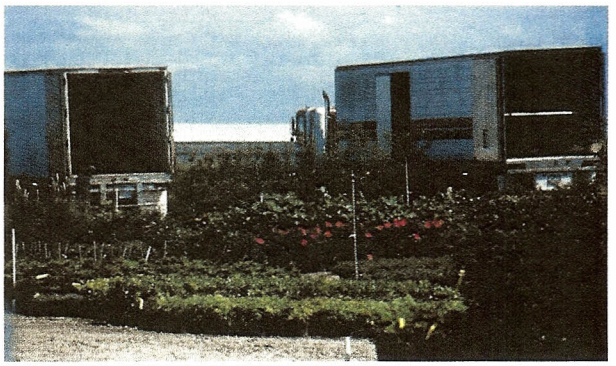
Nursery Stock in Containers

There are four methods for treating containerized nursery stock and different pesticides are approved for use in these methods.

- Immersion/Dip—bifenthrin and chlorpyrifos
- Drench—bifenthrin and chlorpyrifos
- Topical—bifenthrin
- Incorporation—bifenthrin, fipronil, and tefluthrin



Method 1—Immersion or Dip Treatment for Container Plants (not common for containerized stock)

Two insecticides are approved for this use pattern:

- Bifenthrin
- Chlorpyrifos

Equipment—An open-top, watertight immersion tank sufficiently large to accommodate the treating solution and plants will be needed. Drain plugs and valves will facilitate drainage after treatment. Use all personal protection equipment as required on the insecticide label. *Important: Do not allow runoff from the treatment area.*

Step 1—Choose an appropriate site.

- Locate the immersion tank in a well-ventilated place.

Step 2—Choose immersion tank.

- Choose an appropriate sized immersion tank that will allow complete submersion of the root/soil portion of the plant.
- Allow room for displacement of liquid solution as the plant is immersed so that no treatment liquid overruns the top of the tank.

Step 3—Immerse the plants.

- Do not remove plastic containers with drain holes before immersion.
- Immerse the containers, singly or in groups, so that the soil is completely covered by the insecticidal solution.
- Allow the plants to remain in the solution until bubbling ceases. Thorough saturation of the containers with the insecticide solution is essential.

Step 4—Remove the plants from the dip solution.

- After removal from the dip, set the plants on a drainboard until adequately drained.

Step 5—Maintain appropriate level of treating mixture.

- As treating progresses, add freshly prepared insecticide mixture to maintain the liquid at immersion depth.

Step 6—Dispose of solution.

- Dispose of tank contents 8 hours after mixing. Disposal must comply with label instructions, as well as State and local regulations.

Pesticides Approved, Dose Rates and Certification Periods for Immersion of Container Plants

Pesticide	Formulation	Dose Rate Lb ai/100 gal H2O	Certification Period
Chlorpryrifos*	EC	0.125 lb ai	30 days
Bifenthrin*	EC or F	0.115 lb ai	180 days
		0.05 lb ai	120 days
		0.025 lb ai	60 days

* use labels with use pattern listed on label

Exposure period—plants are certifiable upon completion of treatment (follow reentry interval [REI] instructions on label).

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

Method 2—Drench Treatment for Container Plants

Two insecticides are approved for this use pattern:

- Bifenthrin
- Chlorpyrifos

Equipment—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 container with the insecticide solution.

Step 1—If using bifenthrin determine dry weight bulk density of potting media (see page 17 for instructions).

Step 2—Choose an appropriate site with regard to potential runoff and ventilation.

Step 3—Determine amount of treating solution per container, total amount of treating solution required, and calibrate equipment.

- Volume of treating solution must be 1/5 (20 percent) the volume of the media in the container (minimum required).
- *Example.* A trade gal container is ca. 6"w x 7"h and in theory is ca. 3 quarts. If the container is filled within 1" of the top of the container, then use the height of 6". Therefore 1/5 volume of a trade gal container filled within 1" of the top is ca. 19 oz (rounding up).
- For many, calibrating is determined by how long (number of seconds) it takes for equipment to apply 19 oz (ca 2.5 cups) solution if treating all trade gallon containers.

Step 4—Treat containers.

- Apply treating solution to the point of saturation with a minimum of your predetermined 1/5 volume of a single container.

Step 5—Dispose of solution.

- Dispose of tank contents 8 hours after mixing. Disposal must comply with label instructions, as well as State and local regulations.

Pesticides Approved, Dose Rates and Certification Periods for Drench of Container Plants

Pesticide	Formulation	Rate of Application Amount formulation/100 gal H_2O or ppm	Certification Period
Chlorpryrifos*	4EC	4 fl oz	30 days
	2EC	8 fl oz	30 days
Bifenthrin*	23.4%EC	25 ppm**	180 days
	7.9%F	25 ppm**	180 days

* use labels with use pattern listed on label

** ppm based on dry weight bulk density of potting media, see table below and page 17 for instructions regarding bulk density determination.

