

# Fire Ant Quarantine Compliance for Container Nurseries

► Learn the specifications for incorporating bifenthrin as your federally approved fire ant treatment.

If you plan to ship plants outside of the federal imported fire ant quarantine, you must comply with federal regulations (7 CFR §301.81-11, 2010). Compliance involves the exclusion of fire ants by treating the growing media with an approved insecticide such as bifenthrin. Special provisions are made for greenhouse-grown products and fruiting containerized crops.

For adequate control and compliance, the proper amount of bifenthrin must be used. Most growers choose to incorporate the insecticide into the potting mix.

Dosage rates of 10 to 25 ppm (parts per million) are used depending on the desired certification period. This coverage period can range from 6 months to continuous (table 1).

The rate will change based on the bulk density of the potting mix (table 2). Bulk density is simply the weight of a known volume of a material. For our purposes we can think of it as the dry weight of your bark mix in pounds per cubic yard.

Here are a few simple steps to follow to determine bulk density using the ounces/fluid-ounces method:

- Collect three to five representative samples from random areas in the pile and mix together. This is a composite sample.
- Pull a 32-fluid-ounce sample (figure 1) from the composite sample, then weigh and record the weight in ounces (figure 2).

**Table 1. Bifenthrin dose rates for varying certification periods**

Dose Rate	Certification Period
10	6 months
12	12 months
15	24 months
25	Continuous

Accessed from *Imported Fire Ant: Quarantine Treatments for Nursery Stock, Grass Sod, and Related Material*, APHIS 81-25-001, 2019



Figure 1. Gather a 32-ounce sample of bark.

- Oven dry the sample on low heat or air dry it. Periodically weigh the sample and keep drying until it stops losing weight. It will dry quicker if you spread it out on a baking sheet (figure 3). When the sample weight stabilizes, record the weight in ounces. That is the dry weight.
- Take the dry weight and divide by the original volume (32 fluid ounces). Now you have the ounce per fluid ounce. Multiply that number by 1615.8 to get pounds per cubic yard. That is your bulk density. Your bulk density should be between 300 and 500 pounds per cubic yard.



Figure 2. Weigh and record the bark weight in ounces.

**Table 2. 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**

Dose Rate	Amount of Granular Bifenthrin 0.2% Based on Bulk Density of Media (lb/cu yd)						
	200	300	400	500	600	800	1,000
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

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- Look at your bifenthrin product label. Match the bulk density to the desired concentration to provide you with the pounds of product to add per cubic yard of mix. Remember that ounces (oz.) is a weight and fluid ounces (fl. oz.) is a volume.

### Example Scenario

About 3 quarts of bark were dried in a flat pan with a fan over it for several days. The bark was turned over several times a day to speed drying.

A known volume was established by pouring 80 fluid ounces of water into a bowl, marking the waterline, and then drying the bowl. The empty bowl was weighed (5 ounces) and the bark was filled to the marked waterline. The combined weight of the bowl and bark was 30 ounces. The weight of the bowl was deducted from the total weight, leaving the dry bark sample weight at 25 ounces.

We incorporated the weight into the ounce/fluid-ounce formulation ( $25 \text{ oz} \div 80 \text{ fl oz} = 0.3125 \text{ oz/fl oz}$ ). Next, we used our conversion to get the bulk density ( $0.3125 \text{ oz/fl oz} \times 1615.8 = 504.9 \text{ lbs/yd}^3$ ). Using  $500 \text{ lbs/yd}^3$  we determined that 6.25 pounds of bifenthrin product would provide us with the continuous rate (table 2).



Figure 3. Spread bark onto a baking sheet to help it dry out quicker.

If you don't want to go to all that trouble, you can send a quart sample to the Soil, Forage and Water Testing Laboratory at Auburn University (<https://ssl.acesag.auburn.edu/anr/soillab/>). Use a routine soil analysis form and write in that you would like testing for "bulk density only." A small fee is involved. For more information, contact your regional horticulture Extension agent ([www.aces.edu](http://www.aces.edu)).

For complete specifications on federal fire ant quarantine compliance, see *Fire Ant: Quarantine Treatments for Nursery Stock, Grass Sod and Related Materials* (available online at [www.aphis.usda.gov/plant\\_health/plant\\_pest\\_info/fireants/downloads/IFA\\_nursery.pdf](http://www.aphis.usda.gov/plant_health/plant_pest_info/fireants/downloads/IFA_nursery.pdf)).



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