GROWERTALKS

Columns

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Growing With Griffin: Benefitting from the Body Snatchers

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Beneficial nematodes are a safe and effective integrated pest management (IPM) tool. They also serve as a good addition to existing insecticide programs since they're compatible with many chemicals. Beneficial nematodes are environmentally friendly, as well, and safe for humans and animals. Because the EPA doesn't require them to be registered as a pesticide, nematodes carry no REI or requirements for personal protection equipment.

Pictured: When

released in their juvenile stage, the beneficial nematodes enter an insect's body cavity and immediately start to feed. Deadly bacteria are then released from the nematode's intestinal tract and the targeted insect dies within 2

4 to 48 hours.

All beneficial nematodes are microscopic, non-segmented round worms that attack and kill specific, targeted insects without affecting any other organisms. *Steinernema feltiae* nematodes help provide biological control of soil-dwelling stages of fungus gnats, as well as the pre-pupal and pupal stages of Western flower thrips. *S. carpocapsae* nematodes help control shoreflies and some soil-dwelling insects, such as weevil larvae and certain worms. *Heterorhabditis bacteriophora* beneficial nematodes help provide biological control of white grub, black vine weevils, stages of European chafers and Japanese beetles.

When released in their juvenile stage, the beneficial nematodes enter an insect's body cavity and immediately start to feed. Deadly bacteria are then released from the nematode's intestinal tract and the targeted insect dies within 24 to 48 hours. The bacteria then convert the host tissue into products, which are

easily taken up by the nematodes. This facilitates the rapid reproduction of more nematodes that disperse in search of new hosts.

Most nematode species are applied as a drench, though *S. feltiae* can be applied either as a drench or a spray. While spraying the plants is an option for thrips, a drench provides a longer period of control for both thrips and fungus gnats from a single application. The drench rate for *S. feltiae* using an injector set at 1:100 is one tray of 50 million nematodes mixed in ½ gallon of water treating 1,100 sq. ft. Another drench option would be to use a Siphonject/Hozon at one tray of 50 million per 2.5 gal. of water in the stock tank injected at 1:15. Drench rates for other nematode species vary slightly.

Nematodes are living organisms and require a few more conditions of their own in order to deliver their maximum performance. Nematodes like to be kept cool. Water in the stock tank should be maintained at a temperature below 55F (12C). The ice packs that are shipped with these products work well when added to the stock tank to lower the temperature. Being live microscopic worms, nematodes can drown if submerged in the stock tank for more than one hour. Aerating the tank to maintain oxygen levels and to help keep the nematodes in suspension has proven to be very beneficial.

Many growers make use of fish tank aerators in their stock tank or have implemented one of the many plans available online for hand-building a bubbler. When using larger amounts of nematodes, plan to use aeration on a regular basis. To ensure successful nematode applications, it's also best to remove all screens/filters that are 50 mesh or finer. Do not apply nematodes through sprayers that exceed 300 psi or have nozzle apertures less than 0.5 mm. Drench applications should be made to moist soil.

When applying *S. feltiae* as a spray, the goal is to keep the nematodes moist and alive on the foliage for a minimum of two hours. Nematodes are UV sensitive. Avoid exposing them to high light by making applications when light levels will be low in the greenhouse for a few hours or more. Foliar applications can also be made during mornings, at night or with blackout curtains in place. Continue foliar applications on a weekly basis for three weeks at the rate of one 50 million tray per 5 to 10 gal. of water, depending on thrips pressure. Adding a high-quality surfactant, such as CapSil, to spray applications causes water droplets to sheet over plant surfaces more evenly, allowing the nematodes to come in contact with more thrips. Air temperature at spray time should be less than 90F (32C).

Nematodes are packaged in containers of 50, 100, 150, 250 or 500 million nematodes. You won't find nematodes on the OMRI list, though, due to the silicon carrier in which they're shipped. Upon receipt, immediately remove packs from shipping packaging and refrigerate. Nematodes may be stored at 35 to 40F (1.6 to 4C) in a refrigerator for 4 to 6 weeks for future use. DO NOT FREEZE. In solution under magnification, the viable nematodes should be 0.5 to 1.0 mm long and appear dense, not transparent. They often remain motionless, but should have a J shape. A straight, toothpick-like appearance indicates the nematodes are no longer viable.

For nematode chemical compatibility, very helpful compatibility charts are available from the nematode manufacturers: BASF, Syngenta BioLine and BioWorks.

Are you interested in using nematodes in your insect control program? Consult your plant-protection supplier

for further information. **GT**

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