Amount of Product by Formulation type to add to 100 gal water Based on Bulk Density of Potting Media

Potting media bulk density* lb/cu.yd.	Bifenthrin 7.9% flowable** Oz formulation/100 gal H_2O	Bifenthrin 23.4% EC** Oz formulation/100 gal H_2O
200	2.4	0.8
400	4.8	1.6
600	7.2	2.4
800	9.6	3.2
1,000	12.0	4.0
1,200	14.4	4.9
1,400	16.8	5.7

* see page 17 for instruction regarding bulk density determination.

** these rates are listed under High Drench Application Rate on labels

Exposure period—plants are certifiable upon completion of treatment (follow reentry interval [REI] instructions on label).

Diazinon may be registered by a State under FIFRA, sec. 24(c), Special Local Needs, for treatment of containerized non-bearing blueberries and fruit and nut plants. Check with your State regulatory official for 24(c) labels, treatment rates, and certification periods.

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

Method 3—Topical Treatment for Container Plants

This topical application method of treatment was developed when the Talstar®10WP formulation was the most common formulation available for bifenthrin. This formulation is no longer available for nursery uses, but the treatment language was transferred to the flowable and EC labels of bifenthrin. While this topical treatment is approved, it is not generally used.

One insecticide is approved for this use pattern:

- Bifenthrin

Caution: This method is approved only for treatment of nursery stock in 3- and 4-quart containers.

Step 1— Determine dry weight bulk density of potting media (see page 17 for instructions).

Step 2—Prepare treatment solution.

- Based on container size and bulk density of potting media, mix appropriate amount of bifenthrin in 1,000 oz water (or equivalent, based on number of pots to treat).
- Apply 1 fl oz of treating solution to each of the containers evenly distributed over the surface of the potting media.
- Irrigate all treated containers with 1.5 inches of water following treatment.

Pesticides Approved, Dose Rate and Certification Periods for Topical Drench of Container Plants

Potting media bulk density* Lb/cu yd	Bifenthrin 7.9% Flowable**		Bifenthrin 23.4% EC**		Certification Period
	Oz F/1,000 oz H_2O 3-qt pots	Oz F/1,000 oz H_2O 4-qt pots	Oz EC/1,000 oz H_2O 3-qt pots	Oz EC/1,000 oz H_2O 4-qt pots	
200	3.6	5.2	1.2	1.8	180 days
400	7.2	10.4	2.4	3.5	180 days
600	10.8	15.6	3.7	5.2	180 days
800	14.4	20.8	4.9	7.0	180 days
1,00	18.0	26.0	6.1	8.8	180 days
1,200	21.6	31.2	7.3	10.5	180 days
1,400	25.2	36.4	8.5	12.3	180 days

* see page 17 for instructions on dry weight bulk density determination
**use labels with use pattern listed on label

Exposure period – plants are certifiable upon completion of treatment (follow reentry interval [REI] instruction on label).

Method 4—Incorporation of Granular Insecticides into Potting Media for Container Plants

Three insecticides are approved for incorporation into potting media:

- Bifenthrin
- Fipronil
- Tefluthrin

Note: An online search conducted in March 2013 did not produce any fipronil or tefluthrin labels with this use pattern and rate of application.

Equipment—use soil-mixing equipment that will adequately mix and thoroughly blend the required dosage of pesticide throughout the potting media.

If you have your media prepared offsite by another company, granular insecticide may be premixed for you. However, once media is prepared and granular insecticide incorporated, the "clock" starts on the certification period. Therefore, to retain the maximum certification period for container stock, the premixed media should be used to pot nursery stock as soon as possible.

Step 1—Determine how long a certification period is required for the nursery stock you are potting.

Step 2—Determine dry weight bulk density of potting media (see page 17 for instructions).

Step 3—Calculate amount of granular product to mix per cubic yard of potting media based on dry weight bulk density, or use table from label.

Pesticides Approved, Dose Rate and Certification Periods for Incorporation of Granular Products into Potting Media for Container Plants

Insecticide*	Dose Rate (ppm)	Certification period
Bifenthrin	10	6 month
	12	12 month
	15	24 monnh
	25	Continuous**
Fipronil	10	6 month
	12	12 month
	15	24 month
	25	Continuous**
Tefluthrin	10	18 month
	25	Continuous**

* use labels with use pattern listed on label
** continuous certification if all other provisions of IFA Free Nursery Program are met (see page 11)

Amount of Granular Bifenthrin 0.2% Formulation to add to 1 cubic yard of Media Based on Dose Rate and Bulk Density of Potting Media

	Amt. of granular bifenthrin 0.2% based on bulk density of media (lb/cu yd)						
Dose Rate	200	300	400	500	600	800	1000
10	1.0	1.5	2.0	2.5	3.0	4.0	5.0
12	1.2	1.8	2.4	3.0	3.6	4.8	6.0
15	1.5	2.25	3.0	3.75	4.5	6.0	7.5
25	2.5	3.75	5.0	6.25	7.5	10.0	12.5

* see page 17 for instruction regarding bulk density determination.

