Dahlia damaged by fungus gnat larvae

Fungus Gnats: More Than a Nuisance

Avoid plant damage caused by fungus gnat populations by practicing vigilant scouting and using effective control options.

BY RICK YATES

The fact that adult fungus gnats don't feed on plants may have earned these pests a bit of a free pass that they never deserved. It's true that they're a nuisance, flying into the faces of unsuspecting customers and leaving their calling cards — brown spots of frass — on leaf surfaces. However, their crimes go much further than that.

Larval stages of fungus gnats devour young, tender roots, sometimes consuming all but the heavier support roots. They can also tunnel into the stems of certain plants and feed on leaves that lie in contact with moist soil. Both adult and the larval stages are believed to spread disease spores in their travels, including Fusarium, Pythium and Thielaviopsis. So, it's game on: They must be controlled.

Fungus gnat adults are weak flyers, essentially bounding from plant to plant when disturbed. Roughly ⅛-inch long, they have longer, wispier antennae and legs than their stouter counterparts, the shoreflies. Fungus gnats sport a distinct Y-shaped vein in their wings that can be hard to discern when you find them crash-landed onto yellow sticky cards.

Adult fungus gnats represent the visible "tip of the iceberg." The rest of the life cycle takes place in the media, where

adults lay eggs in the cracks and crevices. The larvae are most plentiful in the top layer of soil but can be found all of the way down to the drain holes in the bottom of the pot. They are clear to white in color with a distinctive black head capsule, about ¼-inch in length with no legs.

CONTROL OPTIONS

Published studies compare different types of soilless media for fungus gnat preference. While some differences have been documented, it's not enough to be the determining factor in media selection for crop production. Regardless of the media used, avoid waterlogged conditions as that will serve to accelerate population growth.

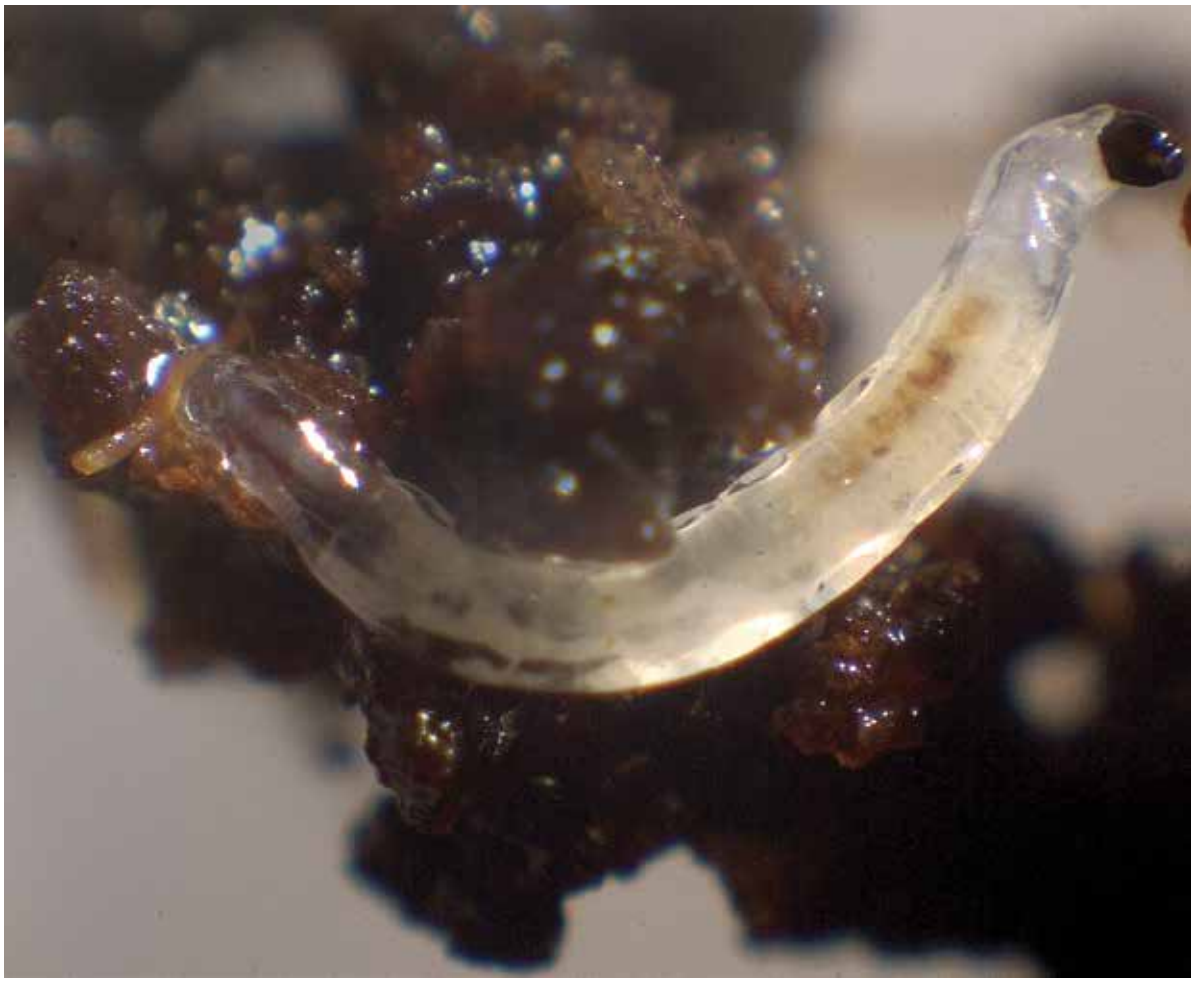
Regular scouting provides valuable information regarding fungus gnat populations, including a way to evaluate control efforts. Yellow sticky cards are highly attractive to adult fungus gnats. Mount at least one sticky card per 1,000 square feet, taking care to check and change the cards often. The larval stages can be monitored with potato wedges pressed into the surface of the soil. Check back in 24 to 36 hours to inspect the wedges for fungus gnat larvae.

