Officers (PEQLO) in both the Eastern and Western regions. Plant Inspection Stations (PIS) should use this list when determining who to contact and to whom PEQ forms and correspondence should be sent, i.e., PPQ Form 236 for the PPQ Liaison Officers. A list of State Plant Regulatory Officials and State PEQ Contacts can be found in Directory of SPROs and State PEQ Contacts.

Listings

Table A-1 Directory of PEQ Liaison Officers

State	Contact:	Address:	Phone/Cell/Fax:
PEQP	Melanie Pickel, National Coordinator (melanie.pickel@usda.gov; postentry@usda.gov)	USDA–APHIS–PPQ–Field Operations	C: 512-592-8500
Alabama	Jeffrey Lasiter (jeffrey.t.lasiter@usda.gov)	USDA–APHIS–PPQ 3737 Government Blvd., Suite 517 Mobile, AL 36693	P: 251-661-2742 (mobile workstation) F: 251-661-4381
Alabama	Lisa Lockhart (lisa.m.lockhart@usda.gov)	USDA–APHIS–PPQ 2278 CO RD 19 N Prattville, AL 36067	C: 334-850-3139 P: 205-755-2707
Alabama	Chalin Street (chalin.b.street@usda.gov)	USDA–APHIS–PPQ 7165 Londonderry Drive Mobile, AL 36695	P: 251-331-3757
Alaska	Refer to Washington.	—	—
Arizona	Samuel Killday (samuel.killday@usda.gov)	USDA-APHIS-PPQ 3640 E Wier Ave Phoenix, AZ 85040	P: 602-341-9879
Arkansas	Thomas Hill (thomas.e.hill@usda.gov)	USDA–APHIS–PPQ 1200 Cherry Brook Dr., Suite 100 Little Rock, AR 72211	P: 501-324-5258 F: 501-324-5230

State	Contact:	Address:	Phone/Cell/Fax:
California	Helene Wright, SPHD (helene.r.wright@usda.gov)	USDA–APHIS–PPQ 650 Capitol Mall, Suite 7-400 Sacramento, CA 95814-4712	P: 279-300-5200 F: 279-300-5240
California	Andrew Vandergrift (andrew.vandergrift@usda.gov)	USDA–APHIS–PPQ Plant Inspection Station 9795 Via de la Amistad San Diego, CA 92154	C: 540-588-4101 P: 619-661-3029
California	Musa Abdelshife (musa.a.abdelshife@usda.gov)	USDA–APHIS–PPQ Plant Inspection Station 222 Kansas St. El Segundo, CA 90245	P: 310-955-3281 F: 310-955-3347
California	Luis E. Oquendo Diaz (luis.e.oquendo@usda.gov)	USDA–APHIS–PPQ 650 Capitol Mall, Suite 7-400 Sacramento, CA 95814	P: 909-283-2123
Colorado	Elvir Tenic (elvir.tenic@usda.gov)	USDA–APHIS–PPQ 3950 North Lewiston St., Suite 104 Aurora, CO 80011	P: 720-762-9733
Commonwealth of the Northern Mariana Islands (CNMI)	Refer to Guam.	—	—
Connecticut	Charles Baker (charles.e.baker@usda.gov)	USDA–APHIS–PPQ 97 Barnes Road, Unit 200 Wallingford, CT 06492	P: 203-741-5656 F: 203-741-5660
Delaware	Darryl Moore (darryl.c.moore@usda.gov)	USDA–APHIS–PPQ 500 W. Loockerman St. #310 Dover, DE 19904	P: 302-678-5868 F: 302-734-7814
Delaware	Mark Johnston (mark.r.johnston@usda.gov)	→	P: 302-652-1642 F: 302-652-1645
District of Columbia	Refer to Maryland.	—	—
Florida	Cody Matthews, Central Florida Area Director (cody.matthews@usda.gov)	USDA–APHIS–PPQ Plant Inspection Station 3951 Centerport St. Orlando, FL 32827	P: 407-541-6711 F: 407-541-6730
Georgia	Jamie Arrington (jamie.arrington@agr.georgia.gov)	Plant Protection Section Georgia Department of Agriculture 1109 Experiment Street Redding Building, Room 213 Griffin, GA 30223	P: 404-586-1140
Georgia	Philip Bailey (philip.a.bailey@usda.gov)	USDA–APHIS–PPQ 1506 Klondike Road Suite 306 Conyers, GA 30094	P: 770-860-4025 F: 770-860-4050
Guam	Michael (Troy) Brown (michael.t.brown@usda.gov)	USDA–APHIS–PPQ 17-3306 Neptune Avenue Barrigada, GU 96913	P: 671-475-0854 F: 671-475-0853
Hawaii	Matthew Goo (matthew.y.goo@usda.gov)	USDA–APHIS–PPQ Honolulu International Airport 300 Rogers Blvd. #58 Honolulu, HI 96819	P: 808-834-3240 F: 808-861-8500
Idaho	Robert Gourley, SPHD (robert.b.gourley@usda.gov)	USDA–APHIS–PPQ 9118 W. Blackeagle Dr. Boise, ID 83616	P: 208-373-1600 C: 208-351-8911
Illinois	Laura Ettema-Khan (laura.ettema-khan@usda.gov)	USDA–APHIS–PPQ 1817 South Neil St. Illinois Plaza, Suite 105 Champaign, IL 61820	P: 217-398-1698 F: 217-398-1732

State	Contact:	Address:	Phone/Cell/Fax:
Illinois	Greg Rentschler, SPHD (greg.j.rentschler@usda.gov)	USDA–APHIS–PPQ 2300 E Devon Ave., Suite 210 Des Plaines, IL 60018	P: 847-699-2417 C: 847-924-5818
Indiana	Jason Allen, SPHD (jason.m.allen@usda.gov)	USDA–APHIS–PPQ 1305 Cumberland Ave. Suite 102 West Lafayette, IN 47906	P: 206-450-9805
Indiana	Tim Vawryk, PPQ Officer (timothy.s.vawryk@usda.gov)	USDA–APHIS–PPQ 131 East Court Ave. LL1 Jeffersonville, IN 47130	P: 812-282-6370 F: 812-282-6381
Iowa	Mark Hollister, SPHD (mark.g.hollister@usda.gov)	USDA–APHIS–PPQ 11213 Aurora Ave. Urbandale, IA 50322	P: 515-251-4083 C: 515-371-1178 F: 515-251-4093
Kansas	Refer to Nebraska.	—	—
Kentucky	Brian Zaborski (brian.zaborski@usda.gov)	For UPS **only**: USDA–APHIS–PPQ 1973 Burlington Pike Burlington, KY 41005 For USPS: USDA–APHIS–PPQ P.O. Box 475 Hebron, KY 41048	C: 513-514-9693 F: 502-543-1609
Louisiana	Joseph Bravata, SPHD (joseph.j.bravata@usda.gov)	USDA–APHIS–PPQ 4354 S.Sherwood Forest Blvd. Baton Rouge, LA 70816	P: 225-298-5425 F: 504-715-9535
Maine	Rachel S. Nyce, SPHD (rachel.s.nyce@usda.gov)	USDA–APHIS–PPQ 15 Iron Rd., Suite 1 Hermon, ME 04401	P: 207-848-0008 C: 207-409-3325
Maryland	Darryl Moore (darryl.c.moore@usda.gov)	USDA–APHIS–PPQ 500 W. Loockerman St. #310 Dover, DE 19904	P: 302-678-5868 F: 302-734-7814
Massachusetts	Refer to Connecticut.	—	—
Michigan	David Burt (david.m.burt@usda.gov)	USDA–APHIS–PPQ 3200 Eagle Park Drive NE Suite 100D Grand Rapids, MI 49525	P: 616-222-5865 C: 734-732-2947 F: 833-967-0225
Minnesota	William Farhat, SPHD (william.farhat@usda.gov)	USDA–APHIS–PPQ 900 American Blvd., East Suite 204 Bloomington, MN 55420	C: 763-620-9301 F: 952-814-1073
Mississippi	Chad Wetzel (chad.w.wetzel@usda.gov)	USDA–APHIS–PPQ 2159 Henry Hill Dr., Suite 100B Jackson, MS 39204	P: 601-922-1417 C: 251-277-1532 F: 601-922-7648
Missouri	Brian R. Deschu (brian.r.deschu@usda.gov)	USDA–APHIS–PPQ 1715 Southridge Dr. Jefferson City, MO 65109	P: 573-893-6833 F: 573-216-0657
Montana	Joey Esilva (joey.esilva@usda.gov)	USDA–APHIS–PPQ 1220 Cole Ave. Helena, MT 59601	P: 406-449-5210 F: 406-449-5212
Nebraska	Craig A. Webb, Ph.D., SPHD (craig.a.webb@usda.gov)	USDA–APHIS–PPQ 1131 SW Winding Rd., Suite A Topeka, KS 66615 USDA–APHIS–PPQ 5940 S. 58th St. Lincoln, NE 68516	P: 785-228-6551 (KS) C: 785-633-9117 P: 402-434-2346 (NE)

State	Contact:	Address:	Phone/Cell/Fax:
Nevada	Peter Rockermann (peter.rockermann@usda.gov)	USDA–APHIS–PPQ 8775 Technology Way Reno, NV 89521	P: 775-851-8818 C: 775-484-0762
New Hampshire	Connor Shaughnessy, PHSS (connor.j.shaughnessy@usda.gov)	USDA–APHIS–PPQ 629 Calef Highway, Suite 204 Epping, NH 03402	C: 508-320-2026
New Jersey	Matthew Parkinson (matthew.d.parkinson@usda.gov)	USDA–APHIS–PPQ 10 High St. P.O. Box 154 Mullica Hill, NJ 08062	P: 856-478-9740 F: 856-478-0128
New Mexico	Shawn Carson (shawn.r.carson@usda.gov)	USDA–APHIS–PPQ 270 South 17th St. Las Cruces, NM 88005	P: 575-527-6985
New York	Thomas DeSisto (thomas.m.desisto@usda.gov)	USDA–APHIS–PPQ 2044 Route 32, Suite 2 Modena, NY 12548	P: 845-244-6052 F: 845-264-2552
North Carolina	Sheena Stanley (sheena.stanley@usda.gov)	USDA–APHIS–PPQ 1815 Gardner Dr. Wilmington, NC 28405	P: 910-515-6017
North Dakota	Amy Mesman, SPHD (amy.mesman@usda.gov)	USDA–APHIS–PPQ 3509 Miriam Ave., Suite A Bismarck, ND 58501	P: 701-250-4473 F: 701-250-4640
Ohio	Rachael Browne (rachael.browne@usda.gov)	USDA–APHIS–PPQ 8995 East Main St. Reynoldsburg, OH 43068	P: 614-322-4701
Oklahoma	Jonathan Motloch (jonathan.motloch@usda.gov)	USDA–APHIS–PPQ 301 N.W. 6th St., Suite 101 Oklahoma City, OK 73102	P: 405-609-8842 F: 405-609-8841
Oregon	Colin Park (colin.g.park@usda.gov)	USDA–APHIS–PPQ 6035 NE 78th Court Portland, OR 97218	P: 503-983-6521
Pennsylvania	Michele McDonald, PHSS (michele.l.mcdonald@usda.gov)	USDA–APHIS–PPQ 121 Locust St. Wrightsville, PA 17368	P: 717-574-2882 P: 215-768-4841
Puerto Rico	Contact PEQ Coordinator.	—	—
Rhode Island	Refer to Connecticut.	—	—
South Carolina	Heather Russell (heather.n.russell@usda.gov)	USDA–APHIS–PPQ 4600 Goer Drive, Suite 104 Charleston, SC 29406	P: 864-346-4410
South Dakota	Amy Mesman, SPHD (amy.mesman@usda.gov)	USDA–APHIS–PPQ 314 South Henry, Suite 200 P.O. Box 250 Pierre, SD 57501-0250	P: 605-224-1713 F: 605-494-0534
Tennessee	Paul Allyn (paul.d.allyn@usda.gov)	USDA–APHIS–PPQ 1410 Kensington Square Ct. Suite 101 Murfreesboro, TN 37130	P: 615-907-7804 C: 615-566-1204 F: 615-907-8168
Texas	Erin Foley (erin.k.foley@usda.gov)	USDA–APHIS–PPQ 903 San Jacinto Blvd. Suite 270 Austin, TX 78701	P: 512-583-4817
U.S. Virgin Islands	Diana Collingwood (diana.collingwood@doa.vi.gov)	RR1 Box 10345 Kingshill, VI 00850	P: 340-642-9027
Utah	Gregory Abbott (gregory.c.abbott@usda.gov)	USDA–APHIS–PPQ 65 South 100 East Richfield, UT 84701	P: 435-896-4772 F: 435-896-8164
Vermont	Lindsay Modesto (lindsay.modesto@usda.gov)	USDA–APHIS–PPQ 222 Holiday Drive Building 2, Suite 1 White RIver Junction, VT 05001	P: 802-369-3207

State	Contact:	Address:	Phone/Cell/Fax:
Virginia	Karen Williams (karen.a.williams@usda.gov) Dennis Heltzel (dennis.l.heltzel@usda.gov)	USDA–APHIS–PPQ 200 Granby Mall Federal Bldg., Rm. 331 Norfolk, VA 23510	P: 757-441-3211 F: 757-441-6267
Washington	Ricky Corder (ricky.f.corder@usda.gov)	USDA–APHIS–PPQ 835 S.192nd St., Suite 1600 Seatac, WA 98148	P: 206-878-6600 F: 206-870-8043
West Virginia	Justin Thaxton (justin.b.thaxton@usda.gov)	USDA–APHIS–PPQ 1900 Kanawha Blvd. East Charleston, WV 25305	P: 304-343-8585 F: 304-343-8586
Wisconsin	Ellen M. Natzke (ellen.m.natzke@usda.gov)	USDA–APHIS–PPQ 1 Gifford Pinchot Dr. Building 1, Room 229 Madison, WI 53726	P: 608-286-3610
Wyoming	Jeremy Newland (jeremy.j.newland@usda.gov)	USDA–APHIS–PPQ 5252 Yellowstone Road Suite 208 Cheyenne, WY 82009	P: 307-432-7979 C: 307-421-1202
Wyoming	Bruce Shambaugh, SPHD (bruce.a.shambaugh@usda.gov)	USDA–APHIS–PPQ 5252 Yellowstone Road Suite 208 Cheyenne, WY 82009	P: 307-432-7979 C: 307-421-4641

Appendix B

Plant Inspection Stations

Contents

Listings

Table B-1 Directory of Plant Inspection Stations

Region:	Address:	Phone/Fax:
Eastern	USDA–APHIS–PPQ Plant Inspection Station P.O. Box 660520 Miami, FL 33266	Phone: 305-526-3900 Fax: 305-871-4205
	USDA–APHIS–PPQ Plant Inspection Station 3951 Centerport St. Orlando, FL 33122	Phone: 407-825-4237 Fax: 407-825-4235
	USDA–APHIS–PPQ Atlanta Plant Inspection Station 1220 Toffie Terrace Atlanta, GA 30354	Phone: 404-260-7830 Fax: 404-260-7832
	USDA–APHIS–PPQ Memorial Inspection Station 2500 Brunswick Ave., Bldg. G Linden, NJ 07036	Phone: 908-862-2012 Fax: 908-862-2095
	USDA–APHIS–PPQ Plant Inspection Station 230-59 International Airport Centers Blvd. Building C-Suite 100-Room 109 Jamaica, NY 11413	Phone: 718-553-3500 Fax: 718-553-3510
	USDA–APHIS–PPQ Plant Inspection Station 150 Central Sector, Bldg. C2, Warehouse #3 Carolina, PR 00979	Phone: 787-253-7850 Fax: 787-253-4514
Western	USDA–APHIS–PPQ Plant Inspection Station 9 North Grand Ave., Room 120 Nogales, AZ 85621	Phone: 520-287-6463 Fax: 520-397-0138
	USDA–APHIS–PPQ Plant Inspection Station 9777 Via de la Amistad, Rm. 140 San Diego, CA 92154	Phone: 619-661-3316 Fax: 619-661-3047

Region:	Address:	Phone/Fax:
Western	USDA–APHIS–PPQ Plant Inspection Station 560 Eccles Avenue South San Francisco, CA 94080	Phone: 650-876-9093 Fax: 650-876-9008
	USDA–APHIS–PPQ Plant Inspection Station 222 Kansas St. El Segundo, CA 90245	Phone: 310-955-3258 Fax: 310-321-0035
	USDA–APHIS–PPQ Plant Inspection Station 17-3306 Neptune Avenue Barrigada, GU 96913	Phone: 671-475-1427 Fax: 671-477-9487
	USDA–APHIS–PPQ Plant Inspection Station 300 Rodgers Blvd., #58 Honolulu, HI 96819	Phone: 808-834-3240 Fax: 808-861-8501
	USDA–APHIS–PPQ Plant Inspection Station 900 E. Airline Hwy., Service Rd. A Kenner, LA 70063	Phone: 504-464-0430 Fax: 504-465-0968
	USDA–APHIS–PPQ Plant Inspection Station 19581 Lee Rd. Humble, TX 77338	Phone: 281-982-9540 Fax: 281-230-7223
	USDA–APHIS–PPQ Plant Inspection Station (Brownsville) P.O. Drawer 393 100 Los Indios Blvd. Los Indios, TX 78567	Phone: 956-399-2085 Fax: 956-399-4001
	USDA–APHIS–PPQ Plant Inspection Station 835 S. 192nd St., Suite 1600 SeaTac, WA 98148	Phone: 206-878-6600 Fax: 206-870-8043

Appendix C

Directory of SPROs and State PEQ Contacts

Contents

Introduction

The following list includes contact information for State and Territory Plant Regulatory Officials (SPRO) and State PEQ Contacts. Plant Inspection Stations (PIS) should use this list when determining who to contact and to whom PEQ forms and correspondence should be sent, i.e., PPQ Form 236 for the State Contacts (copies number 3, 4, 5, and 6). A list of PPQ Liaison Officers for each State can be found in the Directory of PPQ Postentry Quarantine Liaison Officers.

National Plant Board

What is the National Plant Board?[1]

The National Plant Board is a nonprofit organization of the plant pest regulatory agencies of each of the states and Commonwealth of Puerto Rico. Member agencies **must** be members in good standing of the regional plant board in which their state or commonwealth is located.

Purpose[2]

Purposes of the National Plant Board as stated in its Articles of Incorporation include:

1. To provide national representation for the Eastern Plant Board, the Southern Plant Board, the Central Plant Board, and the Western Plant Board, and to receive, consider and implement to the extent possible, all regional plant board recommendations.

[1] This information was retrieved from the National Plant Board website.
[2] *Id.*

2. To foster effective and harmonized plant health programs; to act as an information clearinghouse on plant pest prevention and regulatory matters; to provide for a discussion of principles, policies and methods; and to make recommendations to the regional boards for the promotion of efficiency, harmony and uniformity in and among the states in the field of plant pest prevention and regulation.
3. To collaborate and communicate effectively with public and private agencies and organizations on plant health and plant pest regulatory issues which affect the states.
4. To protect agriculture, horticulture, forestry, and the environment on state, national and international levels.

The National Plant Board Members[3]

Membership of the National Plant Board is made up of the principal plant pest regulatory officials of each member Commonwealth and State. This person is usually the administrator of the section of his or her state's Department of Agriculture that deals with pest prevention. Such units usually carry titles such as Plant Industry, Plant Health, Entomologist, State Plant Pathologist, etc. In some States the function is in an agency **other than** the department of agriculture.