Exposure period—plants are certifiable upon completion of treatment (follow reentry interval [REI] instructions on label).

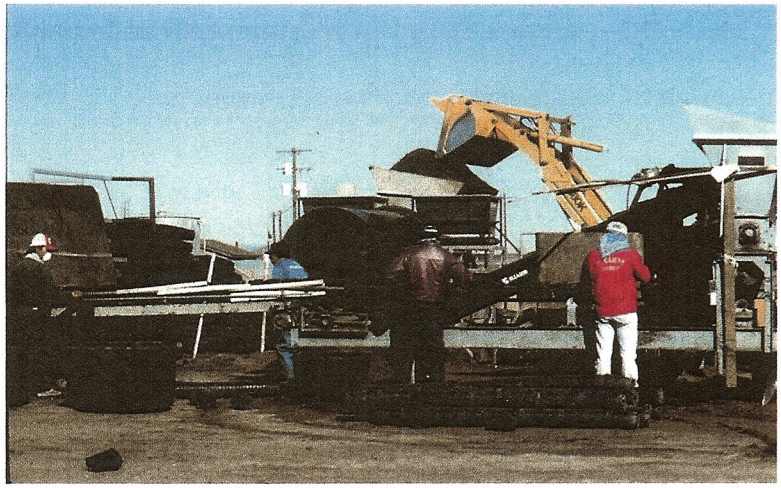
Calculation for amount of granular insecticide to mix into 1 cubic yard of potting media based on known dry weight bulk density of media

$$\frac{\text{Bulk density of media} \times \text{ppm}}{\text{Concentration of pesticide}} = \text{lb granular needed per cubic yard media}$$

Example: You want to treat 1 cubic yard of potting media with a bulk density of 500 lb/cu yd, with enough 0.2% granular bifenthrin for a 12-month certification period (12 ppm).

12 ppm = 12/1,000,000 = 0.000012
0.2% granular bifenthrin = 0.2/100 = 0.002

(500 x 0.000012)/0.002 = 3.0lb 0.2G bifenthrin/1 cu yd potting media



Note: Many nursery plants may require a longer certification than 24 months. When a plant is "potted up" into a larger container, the grower can use potting media with newly incorporated granular insecticide to surround and augment "old" media, therefore extending the certification period. For example, if a grower started a plant in a 1 gallon container on 3/1/10 with 12 ppm bifenthrin in the media, this plant now is certified for 12 months. On 2/28/11 (1 year later), the grower moves the plant into a 3-gallon container, and the potting media added to fill the container has been treated with 15 ppm bifenthrin. This plant may now be certified for an additional 24 months or until 2/28/13 (or for 24 months after the potting media was treated with the granular bifenthrin). This example illustrates the importance of recordkeeping to ensure the grower can verify certification of plants that have been repotted several times.

If the treatment in a container has "expired" (the certification period has been exceeded), there are two options:

1. Treat with an approved drench treatment, wait the REI period, then pot up as usual with media treated with granular insecticide for the certification period you desire.
2. Pot up the plant in non-treated media, and immediately drench the larger container with an approved drench treatment. This plant will then have the drench certification period (up to 6 months with a bifenthrin drench) before it will require an additional drench or another potting up with media treated with granular insecticide for the certification period you desire.

Federal IFA-Free Nursery Program for Plants in Containers

This IFA-Free Nursery Program is not mandatory for movement of nursery stock. Certification may be granted on the basis of other treatments listed on pages 6–10 of this document.

The IFA-Free Nursery Program is designed to keep nurseries free of IFA and provides a basis to certify containerized nursery stock on a continuous basis. The program has detection, control, exclusion, and enforcement components that, in combination, provide maximum control of IFA. This program is available for growers who wish to include the entire property in their IFA treatment program and thus be able to ship container stock on a continuous basis. Participating establishments must operate under a compliance agreement. Few nurseries participate in this program, but it is available for use. Please contact your State inspector to discuss whether this program is right for your nursery. Specific details may be found in the *Code of Federal Regulations* (7 CFR 301.81–11: Imported fire ant detection, control, exclusion, and enforcement program for nurseries producing containerized plants). This regulation is updated annually, so please go to the USDA, APHIS link to the current *Code of Federal Regulations* information:
www.aphis.usda.gov/plant_health/plant_pest_info/fireants/index.shtml