Biological control of fungus gnats can be highly successful. In fact, for growers looking for their entry point into biocontrols, fungus gnat control can be a great place to log your first success. Utilizing a combination of biological control agents (BCAs) is the best approach. Beneficial nematodes are the backbone of such a control program, specifically *Steinernema feltiae* (or if you have friends you need to impress, entomopathogenic nematodes).

Applied properly to the soil, the nematodes enter the fungus gnat larvae through various body openings. Once inside, they release a bacterium that kills the host. The nematodes reproduce within the fungus gnat larvae and later return to the soil to look for more prey. *S. feltiae* operate in a soil temperature range of 50 to 86° F and are hindered by low soil moisture.

Failure to gain control when using *S. feltiae* often results from improper handling or application of the nematodes. Maintaining cool water to mix the nematodes in, gentle agitation and aeration are among the factors critical for success. If you're not experienced with nematode application, enlist the help of a BCA advisor to coach you.

Several other BCAs will also control fungus gnats. *Hypoaspis miles*, aka *Stratiolaelaps scimitus*, is a soil-dwelling predator mite that can complement the nematodes in controlling fungus gnat larvae. Rove beetles, *Atheta coriaria*, are efficient scavengers of soil-dwelling pests that round out



Fungus gnat larvae

the most commonly applied BCAs. Growers who carefully limit the use of pesticides in production sometimes acquire an unexpected ally in the Hunter Fly, *Coenosia attenuate*; they snatch fungus gnat adults out of the air and empty their contents with a dagger-like mouthpart. We could use more friends like that!

Insecticidal control of fungus gnats has become more difficult due to pesticide resistance. Grower feedback indicates that none of the products labeled to control the adult stage of fungus gnats does an acceptable job. The larval stage is more vulnerable, so control efforts are focused there. Insect growth regulators make up the largest group of effective options. Adept (MOA 15), Citation (MOA 17), Distance (MOA 7C) and Fulcrum (MOA 7C) are commonly employed with good success. (MOA = mode of action.) Bear in mind that these products are all effective only on the larval stage. Adults live seven or more days, so take that into account when evaluating effectiveness via sticky card counts (i.e., allow at least seven days for sticky card counts to drop.) Pylon (MOA 13) is effective as a soil surface spray but must be applied before foliage cover limits the ability of pesticide applicators to achieve good coverage of the soil surface.

Insecticidal control of fungus gnats has become more difficult due to pesticide resistance.

Safari and Flagship (MOA 4A) can be applied by soil drench.

For growers seeking fungus gnat control with OMRI-listed pesticides, Gnatrol (MOA 11A) and azadirachtin-based IGRs such as Azaguard, Azatin-O and Molt-X (MOA UN) may be applied as soil drenches and include many edible crops on their labels.

Fungus gnats don't have to be a given in the greenhouse environment. The combination of vigilant scouting and proven effective control options will minimize fungus gnat populations. Avoiding the plant damage, potential disease spread and nuisance associated with fungus gnats makes it well worth the effort.

Remember: It is the responsibility of the applicator to always read and follow all label directions. Labels do change without notice. Pesticides other than those mentioned here may also be safe, legal and effective. gpn

Rick Yates is GGSPro technical support manager for Griffin Greenhouse Supplies. He can be reached at ggsprotech@griffinmail.com.