Listings

Table C-1 Directory of State Plant Regulatory Officials and State PEQ Contacts

State:	Contact:	Address:	Phone/Cell/Fax:
Alabama	Christel F. Harden, SPRO Plant Pest Administrator (christel.harden@agi.alabama.gov)	Alabama Department of Agriculture and Industries 1445 Federal Drive Montgomery, AL 36107	P: 334-240-7226 F: 334-240-7168
Alabama	Jim Preast (jim.preast@agi.alabama.gov)	23849 Common Oak Drive Loxley, AL 36551	P: 334-300-0854
Alabama	Tim Johnson Plant Protection Inspector (ptimjohn@aol.com)	P.O. Box 764 Moulton, AL 35650	P: 334-850-7736
Alaska	Mia Kirk (mia.kirk@alaska.gov)	1801 S. Margaret Drive Suite 12 Palmer, AK 99645	P: 907-767-3866 C: 907-795-9209 F: 907-745-7112
Arizona	Jack Peterson (jpeterson@azda.gov)	Arizona Department of Agriculture Plant Services Division 1688 West Adams Street Phoenix, AZ 85007	P: 602-542-3575 F: 602-542-1004
Arkansas	Paul Shell (paul.shell@agriculture.arkansas.gov)	1 Natural Resources Drive P.O. Box 1069 Little Rock, AR 72203	P: 501-225-1598 F: 501-225-3590
California	Victoria Hornbaker (victoria.hornbaker@cdfa.ca.gov) (permits@cdfa.ca.gov)	CA Department of Food & Agriculture Plant Health & Pest Prevention Services Permits and Regulation Environmental Compliance/PDAS 1220 N Street Sacramento, CA 95814	P: 916-262-1100 P: 916-261-1498

[3] *Id.*

State:	Contact:	Address:	Phone/Cell/Fax:
Colorado	Wondirad Gebru (wondirad.gebru@state.co.us)	Colorado Department of Agriculture Division of Plant Industry 305 Interlocken Parkway Broomfield, CO 80021	P: 303-869-9052 F: 303-466-2860
Commonwealth of the Northern Mariana Islands (CNMI)	Michael (Troy) Brown (michael.t.brown@usda.gov)	USDA, APHIS, PPQ 17-3306 Neptune Avenue Barrigada, GU 96913	P: 671-475-0854 F: 671-475-0853
Connecticut	Victoria Smith (victoria.smith@ct.gov)	The CT Agricultural Experiment Station 123 Huntington Street New Haven, CT 06511	P: 203-974-8474
Delaware	Jessica Inhof, SPRO (jessica.inhof@delaware.gov)	Delaware Dept. of Agriculture Plant Industries Section 2320 South DuPont Highway Dover, DE 19901	P: 302-698-4500 F: 302-697-6287
District of Columbia	Matthew A. Travis, SPHD (matthew.a.travis@usda.gov)	USDA, APHIS, PPQ 2200 Broening Highway, Suite 140 Baltimore, MD 21224	P: 410-631-0073 F: 410-631-0069 C: 410-977-7214
Florida	Cheryl Jones (Cheryl.Jones@FDACS.gov)	Florida Dept. of Agriculture and Consumer Services Division of Plant Industry P.O. Box 147100 1911 Southwest 34th Street Gainesville, FL 32614-7100	P: 352-395-4708 F: 352-395-4619
Georgia	Carl Lightfoot, SPHD (carl.w.lightfoot@usda.gov)	USDA, APHIS, PPQ 1506 Klondike Road, Suite 306 Conyers, GA 30094	P: 770-860-4023 F: 770-860-4050
Georgia	Mike Evans, SPRO (mike.evans@agr.georgia.gov)	Plant Protection Section Georgia Department of Agriculture 1109 Experiment Street Redding Building, Room 213 Griffin, GA 30223	P: 404-586-1140
Guam	Dr. Glenn Dulla (glenn.dulla@doag.guam.gov)	Guam Department of Agriculture USDA Plant Inspection Station 17-3306 Neptune Avenue Barrigada, GU 96913	P: 671-486-6205
Hawaii	Jonathan K. Ho, Acting Manager (jonathan.k.ho@hawaii.gov)	Hawaii Department of Agriculture 1849 Auiki Street Honolulu, HI 96819	P: 808-832-0566 F: 808-832-0584
Idaho	Andrea Thompson (andrea.thompson@isda.idaho.gov)	Division of Plant Industries Idaho State Dept. of Agriculture P.O. Box 790 Boise, ID 83701-0790	P: 208-332-8620
Illinois	Scott Schirmer, Nursery & Northern Field Office Section Manager, SPRO (scott.schirmer@illinois.gov)	Illinois Dept. of Agriculture Bureau of Environmental Programs DeKalb Field Office 2280 Bethany Road, Suite B DeKalb, IL 60115	P: 815-787-5476 C: 708-638-9562 F: 815-787-5488
Indiana	Megan Abraham (mabraham@dnr.in.gov)	Indiana Dept. of Natural Resources Division of Entomology & Plant Pathology 402 West Washington Street Room 290W Indianapolis, IN 46204	P: 317-232-4189 F: 317-232-2649

State:	Contact:	Address:	Phone/Cell/Fax:
Iowa	Robin Pruisner (robin.pruisner@IowaAgriculture.gov)	Iowa Dept. of Agriculture & Land Stewardship State Entomologist 2230 South Ankeny Boulevard Ankeny, IA 50023	P:515-725-1470
Kansas	Jeff Vogel	Kansas Dept. of Agriculture Plant Protection and Weed Control Forbes Field, Bldg. 282 P.O. Box 19282 Topeka, KS 66619	P: 785-862-2180 F: 785-862-2182
Kentucky	Joe Collins (joe.collins@uky.edu)	University of Kentucky Department of Entomology Agricultural Science Bldg. N, Rm. S225 Lexington, KY 40546	P: 859-257-5838 F: 859-257-3807
Louisiana	Tina Peltier (tpeltier@ldaf.state.la.us)	Louisiana Dept. of Agriculture & Forestry 5825 Florida Boulevard Suite 3002 Baton Rouge, LA 70821-3596	P: 225-952-8100 F: 225-237-5571
Maine	Sarah Scally (sarah.h.scally@maine.gov)	Maine Dept. of Agriculture Conservation and Forestry 28 State House Station Augusta, ME 04333	P: 207-287-3891 F: 207-287-5576
Maryland	Jaime Tsambikos (jaime.tsambikos@maryland.gov)	Nursery Inspection Program Supervisor Plant Protection & Weed Management Maryland Department of Agriculture 50 Harry S. Truman Parkway Annapolis, MD 21401	P: 410-841-5920 C: 443-571-2974
Massachusetts	Taryn LaScola (Taryn.LaScola@state.ma.us)	Massachusetts Dept. of Agricultural Resources 251 Causeway Street, Suite 500 Boston, MA 02114	
Michigan	Molly Mott (mottm@michigan.gov)	MDA and Rural Development Pesticide and Plant Pest Management P.O. Box 30017 Lansing, MI 48909	P: 248-521-0501 F: 517-335-4540
Minnesota	Mark Abrahamson, SPRO (mark.abrahamson@state.mn.us)	Minnesota Dept. of Agriculture Plant Protection Division 625 Robert Street North Saint Paul, MN 55155-2538	P: 651-201-6505
Mississippi	Mississippi Dept. of Agriculture and Commerce (Kenneth@mdac.state.ms.us)	Bureau of Plant Industry P.O. Box 5207 Mississippi State, MS 39762	P: 662-325-7765 F: 662-325-0397
Missouri	Rosalee Knipp, State Entomologist (rosalee.knipp@mda.mo.gov)	Plant Industries Division Missouri Dept. of Agriculture P.O. Box 630 Jefferson City, MO 65102-0630	P: 573-751-5505 F: 573-522-1109
Montana	Elizabeth (Beth) Eiring (eeiring@mt.gov)	Montana Department of Agriculture P.O. Box 200201 Helena, MT 59620-0201	P: 406-444-9066 F: 406-444-5409
Nebraska	Julie Van Meter	Nebraska Department of Agriculture 301 Centennial Mall South P.O. Box 94756 Lincoln, NE 68509-4756	P: 402-471-2351 F: 402-471-6892

State:	Contact:	Address:	Phone/Cell/Fax:
Nevada	Ashley Jeppson (ajeppson@agri.nv.gov)	Nevada Dept. of Agriculture Plant Industry 405 South 21st Street Sparks, NV 89431	P: 775-353-3729 F: 775-688-1178
New Hampshire	Chris Rallis (crallis@agr.state.nh.us)	NH Dept. of Agriculture, Markets, & Food State Laboratory Building D 6 Hazen Drive Concord, NH 03301	P: 603-271-3691 F: 603-271-3692
New Jersey	Joseph Zoltowski (joseph.zoltowski@ag.state.nj.us)	Division of Plant Industry New Jersey Dept. of Agriculture P.O. Box 330 Trenton, NJ 08625	P: 609-292-5440
New Mexico	Ryan Hiles (rhiles@nmda.nmsu.edu)	Bureau of Entomology and Nursery Industries New Mexico Dept. of Agriculture MSC, 3BA P.O. Box 30005 Las Cruces, NM 88003-0005	P: 575-646-3207 F: 575-646-5977
New York	Michael Dorgan, Assistant Director (michael.dorgan@agriculture.ny.gov)	Division of Plant Industry New York Dept. of Agriculture and Markets 10 B Airline Drive Albany, NY 12235	P: 516-315-9003
North Carolina	Joy Goforth (joy.goforth@ncagr.gov)	North Carolina Dept. of Agriculture and Consumer Services 1060 Mail Service Center Raleigh, NC 27699-1060	P: 919-707-3573
North Dakota	Charles Elhard, SPRO (celhard@nd.gov)	North Dakota Dept. of Agriculture 600 East Boulevard Avenue, Dept. 602 Bismarck, ND 58505-0020	P: 701-220-0485
Ohio	Dan Kenny (dkenny@agri.ohio.gov)	Ohio Dept. of Agriculture Plant Pest Control Section 8995 East Main Street Reynoldsburg, OH 43068	P: 614-728-6400 F: 614-728-6453
Oklahoma	Kaci Hubbell (kaci.hubbell@ag.ok.gov)	2800 North Lincoln Blvd. Oklahoma City, OK 73105	P: 405-522-5971 C: 405-206-7594
Oregon	Kara Mills, Lead Horticulturist (kara.mills@oda.oregon.gov)	Oregon Dept. of Agriculture–Nursery & Christmas Tree Program 635 Capital Street, NE Salem, OR 97301-2532	P: 503-983-6521
Pennsylvania	Michael Hutchinson (mhutchinso@pa.gov)	Bureau of Plant Industry Pennsylvania Dept. of Agriculture 2301 North Cameron Street Harrisburg, PA 17110	P: 717-772-5229 F: 717-783-3275
Puerto Rico	Nilda Perez (sanidadvegetal@prtc.net)	Puerto Rico Dept. of Agriculture P.O. Box 10163 San Juan, PR 00908-1163	P: 787-724-4627 F: 787-724-6955
Rhode Island	Ken Ayars (ken.ayars@dem.ri.gov)	RI DEM Division of Agriculture 235 Promenade Street, Rm. 370 Providence, RI 02908	P: 401-222-2781 ext. 4500
South Carolina	Steven H. Long (slong2@clemson.edu)	Department of Plant Industry Clemson University 511 Westinghouse Road Pendleton, SC 29670	P: 864-646-2135

State:	Contact:	Address:	Phone/Cell/Fax:
South Dakota	Brenda Sievers, SPRO (brenda.sievers@usda.gov)	Plant Industry Program Division of Regulatory Services South Dakota Dept. of Agriculture 523 E. Capitol Pierre, SD 57501-3185	P: 605-773-3796
Tennessee	Anni Self (anni.self@state.tn.us)	Ellington Agricultural Center P.O. Box 40627, Melrose Station 440 Hogan Road, Porter Bldg. Nashville, TN 37204	P: 615-837-5313 F: 615-837-5246
Texas	Awinash Bhatkar (awinash.bhatkar@texasagriculture.gov)	Texas Department of Agriculture P.O. Box 12847 Austin, Texas 78711	P: 512-463-5025 F: 888-215-5385
U.S. Virgin Islands	Leyinska Wiscovitch, State Plant Health Director (leyinska.wiscovitch@usda.gov)	USDA–APHIS–PPQ 654 Muñoz Rivera Ave. Plaza Building, Suite 700 San Juan, PR 00918	P: 787-919-0585 F: 787-771-3613
Utah	→	Utah Dept. of Agriculture and Food Plant Industry 350 North Redwood Road P.O. Box 146500 Salt Lake City, UT 84116-6500	P: 801-538-7184 F: 801-538-7126
Vermont	Judy Rosovsky, State Entomologist (judy.rosovsky@vermont.gov)	PHARM Division 163 Admin Drive Randolph Center, VT 05061	P: 802-279-2212
Virginia	David Gianino (david.gianino@vdacs.virginia.gov)	Virginia Dept. of Agriculture and Consumer Services P.O. Box 1163 Richmond, VA 23218	P: 804-786-3515
Washington	Benita Matheson, Plant Services Program Supervisor (bmatheson@agr.wa.gov)	Washington State Dept. of Agriculture Plant Protection Division P.O. Box 447 Ephrata, WA 98823	P: 360-410-1260
West Virginia	Tim Brown (tlbrown@wvda.us)	WVDA—Plant Industries Division 1900 Kanawha Boulevard East Charleston, WV 25305-0191	P: 304-558-2212 F: 304-558-2435
Wisconsin	Shanon Hankin (shanon.hankin@wisconsin.gov)	Wisconsin Dept. of Agriculture, Trade, & Consumer Protection P.O. Box 8911 Madison, WI 53708-8911	P: 608-224-4576 F: 608-224-4656
Wyoming	Kent Drake (kent.drake@wyo.gov)	Wyoming Department of Agriculture 2219 Carey Avenue Cheyenne, WY 82002	P: 307-777-6574 F: 307-640-1205

Appendix D

Violations of the Postentry Growing Agreement

Contents

Roles in Handling and Documenting Violations

This appendix details what the State Cooperator, Postentry Quarantine Liaison Officer, Representative of the Postentry Quarantine Program (PEQP), local Investigative and Enforcement Services (IES) Investigator, and State Plant Health Director (SPHD) do when a State Cooperator detects a violation of the Postentry Growing Agreement (PPQ Form 546).

NOTICE

The SPHD and/or the PEQP decides whether to request that the permit unit revoke a company's or individual's postentry permit. Moreover, the SPHD decides, with input from the Liaison Officer, IES Enforcement Operations, and State Cooperator, whether it is more appropriate to issue a warning letter or pursue prosecution.

1. The State Cooperator detects the violation. The following are violations of the Postentry Growing Agreement (PPQ Form 546):
    A. The cooperator finds plants growing on premises **not** controlled by the person or company who signed the Agreement. If there was approval from the State and the National Coordinator for Postentry Quarantine in Beltsville, MD, or, for Hawaii, Guam, and CNMI, the Postentry Coordinator in Honolulu, HI to move the plants, no violation occurred.
    B. The person who signed the Postentry Growing Agreement, or a representative of the company signing the Agreement, refuses to allow a cooperator on the premises during the cooperator's normal business hours.
    C. The cooperator finds quarantined plant(s) or any material propagated from these plants unlabeled or with inappropriate labeling. The label **must** show the plant name, the port accession number, and the importation date.
    D. The cooperator finds other postentry genera or domestic plants of the same genus planted within 3 meters (approximately 10 feet) of the postentry plants.

E. The cooperator learns that postentry plants have been propagated by seed or other propagules (e.g., air layers, cuttings, flowers, plants, or suckers) taken from the quarantined plants when there was no prior written approval by the State and the National Coordinator for Postentry Quarantine or, for Hawaii, Guam, and CNMI, the Postentry Coordinator.
F. The person who signed the Postentry Growing Agreement, or a representative of the company signing the Agreement, refuses to apply a treatment prescribed by the cooperator to eliminate pests on the quarantined plant material. Treatment may include destruction of the quarantined plant material when prescribed by the cooperator as the **only** way to eliminate pests.
G. The cooperator, using his or her best professional judgment, believes the person who signed the Postentry Growing Agreement, or a representative of the company signing the Agreement, failed to notify the State or Liaison Officer when that person had an opportunity to report a conspicuous abnormality in the plant material. The importer **must** also report the death of a plant or plants to the cooperator.
H. The cooperator learns that the person who signed the Postentry Growing Agreement, or a representative of the company signing the Agreement, failed to report an address change to the PEQP.
I. The cooperator finds plants of Rubus spp. from Europe growing outside or growing in an indoor facility with mesh larger than 16 mesh per inch or finds *Chrysanthemum* or *Dianthus* growing outside an enclosed building.
J. The cooperator finds some or all of the plants are unaccounted for before release at 6 months for *Chrysanthemum*, 1 year for *Dianthus*, or 2 years for the remaining postentry genera.
K. The cooperator detects any violations of restrictions listed in the permit.

2. If the State Cooperator detects an apparent pest risk, he or she eliminates the risk immediately. Such actions may include prescribing a treatment or supervising the destruction of the infested or infected plants.
3. The State Cooperator reports the violation and any action taken to eliminate pest risk to the Liaison Officer within 1 work day or the discovery of the violation.
4. The Liaison Officer informs the SPHD and either one will then issue an EAN (PPQ Form 523).

NOTICE

For **first-time** offenders a Letter of Information (LOI) can be used before issuing a PPQ Form 518, Report of Violation. The LOI may be issued instead of referring the matter to Investigative and Enforcement Services (IES) for investigation and possible issuance of civil or criminal penalties. The intent of the letter is to educate alleged noncompliant entities about APHIS regulations and their obligation to comply with them. The LOI may be used as the first step toward achieving compliance. In the event the violation continues and IES conducts a subsequent investigation, the LOI may be used as evidence to show the alleged violator had notice of regulatory requirements and may be considered aggravating factors to increase civil penalties. Details on preparing, issuing, communicating, and documenting a LOI can be found on the Compliance and Enforcement SharePoint website (for authorized users **only**).

1. The Liaison Officer and the IES Investigator meet with the State Cooperator to review the details of the violation. It would be favorable for the Liaison Officer, the State Cooperator, and the IES Investigator to visit the premises where the violation occurred.
2. Having the details of the violation, the Liaison Officer contacts the PEQP to give details of the incident.
3. The IES Investigator assembles a case file that includes affidavits from the State Cooperator, witnesses, and violator.
4. Once the case file is completed, the IES investigator writes a cover letter to transmit a copy of that file to the SPHD. The original investigative case file will be sent to the IES headquarters office in Riverdale, Maryland for review.
5. Following the guidelines of the Civil Penalty Action Team, the reviewer at the IES headquarters staff will submit an e-mail to the Coordinator, Postentry Quarantine Program and SPHD with a projected recommendation. The following are actions that may be appropriate forms of action:

    A. Official Warning Letter (APHIS Form 7060)
    B. Civil penalty
    C. Revocation of the Controlled Import Permit for Postentry Quarantine (CIP)
    D. Innovative terms (suspend a portion of the civil penalty provided training is provided by the violator)

Instructions for Completing a Report of Violation (PPQ Form 518)

While completing the form, the Liaison Officer will interview the State Cooperator to obtain a statement of the facts surrounding the alleged violation. The IES Investigator will interview all other parties including the violator and witnesses.

Block:	**Instruction:**
A. Date Violation Discovered	Enter the date the State Cooperator discovered the violation.
B. Reg/Compl. Agreement Violate	Enter the regulation violated. If it is a violation of the Postentry Growing Agreement, enter 7 CFR 319.37-23.
C. Where Intercepted	Enter the city and State where the violation was detected.
D. Origin of Article	Fill in the name of the country where the postentry material was originally grown.
E. Article Moved in Violation of Regulations	Enter “Material grown under postentry quarantine”.
F. Identity of Article	Enter the number and identity of the plants associated with the violation. If available, fill in both common and scientific name. Always enter the scientific name.
G. Name and Business Address of Violator	Fill in the violator’s name—usually this will be the name of the person who signed the Postentry Growing Agreement (in parentheses after the name, give the person’s position (e.g., owner, nurseryman, grower, salesperson)) and if appropriate, enter the violator’s business address.
H. Violator Had/If No, Violator was Aware of Regulation	Check and fill in as appropriate.

Block:	Instruction:
I. Violator Had/If No, Violator was Aware of Regulation	If the name of the violator and the name of the person signing the Postentry Growing Agreement are the same, check “Yes”
J. Violator Had/If No, Violator was Aware of Regulation	Write, “(name of violator) signed a Postentry Growing Agreement on (date signed) a copy of which is on file”.
K. Carrier Information	Draw a diagonal line through.
L. Carrier Information	Draw a diagonal line through.
M. Name and Business Address of Consignee	Cross out “NAME AND BUSINESS ADDRESS OF CONSIGNEE” and write, “ADDRESS OR LOCATION WHERE MATERIAL IS BEING GROWN”—ill in the complete address or, as accurate, a description of the property as practicable.
N. Disposition of Pest Risk	Fill in the action(s) taken to eliminate the pest risk, e.g., “the plants were rouged and incinerated,” or, “the plants were sprayed with (description of pesticide and how applied)”—if applicable, include the Emergency Action Notice as an attachment and reference in the Officer’s Statement.
O. Remarks	Fill in any pertinent remarks or the information from the continuation of another Block.
P. Violator or Carrier’s Statement of Violation	The IES Investigator will obtain an affidavit or statement from the violator and all other subjects once the investigation is underway.
Q. Liaison Officer’s Statement	Together with your State Cooperator, describe the violation on a separate sheet of paper; give this statement an exhibit number. A State Cooperator and/or a Liaison Officer’s Statement **must** be written and accompany each PPQ Form 518 submitted. Describe all the facts associated with the violation of the Postentry Growing Agreement. Write down all the facts including who, what, when, where, and how. Include the information in Figure D-1 when appropriate—Sign and date the Liaison Officer’s Statement (**only** this person signs). If more than one officer was involved in the violation, each officer must write a separate statement.
R. Signatures and Dates	Fill in as appropriate.
S. Signatures and Dates	Fill in as appropriate.
T. . Signatures and Dates	Fill in as appropriate.

Block:	**Instruction:**
U. Officer in Charge Comments	SPHD should fill in any additional information that may help to substantiate the case: e.g., specify any previous warning letters and the dates sent; list any known previous civil penalties, case numbers, dates, and amounts of penalties assessed—word this information as follows: “Case #RSS-CP-45-95 fined $1,000 on 03/07/06.” Recommend the appropriate action. Limit your recommendations to the following actions: • **No** action • Letter of warning • Civil penalty • Innovative terms • Revocation of the Controlled Import Permit for Postentry Quarantine (CIP)

LIAISON OFFICER'S STATEMENT PREPARATION

Officer's Statement Should Contain the following:

Your identity	**The violator's identity**
Full name	Full name(s)
Work address	Address
Phone number	Phone Number
Badge number	

Capture information on everyone involved i.e. State inspector.

WHAT HAPPENED?
Provide a full explanation of what happened. It is easiest to prepare the statement in chronological order, providing a step-by-step account of events. Consider the following questions:

- What commodity or organisms was involved
- What was the nature of the alleged violation?
- Are there records that show what happened?
- Are there any photographs to support you statement?

WHEN DID THIS OCCUR?
It is important to record the time/date of each event.

WHERE DID THIS OCCUR?
Give location details

- Physical addresses
- Mailing addresses

WHY DID THIS HAPPEN?
If able to determine, describe why. Examples:

- Not knowing the regulations
- Oversight
- Record what you know and what was said, not what you suspect

HOW?

- How did you discover the alleged violation(s)?
- How did the alleged violation(s) occur based upon observation or evidence?
- Be specific
- Avoid assumptions unless circumstantial evidence supports them.

IT'S CRUCIAL TO BE SPECIFIC ON ALL DETAILS:

Can someone else reading your narrative fully understand and explain what happened?

Figure D-1 Liaison Officer's Statement Preparation

Instructions for Conducting an Investigation and Assembling a Case File

The purpose of conducting an investigation is to substantiate that a violation took place. The Office of the General Counsel (OGC) will decide whether to prosecute a violation based on the results of the investigation and how well the case file was prepared. Only a sound investigation and well-prepared case file will result in a successful prosecution!

During the investigation, **do not** discuss any phase of the investigation with unauthorized persons (non-APHIS personnel) except for the State Cooperator(s) who initially detected the violation.

Once the PPQ Form 518 has been prepared, the officer's statement and any associate evidence (invoices, sales receipts/records, packing lists, photographs, Emergency Action Notification, Compliance Agreement, and any other pertinent records) should be submitted to the local IES investigator. Also, provide Postentry Permit copies, Postentry growing agreements (PPQ Form 546) and Notices of Arrival (PPQ Form 236).

Once a violation has been noted, always document what transpired. Collect evidence to corroborate the violation. If germane to your case, take photographs. Photographs make forceful evidence. When submitting photographs, write the date, description, and photographer's name on the back of the photograph or on a piece of paper onto which the photograph is mounted. Physical evidence such as counterfeit or forged labels on postentry plants, samples of propagules collected from postentry plants without permission, etc. should be assembled. If the physical evidence presents a risk, submit it so as to prevent disease dissemination—put it in a tightly closed plastic bag.

