



Fungus lilies and Easter gnats?

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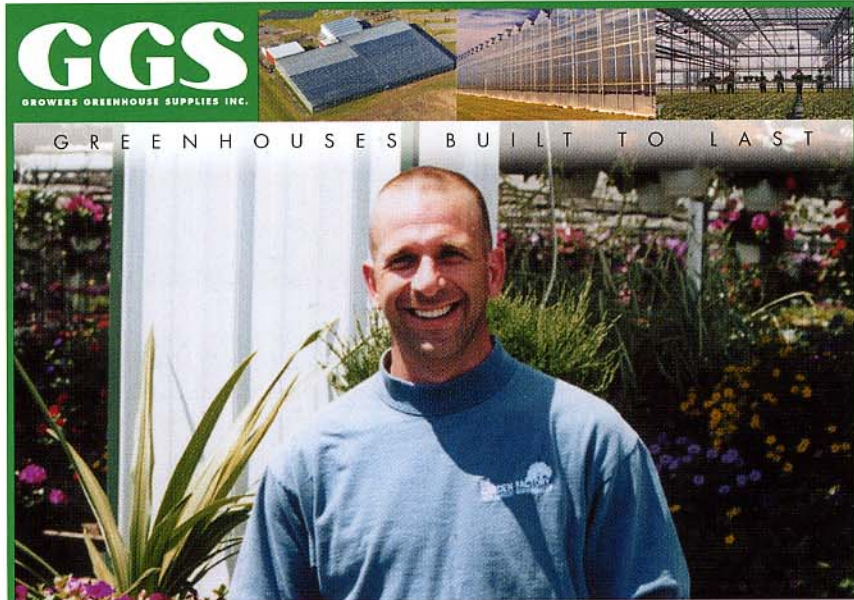
By Graeme Murphy

Easter lilies don't suffer from the types of high profile pest problems of other crops. Not for them the plagues of thrips, whiteflies, leafminers or

mites that can make growers of other crops feel impotent in the face of the onslaught. Yes, aphids enjoy Easter lilies as much as they like many other crops, but their attacks

are sporadic and usually controlled without too much difficulty. Another problem can be bulb mites, although growers often treat for those as a matter of course, early in the crop.

However, the most commonly occurring problems growers have to face with their lily crops are usually more difficult to see, and hidden beneath the soil surface. Not only that, they are often interrelated.



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Fungus gnat larvae (note the black head capsules) feeding on plant roots.

Fungus gnat adults are small, black flies, not often seen except on sticky cards, or when populations get very high. They lay their eggs in the soil and the worm-like larvae feed on organic matter including roots and root hairs, and on any soil-dwelling fungi. Which leads into the second major problem; fungal root rots. Diseases such as *Pythium* root rot and *Rhizoctonia* can result in heavy losses for growers, if the crop is not being closely monitored.

And the connection between fungus gnats and root rots? Fungus gnats are attracted to plants with fungal root diseases as a particularly suitable egg-laying site. As the adults fly around the greenhouse, they can pick up fungal spores and spread them to other plants. The larvae also feed on fungal spores and can transmit them as they feed or when they become adults. And the root wounds that are made by fungus gnat larvae as they feed make an excellent entry point for new infections.

So what comes first, the fungus gnats or the root rots?

It probably doesn't matter and it's certainly not worth laying awake at night trying to figure it out. What is important is that both parts of this pest/disease complex have to be addressed. Drenching a fungicide to control root rots will not be the best use of your time if a rampant fungus gnat population is not also controlled. And don't wait until the problem is out of control. Set up a fungus gnat control program early in the crop and monitor root growth on a regular basis to detect early signs of disease.

For fungus gnat control, the primary target is the larval population below the soil surface (adults are notoriously hard to kill) and the issue needs to be addressed early. Once the crop fills in (by late January or early February), it can become very difficult to get access to the soil. The program needs to be started when the bulbs are first planted.

There are a number of options. There are various pesticides that provide excellent control of fungus gnats. Trumpet as a soil surface spray, or the insect growth regulators Dimilin or Citation as drenches, work very well. They should be applied about a week after planting (because fungus gnats love newly planted peat mix) and again if sticky card trapping indicates the need. The real danger periods to be aware of include:

- The period immediately after first planting.
- If bulbs are being pot-cooled, then as soon as they are removed from the cooler.
- And just before the crop fills in and it becomes difficult to drench the growing medium.

The other option is the use of biological control, which can provide excellent control of fungus gnats. It is critical to start early (Day 1 preferably) before fungus gnat populations have a chance to build up.

Once that happens, it can be much more difficult for the beneficials to play catch up.

There are a number of beneficial organisms that can be used.

Two predators, the mite *Hypoaspis* and the rove beetle *Atheta*, live in the soil and actively prey on the eggs and early stages of fungus gnat larvae. Either or both of these should be applied when the bulbs are first planted. One application is sufficient.

Another useful biological is the nematode *Steinernema feltiae*, which is sold under a number of different trade names. It is drenched into the soil in a similar fashion to pesticides. Likewise, the biological insecticide Vectobac can be applied in the same manner. If you commonly have fungus gnat problems in Easter lilies, then consider the following program:

- Don't wait until you see the fungus gnats.
- Apply *Hypoaspis* and/or *Atheta* when the bulbs are planted.
- Drench nematodes about 7 to 10 days after planting the crop and again a couple of weeks later. If the crop is to be cooled, apply again when it is removed from the cooler. A final application could be considered just before the crop fills in to the point where it becomes difficult to drench.
- Monitor root health closely for any signs of disease.

The last thing you want to be doing is fighting clouds of gnats in the last few weeks of the crop. Plan early and follow through with your plan. 🌿

Graeme Murphy is the greenhouse floriculture IPM specialist with the Ontario Ministry of Agriculture and Food at Vineland.

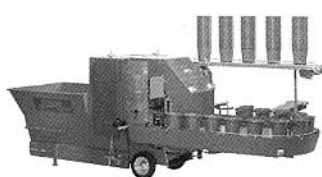
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