Reference Documents

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Treatments - D301 - Schedules for Domestic Movement of Regulated Articles

This document contains supplemental information or program guidance

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Introduction

- The treatments listed in this document are to be used **only** for domestic movement of regulated articles and are conducted in conjunction with a systems approach. State and local guidelines may apply.

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D301.32-10 Fruit Fly Treatments

The fruit fly treatments are organized by family or genus and species, and then by approved site or commodity.

NOTICE

- Several treatments in this section are equivalent to treatments for imported commodities found in T100 - Schedules for Fruits, Nuts, and Vegetables. In these cases, search in the ACIR Treatment search tile to go to the appropriate treatment.

Fruit Fly Family *Tephritidae* D301.32-10(a)—Soil in Containerized Nursery Stock

NOTICE

- Refer to the appropriate EPA-approved document that gives PPQ the authority to treat at the rates described in the treatment schedules. Examples of documents include chemical manufacturer labels, special local need registration (24c or SLN), and Section 18 quarantine exemptions.
- Contact the National Fruit Fly Coordinator to find out if the chemicals in the treatment schedules are registered for use in your state.

Treatment: D301.32-10(a-1) — Chemical treatment Diazinon

- Application Instructions
  - Apply to nursery stock using equipment that generates a coarse, low-pressure spray.
  - Soak the entire contents of the nursery stock container.
  - **Do not** drench to the point of runoff.
  - **Do not** allow the solution to enter sewers, drains, bodies of water, or aquatic habitats.

Diazinon Dosages for Nursery Stock

Insecticide	Dosage Rate (lb. a.i. per acre)
Diazinon	5.0

Treatment: D301.32-10(a-2) — Chemical treatment Lambda-Cyhalothrin

- The yellow and black colors of this schedule indicates that the authority to conduct the treatment comes from an emergency action required by PPQ in order to mitigate the pest risk. The emergency action is an interim measure and is pending final regulatory approval.

Lambda-Cyhalothrin Dosages for Nursery Stock

Insecticide	Dosage Rate (lb. a.i. per acre)
Lambda-Cyhalothrin	0.4

- Application Instructions
  - Apply to nursery stock using equipment that generates a coarse, low-pressure spray.
  - Soak the entire contents of the nursery stock container.
  - **Do not** drench to the point of runoff.
  - **Do not** allow the solution to enter sewers, drains, bodies of water, or aquatic habitats.

Fruit Fly Family *Tephritidae* D301.32-10(a)— Fruits, Vegetables, Cut Flowers, Foliage

Treatment: D301.32-10(a-3) — Irradiation using 70-150 Gy (not to exceed 1,000 Gy)

- Refer to the table **Pest-Specific Minimum Absorbed Dose for Fruit Fly Irradiation** for a list of fruit flies that can be irradiated. Treat using the minimum absorbed dose.
- Treatment facilities **must** be approved in advance by PPQ Field Operations. Facilities located in AL, AZ, CA, FL, GA, KY, LA, MS, NV, NM, NC, SC, TN, TX, or VA will require additional safeguarding measures described in 7 CFR 305.9(a).

Pest-Specific Minimum Absorbed Dose (Gy) for Fruit Fly Irradiation

Scientific Name	**Common Name**	**Minimum Absorbed Dose (Gy)**
Anastrepha ludens	Mexican fruit fly	70
Anastrepha obliqua	West Indian fruit fly	70
Anastrepha serpentina	Sapote fruit fly	100
Anastrepha suspensa	Caribbean fruit fly	70
Bactrocera cucurbitae	Melon fruit fly	150
Bactrocera dorsalis	Oriental fruit fly	150
Bactrocera jarvisi	Jarvis fruit fly	100
Bactrocera tryoni	Queensland fruit fly	100
Ceratitis capitata	Mediterranean fruit fly	100
	All other fruit flies of the family *Tephritidae* which are **not** listed above	150

Anastrepha ludens (Mexican fruit fly) D301.32-10(b)

White Sapote (*Casimiroa edulis*) Treatment: D301.32-10(b-1) — Cold treatment (refer to the equivalent treatment T107-b)

Citrus Treatment: D301.32-10(b-2) — High temperature forced air (refer to the equivalent treatment T103-a-1)

Pear, Quince, Citron Treatment: D301.32-10(b-3) — Cold treatment

Temperature	Exposure Period (days)
33 °F (0.56 °C) or below	18
34 °F (1.11 °C) or below	20
35 °F (1.67 °C) or below	22

Ceratitis capitata (Mediterranean fruit fly) D301.32-10(c)

Tomato Treatment: D301.32-10(c-1) — MB at NAP

Temperature (°F)	Dosage Rate (lb/1,000 ft^3)	Minimum Concentration Readings (ounces) At:			
		0.5 hr.	2 hrs.	3.5 hrs.	4 hrs.
70 and above	2.0	26	21	21	---
65-69	2.0	26	21	---	19

!WARNING

- Host tolerance is marginal. Warn the shipper of possible injury.

Tomato treatment: D301.32-10(c-2) — Vapor heat (refer to the equivalent treatment T106-b)

Citrus Treatment: D301.32-10(c-3) — MB at NAP — tarpaulin or chamber

Temperature (°F)	Dosage Rate (lb/1,000 ft^3)	Minimum Concentration Readings (ounces) At:	
		0.5 hr.	3.5 hrs.[1]
70 and above	2.0	26	21

[1] This treatment is currently **not authorized** pending EPA-approval to increase the duration to 3.5 hours.