The IES investigator can obtain a statement or prepare an affidavit to enter as evidence for the investigative case report. The investigator will also obtain written statements from all persons who have knowledge of the violation.

IES Distribution of the Case File

When the IES investigator sends the case file to the IES staff in Riverdale, MD, he or she will make a copy for the SPHD.

Table D-1 Case File Responsibilities

If you are:	Then:
Liaison Officer	REPORT serious violations to the PEQU in Beltsville, MD within 1 work day of notification by the State Cooperator.
Liaison Officer	GIVE or SEND the originals of the evidence directly to the IES investigator or through your local SPHD.
State Plant Health Director (SPHD)	If you have additional information on earlier violations or anything else germane to this case, give a statement to the IES investigator.
State Plant Health Director (SPHD)	SEND a copy of the case file to the National Coordinator at the PEQU in Beltsville, MD.
The National Coordinator of the PEQP	REVIEW the case file.
The National Coordinator of the PEQP	NOTIFY the Permit Unit in Riverdale, MD.

If you are:	Then:
The National Coordinator of the PEQP	SERVE as advisor on the case to the IES staff in Riverdale, MD.

Appendix

E

Plant Genera Subject to Postentry Quarantine

Introduction

Please refer to the Plants for Planting – Postentry Quarantine (PEQ) Program and Plants Subject to PEQ ACIR Reference Document in the *Plants for Planting Manual* to determine plant genera that **must** be grown in postentry.

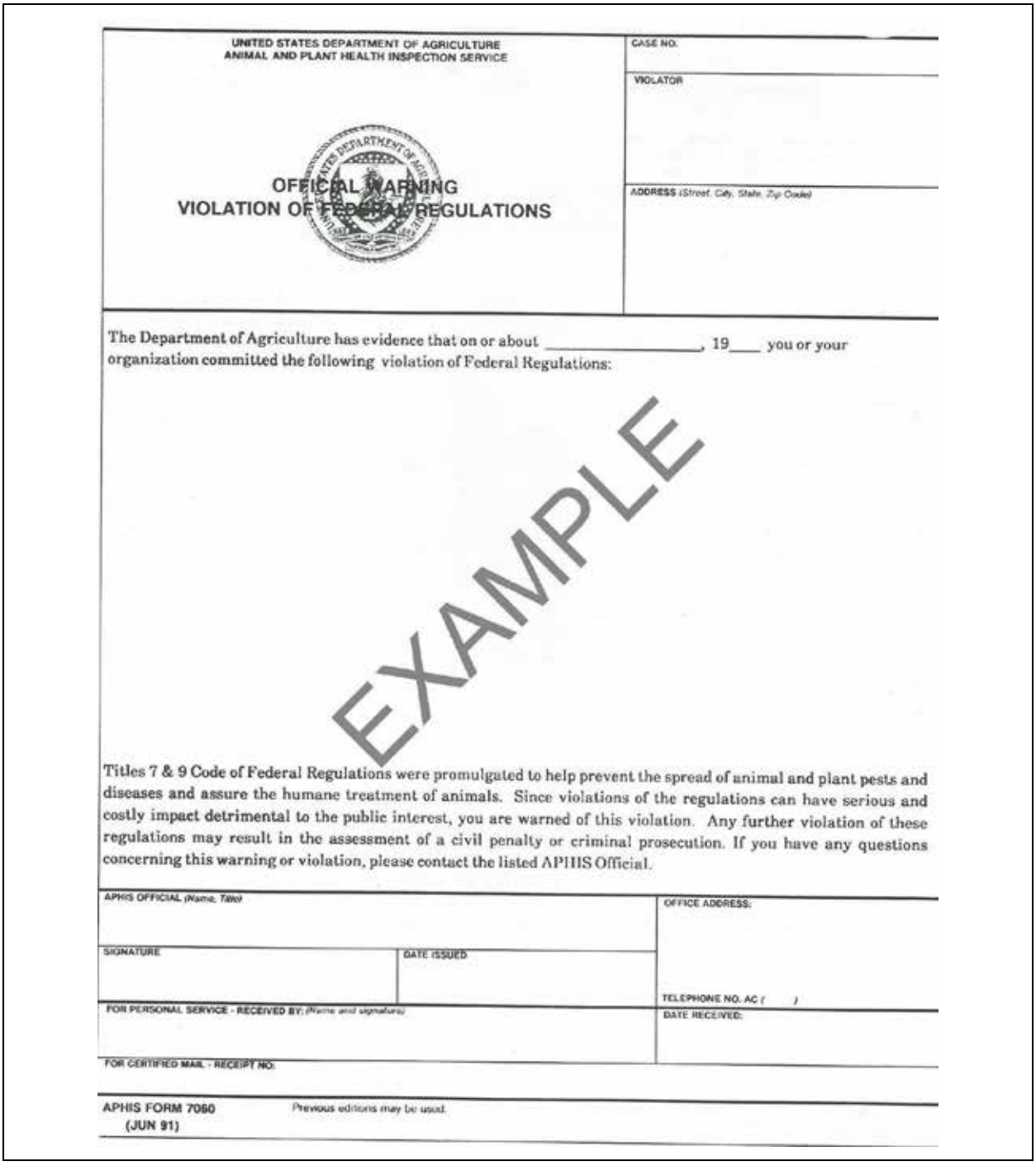
Appendix

F

Forms and Permits

Contents

APHIS Form 7060, Official Warning, Violation of Federal Regulations



UNITED STATES DEPARTMENT OF AGRICULTURE
ANIMAL AND PLANT HEALTH INSPECTION SERVICE

CASE NO.

VIOLATOR

ADDRESS (Street, City, State, Zip Code)

OFFICIAL WARNING
VIOLATION OF FEDERAL REGULATIONS

The Department of Agriculture has evidence that on or about _____, 19____ you or your organization committed the following violation of Federal Regulations:

EXAMPLE

Titles 7 & 9 Code of Federal Regulations were promulgated to help prevent the spread of animal and plant pests and diseases and assure the humane treatment of animals. Since violations of the regulations can have serious and costly impact detrimental to the public interest, you are warned of this violation. Any further violation of these regulations may result in the assessment of a civil penalty or criminal prosecution. If you have any questions concerning this warning or violation, please contact the listed APHIS Official.

APHIS OFFICIAL (Name, Title)

OFFICE ADDRESS:

SIGNATURE

DATE ISSUED

TELEPHONE NO. AC ( )

FOR PERSONAL SERVICE - RECEIVED BY: (Name and signature)

DATE RECEIVED:

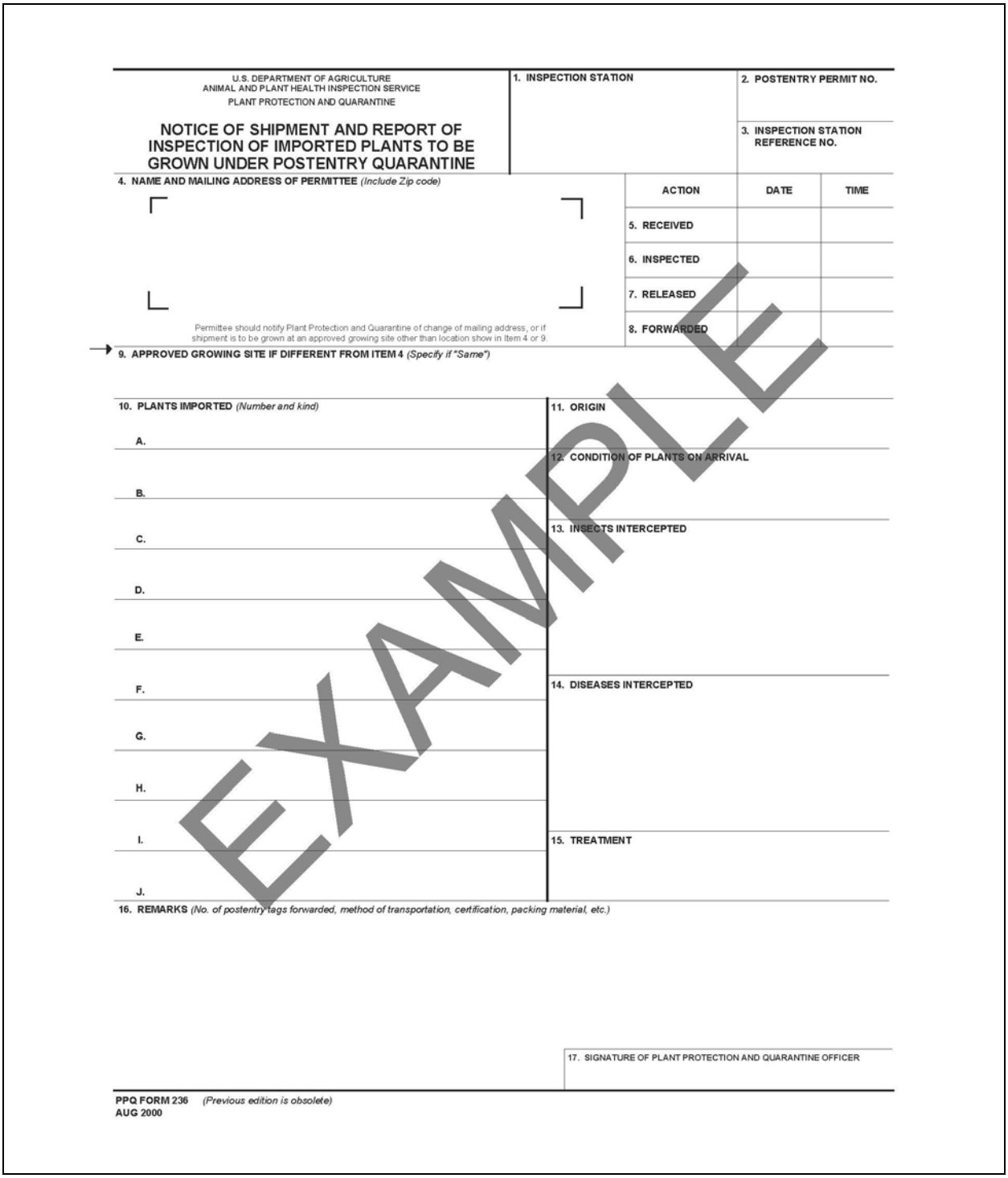
FOR CERTIFIED MAIL - RECEIPT NO:

APHIS FORM 7060
(JUN 91)

Previous editions may be used.

Figure F-1 APHIS Form 7060, Official Warning, Violation of Federal Regulations

PPQ Form 236, Notice of Shipment and Report of Imported Plants to be Grown Under Postentry Quarantine



U.S. DEPARTMENT OF AGRICULTURE
ANIMAL AND PLANT HEALTH INSPECTION SERVICE
PLANT PROTECTION AND QUARANTINE

NOTICE OF SHIPMENT AND REPORT OF INSPECTION OF IMPORTED PLANTS TO BE GROWN UNDER POSTENTRY QUARANTINE

1. INSPECTION STATION
2. POSTENTRY PERMIT NO.
3. INSPECTION STATION REFERENCE NO.

4. NAME AND MAILING ADDRESS OF PERMITTEE *(Include Zip code)*

Permittee should notify Plant Protection and Quarantine of change of mailing address, or if shipment is to be grown at an approved growing site other than location show in Item 4 or 9.

ACTION	DATE	TIME
5. RECEIVED		
6. INSPECTED		
7. RELEASED		
8. FORWARDED		

9. APPROVED GROWING SITE IF DIFFERENT FROM ITEM 4 *(Specify if "Same")*

10. PLANTS IMPORTED *(Number and kind)*

A.
B.
C.
D.
E.
F.
G.
H.
I.
J.

11. ORIGIN
12. CONDITION OF PLANTS ON ARRIVAL
13. INSECTS INTERCEPTED
14. DISEASES INTERCEPTED
15. TREATMENT

16. REMARKS *(No. of postentry tags forwarded, method of transportation, certification, packing material, etc.)*

17. SIGNATURE OF PLANT PROTECTION AND QUARANTINE OFFICER

PPQ FORM 236 *(Previous edition is obsolete)*
AUG 2000

Figure F-2 Example of PPQ Form 236, Notice of Shipment and Report of Imported Plants to be Grown Under Postentry Quarantine (page 1 of 3)

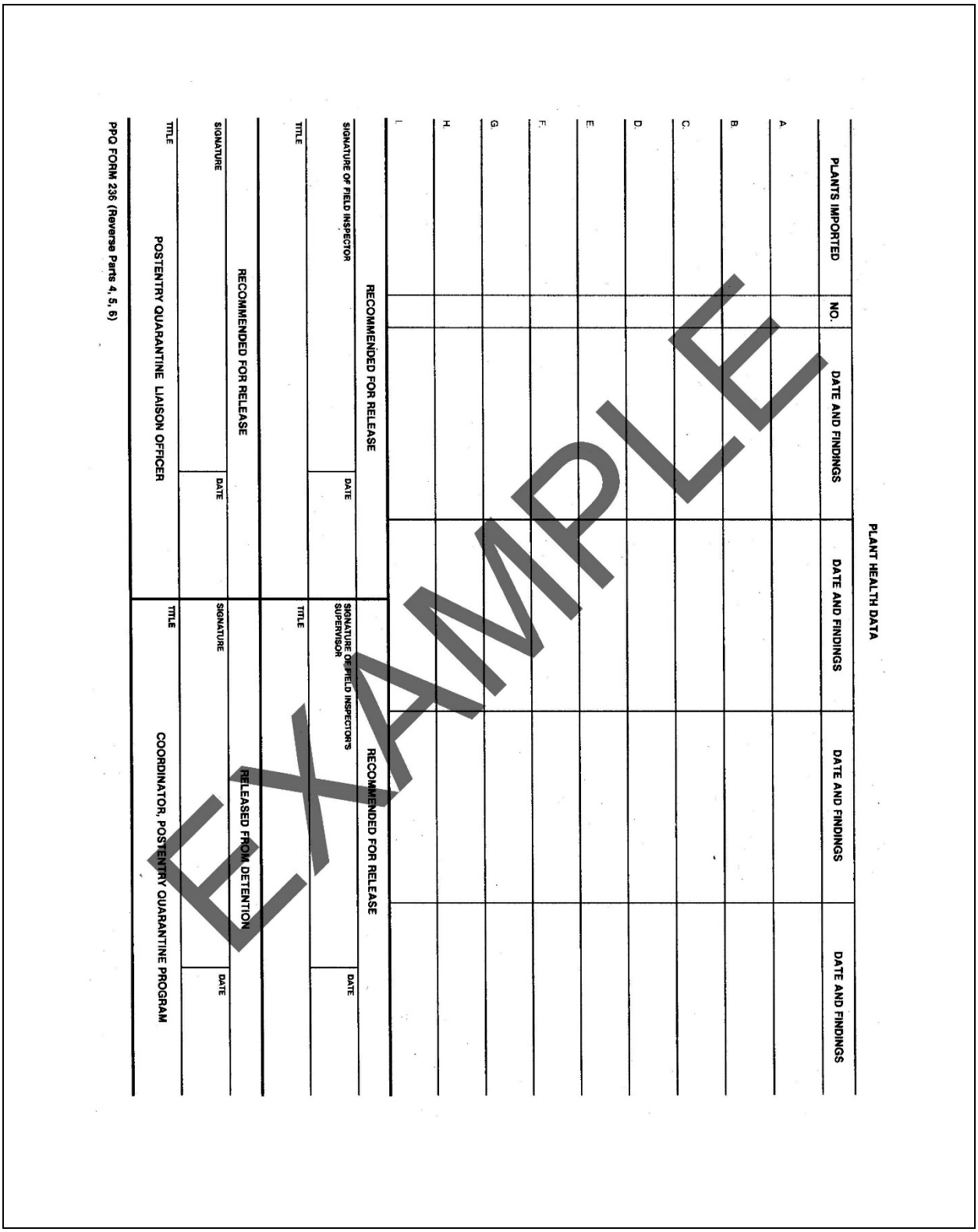


Figure F-3 Example of PPQ Form 236, Notice of Shipment and Report of Imported Plants to be Grown Under Postentry Quarantine (page 2 of 3)

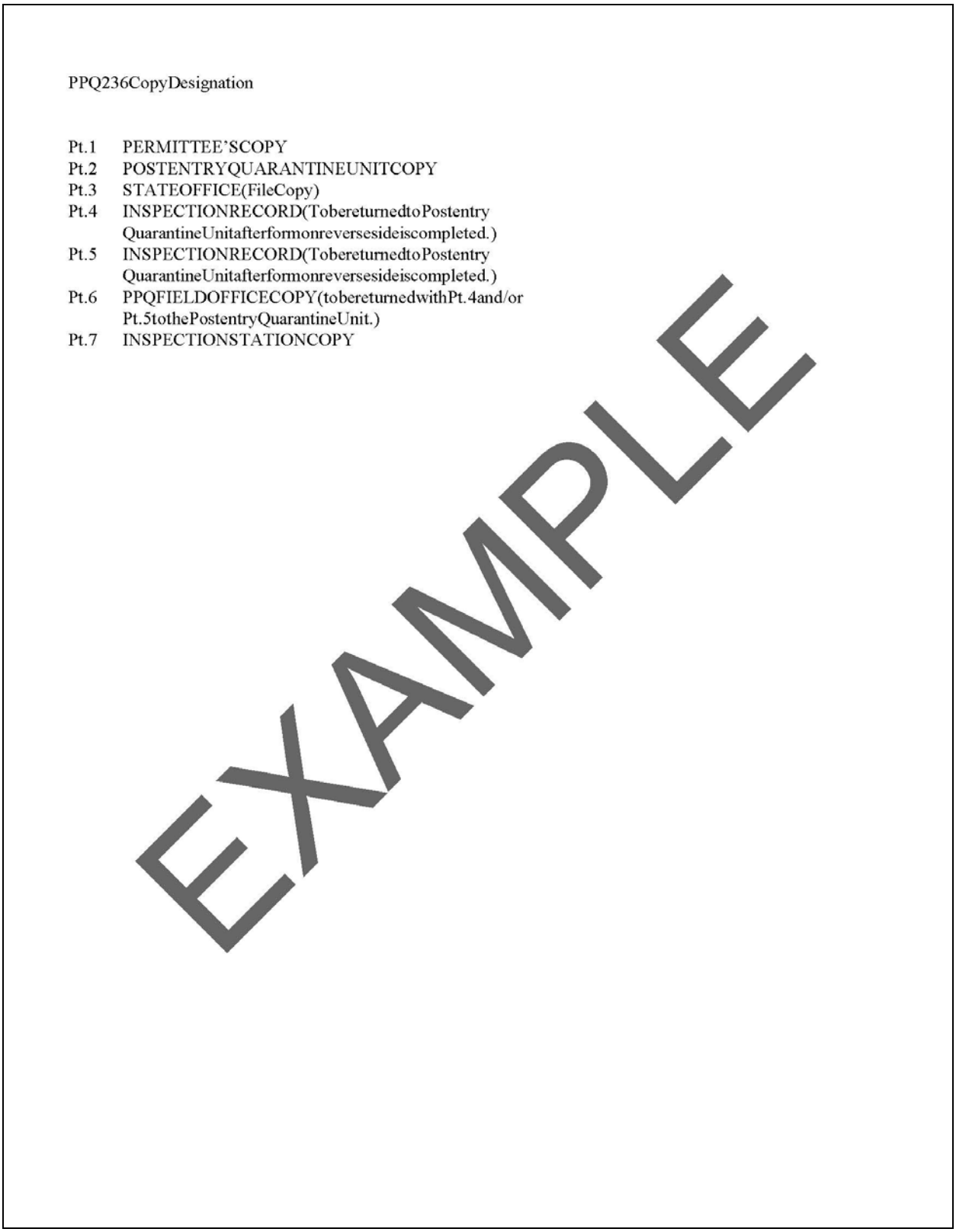


Figure F-4 Example of PPQ Form 236, Notice of Shipment and Report of Imported Plants to be Grown Under Postentry Quarantine (page 3 of 3)

Routing and Distribution of PPQ Form 236

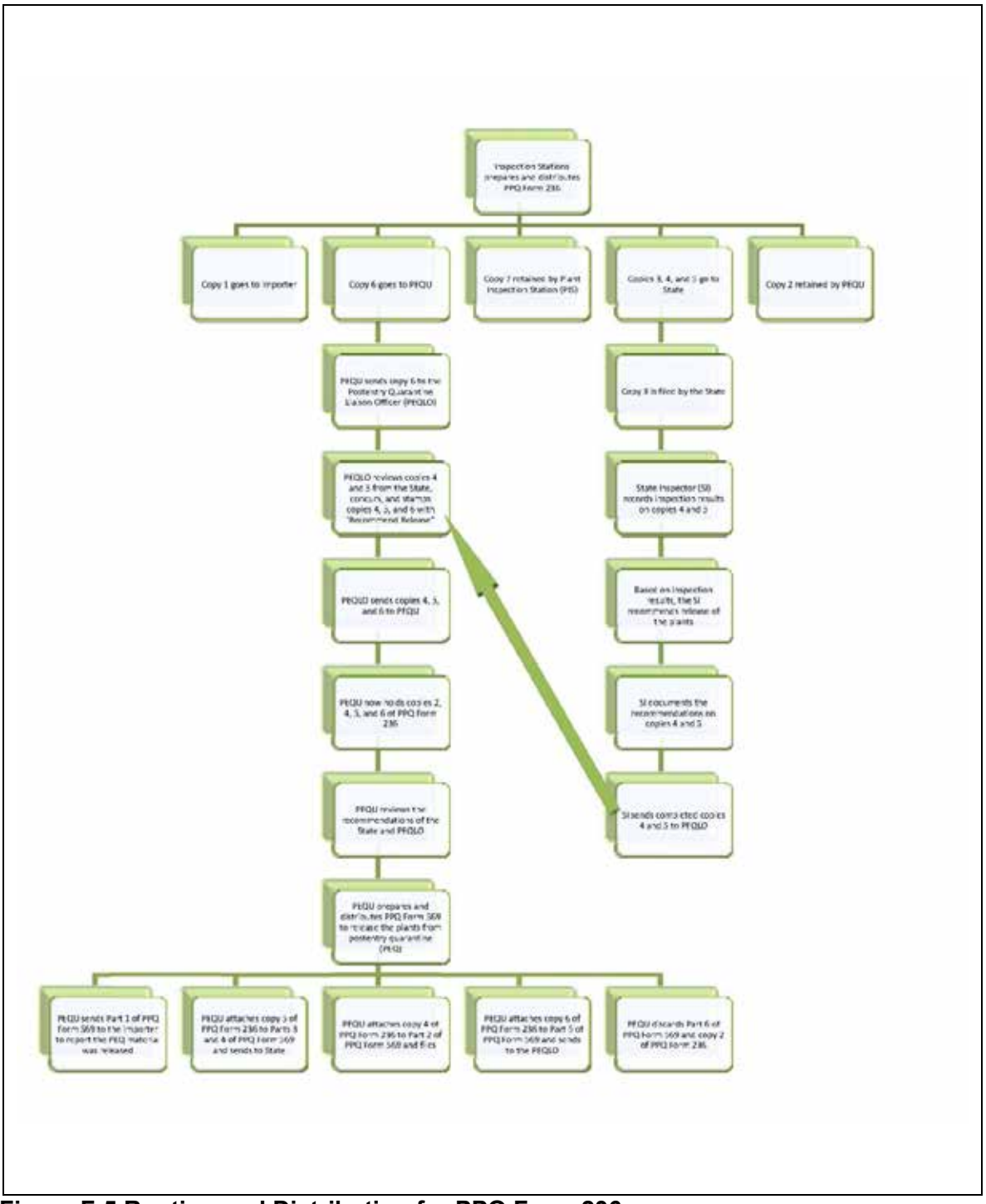
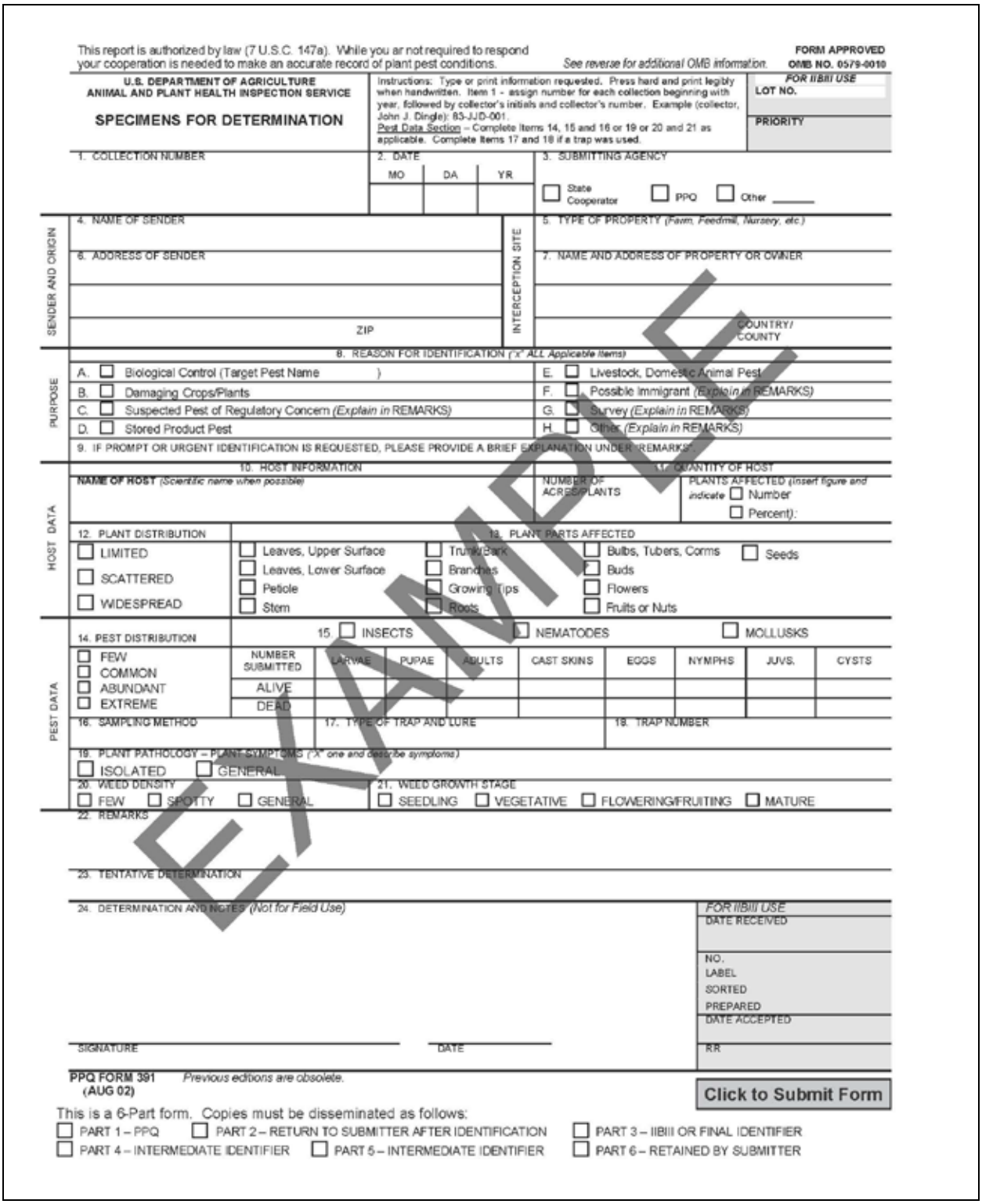


Figure F-5 Routing and Distribution for PPQ Form 236

PPQ Form 391, Specimens for Determination



This report is authorized by law (7 U.S.C. 147a). While you ar not required to respond your cooperation is needed to make an accurate record of plant pest conditions. *See reverse for additional OMB information.* FORM APPROVED OMB NO. 0579-0010

U.S. DEPARTMENT OF AGRICULTURE
ANIMAL AND PLANT HEALTH INSPECTION SERVICE

SPECIMENS FOR DETERMINATION

Instructions: Type or print information requested. Press hard and print legibly when handwritten. Item 1 - assign number for each collection beginning with year, followed by collector's initials and collector's number. Example (collector, John J. Dingle): 83-JJD-001.
Pest Data Section – Complete Items 14, 15 and 16 or 19 or 20 and 21 as applicable. Complete Items 17 and 18 if a trap was used.

FOR IIBIII USE
LOT NO.
PRIORITY

1. COLLECTION NUMBER
2. DATE MO DA YR
3. SUBMITTING AGENCY ☐ State Cooperator ☐ PPQ ☐ Other _____

SENDER AND ORIGIN
4. NAME OF SENDER
6. ADDRESS OF SENDER
ZIP

INTERCEPTION SITE
5. TYPE OF PROPERTY (*Farm, Feedmill, Nursery, etc.*)
7. NAME AND ADDRESS OF PROPERTY OR OWNER
COUNTRY/ COUNTY

PURPOSE
8. REASON FOR IDENTIFICATION (*"X" ALL Applicable Items*)
A. ☐ Biological Control (Target Pest Name)
B. ☐ Damaging Crops/Plants
C. ☐ Suspected Pest of Regulatory Concern (*Explain in* REMARKS)
D. ☐ Stored Product Pest
E. ☐ Livestock, Domestic Animal Pest
F. ☐ Possible Immigrant (*Explain in* REMARKS)
G. ☐ Survey (*Explain in* REMARKS)
H. ☐ Other (*Explain in* REMARKS)
9. IF PROMPT OR URGENT IDENTIFICATION IS REQUESTED, PLEASE PROVIDE A BRIEF EXPLANATION UNDER "REMARKS"

HOST DATA
10. HOST INFORMATION
NAME OF HOST (*Scientific name when possible*)
11. QUANTITY OF HOST
NUMBER OF ACRES/PLANTS
PLANTS AFFECTED (*Insert figure and indicate* ☐ Number ☐ Percent):
12. PLANT DISTRIBUTION ☐ LIMITED ☐ SCATTERED ☐ WIDESPREAD
13. PLANT PARTS AFFECTED
☐ Leaves, Upper Surface ☐ Leaves, Lower Surface ☐ Petiole ☐ Stem
☐ Trunk/Bark ☐ Branches ☐ Growing Tips ☐ Roots
☐ Bulbs, Tubers, Corms ☐ Buds ☐ Flowers ☐ Fruits or Nuts ☐ Seeds

PEST DATA
14. PEST DISTRIBUTION ☐ FEW ☐ COMMON ☐ ABUNDANT ☐ EXTREME
15. ☐ INSECTS ☐ NEMATODES ☐ MOLLUSKS

NUMBER SUBMITTED	LARVAE	PUPAE	ADULTS	CAST SKINS	EGGS	NYMPHS	JUVS.	CYSTS
ALIVE								
DEAD								

16. SAMPLING METHOD
17. TYPE OF TRAP AND LURE
18. TRAP NUMBER
19. PLANT PATHOLOGY – PLANT SYMPTOMS (*"X" one and describe symptoms*) ☐ ISOLATED ☐ GENERAL
20. WEED DENSITY ☐ FEW ☐ SPOTTY ☐ GENERAL
21. WEED GROWTH STAGE ☐ SEEDLING ☐ VEGETATIVE ☐ FLOWERING/FRUITING ☐ MATURE
22. REMARKS
23. TENTATIVE DETERMINATION
24. DETERMINATION AND NOTES (*Not for Field Use*)

FOR IIBIII USE
DATE RECEIVED
NO.
LABEL
SORTED
PREPARED
DATE ACCEPTED
RR

SIGNATURE DATE

PPQ FORM 391 (AUG 02) *Previous editions are obsolete.*

Click to Submit Form

This is a 6-Part form. Copies must be disseminated as follows:
☐ PART 1 – PPQ ☐ PART 2 – RETURN TO SUBMITTER AFTER IDENTIFICATION ☐ PART 3 – IIBIII OR FINAL IDENTIFIER
☐ PART 4 – INTERMEDIATE IDENTIFIER ☐ PART 5 – INTERMEDIATE IDENTIFIER ☐ PART 6 – RETAINED BY SUBMITTER

Figure F-6 Example of PPQ Form 391, Specimens for Determination (page 1 of 2)

OMB Information

According to 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. The valid OMB control number for this information collection is 0579-0010. The time required to complete this information collection is estimated to average .25 hours per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information.

Instructions

Use PPQ Form 391, Specimens for Determination, for domestic collections (warehouse inspections, local and individual collecting, special survey programs, export certification).

BLOCK	INSTRUCTIONS
1	1. Assign a number for each collection beginning the year, followed by the collector's initials and collector's number **EXAMPLE** In 2001, Brian K. Long collected his first specimen for determination of the year. His first collection number is 01-BLK-001 2. Enter the collection number
2	Enter date
3	Check block to indicate Agency submitting specimens for identification
4	Enter name of sender
5	Enter type of property specimen obtained from (farm, nursery, feedmill, etc.)
6	Enter address
7	Enter name and address of property owner
8A-8L	Check all appropriate blocks
9	Leave Blank
10	Enter scientific name of host, if possible
11	Enter quantity of host and plants affected
12	Check block to indicate distribution of plant
13	Check appropriate blocks to indicate plant parts affected
14	Check block to indicate pest distribution
15	• Check appropriate block to indicate type of specimen • Enter number specimens submitted under appropriate column
16	Enter sampling method
17	Enter type of trap and lure
18	Enter trap number
19	Enter X in block to indicate isolated or general plant symptoms
20	Enter X in appropriate block for weed density
21	Enter X in appropriate block for weed growth stage
22	Provide a brief explanation if Prompt or URGENT identification is requested
23	Enter a tentative determination if you made one
24	Leave blank

Distribution of PPQ Form 391

Distribute PPQ Form 391 as follows:

1. Send Original along with the sample to your Area Identifier.
2. Retain and file a copy for your records.

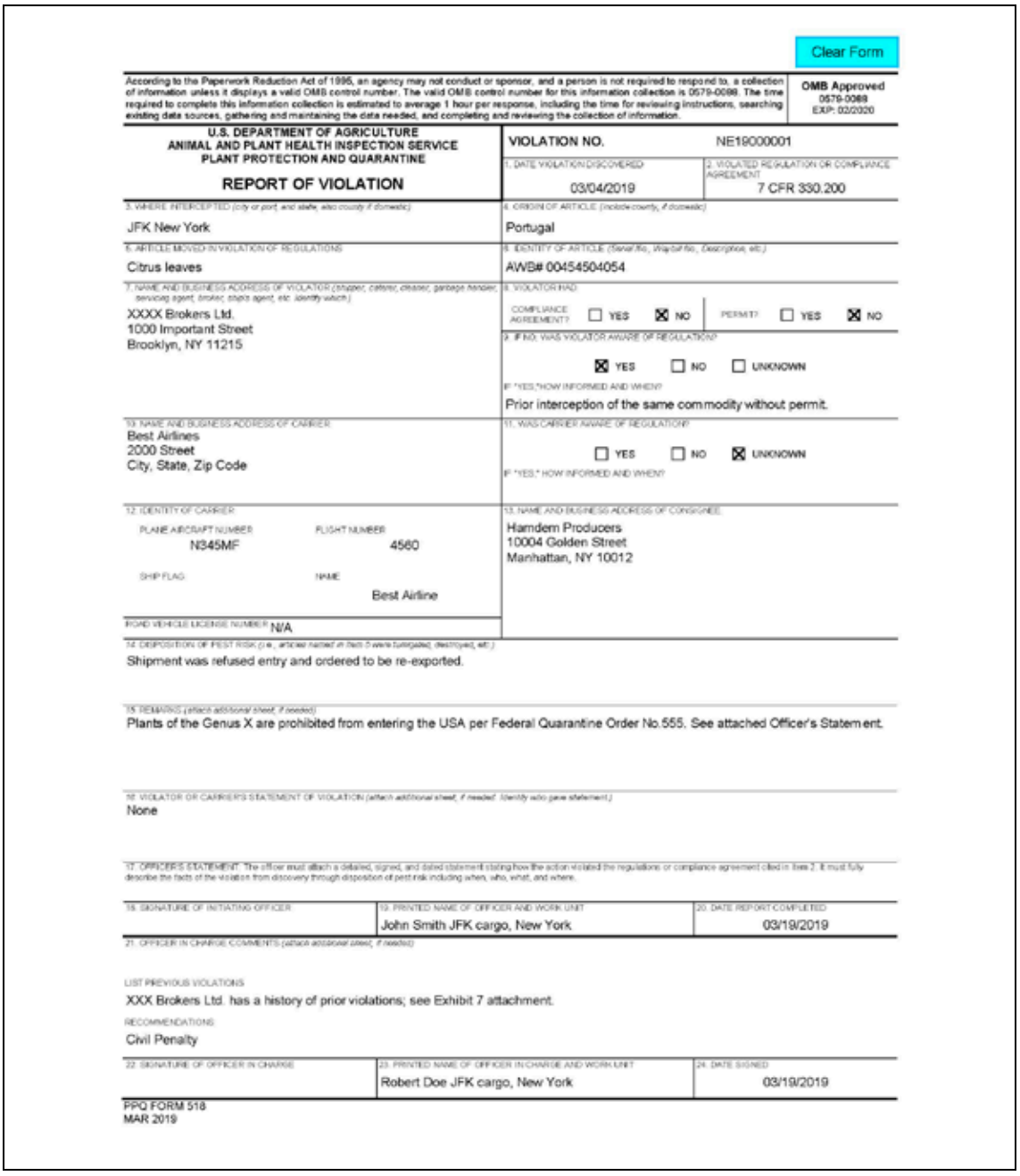
Figure F-7 Example of PPQ Form 391, Specimens for Determination (page 2 of 2)

NOTICE

The above form **must** accompany any disease specimen for identification sent to the Postentry Quarantine Unit by State Cooperators or local PPQ identifiers.

PPQ Form 518, Report of Violation

A fillable version of the PPQ Form 518, Report of Violation is available on the APHIS^CBP internal website (for authorized users **only**).



Clear Form

According to the Paperwork Reduction Act of 1995, an agency may not conduct or sponsor, and a person is not required to respond to, a collection of information unless it displays a valid OMB control number. The valid OMB control number for this information collection is 0579-0088. The time required to complete this information collection is estimated to average 1 hour per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information.

OMB Approved
0579-0088
EXP: 02/2020

U.S. DEPARTMENT OF AGRICULTURE
ANIMAL AND PLANT HEALTH INSPECTION SERVICE
PLANT PROTECTION AND QUARANTINE

REPORT OF VIOLATION

VIOLATION NO. NE19000001

1. DATE VIOLATION DISCOVERED: 03/04/2019

2. VIOLATED REGULATION OR COMPLIANCE AGREEMENT: 7 CFR 330.200

3. WHERE INTERCEPTED (city or port, and state, also county if domestic): JFK New York

4. ORIGIN OF ARTICLE (include county, if domestic): Portugal

5. ARTICLE MOVED IN VIOLATION OF REGULATIONS: Citrus leaves

6. IDENTITY OF ARTICLE (Serial No., Waybill No., Description, etc.): AWB# 00454504054

7. NAME AND BUSINESS ADDRESS OF VIOLATOR (shipper, carrier, cleaner, garbage hauler, servicing agent, broker, stock agent, etc. identify which.):
XXXX Brokers Ltd.
1000 Important Street
Brooklyn, NY 11215

8. VIOLATOR HAD
COMPLIANCE AGREEMENT? ☐ YES ☒ NO
PERMIT? ☐ YES ☒ NO

9. IF NO, WAS VIOLATOR AWARE OF REGULATION?
☒ YES ☐ NO ☐ UNKNOWN

IF "YES," HOW INFORMED AND WHEN?
Prior interception of the same commodity without permit.

10. NAME AND BUSINESS ADDRESS OF CARRIER:
Best Airlines
2000 Street
City, State, Zip Code

11. WAS CARRIER AWARE OF REGULATION?
☐ YES ☐ NO ☒ UNKNOWN

IF "YES," HOW INFORMED AND WHEN?

12. IDENTITY OF CARRIER
PLANE AIRCRAFT NUMBER: N345MF
FLIGHT NUMBER: 4560
SHIP FLAG:
NAME: Best Airline
ROAD VEHICLE LICENSE NUMBER: N/A

13. NAME AND BUSINESS ADDRESS OF CONSIGNEE:
Hamdem Producers
10004 Golden Street
Manhattan, NY 10012

14. DISPOSITION OF PEST RISK (i.e., articles named in Item 5 were fumigated, destroyed, etc.):
Shipment was refused entry and ordered to be re-exported.

15. REMARKS (attach additional sheet, if needed):
Plants of the Genus X are prohibited from entering the USA per Federal Quarantine Order No.555. See attached Officer's Statement.

16. VIOLATOR OR CARRIER'S STATEMENT OF VIOLATION (attach additional sheet, if needed. Identify who gave statement.):
None

17. OFFICER'S STATEMENT. The officer must attach a detailed, signed, and dated statement stating how the action violated the regulations or compliance agreement cited in Item 2. It must fully describe the facts of the violation from discovery through disposition of pest risk including when, who, what, and where.

18. SIGNATURE OF INITIATING OFFICER	19. PRINTED NAME OF OFFICER AND WORK UNIT	20. DATE REPORT COMPLETED
	John Smith JFK cargo, New York	03/19/2019

21. OFFICER IN CHARGE COMMENTS (attach additional sheet, if needed):

LIST PREVIOUS VIOLATIONS
XXX Brokers Ltd. has a history of prior violations; see Exhibit 7 attachment.

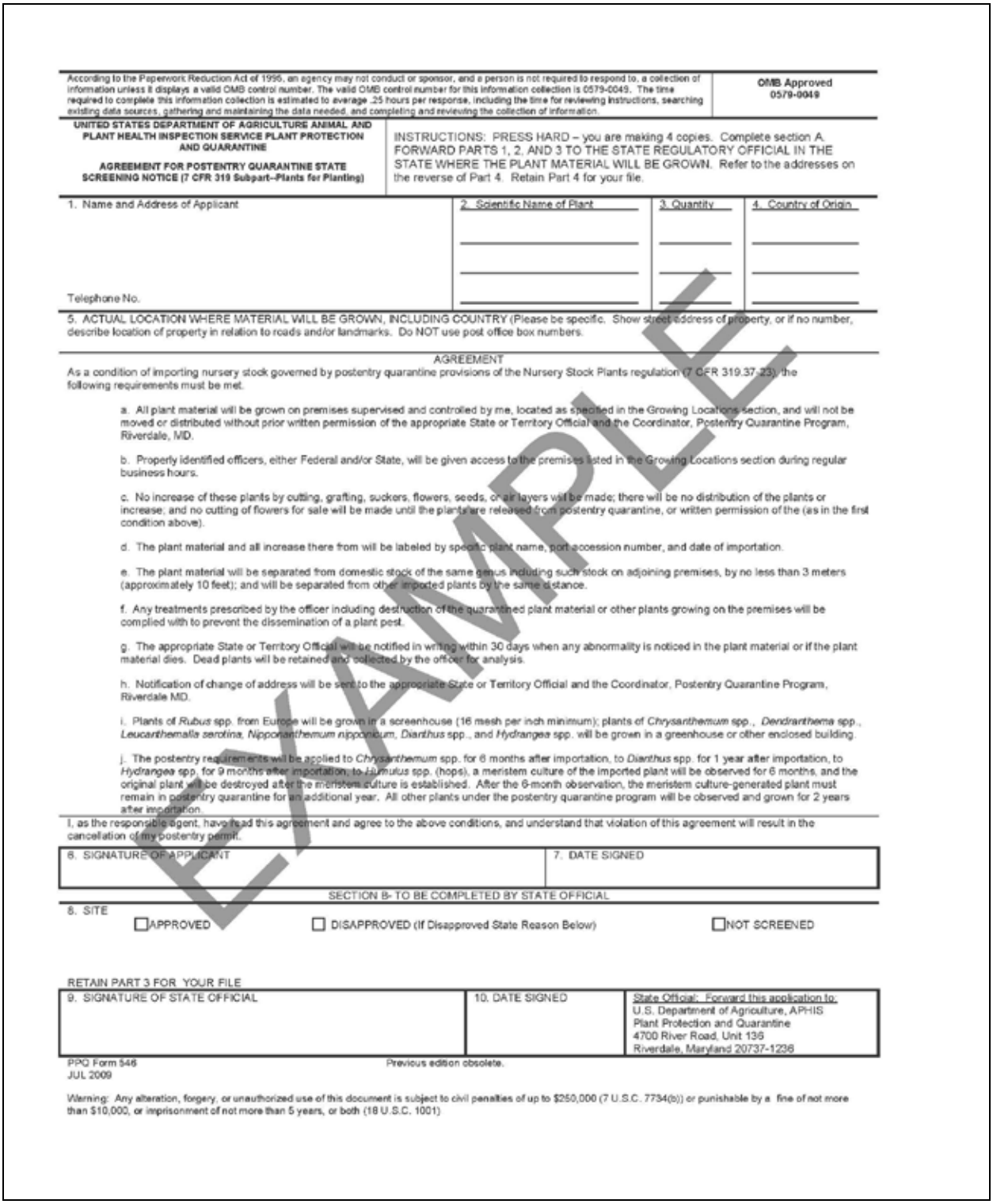
RECOMMENDATIONS
Civil Penalty

22. SIGNATURE OF OFFICER IN CHARGE	23. PRINTED NAME OF OFFICER IN CHARGE AND WORK UNIT	24. DATE SIGNED
	Robert Doe JFK cargo, New York	03/19/2019

PPQ FORM 518
MAR 2019

Figure F-8 Example of PPQ Form 518, Report of Violation

PPQ Form 546, Agreement for Postentry Quarantine—State Screening Notice



According to the Paperwork Reduction Act of 1995, an agency may not conduct or sponsor, and a person is not required to respond to, a collection of information unless it displays a valid OMB control number. The valid OMB control number for this information collection is 0579-0049. The time required to complete this information collection is estimated to average .25 hours per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information.