Citrus Treatment: D301.32-10(c-4) — Cold treatment (refer to the equivalent treatment T107-a)

Citrus Treatment: D301.32-10(c-5) — MB at NAP — tarpaulin or chamber followed by cold treatment

Temperature (°F)	Dosage Rate (lb/1,000 ft^3)	Minimum Concentration Readings (ounces) At:	
		0.5 hr.	2 hrs.
70 and above	2.0	25	18
Followed by cold treatment			

Refrigeration	
Temperature	**Exposure Period (days)**
33 to 37 °F (0.56 to 2.77 °C)	4
OR 38 to 47 °F (3.33 to 8.33 °C)	11

Citrus Treatment: D301.32-10(c-6) — MB at NAP — tarpaulin or chamber followed by cold treatment

Temperature (°F)	Dosage Rate (lb/1,000 ft^3)	Minimum Concentration Readings (ounces) At:		
		0.5 hr.	2 hrs.	2.5 hrs.

70 and above	2.0	25	18	18
Followed by cold treatment				

Refrigeration	
Temperature	**Exposure Period (days)**
34 to 40 °F (1.11 to 4.44 °C)	4
OR 41 to 47 °F (5.0 to 8.33 °C)	6
OR 48 to 56 F (8.88 to 13.33 C)	10

Citrus Treatment: D301.32-10(c-7) — MB at NAP — tarpaulin or chamber followed by cold treatment

Temperature (°F)	Dosage Rate (lb/1,000 ft^3)	Minimum Concentration Readings (ounces) At:			
		0.5 hr.	2 hrs.	2.5 hrs.	3 hrs.
70 and above	2.0	25	18	18	17
Followed by cold treatment					

Refrigeration	
Temperature	**Exposure Period (days)**
43 to 47 °F (6.11 to 8.33°C)	3
OR 48 to 56 °F (8.88 to 13.33 °C)	6

Bell Pepper Treatment: D301.32-10(c-8) — Vapor heat (refer to the equivalent treatment T106-b)

Bactrocera dorsalis (Oriental fruit fly) D301.32-10(d)

Tomato Treatment: D301.32-10(d-1) — MB at NAP

Temperature (°F)	Dosage Rate (lb/1,000 ft^3)	Minimum Concentration Readings (ounces) At:		
		0.5 hr.	2 hrs.	3.5 hrs.
70 and above	2.0	26	21	21

!WARNING
Host tolerance is marginal. Warn the shipper of possible injury.

Tomato Treatment: D301.32-10(d-2) — Vapor heat (refer to the equivalent treatment T106-b)

Citrus and Grape Treatment: D301.32-10(d-3) — MB at NAP — tarpaulin or chamber followed by cold treatment

Temperature	Dosage Rate (lb/1,000	Minimum Concentration Readings (ounces) At:

(°F)	ft^3)	0.5 hr.	2 hrs.
70 and above	2.0	25	18
Followed by cold treatment			

Refrigeration	
Temperature	**Exposure Period (days)**
33 to 37 °F (0.56 to 2.77°C)	4
OR 38 to 47 °F (3.33 to 8.33 °C)	11

Citrus and Grape Treatment: D301.32-10(d-4) — MB at NAP — tarpaulin or chamber followed by cold treatment

Temperature (°F)	Dosage Rate (lb/1,000 ft^3)	Minimum Concentration Readings (ounces) At:		
		0.5 hr.	2 hrs.	2.5 hrs.
70 and above	2.0	25	18	18
Followed by cold treatment				

Refrigeration	
Temperature	**Exposure Period (days)**
34 to 40 °F (1.11 to 4.44 °C)	4
OR 41 to 47 °F (5.0 to 8.33 °C)	6
OR 48 to 56 F (8.88 to 13.33 C)	10

Treatment: D301.32-10(d-5) — MB at NAP — tarpaulin or chamber followed by cold treatment

Temperature (°F)	Dosage Rate (lb/1,000 ft^3)	Minimum Concentration Readings (ounces) At:			
		0.5 hr.	2 hrs.	2.5 hrs.	3 hrs.
70 and above	2.0	25	18	18	17
Followed by cold treatment					

Refrigeration	
Temperature	**Exposure Period (days)**
43 to 47 °F (6.11 to 8.33°C)	3
OR 48 to 56 °F (8.88 to 13.33 °C)	6

Citrus and Grape Treatment: D301.32-10(d-6) — Cold treatment followed by MB at NAP — tarpaulin or chamber

Refrigeration	
Temperature	**Exposure Period (days)**
33 or below (0.56 °C)	21
Followed by MB at NAP — tarpaulin or chamber	

Temperature (°F)	Dosage Rate (lb/1,000 ft^3)	Minimum Concentration Readings (ounces) At:	
		0.5 hr.	2 hrs.
70 and above	2.0	30	25
60 to 69	2.5	36	28
40 to 59	3.0	44	36

Bell Pepper Treatment: D301.32-10(d-7) — Vapor heat (refer to the equivalent treatment T106-b-1)

Anastrepha serpentina (Sapote fruit fly) D301.32-10(e)

Citrus Treatment: D301.32-10(e-1) — Methyl bromide (refer to the equivalent treatment 101-j-2-1)

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D301.50-10 Pine Shoot Beetle (*Tomicus piniperda*)

NOTICE
Cut trees at least 2 weeks prior to treatment in order to reduce possible damage by the fumigant to the trees. APHIS assumes **no** responsibility for damage due to the phytotoxic effects of these treatments.

D301.50-10(a) Pine Logs and Pine Lumber with Bark Attached, Pine Bark Products, and Pine Stumps

Treatment: D301.50-10(a)—MB at NAP—tarpaulin or chamber (refer to the equivalent treatment T404-b-1-1)

Temperature (°F)	Dosage Rate (lb/1,000 ft^3)	Minimum Concentration Readings (ounces) At:			
		0.5 hr.	2 hrs.	4 hrs.	16 hrs.
70 and above	3.0	36	30	27	25
40-69	5.0	60	51	46	42

D301.50-10(b) Christmas Trees, Pine Nursery Stock, Raw Pine Materials for Pine Wreaths and Garlands

Treatment: D301.50-10(b)—Cold Treatment

Temperature	Exposure Period (days)
-0.5 °F (-20.6 °C)	1

- Load the commodity into an APHIS-approved refrigeration unit. **Do not** start the treatment time until the refrigeration unit reaches the treatment temperature.