OMB Approved
0579-0049

UNITED STATES DEPARTMENT OF AGRICULTURE ANIMAL AND PLANT HEALTH INSPECTION SERVICE PLANT PROTECTION AND QUARANTINE

AGREEMENT FOR POSTENTRY QUARANTINE STATE SCREENING NOTICE (7 CFR 319 Subpart--Plants for Planting)

INSTRUCTIONS: PRESS HARD – you are making 4 copies. Complete section A. FORWARD PARTS 1, 2, AND 3 TO THE STATE REGULATORY OFFICIAL IN THE STATE WHERE THE PLANT MATERIAL WILL BE GROWN. Refer to the addresses on the reverse of Part 4. Retain Part 4 for your file.

1. Name and Address of Applicant Telephone No.	2. Scientific Name of Plant	3. Quantity	4. Country of Origin

5. ACTUAL LOCATION WHERE MATERIAL WILL BE GROWN, INCLUDING COUNTRY (Please be specific. Show street address of property, or if no number, describe location of property in relation to roads and/or landmarks. Do NOT use post office box numbers.

AGREEMENT

As a condition of importing nursery stock governed by postentry quarantine provisions of the Nursery Stock Plants regulation (7 CFR 319.37-23), the following requirements must be met.

a. All plant material will be grown on premises supervised and controlled by me, located as specified in the Growing Locations section, and will not be moved or distributed without prior written permission of the appropriate State or Territory Official and the Coordinator, Postentry Quarantine Program, Riverdale, MD.

b. Properly identified officers, either Federal and/or State, will be given access to the premises listed in the Growing Locations section during regular business hours.

c. No increase of these plants by cutting, grafting, suckers, flowers, seeds, or air layers will be made; there will be no distribution of the plants or increase; and no cutting of flowers for sale will be made until the plants are released from postentry quarantine, or written permission of the (as in the first condition above).

d. The plant material and all increase there from will be labeled by specific plant name, port accession number, and date of importation.

e. The plant material will be separated from domestic stock of the same genus including such stock on adjoining premises, by no less than 3 meters (approximately 10 feet); and will be separated from other imported plants by the same distance.

f. Any treatments prescribed by the officer including destruction of the quarantined plant material or other plants growing on the premises will be complied with to prevent the dissemination of a plant pest.

g. The appropriate State or Territory Official will be notified in writing within 30 days when any abnormality is noticed in the plant material or if the plant material dies. Dead plants will be retained and collected by the officer for analysis.

h. Notification of change of address will be sent to the appropriate State or Territory Official and the Coordinator, Postentry Quarantine Program, Riverdale MD.

i. Plants of *Rubus* spp. from Europe will be grown in a screenhouse (16 mesh per inch minimum); plants of *Chrysanthemum* spp., *Dendranthema* spp., *Leucanthemella serotina*, *Nipponanthemum nipponicum*, *Dianthus* spp., and *Hydrangea* spp. will be grown in a greenhouse or other enclosed building.

j. The postentry requirements will be applied to *Chrysanthemum* spp. for 6 months after importation, to *Dianthus* spp. for 1 year after importation, to *Hydrangea* spp. for 9 months after importation, to *Humulus* spp. (hops), a meristem culture of the imported plant will be observed for 6 months, and the original plant will be destroyed after the meristem culture is established. After the 6-month observation, the meristem culture-generated plant must remain in postentry quarantine for an additional year. All other plants under the postentry quarantine program will be observed and grown for 2 years after importation.

I, as the responsible agent, have read this agreement and agree to the above conditions, and understand that violation of this agreement will result in the cancellation of my postentry permit.

6. SIGNATURE OF APPLICANT	7. DATE SIGNED

SECTION B- TO BE COMPLETED BY STATE OFFICIAL

8. SITE

☐ APPROVED ☐ DISAPPROVED (If Disapproved State Reason Below) ☐ NOT SCREENED

RETAIN PART 3 FOR YOUR FILE

9. SIGNATURE OF STATE OFFICIAL	10. DATE SIGNED	State Official: Forward this application to: U.S. Department of Agriculture, APHIS Plant Protection and Quarantine 4700 River Road, Unit 136 Riverdale, Maryland 20737-1236

PPQ Form 546
JUL 2009

Previous edition obsolete.

Warning: Any alteration, forgery, or unauthorized use of this document is subject to civil penalties of up to $250,000 (7 U.S.C. 7734(b)) or punishable by a fine of not more than $10,000, or imprisonment of not more than 5 years, or both (18 U.S.C. 1001)

Figure F-9 Example of PPQ Form 546, Agreement for Postentry Quarantine—State Screening Notice (7 CFR 319 Subpart—Plants for Planting) (page 1 of 2)

Instruction for Completing PPQ Form 546
Agreement for Postentry Quarantine State Screening Notice

Note: Please TYPE or PRINT legibly to complete this form.

1. Enter the name of the company representative who is responsible for the shipment, the company name, and a street address. If you have a Post Office box for mail deliveries, add this to the street address in this box.

2. Enter the scientific (Latin) name of each plant you wish to import. If you do not know the scientific name(s), enter the English common name(s).

3. Enter the maximum number of plants/cuttings you and the State inspector consider appropriate for the growing you have selected during the quarantine period for the genus or genera you are importing.

4. Enter the country or countries from which the product is originally being shipped.

5. Enter the specific location – street address (if available), city, county, and State – where the plant material will be grown for the duration of the quarantine period. If no street address is available, you and the State inspector must determine how to describe the location in detail (GPS coordinates can be used).

STOP. Contact your State Plant Regulatory Official to set up an appointment for a site inspection. See the National Plant Board website at http://www.nationalplantboard.org/ for contact information for your State's Regulatory Official.

6. After the site inspection and consultation, the person named in Block 1 must sign the application.

7. Enter the date the application was completed and signed.

The State Regulatory Official will complete the form and submit it to USDA, APHIS, Plant Protection and Quarantine (full address on bottom of form).

Figure F-10 Example of PPQ Form 546, Agreement for Postentry Quarantine—State Screening Notice (7 CFR 319 Subpart—Plants for Planting) (page 2 of 2)

NOTICE

Sets of PPQ Form 546 dated prior to January 1998 are obsolete and **MUST** be discarded. The State should contact the SPHD to order new forms, or download from the website.

Routing and Distribution of PPQ Form 546

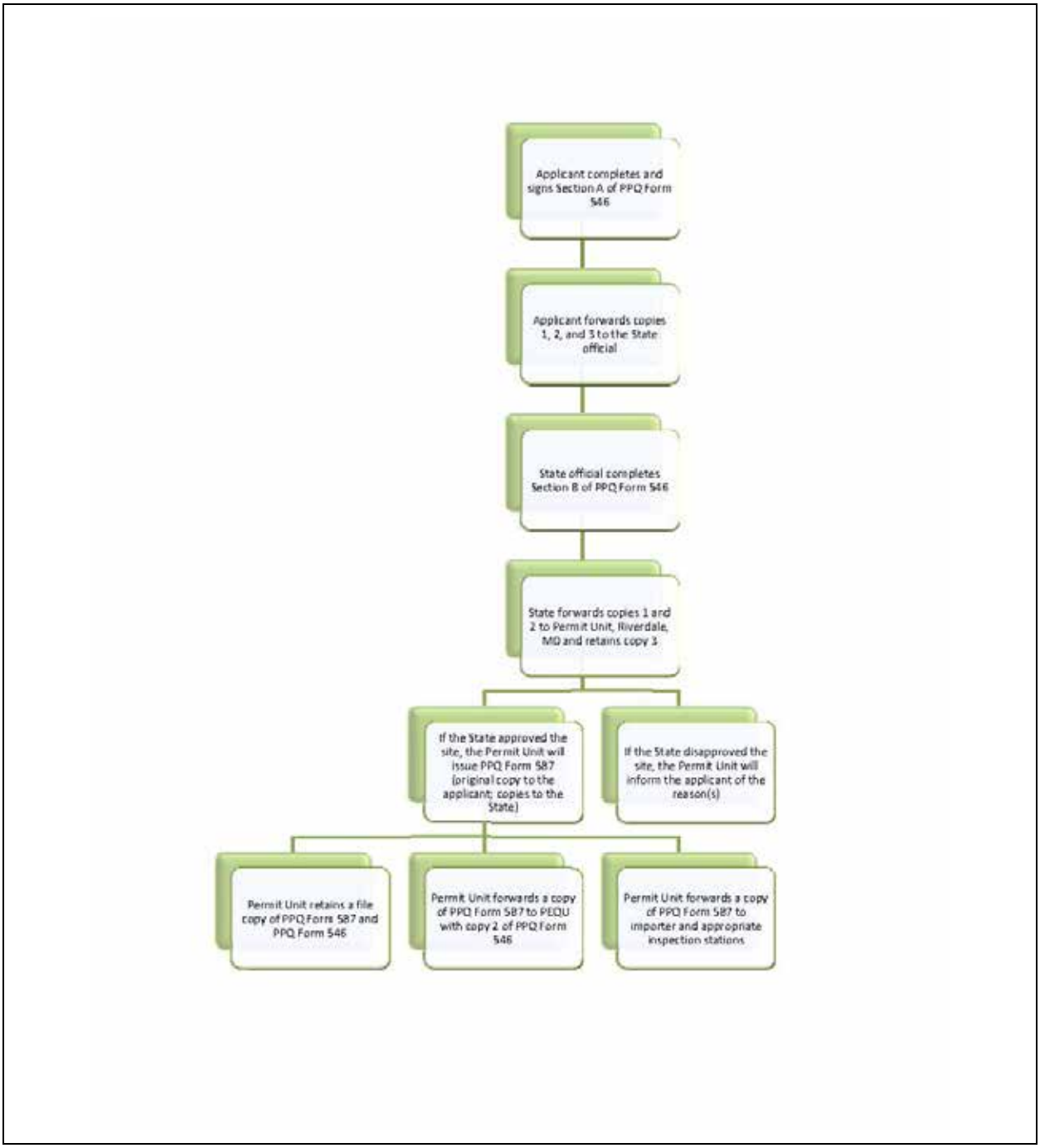


Figure F-11 Routing and Distribution for PPQ Form 546

PPQ Form 547, Postentry Quarantine Tag

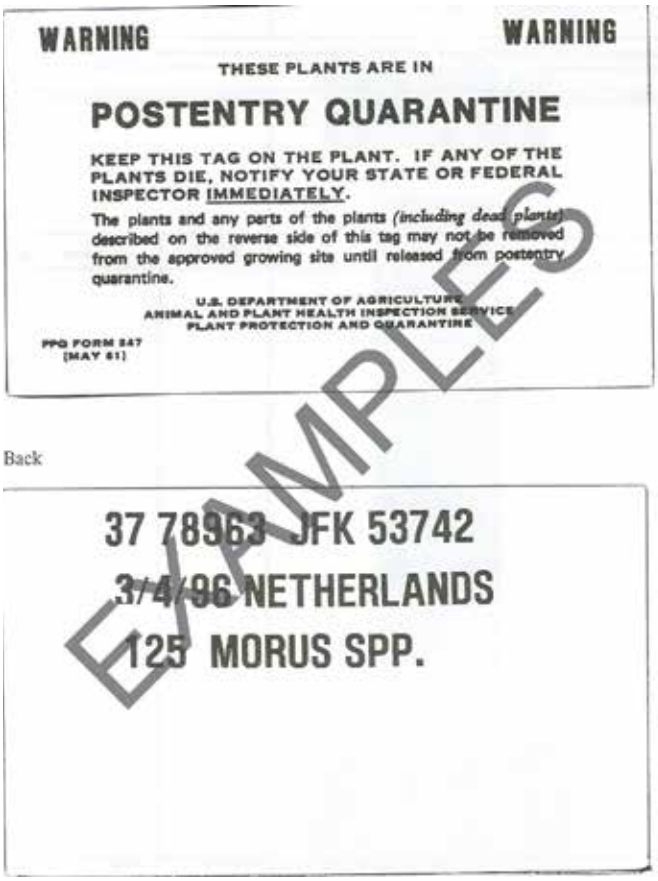


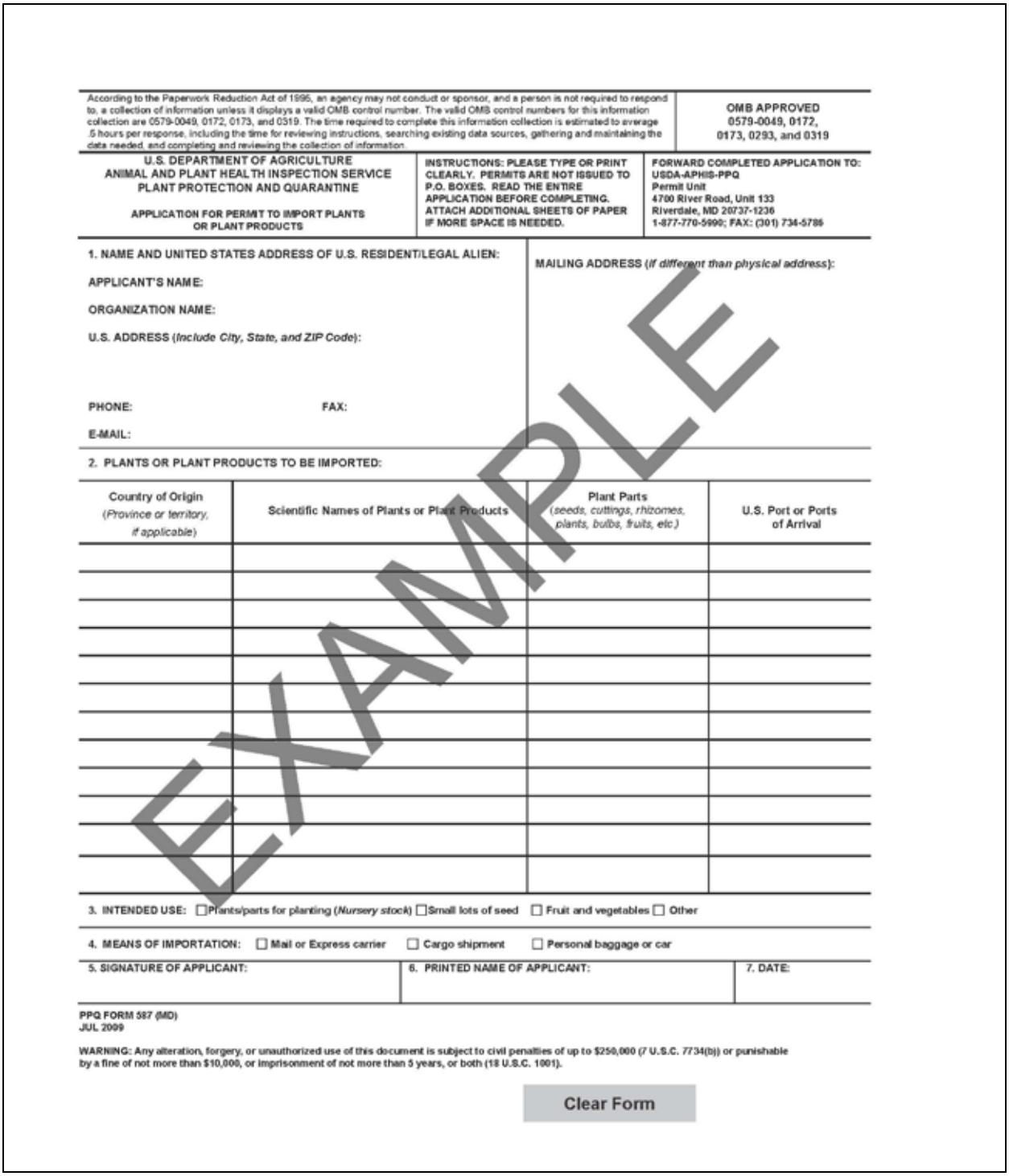
Figure F-12 Example of PPQ Form 547, Postentry Quarantine Tag

PPQ Form 569 Release from Postentry Quarantine

NOTICE

This form is **only** issued by the National Coordinator, PEQP and the PEQ Coordinator for Hawaii, Guam, and CNMI in Honolulu, HI.

PPQ Form 587, Application for Permit to Import Plants or Plant Products



According to the Paperwork Reduction Act of 1995, an agency may not conduct or sponsor, and a person is not required to respond to, a collection of information unless it displays a valid OMB control number. The valid OMB control numbers for this information collection are 0579-0049, 0172, 0173, and 0319. The time required to complete this information collection is estimated to average .5 hours per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information.

OMB APPROVED
0579-0049, 0172,
0173, 0293, and 0319

U.S. DEPARTMENT OF AGRICULTURE
ANIMAL AND PLANT HEALTH INSPECTION SERVICE
PLANT PROTECTION AND QUARANTINE

APPLICATION FOR PERMIT TO IMPORT PLANTS OR PLANT PRODUCTS

INSTRUCTIONS: PLEASE TYPE OR PRINT CLEARLY. PERMITS ARE NOT ISSUED TO P.O. BOXES. READ THE ENTIRE APPLICATION BEFORE COMPLETING. ATTACH ADDITIONAL SHEETS OF PAPER IF MORE SPACE IS NEEDED.

FORWARD COMPLETED APPLICATION TO:
USDA-APHIS-PPQ
Permit Unit
4700 River Road, Unit 133
Riverdale, MD 20737-1236
1-877-770-5990; FAX: (301) 734-5786

1. NAME AND UNITED STATES ADDRESS OF U.S. RESIDENT/LEGAL ALIEN:

APPLICANT'S NAME:

ORGANIZATION NAME:

U.S. ADDRESS (*Include City, State, and ZIP Code*):

PHONE: FAX:

E-MAIL:

MAILING ADDRESS (*if different than physical address*):

2. PLANTS OR PLANT PRODUCTS TO BE IMPORTED:

Country of Origin (*Province or territory, if applicable*)	Scientific Names of Plants or Plant Products	Plant Parts (*seeds, cuttings, rhizomes, plants, bulbs, fruits, etc.*)	U.S. Port or Ports of Arrival

3. INTENDED USE: ☐ Plants/parts for planting (*Nursery stock*) ☐ Small lots of seed ☐ Fruit and vegetables ☐ Other

4. MEANS OF IMPORTATION: ☐ Mail or Express carrier ☐ Cargo shipment ☐ Personal baggage or car

5. SIGNATURE OF APPLICANT:	6. PRINTED NAME OF APPLICANT:	7. DATE:

PPQ FORM 587 (MD)
JUL 2009

WARNING: Any alteration, forgery, or unauthorized use of this document is subject to civil penalties of up to $250,000 (7 U.S.C. 7734(b)) or punishable by a fine of not more than $10,000, or imprisonment of not more than 5 years, or both (18 U.S.C. 1001).

Clear Form

Figure F-13 Example of PPQ Form 587, Application for Permit to Import Plants or Plant Products (page 1 of 2)

Instructions for completing PPQ Form 587
Application for Permit to Import Plants or Plant Products

Please TYPE or PRINT legibly to complete. You must complete all of the boxes.

1. Enter the name and street address of the person responsible for the importation. The applicant must be a United States resident. Enter the organization or company name, if applicable. A physical address of the facility or business is required. You may include a post office box address **in addition** to the street address for mailing purposes. Enter your daytime telephone number, including the Area Code. Enter your facsimile number, including the Area Code. Enter your e-mail address if applicable.

2. In the first column, enter a country or countries (if from Canada include Province, if from Mexico include State) from which you want to import the plants or plant products (the term **"various"** will **not** be accepted). In the second column, enter the scientific (Latin) name of each plant. If you do not know the scientific name(s), try to find out from the exporter. As a last resort, enter the English common name(s). In the third column, enter the type of plant parts you plan to import for each species. In the fourth column, enter the City and State of the preferred port(s) of arrival. If you do not know the port, enter "N/A." (Check your permit when you receive it for the approved ports.)

3. Check the appropriate box. Select "Plants for planting", if the plants/plant parts you want to import will be planted or sold for planting. Select "Small lots of seed" if you want to import under the small lots of seed program (see below*). Select "Fruits and Vegetables" if you are importing fruits and vegetables for consumption or resale. Select "Other" if the article you want to import does not fall into any of the other categories. List the category or additional information needed to describe the article (i.e., Cut flowers, broomcorn, etc...). * **Special instructions for small lots of seed:** Small lots of eligible seed may be imported without a phytosanitary certificate with a written permit. See the permit unit website (http://www.aphis.usda.gov/import_export/plants/plant_imports/ smalllots_seed.shtml) for help in determining eligibility. In part #2 list the seed species and countries from which you want to ship each species. If the list of species and/or countries of origin is long, you may enter "eligible taxa." By using this option, you are accepting responsibility for determining the eligibility of the seeds. A permit is issued for taxa that are enterable with no restrictions beyond port of entry inspection. If port of entry inspectors find prohibited or restricted seeds in your shipment, they will remove the ineligible kinds.

4. Check the appropriate box or boxes that apply to the means of importation.

5. The applicant named in box #1 must sign the form.

6. Printed name of person who signed the form.

7. Enter the date the form is completed and signed.

If you attach additional sheets of paper, type or print PPQ Form 587, the applicant's name, and the company name at the top of each page.

Send the completed application by facsimile to (301) 734-5786, or mail to:

USDA-APHIS-PPQ
Permit Unit
4700 River Road, Unit 133
Riverdale, MD 20737-1236

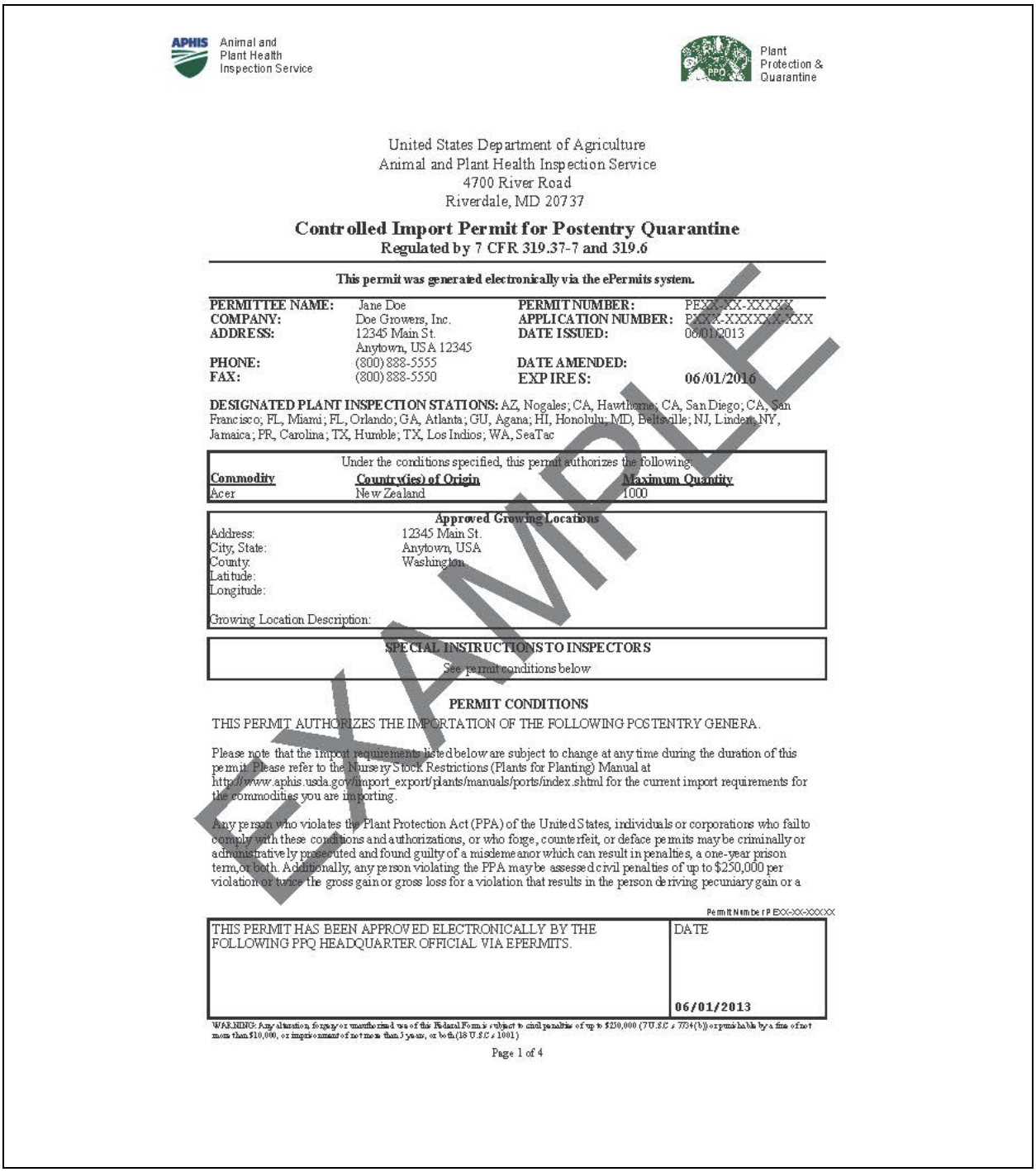
Call our automated phone number at 1-877-770-5990 if you have questions.

Figure F-14 Example of PPQ Form 587, Application for Permit to Import Plants or Plant Products (page 2 of 2)

NOTICE

This application is for all genera that are **not** prohibited or Postentry Quarantine.

PPQ Controlled Import Permit for Postentry Quarantine



APHIS Animal and Plant Health Inspection Service

Plant Protection & Quarantine

United States Department of Agriculture
Animal and Plant Health Inspection Service
4700 River Road
Riverdale, MD 20737

Controlled Import Permit for Postentry Quarantine
Regulated by 7 CFR 319.37-7 and 319.6

This permit was generated electronically via the ePermits system.

PERMITTEE NAME:	Jane Doe	**PERMIT NUMBER:**	PEXX-XX-XXXXX
COMPANY:	Doe Growers, Inc.	**APPLICATION NUMBER:**	PXXX-XXXXXX-XXX
ADDRESS:	12345 Main St. Anytown, USA 12345	**DATE ISSUED:**	06/01/2013
PHONE:	(800) 888-5555	**DATE AMENDED:**	
FAX:	(800) 888-5550	**EXPIRES:**	**06/01/2016**

DESIGNATED PLANT INSPECTION STATIONS: AZ, Nogales; CA, Hawthorne; CA, San Diego; CA, San Francisco; FL, Miami; FL, Orlando; GA, Atlanta; GU, Agana; HI, Honolulu; MD, Beltsville; NJ, Linden; NY, Jamaica; PR, Carolina; TX, Humble; TX, Los Indios; WA, SeaTac

Under the conditions specified, this permit authorizes the following:

Commodity	Country(ies) of Origin	Maximum Quantity
Acer	New Zealand	1000

Approved Growing Locations

Address:	12345 Main St.
City, State:	Anytown, USA
County:	Washington
Latitude:	
Longitude:	

Growing Location Description:

SPECIAL INSTRUCTIONS TO INSPECTORS

See permit conditions below

PERMIT CONDITIONS

THIS PERMIT AUTHORIZES THE IMPORTATION OF THE FOLLOWING POSTENTRY GENERA.

Please note that the import requirements listed below are subject to change at any time during the duration of this permit. Please refer to the Nursery Stock Restrictions (Plants for Planting) Manual at http://www.aphis.usda.gov/import_export/plants/manuals/ports/index.shtml for the current import requirements for the commodities you are importing.

Any person who violates the Plant Protection Act (PPA) of the United States, individuals or corporations who fail to comply with these conditions and authorizations, or who forge, counterfeit, or deface permits may be criminally or administratively prosecuted and found guilty of a misdemeanor which can result in penalties, a one-year prison term, or both. Additionally, any person violating the PPA may be assessed civil penalties of up to $250,000 per violation or twice the gross gain or gross loss for a violation that results in the person deriving pecuniary gain or a

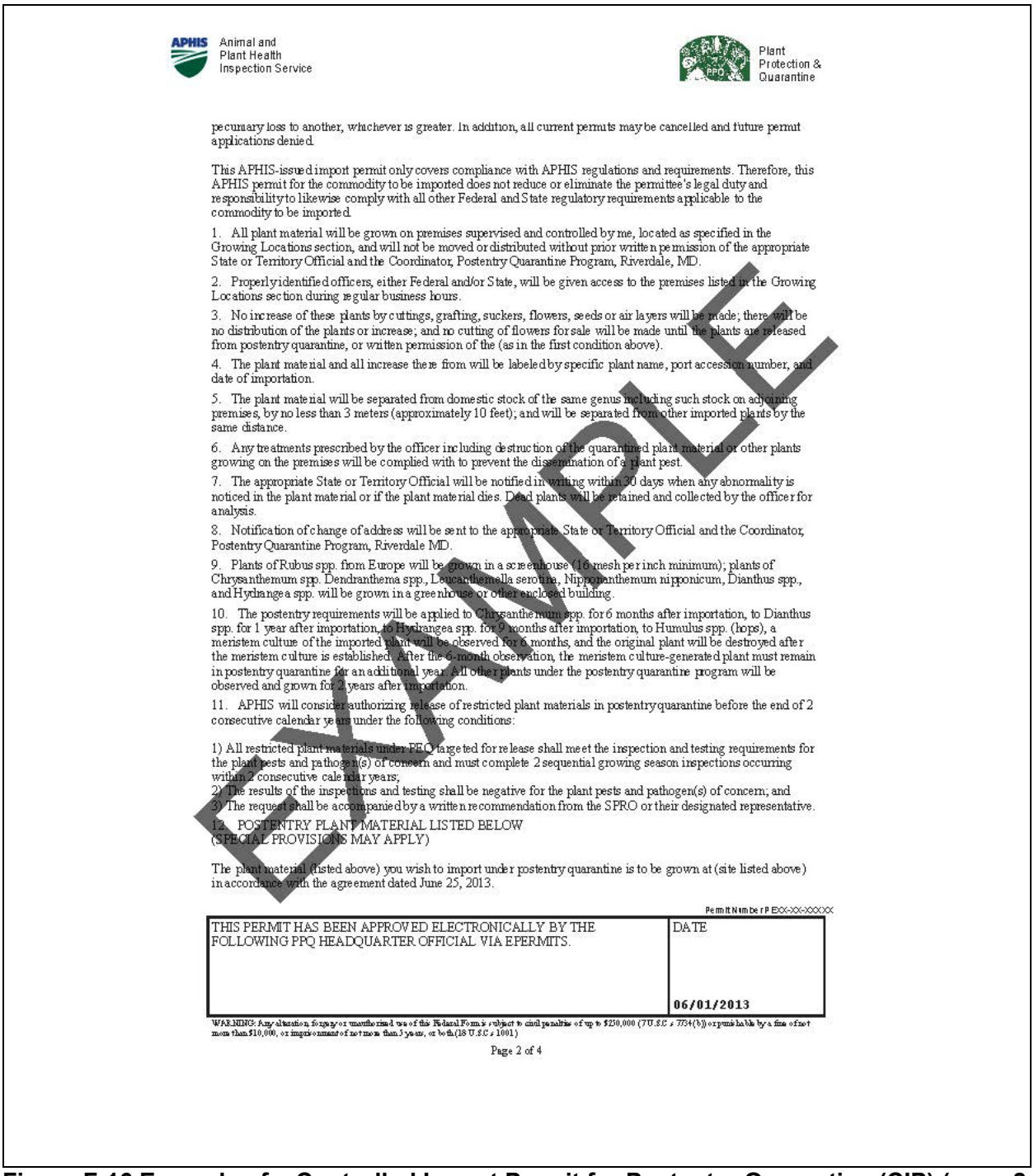
Permit Number PEXX-XX-XXXXX

THIS PERMIT HAS BEEN APPROVED ELECTRONICALLY BY THE FOLLOWING PPQ HEADQUARTER OFFICIAL VIA EPERMITS.	DATE **06/01/2013**

WARNING: Any alteration, forgery or unauthorized use of this Federal Form is subject to civil penalties of up to $250,000 (7 U.S.C. § 7734(b)) or punishable by a fine of not more than $10,000, or imprisonment of not more than 5 years, or both (18 U.S.C. § 1001)

Page 1 of 4

Figure F-15 Example of a Controlled Import Permit for Postentry Quarantine (CIP) (page 1 of 4)



Animal and Plant Health Inspection Service

Plant Protection & Quarantine

pecuniary loss to another, whichever is greater. In addition, all current permits may be cancelled and future permit applications denied.

This APHIS-issued import permit only covers compliance with APHIS regulations and requirements. Therefore, this APHIS permit for the commodity to be imported does not reduce or eliminate the permittee's legal duty and responsibility to likewise comply with all other Federal and State regulatory requirements applicable to the commodity to be imported.

1. All plant material will be grown on premises supervised and controlled by me, located as specified in the Growing Locations section, and will not be moved or distributed without prior written permission of the appropriate State or Territory Official and the Coordinator, Postentry Quarantine Program, Riverdale, MD.

2. Properly identified officers, either Federal and/or State, will be given access to the premises listed in the Growing Locations section during regular business hours.

3. No increase of these plants by cuttings, grafting, suckers, flowers, seeds or air layers will be made; there will be no distribution of the plants or increase; and no cutting of flowers for sale will be made until the plants are released from postentry quarantine, or written permission of the (as in the first condition above).

4. The plant material and all increase there from will be labeled by specific plant name, port accession number, and date of importation.

5. The plant material will be separated from domestic stock of the same genus including such stock on adjoining premises, by no less than 3 meters (approximately 10 feet); and will be separated from other imported plants by the same distance.

6. Any treatments prescribed by the officer including destruction of the quarantined plant material or other plants growing on the premises will be complied with to prevent the dissemination of a plant pest.

7. The appropriate State or Territory Official will be notified in writing within 30 days when any abnormality is noticed in the plant material or if the plant material dies. Dead plants will be retained and collected by the officer for analysis.

8. Notification of change of address will be sent to the appropriate State or Territory Official and the Coordinator, Postentry Quarantine Program, Riverdale MD.

9. Plants of Rubus spp. from Europe will be grown in a screenhouse (16 mesh per inch minimum); plants of Chrysanthemum spp. Dendranthema spp., Leucanthemella serotina, Nipponanthemum nipponicum, Dianthus spp., and Hydrangea spp. will be grown in a greenhouse or other enclosed building.

10. The postentry requirements will be applied to Chrysanthemum spp. for 6 months after importation, to Dianthus spp. for 1 year after importation, to Hydrangea spp. for 9 months after importation, to Humulus spp. (hops), a meristem culture of the imported plant will be observed for 6 months, and the original plant will be destroyed after the meristem culture is established. After the 6-month observation, the meristem culture-generated plant must remain in postentry quarantine for an additional year. All other plants under the postentry quarantine program will be observed and grown for 2 years after importation.

11. APHIS will consider authorizing release of restricted plant materials in postentry quarantine before the end of 2 consecutive calendar years under the following conditions:

1) All restricted plant materials under PEQ targeted for release shall meet the inspection and testing requirements for the plant pests and pathogen(s) of concern and must complete 2 sequential growing season inspections occurring within 2 consecutive calendar years;
2) The results of the inspections and testing shall be negative for the plant pests and pathogen(s) of concern; and
3) The request shall be accompanied by a written recommendation from the SPRO or their designated representative.

12. POSTENTRY PLANT MATERIAL LISTED BELOW
(SPECIAL PROVISIONS MAY APPLY)

The plant material (listed above) you wish to import under postentry quarantine is to be grown at (site listed above) in accordance with the agreement dated June 25, 2013.

Permit Number PEQ-XX-XXXXX

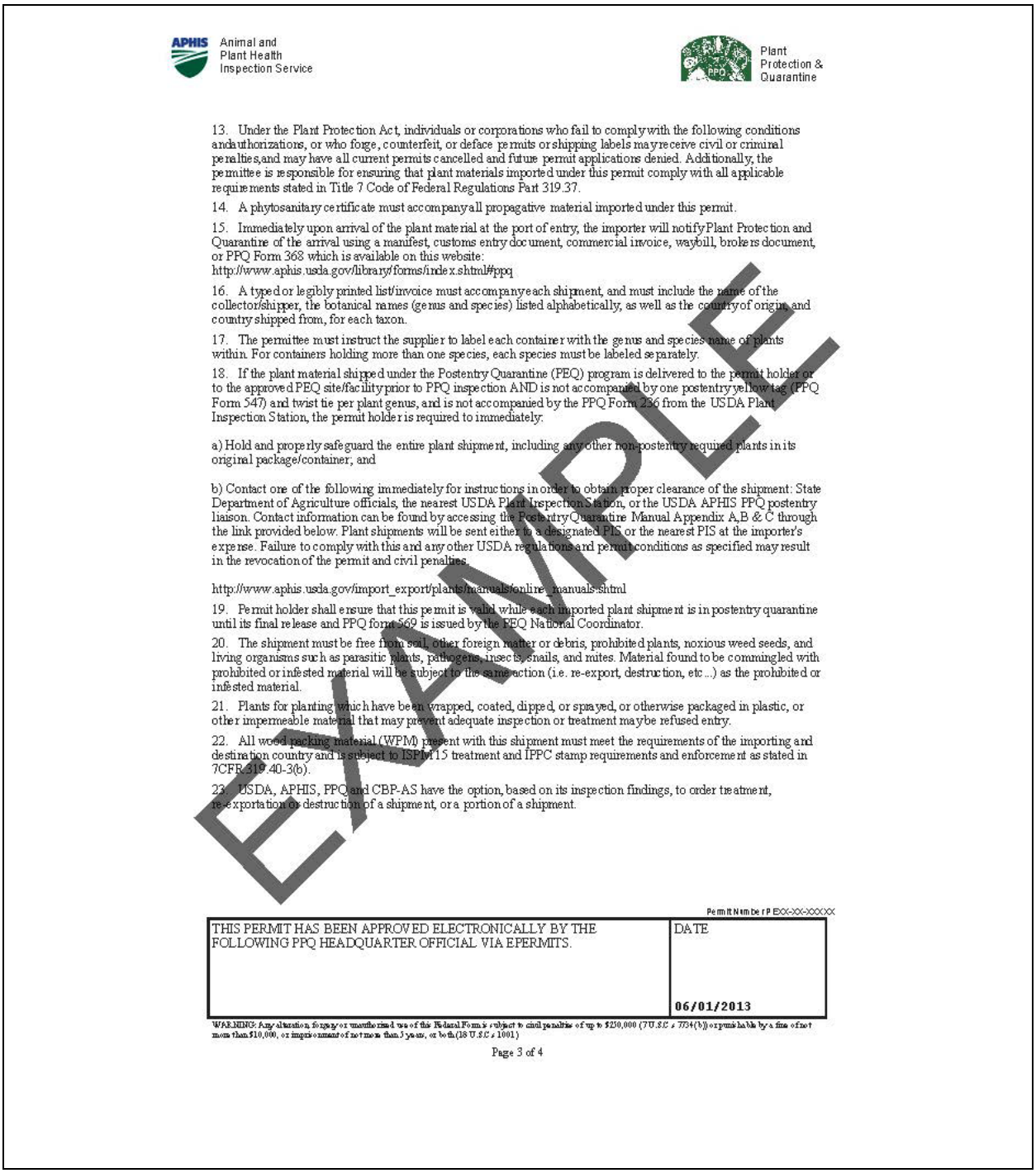
THIS PERMIT HAS BEEN APPROVED ELECTRONICALLY BY THE FOLLOWING PPQ HEADQUARTER OFFICIAL VIA EPERMITS.	DATE 06/01/2013

WARNING: Any alteration, forgery or unauthorized use of this Federal Form is subject to civil penalties of up to $250,000 (7 U.S.C. § 7734(b)) or punishable by a fine of not more than $10,000, or imprisonment of not more than 5 years, or both (18 U.S.C. § 1001)

Page 2 of 4

EXAMPLE

Figure F-16 Example of a Controlled Import Permit for Postentry Quarantine (CIP) (page 2 of 4)



APHIS Animal and Plant Health Inspection Service

Plant Protection & Quarantine

13. Under the Plant Protection Act, individuals or corporations who fail to comply with the following conditions andauthorizations, or who forge, counterfeit, or deface permits or shipping labels may receive civil or criminal penalties,and may have all current permits cancelled and future permit applications denied. Additionally, the permittee is responsible for ensuring that plant materials imported under this permit comply with all applicable requirements stated in Title 7 Code of Federal Regulations Part 319.37.

14. A phytosanitary certificate must accompany all propagative material imported under this permit.

15. Immediately upon arrival of the plant material at the port of entry, the importer will notify Plant Protection and Quarantine of the arrival using a manifest, customs entry document, commercial invoice, waybill, brokers document, or PPQ Form 368 which is available on this website:
http://www.aphis.usda.gov/library/forms/index.shtml#ppq

16. A typed or legibly printed list/invoice must accompany each shipment, and must include the name of the collector/shipper, the botanical names (genus and species) listed alphabetically, as well as the country of origin, and country shipped from, for each taxon.

17. The permittee must instruct the supplier to label each container with the genus and species name of plants within. For containers holding more than one species, each species must be labeled separately.

18. If the plant material shipped under the Postentry Quarantine (PEQ) program is delivered to the permit holder or to the approved PEQ site/facility prior to PPQ inspection AND is not accompanied by one postentry yellow tag (PPQ Form 547) and twist tie per plant genus, and is not accompanied by the PPQ Form 296 from the USDA Plant Inspection Station, the permit holder is required to immediately:

a) Hold and properly safeguard the entire plant shipment, including any other non-postentry required plants in its original package/container, and

b) Contact one of the following immediately for instructions in order to obtain proper clearance of the shipment: State Department of Agriculture officials, the nearest USDA Plant Inspection Station, or the USDA APHIS PPQ postentry liaison. Contact information can be found by accessing the Postentry Quarantine Manual Appendix A,B & C through the link provided below. Plant shipments will be sent either to a designated PIS or the nearest PIS at the importer's expense. Failure to comply with this and any other USDA regulations and permit conditions as specified may result in the revocation of the permit and civil penalties.

http://www.aphis.usda.gov/import_export/plants/manuals/online_manuals.shtml

19. Permit holder shall ensure that this permit is valid while each imported plant shipment is in postentry quarantine until its final release and PPQ form 569 is issued by the PEQ National Coordinator.

20. The shipment must be free from soil, other foreign matter or debris, prohibited plants, noxious weed seeds, and living organisms such as parasitic plants, pathogens, insects, snails, and mites. Material found to be commingled with prohibited or infested material will be subject to the same action (i.e. re-export, destruction, etc...) as the prohibited or infested material.

21. Plants for planting which have been wrapped, coated, dipped, or sprayed, or otherwise packaged in plastic, or other impermeable material that may prevent adequate inspection or treatment maybe refused entry.