D301.50-10(c) Christmas Trees, Raw Pine Materials for Pine Wreaths and Garlands

Treatment: D301.50-10(c)—MB at NAP—tarpaulin or chamber (refer to the equivalent treatment T313-b)

Temperature (°F)	Dosage Rate (lb/1,000 ft^3)	Minimum Concentration Readings (ounces) At:			
		2 hrs.	3 hrs.	3.5 hrs.	4 hrs.
60 and above	3.0	43	---	---	36
60 and above	4.0	57	48	---	---
50-59	3.5	50	---	---	42
50-59	4.0	57	---	48	---
40-69	4.0	57	---	---	48

D301.75-11 Citrus Canker (*Xanthomonas axonopodis*)

Conduct treatments at a commercial packinghouse operating under a compliance agreement.

Notice

- All personnel using these treatments **must** clean their hands using one of the following disinfectants:
  - Gallex 1027 Antimicrobial Soap
  - Hibiclens
  - Hibistat
  - Sani Clean Hand Soap
  - Seventy Percent Isopropyl Alcohol

D301.75-11(a-1)—Chemical Treatment

Treatment: D301.75-11(a-1) Regulated Fruit[1]

D301.75-11(a-1) Regulated Fruit

Regulatory Authority
Changes to pH are effective immediately under authorization of 7 CFR 305.3((b)(1)(iv)) and are subject to change pending notice and comment. (October 2020)

- Thoroughly wet the fruit for at least 2 minutes with a solution containing 0.02% (200 ppm) sodium hypochlorite maintained at a pH of 5.5 to 7.0.
- Refer to the Related Document **Treatments - Procedures - Dips** section **Sodium Hypochlorite (Bleach) Treatments** for dilution tables and pH adjustment directions.
- In general, adjust the pH to 5.5 to 7.0 using acetic acid (white vinegar) under a fume hood or in a well-ventilated area, and mix the following dilutions:

- Using 8.4% sodium hypochlorite formulation, mix 1 part in 419 parts of water.
- Using 12.5% sodium hypochlorite formulation, mix 1 part in 624 parts of water.

- The use site **must** be listed on the label. To minimize corrosion of surfaces in contact with bleach, thoroughly wash down all work areas.

Treatment: D301.75-11(a-2) Regulated Fruit[1]

- Thoroughly wet the fruit with a solution containing sodium o-phenyl phenate (SOPP) at a concentration of 1.86 to 2.0 percent of the total solution.
- If the solution has sufficient soap or detergent to cause a visible foaming action, wet for **45 seconds**.
- If the solution does **not** contain sufficient soap to cause a visible foaming action, wet for **1 minute**.
- Apply according to all label directions.

Treatment: D301.75-11(a-3)—Regulated Fruit[1]

- Thoroughly wet the fruit with a solution of 85 ppm peroxyacetic acid for at least 1 minute.
- Apply according to all label directions.

[1]Regulated fruit is defined as any fruit, seed, plant, plant part, grass, or tree in all species, clones, cultivars, strains, varieties, and hybrids of the genera *Citrus* and *Fortunella*, and all clones, cultivars, strains, varieties, and hybrids of the species *Clausena lansium* and *Poncirus triofoliata*. The most common of these are: calamondin, citron, ethrog, grapefruit, key lime, kumquat, lemon, limequat, mandarin, persian lime, pummelo, satsuma, sour orange, sweet orange, tangelo, tangerine, tangor, trifoliate orange, and wampi.

Treatment: D301.75-11(b) Regulated Seed

Regulated seed is defined as any seed in all species, clones, cultivars, strains, varieties, and hybrids of the genera *Citrus* and *Fortunella*, and all clones, cultivars, strains, varieties, and hybrids of the species *Clausena lansium* and *Poncirus trifoliata*.

Treatment: D301.75-11(b)—Chemical and Heat Treatment (equivalent to T511-1—Seeds of *Citrus, Fortunella, Clausena lansium* and *Poncirus trifoliata* (and all cultivars, varieties, and hybrids))

- Following extraction from fruit treated as described in D301.75-11(a-1, 2, or 3):

1. Wash the seeds to remove the pulp.
2. Immerse in water heated to 125 °F (51.6 °C) or higher for 10 minutes.
3. Immerse in a solution containing 0.525% (5,250 ppm) sodium hypochlorite for at least 2 minutes.

Regulatory Authority
• Changes to sodium hypochlorite concentration and pH are effective immediately under authorization of 7 CFR 305.3((b)(1)(iv)) and are subject to change pending notice and comment. (October 2020)

- Refer to the Related Document **Treatments - Procedures - Dips** section **Sodium Hypochlorite (Bleach) Treatments** for dilution tables and pH adjustment directions.
- In general, adjust the pH to 5.5 to 7.0 using acetic acid (white vinegar) under a fume hood or in a well-ventilated area, and mix the following dilutions:
  - Using 8.25%, 8.3%, 8.5%, or 8.6% sodium hypochlorite formulations, mix 1 part in 15 parts of water.

- The use site **must** be listed on the label. To minimize corrosion of surfaces in contact with bleach, thoroughly wash down all work areas.

Treatment: D301.75-11(d)Vehicles, Equipment, and Other Inanimate Articles—Chemical or Heat Treatment

- All vehicles, equipment, and other articles for which treatment is required **must** be cleaned and disinfected by removing all plants, leaves, twigs, fruit, and other plant parts from all areas of the equipment or vehicles, including in cracks, under chrome strips, and on the undercarriage of vehicles, by wetting all surfaces (including the inside of boxes and trailers), to the point of runoff, with **one** of the following disinfectants:
    - 0.2 percent solution of a quaternary ammonium chloride (QAC) compound
    - Solution containing 85 parts per million (ppm) peroxyacetic acid (indoor use only)
    - Solution of hot water and detergent, under high pressure (at least 30 pounds per square inch), at a minimum temperature of 160 °F
    - Steam, at a minimum temperature of 160 °F at the point of contact
    - 0.02% (200 ppm) solution of sodium hypochlorite with a pH of 5.5 to 7.0. The label **must** include the use site “Sanitization of non-porous, non-food contact surfaces.”

1. Wet all surfaces with the 0.02% sodium hypochlorite solution to the point of runoff.
2. Let stand for 15 minutes.
3. Thoroughly wash down all surfaces after 15 minutes to minimize corrosion.
    1. Refer to the Related Document **Treatments - Procedures - Dips** section **Sodium Hypochlorite (Bleach) Treatments** for dilution tables and pH adjustment directions.
    2. In general, adjust the pH to 5.5 to 7.0 using acetic acid (white vinegar) under a fume hood or in a well-ventilated area.

Regulatory Authority
• Changes to sodium hypochlorite concentration pH are effective immediately under authorization of 7 CFR 305.3((b)(1)(iv)) and are subject to change pending notice and comment. (October 2020)

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D301.76 Asian Citrus Psyllid (*Diaphorina citri Kuwayama*)

D301.76(a-1) Curry Leaf (*Bergera (=Murraya) koenigii*) and Other Regulated Articles for Consumption, Apparel or Similar Personal Accessory, or Decorative Use

Origin: Areas **without** citrus greening (Citrus huanglongbing (HLB)) Refer to the Citrus Diseases web page for detailed information on all citrus diseases. Information includes an interactive map showing all citrus quarantines, in addition to hyperlinks to active Federal Orders.

Treatment: D301.76(a-1)—MB at NAP—tarpaulin or chamber (refer to the equivalent document, T101-n-2)

NOTICE
Curry leaf and kaffir lime leaf **must** be treated as a Section 18 crisis exemption. In addition, citron, clementine, lemon, lime, mandarin, orange, tangelo, and tangerine **must** be treated using no more than 3 pounds at 50 °F. The label **does not** allow fumigation of these citrus commodities at dosages greater than 3 pounds.

Treatment: D301.76(a-2)—Irradiation at 400 Gy (equivalent to T105-a-2)

- Treat using a minimum absorbed dose of 400 Gy, **not** to exceed 1,000 Gy.

Treatment: D301.76(a-3) Curryleaf (*Bergera (=Murraya) koenigii*), Kaffir lime leaf (*Citrus hystrix*), and Bael leaf (*Aegle marmelos*) for consumption—D301.76(a-3)—Processing

NOTICE
The processing protocol has been added under the authority of Federal Order DA-2022-07, published May 12, 2022 and is pending final regulatory approval. The "Protocol for the Interstate Movement of Fresh, Mature Rutaceous Leaves for Consumption" is included as part of the Federal Order. The treatment is subject to change or removal based on public comment. (7 CFR 305.3(b)(2))

- Processing includes specific harvesting, washing, rinsing, drying, and packaging requirements. The approved washing products are listed in the table below.

Product	Rate Per Gallon
Environne	1/4 cup
Rebel Green	1/4 cup
Veggie Wash	1/4 cup

Treatment: D301.76(b) Citrus Nursery Stock and Related Hosts—Chemical Treatment

- Origin: Areas with Asian Citrus Psyllid Refer to the Citrus Diseases web page for detailed information on all citrus diseases. Information includes an interactive map showing all citrus quarantines, in addition to hyperlinks to active Federal Orders.
    - Regulated articles for Asian Citrus Psyllid (ACP) and Citrus Greening (CG) (hosts within the plant family Rutaceae) may be intended for consumption, as apparel, or similar personal accessory, or decorative use:
        - All plants and plant parts (including leaves), except fruit, of the following species: *Aegle marmelos, Aeglopsis chevalieri, Afraegle gabonensis, A. paniculata, Amyris madrensis, Atalantia* (including *Atalantia monophylla*), *Balsamocitris dawei, Bergera (=Murraya) koenigii, Calodendrum capense, Choisya ternate, C. arizonica, X Citroncirus webberi, Citropsis articulata, Citropsis gilletiana, Citrus madurensis (=X Citrofortunella microcarpa), Citrus*, *Clausena anisum-olens, C. excavate, C. indica, C. lansium, Eremocitrus glauca, Eremocitrus* hybrid, *Esenbeckia berlandieri, Fortunella*, *Limonia acidissima, Merrillia caloxylon, Microcitrus australasica, M. australis, M.papuana, X Microcitronella*, *Murraya, Naringi crenulata, Pamburus missionis, Poncirus trifoliata, Severinia buxifolia, Swinglea glutinosa, Tetradium ruticarpum, Toddalia asiatica, Triphasia trifolia, Vepris (=Toddalia) lanceolata,* and *Zanthoxylum fagara*.

- Treat plants with an APHIS-approved soil drench or in-ground granular systemic insecticide, followed by a foliar spray at specified time periods prior to shipment. Refer to the table **APHIS-Approved Insecticides for Control of Psyllids on Citrus**. The treatments will be followed by a visual inspection for living psyllids according to the requirements listed in 7 CFR 301.76.

APHIS-approved Insecticides for Control of Psyllids on Citrus

USDA-approved Soil Drench or In-ground Granular Chemicals:	USDA-approved Foliar Chemicals
Dinotefuran	Bifenthrin
Imidacloprid	Chlorpyrifos
	Deltamethrin
	Fenpropathrin
	Imidacloprid/Cyfluthrin

NOTICE
• Apply the SOIL DRENCH or IN-GROUND GRANULAR chemicals no more than 90 days but no less than 30 days prior to interstate movement. All treatments **must** be applied according to their EPA label, including application directions, restrictions on place of application, and any other precautions and statements pertaining to Worker Protection Standards. • Apply the FOLIAR chemicals no more than 14 days prior to interstate movement. • All treatments **must** be applied according to their EPA label, including application directions, restrictions on place of application, and any other precautions and statements pertaining to Worker Protection Standards.