22. All wood packing material (WPM) present with this shipment must meet the requirements of the importing and destination country and is subject to ISPM15 treatment and IPPC stamp requirements and enforcement as stated in 7CFR 319.40-3(b).

23. USDA, APHIS, PPQ and CBP-AS have the option, based on its inspection findings, to order treatment, re-exportation or destruction of a shipment, or a portion of a shipment.

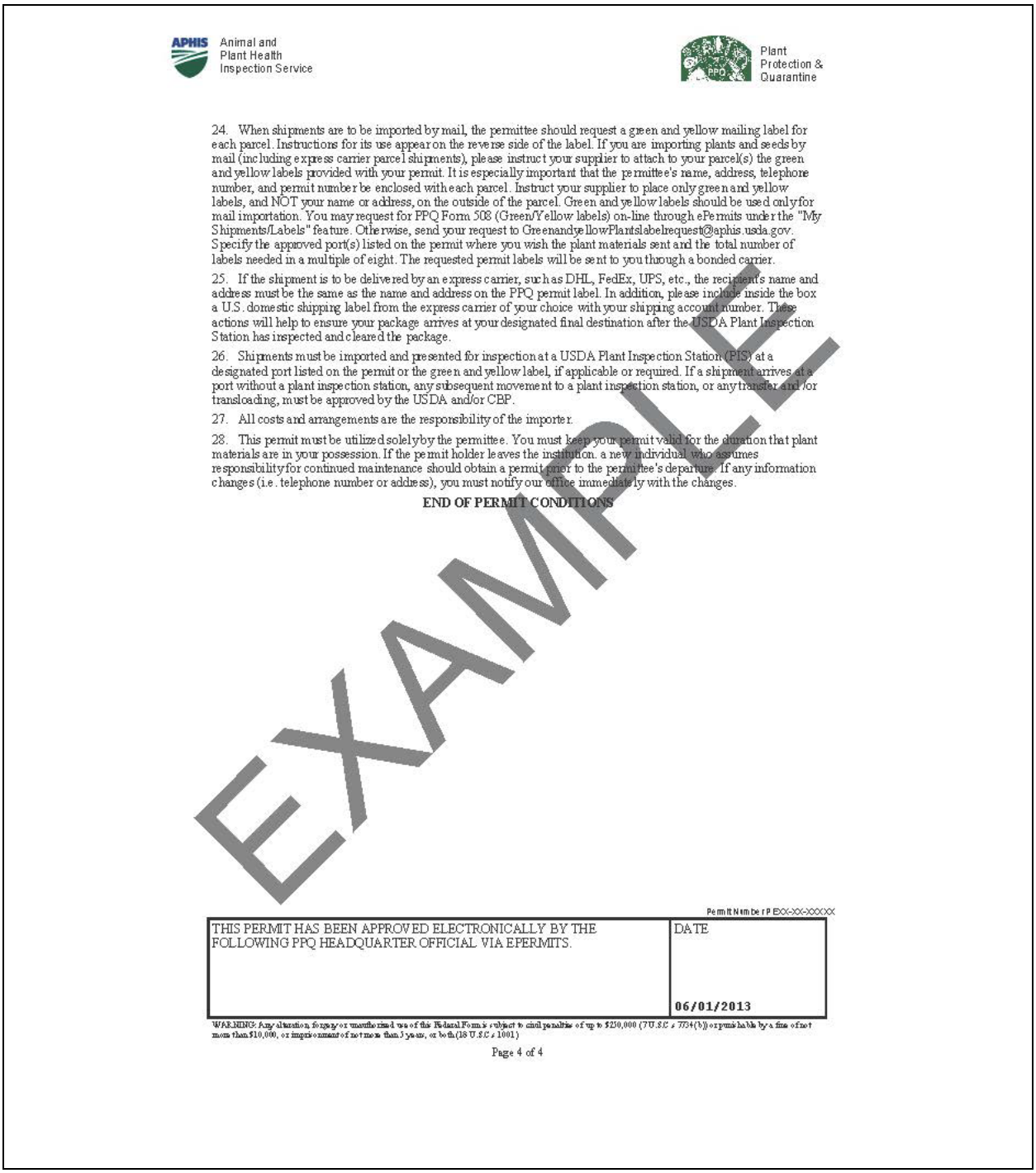
Permit Number PEQ-XX-XXXXX

THIS PERMIT HAS BEEN APPROVED ELECTRONICALLY BY THE FOLLOWING PPQ HEADQUARTER OFFICIAL VIA EPERMITS.	DATE 06/01/2013

WARNING: Any alteration, forgery or unauthorized use of this Federal Form is subject to civil penalties of up to $250,000 (7 U.S.C. § 7734(b)) or punishable by a fine of not more than $10,000, or imprisonment of not more than 5 years, or both (18 U.S.C. § 1001)

Page 3 of 4

Figure F-17 Example of a Controlled Import Permit for Postentry Quarantine (CIP) (page 3 of 4)



Animal and Plant Health Inspection Service

Plant Protection & Quarantine

24. When shipments are to be imported by mail, the permittee should request a green and yellow mailing label for each parcel. Instructions for its use appear on the reverse side of the label. If you are importing plants and seeds by mail (including express carrier parcel shipments), please instruct your supplier to attach to your parcel(s) the green and yellow labels provided with your permit. It is especially important that the permittee's name, address, telephone number, and permit number be enclosed with each parcel. Instruct your supplier to place only green and yellow labels, and NOT your name or address, on the outside of the parcel. Green and yellow labels should be used only for mail importation. You may request for PPQ Form 508 (Green/Yellow labels) on-line through ePermits under the "My Shipments/Labels" feature. Otherwise, send your request to GreenandyellowPlantslabelrequest@aphis.usda.gov. Specify the approved port(s) listed on the permit where you wish the plant materials sent and the total number of labels needed in a multiple of eight. The requested permit labels will be sent to you through a bonded carrier.

25. If the shipment is to be delivered by an express carrier, such as DHL, FedEx, UPS, etc., the recipient's name and address must be the same as the name and address on the PPQ permit label. In addition, please include inside the box a U.S. domestic shipping label from the express carrier of your choice with your shipping account number. These actions will help to ensure your package arrives at your designated final destination after the USDA Plant Inspection Station has inspected and cleared the package.

26. Shipments must be imported and presented for inspection at a USDA Plant Inspection Station (PIS) at a designated port listed on the permit or the green and yellow label, if applicable or required. If a shipment arrives at a port without a plant inspection station, any subsequent movement to a plant inspection station, or any transfer and/or transloading, must be approved by the USDA and/or CBP.

27. All costs and arrangements are the responsibility of the importer.

28. This permit must be utilized solely by the permittee. You must keep your permit valid for the duration that plant materials are in your possession. If the permit holder leaves the institution, a new individual, who assumes responsibility for continued maintenance should obtain a permit prior to the permittee's departure. If any information changes (i.e. telephone number or address), you must notify our office immediately with the changes.

END OF PERMIT CONDITIONS

Permit Number P.EOC-XX-XXXXX

THIS PERMIT HAS BEEN APPROVED ELECTRONICALLY BY THE FOLLOWING PPQ HEADQUARTER OFFICIAL VIA EPERMITS.	DATE 06/01/2013

WARNING: Any alteration, forgery or unauthorized use of this Federal Form is subject to civil penalties of up to $250,000 (7 U.S.C. § 7734(b)) or punishable by a fine of not more than $10,000, or imprisonment of not more than 5 years, or both (18 U.S.C. § 1001)

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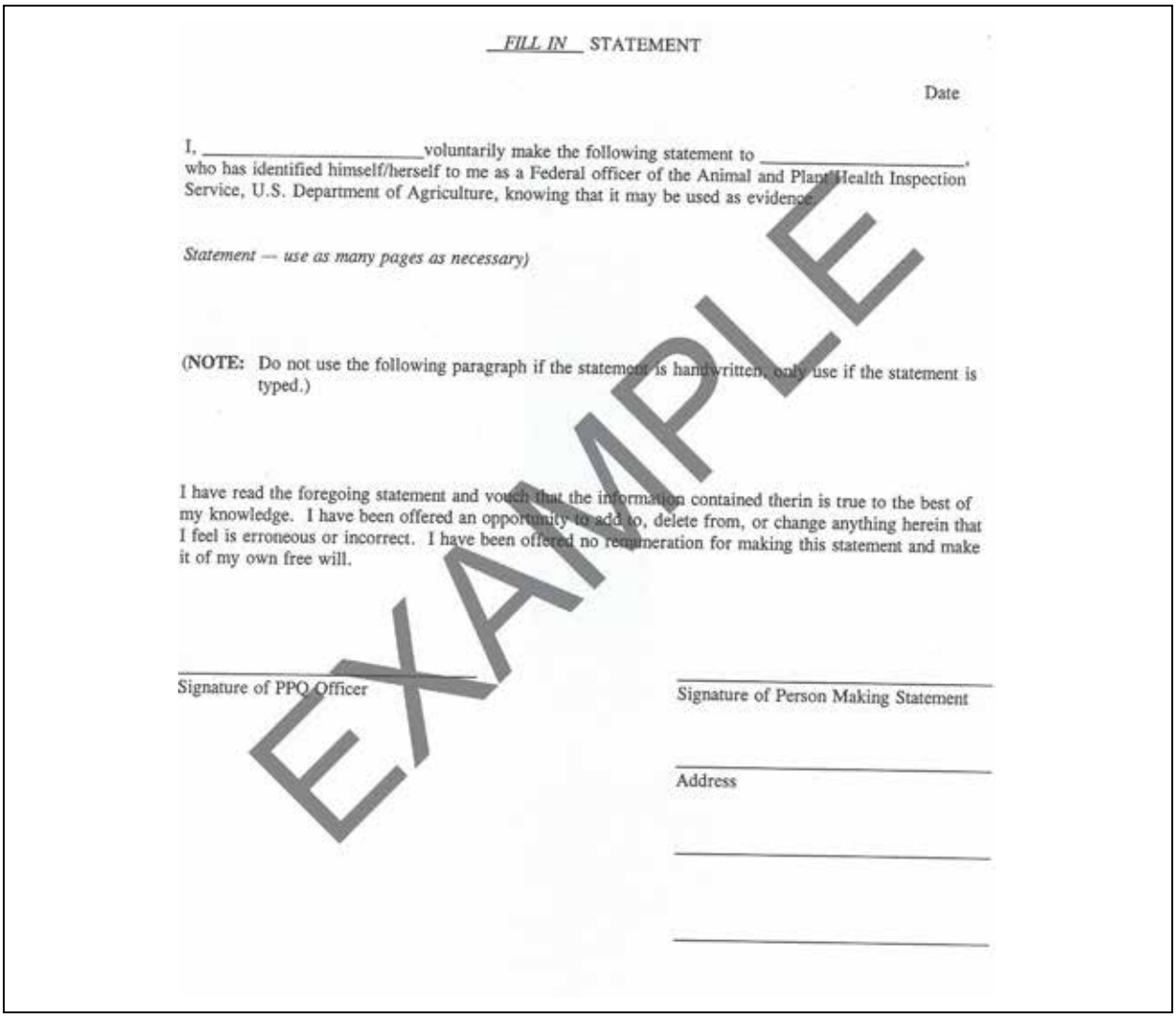
Figure F-18 Example of a Controlled Import Permit for Postentry Quarantine (CIP) (page 4 of 4)

Witness Statements



FILL IN STATEMENT

Date

I, _____ voluntarily make the following statement to _____, who has identified himself/herself to me as a Federal officer of the Animal and Plant Health Inspection Service, U.S. Department of Agriculture, knowing that it may be used as evidence:

Statement — use as many pages as necessary)

(**NOTE:** Do not use the following paragraph if the statement is handwritten, only use if the statement is typed.)

I have read the foregoing statement and vouch that the information contained therin is true to the best of my knowledge. I have been offered an opportunity to add to, delete from, or change anything herein that I feel is erroneous or incorrect. I have been offered no remuneration for making this statement and make it of my own free will.

_____
Signature of PPQ Officer

_____
Signature of Person Making Statement

_____
Address

_____

_____

Figure F-19 Example of a Witness Statement

Appendix G

Postentry Quarantine Regulation 7 CFR 319.37-23

(a) The following restricted articles, from the designated countries and localities, and any increase therefrom must be grown under postentry quarantine conditions specified in paragraphs (c) and (d) of this section, and may be imported or offered for importation into the United States **only**:

(1) If destined for a State that has completed a State postentry quarantine agreement in accordance with paragraph (c) of this section;

(2) If a postentry quarantine growing agreement has been completed and submitted to Plant Protection and Quarantine in accordance with paragraph (d) of this section. The agreement must be signed by the person (the importer) applying for a written permit for importation of the article in accordance with §319.37-3; and,

(3) If Plant Protection and Quarantine has determined that the completed postentry quarantine growing agreement fulfills the applicable requirements of this section and that services by State inspectors are available to monitor and enforce the postentry quarantine.

(c) *State Postentry quarantine agreement.* (1) Articles required to undergo postentry quarantine in accordance with this section may only be imported if destined for postentry quarantine growing in a State which has entered into a written agreement with the Animal and Plant Health Inspection Service, signed by the Administrator or his or her designee and by the State Plant Regulatory Official. In accordance with the laws of individual States, inspection and other postentry quarantine services provided by a State may be subject to charges imposed by the State.

(I) The following States have entered into a postentry quarantine agreement in accordance with this paragraph:

[Reserved]

(2) In any such written agreement, the State shall agree to:

(i) Establish State regulations and requirements prior to the effective date of the agreement and enforce such State and Postentry Quarantine Manual regulations and requirements necessary to inspect sites and plants growing in postentry quarantine and to monitor and enforce compliance with postentry quarantine growing in accordance with this section;

(ii) Review pending permit applications for articles to be grown under postentry quarantine conditions in the States, upon request of Plant Protection and Quarantine, and report to the Permit Unit of Plant Protection and Quarantine whether the State would be able to provide inspection and monitoring services for the proposed postentry quarantine.:

(iii) Provide the services of State inspectors to: inspect sites to be used for postentry quarantine; report to the Permit Unit of Plant Protection and Quarantine whether the site is of adequate size to contain the number of plants proposed for importation, including potential increase if increase is allowed; inspect plants for evidence of exotic pests at least once during the first year and once during the second year for plants required to be grown in postentry quarantine for 2 years, and at least once for plants required to be grown in quarantine for less than 2 years and monitor and enforce compliance with the requirements of this section during the use of the sites for postentry quarantine;

(iv) Report to the Postentry Quarantine Unit of Plant Protection and Quarantine any evidence of plant pests that are not known to exist in the United States and that are found at a postentry quarantine site by State inspectors; recommend to Plant Protection and Quarantine safeguards or mitigation measures to control the pests; and supervise the application of safeguards or mitigation measures approved by Plant Protection and Quarantine; and

(v) Report to the Postentry Quarantine Unit of Plant Protection and Quarantine any propagation or increase in the number of plants that occurs during postentry quarantine.

(3) In any such written agreement, the Administrator shall agree to:

(i) Seek State review of permit applications for postentry quarantine material in that State, and issue permits only after determining that State services are available to monitor the postentry quarantine;

(ii) Upon request of the State, provide training, technical advice, and pest identification services to State officials involved in providing postentry quarantine services in accordance with this section;

(iii) Notify State officials, in writing and within 10 days of the arrival, when plant material destined for postentry quarantine in their State arrives in the United States, and notify State officials in writing when materials in postentry quarantine may be released from quarantine in their State.

(4) *Termination of State postentry quarantine agreement*. A State postentry quarantine agreement may be terminated by either the Administrator or the State Plant Regulatory Official by giving written notice of termination to the other party. The effective date of the termination will be 60 days after the date of actual receipt of notice, with regard to future importation to that State of articles requiring postentry quarantine in accordance with this section. When a postentry quarantine agreement is terminated by either the State Plant Regulatory Official or the Administrator, APHIS and the affected State shall continue to provide postentry quarantine services in accordance with the postentry quarantine agreement, until the time the plant material is eligible to be released from quarantine, for all postentry quarantine material already in the State, and for all postentry quarantine material that arrives in the State prior to the effective date of termination.

(d) *Postentry quarantine growing agreements*. Any restricted article required to be grown under postentry quarantine conditions, as well as any increase therefrom, shall be grown in accordance with a postentry quarantine growing agreement signed by the person (the importer) applying for a written permit in accordance with §319.37-3 for importation of the article and submitted to Plant Protection and Quarantine. On each postentry quarantine growing agreement, APHIS shall also obtain the signature of the State Plant Regulatory Official for the State in which regulated

articles covered by the agreement will be grown. The postentry quarantine growing agreement shall specify the kind, number, and origin of plants to be imported, and shall certify to APHIS and to the State in which the articles are grown that the signed of the agreement will comply with the following conditions for the period of time specified below:

(1) To grow such article or increase therefrom only on specified premises owned, rented, or otherwise in possession of the importer, within a space of dimensions designated by an inspector, and to move, propagate, or allow propagation of the article or increase therefrom or parts thereof only with the written permission of the National Coordinator for postentry quarantine in Beltsville, MD or the Coordinator of postentry quarantine for Hawaii, Guam, and CNMI in Honolulu, HI after approval by the State Plant Regulatory Officer or representative:

(2) To permit an inspector to have access to the specified premises for inspection of such article during regular business hours;

(3) To keep the article and any increase therefrom identified with a label showing the name of the article, port accession number, and date of importation;

(4) To keep the article separated from any domestic plant or plant product of the same genus by no less than 3 meters (approximately 10 feet); and from any other imported plant or plant product by the same distance;

(5) To allow or apply remedial measures (including destruction) determined by an inspector to be necessary to prevent the spread of an injurious plant disease, injurious insect pest, or other plant pest;

(6) To notify an inspector, orally or in writing, within 30 days of the time the importer or the person in charge of the growing site finds any abnormality of the article, or the article dies or is killed by the importer, the person in charge of the growing site, or any other person; to retain the abnormal or dead article for at least 60 days following that date of notification; an to give the abnormal or dead article to an inspector upon request;

(7) To grow the article or increase therefrom, if an article or *Rubus* spp. (cloudberry, blackberry, boysenberry, dewberry, loganberry, raspberry) from Europe, only in a screenhouse with screening of a minimum of 16 mesh per inch;

(8) To grow the article or increase therefrom, if an article of *Chrysanthemum* spp. (chrysanthemum) or *Dianthus* spp. (carnation, sweet-william), only in a greenhouse or other enclosed building; and

(9) To comply with the above conditions for a period of 6 months after importation for an article of *Chrysanthemum* spp. (chrysanthemum), for a period of 1 year after importation for an article of *Dianthus* spp. (carnation, sweet-william), and for a period of 2 years after importation for any other such articles.

(e) A completed postentry quarantine agreement (PPQ form 546) signed by both the applicant and the State Plant Regulatory Officer or representative must be forwarded to the Permits Unit in Riverdale, MD to obtain a written permit for an article required to be grown under postentry quarantine conditions.

(f) *Inspector-ordered disposal, movement, or safeguarding of restricted articles*; *costs and charges, civil and criminal liabilities*.

(1) *Growing at unauthorized sites*. If an inspector determines that any article subject to the postentry quarantine growing requirements of this section, or any appropriately authorized increase therefrom, is being grown at an unauthorized site, the inspector may file an emergency action notification (PPQ Form 523) with the owner of the article or the person who owns or is in possession of the site on which the article is being grown. The person named in the form 523 must, within the time specified in form 523, sign a postentry quarantine growing agreement, destroy, ship to a point outside the United states, move to an authorized postentry quarantine site, and/or apply treatments or other safeguards to the article, the increase therefrom, or any portion of the article or the increase therefrom, as prescribed by an inspector to prevent the introduction of plant pests into the United States. In choosing which action to order and in setting the time limit for the action, the inspector shall consider the degree of pest risk presented by the plant pest(s) associated with the kind of article (including increase therefrom), the types of other host materials for the pest in or near the growing site, the climate and season at the site in relation to the pest's survival, and the availability of treatment facilities.

(2) *Growing at authorized sites*. If an inspector determines that any article, or any increase therefrom, grown at a site specified in an authorized postentry quarantine growing agreement is being grown contrary to the provisions of this section, including in numbers greater than the number approved by the postentry quarantine growing agreement, or in a manner that otherwise presents a risk of introducing plant pests into the United States, the inspector shall issue an emergency action notification (PPQ form 523) to the person who signed the postentry quarantine growing agreement. That person shall be responsible for carrying out all actions specified in the emergency action notification. The emergency action notification may extend the time for which the articles and the increase therefrom must be grown under the postentry quarantine conditions specified in the authorized postentry quarantine growing agreement, or may require that the person named in the notification must destroy, ship to a point outside the United States, or apply treatments or other safeguards to the article, the increase therefrom, or any portion of the article or the increase therefrom, within the time specified in the emergency action notification. In choosing which action to order and in setting the time limit for the action, the inspector shall consider the degree of pest risk presented by the plant pest(s) associated with the kind of article (including increase therefrom), the types of other host materials for the pest in or near the growing site, the climate and season at the site in relation to the pest's survival, and the availability of treatment facilities.

(3) *Costs and charges*. All costs pursuant to any action ordered by an inspector in accordance with this section shall be borne by the person who signed the postentry quarantine growing agreement (PPQ form 546) covering the site where the articles were grown, or if no such agreement was signed, by the owner of the articles at the growing site.

(4) *Civil and criminal liabilities*. Any person who moves an article subject to postentry quarantine growing requirements from the site specified for that article in an authorized postentry quarantine growing agreement, or who otherwise handles such an article contrary to the requirements of this section, shall be subject to such civil penalties and such criminal liabilities as are provided by 18 U.S.C. 1001, 7 U.S.C. 150gg and 163, or other applicable Federal statutes.

(g) *State*. As used in this section. “State” means each of the 50 States of the United States, the District of Columbia, Guam, Northern Mariana Islands, Puerto Rico, the Virgin Islands, of the United States, and all other territories and possessions of the United States.