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D301.81-10 Imported Fire Ant (*Solenopsis invicta and S. richteri*)

D301.81-10(1) Used Soil Moving Equipment

Treatment: D301.81-10(1)—Cleaning Treatment

- Used soil moving equipment is eligible for movement when an inspector determines that one of the following procedures has been done:
  - It has been brushed free of noncompacted soil
  - It has been washed free of noncompacted soil
  - Noncompacted soil has been removed with air pressure equipment using compressors designed specifically for this purpose. Such compressors **must** provide free air delivery of **no** less than 30 ft^3 per minute at 200 pounds per square inch (in^2).

    Certification period: The certification will be valid as long as the equipment remains free of noncompacted soil.

    Limitations: Regardless of the type of cleaning equipment used, all debris and noncompacted soil **must** be removed unless it is steam-heated by a “steam jenny” to disinfest the articles. Used soil moving equipment, such as bulldozers, dirt pans, motor graders, and draglines are difficult to clean sufficiently to eliminate pest risk.

!Caution
Steam may remove loose paint and usually is not recommended for use on equipment with conveyor belts and rubber parts.

Treatment: D301.81-10(2) Hay and Straw

- Baled hay and straw stored in direct contact with the ground is ineligible for movement from the quarantined area to an area outside the quarantine unless inspected, found free of IFA, and issued a certificate.

Treatment: D301.81-10(3) Nursery Stock—Balled or in Containers

- There are four application methods for plants in containers or balled and burlapped. The methods are:
  - Method A—Immersion
  - Method B—Drench
  - Method C—Topical Application
  - Method D—Granular Incorporation

Method A—Immersion

- **Equipment**: You will need an open-top, watertight container sufficiently large to accommodate the treating solution and plants.
- **Procedure:** Follow these steps to treat the plants:
  - Step 1: Choose an appropriate site. Locate the immersion tank in a well-ventilated place. Cover the location if possible. **Do not** remove burlap wrap or plastic containers with drain holes before immersion.
  - Step 2: Immerse the plants. Immerse the soil balls and containers, singly or in groups, so that the soil is ncompletely covered by the insecticidal solution. Allow the plants to remain in the solution until bubbling ceases.
  - Step 3: Remove the plants from the dip. After removal from the dip, set the plants on a drainboard until adequately drained.
    - NOTICE - Thorough saturation of the plant balls or containers with the insecticide solution is essential!
  - Step 4: Add treating mixture. As treating progresses, add freshly prepared insecticide mixture to maintain the liquid at immersion depth.
  - Step 5: Dispose of solution. Dispose of tank contents 8 hours after mixing. Disposal must comply with state and local regulations.

NOTICE
Do not permit runoff of the solution from the treatment area! Dispose of excess and unused solution in accordance with state and local regulations.

!Caution
Wear rubber gloves, boots, and apron during this operation.

Insecticides, Dosages, and Certification Periods

- Refer to table Insecticides for Immersion of Balled or Containerized Insecticides for dosages and certification periods for approved insecticides.

Insecticides for Immersion Treatment of Balled or Containerized Plants

Insecticide (liquid)	Dosage (lb. active ingredient per 100 gallons water)	Certification Period (days)
Chlorpyrifos	0.125	30
Bifenthrin	0.115	180
	0.05	120
	0.025	60

- **Exposure Period**: Plants certifiable immediately upon completion of treatment.

NOTICE
Environmental factors significantly affect phytotoxicity. Dwarf yaupon, some varieties of azaleas, camellias, poinsettias, rose bushes, and variegated ivy may show phytotoxicity to chlorpyrifos. It is recommended that a small group of plants be treated at the recommended rate under the anticipated growing conditions and observed for phytotoxic symptoms for at least 7 days before a large number of plants are treated.

!Caution
The professional user assumes the responsibility for determining if bifenthrin is safe to treat plants under commercial growing conditions.

Method B—Drench

- **Equipment**: You will need the following pieces of equipment to drench the plants:
  - A large-capacity bulk mixing tank, either pressurized or gravity-flow, for mixing and holding the insecticide solution
  - Properly equipped hoses and watering nozzles that can be attached to the mixing tank and used to thoroughly saturate the plant balls with insecticide solution
- **Containerized Plants**
  - **Step 1:** Prepare the solution: the volume of the treating solution **must** be at least 20 percent (1/5) of thevolume of the container.

Insecticides and Dosages for Drenching Plants in Containers

Insecticide	**Dosage**
Chlorpyrifos (4EC)	4 fl. oz. per 100 gallons water
Chlorpyrifos (2EC)	8 fl. oz. per 100 gallons water
Bifenthrin	25 parts per million (ppm)[1]

[1] Dose rate for bifenthrin is 25 ppm based on dry weight bulk density of the potting media. Refer to the table Bifenthrin Calculations Based on Bulk Density for bulk density calculations.

Bifenthrin Calculations Based on Bulk Density

Potting Media Bulk Density (lb/yd^3)	Oz. Bifenthrin/100 gallons water
200	2.4
400	4.8
600	7.2
800	9.6
1,000	12.0
1,200	14.4
1,400	16.8

  - **Step 2:** Apply the solution: apply solution to the point of saturation one time only. The volume of the solution should be one-fifth the volume of the container.

NOTICE
Thorough saturation of the plant balls or containers with the insecticide solution is essential. **Do not** permit runoff of the solution from the treatment area!

Dispose of excess and unused solution in accordance with state and local regulations.

Exposure Period: Plants are certifiable **immediately** upon completion of treatment.