(Approved by the Office of Management and Budget under control number 0579-0049)

(44 U.S.C. 35)[45 FR 31585, May 13, 1980; 45 FR 35305, May 27, 1980, as amended at 45 FR 81531. Dec. 11, 1980; 48 FR 57466, Dec. 30, 1983; 57 FR 43148, 43150, Sept. 18, 1992; 58 FR 38267, July 16, 1993; 58 FR 41124. Aug. 2, 1993; 59 FR 67610. Dec. 30, 19]

Appendix H

Plants Growing in Postentry Quarantine

Contents

Introduction

Use Table H-1 to determine when to look for symptoms of infections caused by bacteria, viruses, fungi, and cankers.

Table H-1 Causal Agent and Onset of Symptoms

If the causal agent is likely:	Then look for symptoms this time of year:
Bacteria	Spring and early summer
Viruses	Cool weather (when leaves are first expanding)
Cankers	Year long
Fungi including lead spots	Mid-summer to fall

Inspection Aid for Plants Growing in Postentry Quarantine

Table H-2 Inspection Aid for Plants Growing in Postentry Quarantine

Host Group:	Pathogen or disease:	Preferred inspection period:	Symptoms:
Abelmoschus spp. (okra)	Cotton leaf curl agent	After leaves are fully opened until 6 weeks after	**Leaves**: Conspicuous netveinenations; on severely affected plants, leaves are small, thick, and curled downwards; also, on severely affected plant, may have “bunchy-top” appearance
Acacia spp.	*Uromycladium tepperianum* (Sacc.) McAlp. (rust)	Throughout growing season	**Leaves**: Gall–like masses along entire length **Branches**: Large rounded galls or areas coated with brown, powdery spores

Host Group:	Pathogen or disease:	Preferred inspection period:	Symptoms:
Acer spp. (maple)	*Xanthomonas acernea* (Ogawa) Burk (leaf disease)	After leaves are fully opened until autumn	**Leaves**: Irregular, water-soaked spotting; spots later turn pale gray to black; leaves turn black and shrivel
	Maple-variegation agent	After leaves are fully opened until 6 weeks after	**Leaves**: Yellow mottle mosaic peppered with very small, round, light-green spots; spots may coalesce to give chlorotic appearance
Althaea spp. (hollyhock)	Hibiscus yellow vein mosaic agent	When leaves are developing until leaves are fully opened	**Leaves**: Faint vein clearing (of young leaves) followed by swelling of the veins at several points on the underside of the leaves; swelling gradually extends to nearly all veins. As leaves grow, the swelling thickens and becomes twisted; thickened veins are deep green in color and appear opaque when seen against the light
Anacardium occidentale (fruit and nut list)	Inspect for any potential exotic pathogen	Various times of the year	REFER to Plant Genera Subject to Postentry Quarantine
Annona spp. (fruit and nut list)	Inspect for any potential exotic pathogens	Various times of the year	REFER to Plant Genera Subject to Postentry Quarantine
Artocarpus spp.	Inspect for any potential exotic pathogens	Various times of the year	REFER to Plant Genera Subject to Postentry Quarantine
Averrhoa carambola (fruit and nut list)	Inspect for any potential exotic pathogens	Various times of the year	REFER to Plant Genera Subject to Postentry Quarantine
Averrhoa spp.	Inspect for any potential exotic pathogens	Various times of the year	REFER to Plant Genera Subject to Postentry Quarantine
Berberis spp. (barberry)	*Puccinia graminis* Pers. (black stem rust)	Between 5 and 9 weeks after leaves are fully opened	**Leaves**: Small, circular, yellowish to orange spots (up to 2 to 5 mm) on upper side; usually on the lower side are groups of orange-yellow horn or cup-like projections
Blighia sapida (akee)	Okra mosaic virus	When leaves are developing until leaves are fully opened	**Leaves**: Chlorosis of the leaf veins and chlorosis of the lamina leaving thin, dark-green bands along the small leaf veins

Host Group:	Pathogen or disease:	Preferred inspection period:	Symptoms:
Bromeliaceae (pineapple family) (Postentry in HI **only**)	*Puccinia pitcairniae* Lagh.	All season	**Leaves**: Scattered or compact cinnamon-brown to blackish-brown lesions
	Puccinia tillandsiae Cummins and Pollack	All season	**Leaves**: Lesions in clusters yellow to golden-brown
Bromeliaceae (pineapple family) (Postentry in HI **only**)	*Uredo nidularii* P. Henn.	All season	**Leaves**: Yellowish to cinnamon-brown lesions arranged in rows in groups
	Ustilago tillandsiae Patterson	During flowering period	**Inflorescences**: Powdery black sori destroying inflorescences
Brugmansia spp.	Datura Colombian virus	Spring and early summer	**Leaves**: 1) Veinbanding or chlorotic flecking followed by mottling; 2) may become rugose and slightly distorted
Ceratonia siliqua	Inspect for any potential exotic pathogen	Various times of year	REFER to Plant Genera Subject to Postentry Quarantine
Chrysanthemum spp. (*Dendranthema* spp.)	*Puccinia horiana* P. Henn. (white rust of *Chrysanthemum*)	When leaves are fully out. Spring: 3 to 6 weeks after planting and again later in the season; summer	**Leaves**: Upper surface—greenish-yellow spots. Lower surface—raised, waxy, whitish-yellow to pink pustules. **Young shoots**: Wilt and die
Chrysobalanus icaco	Inspect for any potential exotic pathogen	Various times of year	REFER to Plant Genera Subject to Postentry Quarantine
Chrysophyllum spp.	Inspect for any potential exotic pathogen	Various times of year	REFER to Plant Genera Subject to Postentry Quarantine
Corylus spp. (**except** *C. avellana*)	Inspect for any potential exotic pathogen	Various times of year	REFER to Plant Genera Subject to Postentry Quarantine
Corylus avellana (hazelnut)	Apple proliferation phytoplasma	Starting in the spring and throughout the season	General yellowing, weak growth, and dieback
Crocosmia spp.	*Puccinia mccleanii*	When leaves are out	—
	Uredo gladioli-buettneri Bub. (rust)	When leaves are out	—
	Uromyces gladioli P. Henn (rust)	When leaves are out	**Leaves**: Telia in small, brown sori crowded together to form a crust
	Uromyces nyikensis Syd. (rust)	When leaves are out	**Leaves**: Telia in small, cinnamon-brown sori along veins sometimes on chlorotic spots

Host Group:	Pathogen or disease:	Preferred inspection period:	Symptoms:
Crocosmia spp.	*Uromyces transversalis*	When leaves are out	**Leaves**: Uredinia appear as powdery bright-orange sori on both leaf surfaces in linear series transversely across the leaf; telia initially surround the uredinia and are dark brown
Datura spp. (thornapple)	Datura Colombian virus	Spring and early summer	**Leaves**: 1) Veinbanding or chlorotic flecking followed by mottling; 2) may become rugose and slightly distorted
Dendranthema spp. (refer to Chrysanthemum spp.)	—	—	—
Dianthus spp. (pink)	Carnation etched ring virus	Spring and early summer	**Leaves**: Oval- to dumbbell-shaped whitish necrotic flecks and rings with dark brown– maroon edges
	Carnation necrotic fleck virus	Spring and early summer	**Leaves**: Grayish white or reddish-purple flecks
	Carnation streak agent	Spring and early summer	**Leaves**: Yellowish or reddish spots parallel to veins. Lower surface may be heavily spotted and turn yellow
Dianthus spp. (pink)	*Phialophora cinerescens* (Wr.) van Beyma (=*Verticillium cinerescens* Wr.)	Any time	**Leaves**: Wilted, wrinkled, and chlorotic; vascular ring discoloration **Stems**: May have “kinks” at nodes and internodes shortened
Eucalyptus spp. (Australian gum)	Leaf chlorosis agent	After leaves are fully opened until 6 weeks later	**Leaves**: Chlorosis and size reduction Plants: Die in full sunlight; less chlorotic plants may live for some years, but growth is retarded
	Pestalotia disseminata Thuem. (parasitic leaf fungus)	From full leaf maturity and thereafter	**Leaves**: Premature drop; blight
Gladiolus spp. (corn flag, sword lily)	*Puccinia mccleanii* Doidge (rust)	When leaves are out	—
	Uredo gladioli-buettneri Bub. (rust)	When leaves are out	—
	Uromyces gladioli P. Henn. (rust)	When leaves are out	**Leaves**: Small, brown-black pustules crowded together to form a crust
	Uromyces transversalis (Thuem.) Wint. (rust)	When leaves are out	**Leaves**: Powdery, bright orange pustules on both surfaces in linear series perpendicular to veinatio

Host Group:	Pathogen or disease:	Preferred inspection period:	Symptoms:
Hibiscus (refer to Abelmoschus spp. (okra)	Cotton leaf curl agent	After leaves are fully opened until 6 weeks after	**Leaves**: Conspicuous net-veinenations; on severely affected plant, leaves are small, thick, and curled downwards; also, on severely affected plants, may have "bunchy-top" appearance
	Hibiscus yellow vein mosaic agent	When leaves are developing until leaves are fully opened	**Leaves**: Vein chlorosis; chlorotic areas yellowish green around leaf tissues to bright yellow near veins. Lower leaf surfaces: veins swollen (thickened), brittle and dark green; vein thickening causes leaf to curl downwards
	Okra mosaic virus	Spring and early summer	**Youngest leaves**: 7 to 8 days after inoculation: light-green mosaic or regular chlorosis of veins **Next two to three leaves produced**: one or more principal veins bordered by broad chlorotic bands **Later leaves**: no symptoms
Hydrangea spp.	*Puccinia glyceriae* S. Ito (*Aecidium hydrangea*)	When leaves are out	**Leaves**: Orange-yellow lesions on the upper surface (spermogonia); aecia on the lower surface of the leaf are cup shaped and pale yellow in color
Juniperus spp. (juniper)	*Stigmina deflectans* (Karst) Ellis (needlecast disease)	When needles are turning brown	**Needles**: Minute brownish fruiting bodies along the median veins of the upper side of needles
	Phacidiopycnis pseudotsuga (M. Wils.) Hahn (Douglas fir canker)	Throughout growing season	**Branches and trunk**: cankers; often exude abundance of resin; fungus not perennial, therefore, isolated cankers may heal over
Leucanthemella serotina	*Puccinia horiana* P. Henn. (white rust of *Chrysanthemum*)	When leaves are fully out; spring: 3 to 6 weeks after planting and again later in the season; summer	**Leaves**: Upper surface—greenish-yellow spots. Lower surface—raised, waxy, whitish-yellow to pink pustules **Young shoots**: Wilt and die

Host Group:	Pathogen or disease:	Preferred inspection period:	Symptoms:
Mahoberberis (*Berberis* × Mahoberberis *Mahonia* hybrid)	*Puccinia graminis* Pers. (black stem rust)	Between 5 to 9 weeks after leaves are fully opened	**Leaves**: Rust appears first on upper surface as yellowish round spots with brighter yellow or reddish-purple margins; later, discolored, slightly thickened spots appear on lower surface (this stage also appears on stem and fruit)
Mahonia spp. (Oregon grape, holly grape)	*Puccinia graminis* Pers. (black stem rust)	Between 5 to 9 weeks after leaves are fully opened	**Leaves**: Rust appears first on upper surface as yellowish round spots with brighter yellow or reddish-purple margins; later, discolored, slightly thickened spots appear on lower surface (this stage also appears on stem and fruit)
Malus spp. (apple)	Apple proliferation phytoplasma	Late summer and fall—opening of blossoms on infected branches; fall—growth of axillary buds (Witches' Broom); spring—early leafing out	**Buds and leaves**: 1) first symptoms—reddening of leaves and late growth of terminal buds; 2) second symptom—Witches' Broom may appear in the same or later years; 3) infested plants may become symptomless after 2 to 3 years of acute reaction
	Diaporthe mali Bres. (leaf, branch, and fruit fungus)	Spring and early summer	**Leaves**: Pale, discolored spots; may curl and drop prematurely **Young shoots**: Irregular, brownish canker about 6 inches below tip; twig surface gradually dries and cracks causing death of shoot
	Apple branch canker (*Valsa* canker) *(Valsa ceratosperma*; Gvritischvili)	Spring (more likely to see during a wet period)	**Bark**: Swollen, water-soaked lesions; small black pycnidia appear in the lesions later and spore horns approximately 1 month after that; cankers (usually on older plants) on the upper side of limbs; a girdling type of injury may be observed on weakened branches and twigs. These signs will probably be found **only** during the second growing season inspection

Host Group:	Pathogen or disease:	Preferred inspection period:	Symptoms:
Malus spp. (apple)	*Guignardia piricola* (Nose) Yamamoto (leaf, branch, and fruit disease)	Spring and summer Spring and summer	**Leaves**: Brown to dark brown spots surrounded by a ring Branches and trunk: Round oval lesions; infected and healthy tissues separated by a crack or crevice; lesion surface depressed, brown in color with many fruiting bodies in center
	Valsa ceratosperma (Tode ex Fr.) Maire (V. mali) (apple branch canker)	Throughout growing season	**Bark**: On the upper side of limbs the bark appears swollen and water soaked especially when wet. The resultant canker becomes sunken, darker, and cracked on the surface. Black pycnidia appear in the canker in late spring and spore horns about 1 month later. These signs will probably be found **only** during the second growing season inspection
Nipponanthemum nipponicum	*Puccinia horiana* P. Henn. (white rust of *Chrysanthemum*)	When leaves are fully out; spring: 3 to 6 weeks after planting and again later in the season; summer	**Leaves**: Upper surface—greenish-yellow spots. Lower surface—raised, waxy, whitish-yellow to pink pustules **Young shoots**: wilt and die
Passiflora spp. (passion fruit)	Passion fruit woodiness virus	During spring growth and early summer	**Leaves**: **P. edulis**: mosaic, distortion, and crinkles, with yellow spots on older leaves ***P. edulis f. flavicarpa*** and hybrids: Pale-green to yellowish ringspots and leaf mosaic on spring growth
Pinus spp. (two- or three-leaved) (pine)	*Cronartium flaccidium* (Alb. & Schw.) Wint. (rust causing serious stunting of hard pines)	Late spring to early summer	**Bark**: Irregular, ballooned, pale, yellow sacs containing powdery, orange spores
	Gall forming rust	—	—

Host Group:	Pathogen or disease:	Preferred inspection period:	Symptoms:
Prunus spp. (stone fruit)	Plum pox (=Sharka) virus	When leaves are fully opened, until six weeks after	**Plum** **Leaves**: severe diffused olive-green rings or mottling **Fruit**: skin with dark colored rings; flesh with brown or red discoloration **Seed**: brown spots **Peach**: Leaves: vein yellowing, chlorotic spotting, and distortion **Flowers**: some varieties will show color breaking symptoms **Apricot** **Leaves**: diffused pale-green rings and lines **Seed**: yellow rings
	Apple proliferation phytoplasma in *P. armeniaca* (apricot); *P. avium* (cherry); and *P. domestica* (plum)	Spring and summer	**Leaves**: wilting to leading to leaf death **Branches and trunk**: necrosis visible when cut across and longitudinally **Flowers**: become necrotic
		Starting in the spring and throughout the season	**Leaves**: wilting **Flowers**: necrosis on cherry flowers Branches and trunks: necrosis in cross-section
	Cherry leaf roll virus	Spring and summer	**Spring**: Delayed leafing and flowering **Summer**: 1) Margins of leaf roll upwards and, in some varieties, leaf turns purple; 2) infected tree declines in vigor and gum exudes from splits in bark
	Cherry rusty mottle (European) agent	Late summer	**Leaves**: Rust-colored pigmentation

Host Group:	Pathogen or disease:	Preferred inspection period:	Symptoms:
Prunus spp. (stone fruit)	European stone fruit yellows phytoplasma	Spring and summer	**Early symptoms**: leaf rolling and yellowing **Later symptoms**: shoot proliferation and unseasonal growth (during winter) Characteristic disease symptoms: presence of weak shoot with small leaves among normal shoots and irregularly distributed dried twigs on branches
	Plum bark split strain of apple chlorotic leaf spot virus	Throughout growing season	**Bark**: formation of reddish-brown areas that become sunken, hard, and usually split; splits increase and are flanked by sunken areas of dead bark with wavy margin
	Arabis mosaic virus and its strains	For Chlorotic symptoms, not more than 6 weeks after leaves are fully opened	**Plants**: dwarfing from slight stunting to extreme miniaturization (extreme miniaturization condition—leaves are twisted, cupped, crinkled, or deformed) **Leaves**: chlorosis between veins and in irregular blotches or yellowing of whole leaves or leaf edges
	Raspberry ringspot virus and its strains	Up to 6 weeks after leaf is fully opened	**Leaves**: “rasp-leaf” condition
	Tomato blackring virus and its strains	Spring and early summer	**Peach**: shoot stunting **Almond**: leaf enations
	Strawberry latent ringspot virus and its strains	Spring and early summer	**Peach**: causes dwarfing **Cherry**: veinal chlorosis and reddening of leaves
Pseudotsuga spp. (Douglas fir)	*Phacidiopycnis pseudotsuga* (M. Wils.) Hahn (Douglas fir canker)	Throughout growing season	**Terminal buds and shoots**: die-back **Branches or trunk:** girdling up to 6 inches wide **Larger branches or trunk**: cankers; isolated cankers may heal over as fungus is not perennial on bark

Host Group:	Pathogen or disease:	Preferred inspection period:	Symptoms:
Rosa spp. (rose)	Rose wilt agent	After leaves are fully opened until 6 weeks later	**Plants**: wilted; pinched, yellowish-green shoots and eventually die-back and death; also, stems proliferation **Leaves**: epinasty; turn pale green or yellow; brittle and easily detached
Rubus spp. (bramble)	Rubus stunt phytoplasm	Early summer	**Leaves**: on infected cane, paler than normal **Canes**: small, thin, and weak; also excessive lateral branching (bushy appearance) **Flowers**: green, leaf-like petals; also excessive proliferation of flowers
Watsonia spp.	*Puccinia mccleanii* Doidge (rust)	When leaves are out	—
	Uredo gladioli-buettneri Bub. (rust)	When leaves are out	—
	Uromyces gladioli gladioli P. Henn (rust)	When leaves are out	**Leaves**: small, brown-black pustules crowded together to form a crust
	Uromyces transversalis (Thuem.) Wint. (rust)	When leaves are out	**Leaves**: powdery, bright orange pustules on both surfaces in linear series perpendicular to veination

Appendix

I

Pesticide Safety

Precautions

Practice the following safety precautions:

1. Check container markings, labels, and accompanying documents to learn if the seed was treated. If the accompanying documents indicate that the seed was treated, skip to Step 3. If the documents tell you nothing, go to Step 2.
2. If you didn't learn anything from the labels or accompanying documents, carefully examine the container and the seed for pesticide residue. If you detect a chemical odor, suspect the seed was treated. If pesticides are suspected, recheck the documentation and labeling to learn the name of the pesticide. By knowing what the pesticide is, you can take the most appropriate action if pesticide poisoning occurs.
3. Don't breathe the air around the open container or the treated seed. Work in a well-ventilated area.
4. If it is necessary for you to touch the seed, wear latex gloves. To increase your protection, handle the seed as little as possible.
5. Once you complete your inspection, appropriately discard the latex gloves. Wash your hands with soap and water.
6. If the seed showed evidence of having been treated but was not so marked, mark the documents and container. Mark them to alert other people who may have to handle the shipment.

Postentry Quarantine

Glossary

Use this glossary to find the meaning of specialized words, abbreviations, acronyms, and terms used in regulating postentry quarantine materials. To locate where in the manual a given definition, term, or abbreviation is mentioned, refer to the index.

Definitions, Terms, and Abbreviations

advisories. important information throughout the manual brought to the user's attention

aecium. cuplike structure of some rust fungi that contains chains of aeciospores

APHIS. Animal and Plant Health Inspection Service

APHIS Form 7060. Official Warning Violation of Federal Regulations

blight. any of numerous plant diseases resulting in sudden conspicuous wilting and dying of affected parts, especially young, growing tissues

cancellate. to make in a crisscross pattern

cankers. (a) localized diseased or necrotic area on a plant part, especially on a trunk, branch, or twig of a woody plant, usually caused by fungi or bacteria; (b) any of several diseases of plants characterized by the presence of such lesions

character. a structure, function, or attribute determined by a gene or group of genes

chlorosis. yellowing or whitening of normally green plant tissue because of a decreased amount of chlorophyll, often as a result of disease or nutrient deficiency

clavate. having one end thickened; club-shaped

dieback. gradual dying of plant shoots, starting at the tips, as a result of various diseases or climatic conditions

eruptment. bursting through or as if through a surface or covering

girdle. to remove a band of bark and cambium from the circumference of (a tree) usually in order to kill it

graft. (a) to unite (a shoot or bud) with a growing plant by insertion or by placing in close contact; (b) to join (a plant or plants) by such union

host. animal or plant on which or in which another organism lives

hyaline. resembling glass, as in translucence or transparency; glassy

lacerate. having jagged, deeply cut edges

necrosis. death of cells or tissues through injury or disease, especially in a localized area of the body

pedicel. small stalk or stalk-like part bearing a single flower in an inflorescence

pedicellate. having or supported by a pedicel

PEQ. Postentry Quarantine

PEQLO. PPQ Postentry Quarantine Liaison Officer

PEQP. Postentry Quarantine Program

PEQU. Postentry Quarantine Unit

peridium. covering of the spore-bearing organ in many fungi

PIS. Plant Inspection Station

PPQ Form 236. Notice of Shipment and Report of Inspection of Imported Plants to be Grown Under Postentry Quarantine

PPQ Form 391. Specimens for Determination

PPQ Form 518. Report of Violation

PPQ Form 546. Agreement for Postentry Quarantine—State Screening Notice (7 CFR 319 Subpart—Plants for Planting)

PPQ Form 569. Release From Postentry Quarantine

PPQ Form 587. Application for Permit to Import Plants or Plant Products

pruinose. having a white, powdery covering or bloom

pulvinate. having a swelling at the base. Used of a leafstalk

pyriform. shaped like a pear

sori. reproductive structures in certain fungi and lichens

SPHD. State Plant Health Director

SPRO. State Plant Regulatory Official

striate. marked with atriae; striped, grooved, or ridged

telium. pustule-like sorus formed on the tissue of a plant infected by a rust fungus and producing teliospores

USDA. United States Department of Agriculture

vector. an organism that carries disease-causing microorganisms from one host to another

verrucose. covered with warts or wart-like projections

xylem. supporting and water-conducting tissue of vascular plants, consisting primarily of tracheids and vessels; woody tissue