Certification Period for Plants in Containers

Insecticide	Certification Period (days)
Chlorpyrifos	30
Bifenthrin	180

- **Balled and Burlapped (B&B) Plants**
  - **Step 1**: Select a site for the treatment: move the plants to a well-ventilated place normally used to maintain plants prior to shipment. Cover the treatment locations, if possible. The treatment will be enhanced by adding any agricultural wetting agent or surfactant.
  - **Step 2**: Apply the solution: do **not** remove burlap wrap or baskets from plants prior to treatment. The total volume of the treating solution **must** be 20 percent (1/5) the volume of the root ball. Treat plants singly or in groups with chlorpyrifos solution twice in one day. Apply one-half the total drench solution, wait at least 30 minutes, then rotate the root ball and apply the second one-half drench solution. Rotating or flipping the root ball between drench applications is required to insure all sides of the root ball are sufficiently treated.

!Caution
Wear rubber gloves, boots, and apron during this operation.

Dosage:

Emulsifiable Chlorpyrifos Dosage for Balled Plants

Chlorpyrifos formulation	Amount of formulation to make 100gallons of treating solution
1 EC	16 fl. oz. (472 ml)
2 EC	8 fl. oz. (236 ml)
4 EC	4 fl. oz. (118 ml)

- **Exposure period**: Plants are certifiable **immediately** upon completion of treatment.
- **Certification period**: 30 days

Method C—Topical Application

Bifenthrin liquid is the **only** insecticide and formulation registered for topical application. Use this method **only** with nursery stock in 3- and 4-quart containers. Penetration of the insecticide in larger containers **does not** provide sufficient residual activity. Prepare a mix with the appropriate amount of bifenthrin in 1,000 oz. of water based on the container size and the bulk density of potting media. Refer to the table below for the potting media bulk density.

Potting Media Bulk Density (lb/yd^3)	Oz. Bifenthrin liquid/1,000 fl. oz. water	
	3-quart Pots	4-quart Pots
200	3.6	5.2
400	7.2	10.4
600	10.8	15.6
800	14.4	20.8
1,000	18.0	26.0
1,200	21.6	31.2

1,400	25.2	36.4

- Apply 1 fluid ounce of the mix to each container evenly distributed over the surface of the potting media.
- Irrigate all treated containers with 1.5 inches of water following application.

NOTICE
Do not permit runoff of the solution from the treatment area! Dispose of excess and unused solution in accordance with state and local regulations.

- **Certification Period**: 180 days

Method D—Granular Incorporation

- There is one granular insecticide registered and approved for incorporation into potting media:
  - Granular bifenthrin
- Use soil mixing equipment that will adequately mix and thoroughly blend the required dosage of insecticide throughout the potting media.
- Dosage is based on the bulk density of the potting media and the desired certification period. Dosage is expressed as parts per million (ppm) and calculated by this formula:

Formula for Calculating Granular Insecticide for Treating Potting Media for IFA

$$\frac{\text{Bulk Density of Media} \times \text{Desired ppm}}{\text{Concentration of Insecticide}} = \frac{\text{Pounds Insecticide Needed}}{\text{Cubic Yard of Media}}$$

Regulatory Authority

Changes to the application rates table below, Application Rates for Incorporation of Granular Insecticides into Potting Media, are effective immediately under authorization of 7 CFR 305.3((b)(1)(iv)) and are subject to change pending notice and public comment. (August 2020)

- Delete Fipronil
- Delete Tefluthrin

Application Rates for Incorporation of Granular Insecticides into Potting Media

Insecticide	Dosage (ppm)	Certification Period (months after treatment)
Bifenthrin	10	0-6 months
	12	0-12 months
	15	0-24 months
	25	Continuous[1]

[1] Continuous certification with 25 ppm dosage when all other provisions of the Imported Fire Ant detection, control, exclusion, and enforcement program for nurseries producing containerized plants are met (7CFR 301.81-11).

Treatment: D301.81-10(5) In-Field Treatment for B&B Stock Prior to Harvest

- This in-field treatment is based on a sequential application of any of the following approved baits followed by a broadcast application of chlorpyrifos:
    - abamectin
    - fenoxycarb
    - hydramethylnon
    - indoxacarb (added under the authority of 7 CFR 305.3 (a)(b) and pending final regulatory approval)
    - metaflumizone
    - methoprene
    - pyriproxyfen
- The combination treatment is necessary since broadcast application of chlorpyrifos (or other short-term residual insecticides) usually **does not** eliminate large, mature IFA colonies, and baits are **not** capable of providing a residual barrier against reinfestation by new queens.
- Therefore, the approved bait application will drastically reduce the IFA population while chlorpyrifos, applied approximately 5 days later, will destroy any remaining weakened colonies and also leave a residual barrier against reinfestation by new queens for at least 12 weeks.
- **Method**: Apply approved bait **only** when ants are actively foraging using a granular applicator capable of applying the labeled rates of 1.0–1.5 lb (0.45– 0.68 kg) of bait per acre. Three to five days after the approved bait application, apply chlorpyrifos broadcast at 6.0 lb. (2.7 kg) active ingredient (a.i.) per acre. Treatment area **must** extend at least 10 feet beyond the base of all plants that are to be certified.
- **Dosage**: Apply approved baits at 1.0–1.5 lb. (0.45–0.68 kg) bait/acre. Apply granular chlorpyrifos at 6.0 lb (2.7 kg) a.i./acre.
- **Exposure Period**: 30 days. Plants are certifiable 30 days after treatment.
- **Certification Period**: 12 weeks; an additional 12 weeks of certification can be obtained with a second application of granular chlorpyrifos.

Treatment: D301.81-10(6) Blueberries and Other Fruit and Nut Nursery Stocks

- Certain states have special local need labeling in accordance with section 24(c) of FIFRA for D-z-n Diazinon AG-500 and D-z-n Diazinon 50W, which APHIS will recognize as a regulatory treatment for containerized non-bearing blueberries and fruit and nut plants. Follow the label directions for use.

Treatment: D301.81-10(7) Greenhouse Grown Plants

- Greenhouse grown plants are certifiable **without** treatment if the inspector determines the greenhouse is constructed of fiberglass, glass, or plastic in such a way that the IFA is physically excluded and **cannot** become established within the enclosure. **No** other treatment of the plants will be necessary if they are **not** exposed to infestation.

Treatment: D301.81-10(8) Grass—Sod

Method:

- **Step 1**: Apply the insecticide.
    - Chlorpyrifos: apply a single broadcast application of chlorpyrifos with ground equipment
    - Fipronil or bifenthrin: apply two sequential broadcast applications 1 week apart of granular fipronil or liquid bifenthrin

Pesticide Dosages for Grass Sod

Material	Dosage (lb. a.i. per acre)	Exposure Period	Certification Period (after exposure period)
Chlorpyrifos	8.0	48 hours	6 weeks
Fipronil–granular	Apply 0.0125 two times, 1 week apart for a total dosage of 0.0250	30 days	20 weeks

Bifenthrin–liquid	Apply a dosage of 0.2 two times, 1 week apart for a total dosage of 0.4. Apply the first dosage of 0.2 and then 7 days later apply a second dose of 0.2 (total dosage of 0.4)	4 weeks (28 days)	16 weeks

EXAMPLE

You are applying liquid bifenthrin to 1 acre of fire ant infested grass sod. Using a broadcast applicator, apply 0.2 lb. a.i. per acre and then 7 days later, apply a second dosage of 0.2 lb. a.i. per acre. After 28 days exposure period, you may harvest and ship sod for 16 weeks. To continue harvesting from the same area after that time, you would have to re-treat.

- **Step 2**: Water the treated areas.
  - Immediately after treatment, water the treated areas with at least 1/2 inch of water.

Treatment: D301.81-10(9) Soil—Bulk

- **Method**: Bulk soil is eligible for movement when heated either by dry or steam heat after all parts of the mass have been brought to the required temperature.
- **Temperature**: 150 °F (65.5 °C)
- **Certification Period:** As long as protected from recontamination.

Treatment: D301.81-10(10) Soil Samples

Soil samples are eligible for movement when heated or frozen as follows:

- **Method (heat)**: Soil samples are heated either by dry heat or steam heat. All parts of the mass **must** be brought to the required temperature.
- **Temperature**: 150 °F (65.5 °C)
- **Certification Period**: As long as protected from recontamination.

- **Method (frozen)**: Soil samples are frozen in any commercial cold storage, frozen food locker, or home freezer capable of rapidly reducing to and maintaining required temperature. Place soil samples in containers, such as plastic bags—one sample per bag. Arrange the containers in the freezer in a manner to allow the soil samples to freeze in the fastest possible time. If desired, the frozen samples may be shipped in one carton.
- **Temperature:** -10 °F to -20 °F (-23 °C to -29 °C) for at least 24 hours
- **Certification Period**: As long as protected from recontamination.

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D301.87-10 Sugarcane Leaf Scald and Gummosis Disease (*Xanthomonas albilineans and X. vasculorum*)

D301.87-10(a) Seed Pieces

Treatment: D301.87-10(a)—Hot water (equivalent to T514-1)

- Presoak in water at room temperature for 24 hours, then immerse in water at 122 °F for 3 hours.

D301.87-10(b) True Seed (Fuzz)—Deleted

Treatment: D301.87-10(b)—Chemical Treatment (equivalent to T514-2)

Regulatory Authority
Sodium hypochlorite is no longer labeled for use on sugarcane. D301.87-10(b) has been removed under authorization of 7 CFR 305.3((b)(1)(iv)) and is subject to change pending notice and comment. (October 2020)

D301.87-10(c) Bagasse

Treatment: D301.87-10(c)—Dry Heat Treatment (equivalent to T514-3)

- Apply dry heat for 2 hours at 158 °F.

D301.87-10(d) Field and Processing Equipment

Treatment: D301.87-10(d)—High Pressure Wash (equivalent to T514-4)

- Remove all debris and soil from equipment with water at high pressure (300 pounds per square inch minimum) or with steam.

D301.87-10(e) Juice

Treatment: D301.87-10(e)—Heat

- Heat at 212 °F (100 °C) for 10 minutes or more.

D301.89 Karnal Bunt (*Tilletia indica*)

D301.89-13(a) Equipment, Grain Elevators, Conveyances, and Other Structures Used for Storing and Handling Wheat, Durum Wheat, or Triticale

Treatment: D301.89-13(a)—Chemical Treatment

1. Wet all surfaces to the point of runoff with 1.5%(15,000 ppm) sodium hypochlorite solution:
    1. Using 8.25%, 8.3%, 8.5%, or 8.6% sodium hypochlorite formulations, mix 1 part in 4 parts of water
2. Let stand for 15 minutes.
3. Thoroughly wash down all surfaces after 15 minutes to minimize corrosion.

The use site **must** be listed on the label. Refer to the Related Document **Treatments Procedure Dips** section on Sodium Hypochlorite (Bleach) Treatments for dilution tables.

Regulatory Authority
Changes to sodium hypochlorite concentration are effective immediately under authorization of 7 CFR 305.3((b)(1)(iv)) and are subject to change pending notice and comment. (October 2020)

D301.89-13(b) Equipment, Grain Elevators, Conveyances, and Other Structures Used for Storing and Handling Wheat, Durum Wheat, or Triticale

Treatment: D301.89-13(b)—Steam

- Apply steam to all surfaces until the point of runoff, and so that a temperature of 170 °F is reached at the point of contact.

D301.89-13(c) Equipment, Grain Elevators, Conveyances, and Other Structures Used for Storing and Handling Wheat, Durum Wheat, or Triticale

Treatment: D301.89-13(c)—Hot Water and High Pressure

- Clean with a solution of detergent and water at a minimum of 170 °F. Apply under pressure of at least 30 pounds per square inch.

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D301.92 *Phytophthora ramorum*

D301.92-10(a) Soil

Treatment: D301.92-10(a)—Heat Treatment

- Heat to a temperature of at least 180 °F at the center of the load for 30 minutes in the presence of an inspector.

D301.92-10(b) Wreaths, Garlands, and Greenery of Host Material

Treatment: D301.92-10(b)—Hot Water

- Dip for 1 hour in water that is held at a temperature of at least 160 °F.

D301.92-10(c) Bay Leaves

Treatment: D301.92-10(c)— Vacuum Heat (formerly T111-a-1)

1. Place bay leaves in a vacuum chamber.
2. Starting at 0 hour, gradually reduce to 0.133 Kpa vacuum at 8 hours.
3. Maintain the vacuum until the end of the treatment, 22 hours.
4. Gradually increase the temperature in the vacuum chamber from ambient temperature at 0 hour to 60 °C at 5 hours.
5. After 5 hours, gradually lower the temperature to 30 °C at 22 hours.

The total length of the treatment is 22 hours.

DA-2016-55 (09/06/2016)—Sweet Orange Scab (SOS), *Elsinoë australis* (Federal Order DA-2016-55)

NOTICE
Federal Order DA-2016-55 issued 09/06/2016 superseded Federal Order DA-2013- 13 issued 04/02/2013.

Regulated Articles

- Regulated articles include fruit, plants, plant products (except seeds) of *Citrus* and *Fortunella* Regulated fruit **must** be free of leaves, stems that are 1-inch or less in length, or other regulated material.
- Conduct treatments at a commercial packinghouse operating under a compliance agreement.
- Regulated fruit can move interstate with a certificate to all States.
- For interstate movement under a limited permit, refer to the APHIS-Approved Packing House Procedures.

!WARNING
Chemicals and fungicides must be applied in accordance with label directions.

- **Step 1:** Wash.
- **Step 2:** Brush.
- **Step 3:** Surface disinfect using at least one of the chemicals in DA-2016- 55.

DA-2016-55 (a-1)

Treatment: DA-2016-55 (a-1) — Chemical Treatment

- Thoroughly wet the fruit for at least 2 minutes with a solution containing 200 parts per million sodium hypochlorite. Maintain the solution at a pH of 6.0 to 7.5.
- Refer to the Related Document **Treatments Procedures Dips** section Sodium Hypochlorite (Bleach) Treatments for dilution tables and pH adjustment directions. Adjust the pH using acetic acid (white vinegar) under a fume hood or in a well-ventilated area.

DA-2016-55 (a-2)

Treatment: DA-2016-55 (a-2)— Chemical Treatment

- Thoroughly wet the fruit with a solution containing sodium o-phenyl phenate (SOPP) at a concentration of 1.86 to 2.0 percent of the total solution. If the solution has sufficient soap or detergent to cause a visible foaming action, wet for 45 seconds. If the solution does **not** contain sufficient soap to cause a visible foaming action. wet for 1 minute.

DA-2016-55 (a-3)

Treatment: DA-2016-55 (a-3)— Chemical Treatment

- Thoroughly wet the fruit with a solution of 85 parts per million peroxyacetic acid for at least 1 minute.

- **Step 4:** Treat with at least one of the fungicides in the table Swet Orange Scab Approved Fungicides below:

Sweet Orange Scab Approved Fungicides

Chemical Name
Imazalil
Thiabendazole
Combination of fludioxonil plus azoxystrobin

- **Step 5:** Wax.

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DA-2012-09 (03/16/2012)—*Guignardia citricarpa*, fungal pathogen causing the disease Citrus Black Spot (CBS) (Federal Order DA-2012-09)

Regulated Articles

- **Regulated articles include fruit, plants, plant products of *Citrus*.**
- **Conduct treatments at a commercial packinghouse operating under a compliance agreement. Regulated fruit can move interstate with a certificate to all States. For interstate movement under a limited permit, refer to the APHIS-Approved Packing House Procedures.**

!WARNING
Chemicals and fungicides must be applied in accordance with label directions.

- Step 1: Wash.
- Step 2: Brush.
- Step 3: Surface disinfect using at least one of the chemicals in DA-2012-09.

DA-2012-09(a-1)

Treatment: DA-2012-09 (a-1) — Chemical Treatment

- Thoroughly wet the fruit for at least 2 minutes with a solution containing 200 parts per million sodium hypochlorite. Maintain the solution at a pH of 6.0 to 7.5.
- Refer to the Related Document **Treatments Procedure Dips** section Sodium Hypochlorite (Bleach) Treatments for dilution tables and pH adjustment directions. Adjust the pH using acetic acid (white vinegar) under a fume hood or in a well-ventilated area.

DA-2012-09(a-2)

Treatment: DA-2012-09 (a-2)— Chemical Treatment

- Thoroughly wet the fruit with a solution containing sodium o-phenyl phenate (SOPP) at a concentration of 1.86 to 2.0 percent of the total solution. If the solution has sufficient soap or detergent to cause a visible foaming action, wet for 45 seconds. If the solution does **not** contain sufficient soap to cause a visible foaming action. wet for 1 minute.

DA-2012-09(a-3)

Treatment: DA-2012-09(a-3) — Chemical Treatment

- Thoroughly wet the fruit with a solution of 85 parts per million peroxyacetic acid for at least 1 minute.

- Step 4: Treat with at least one of the fungicides in the table Citrus Black Spot Approved Fungicides below

Citrus Black Spot Approved Fungicides

Chemical Name
Imazalil
Thiabendazole

- Step 5: Wax.

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Related Documents

Document Name	Document Type
Treatments Procedure - Dips	Procedures