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# 101 Ways to Try to Grow Arabidopsis: Did Any Treatments Reduce Fungus Gnat Infestation?

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## Purdue Methods:



### Did any treatments reduce fungus gnat infestation?

#### Short answer:

Beneficial nematodes, *Steinernama feltiae*

#### Results:

Our first study involving top dressings, beneficial nematodes and different soil mixes showed a statistically significant reduction in fungus gnat larvae captured on soil surface of plants treated with one of the beneficial nematodes treatments. Silica sand at the highest rate significantly increased fungus gnat infestation. A visible layer of green algae formed on the silica sand surface at this rate, which may have explained the attraction.

We repeated the *Steinernama feltiae* nematode treatments in a larger study. 50 untreated pots and 50 treated pots were compared. Fungus gnat larvae per pot of control pots on days 0, 7 and 14 following application were 5.32, 1.54 and 1.48, respectively. Treated pots were 5.92, 1.18 and 0.22. Day 14 results were significantly different at  $p=.005$ .

#### Discussion:

Fungus gnats (families Mycetophilidae and Sciaridae), are a common greenhouse pest, prevalent in soilless mix kept too moist. Proper identification is the first step to control. They are easily mistaken for shore flies (family Ephydriidae) which, though a nuisance, do not typically damage plants. Both larvae and adult forms of these two species can be distinguished upon close inspection. Damage from fungus gnat larval feeding on *Arabidopsis* usually is characterized by skeletonized leaves that are in contact with soil surface. One sound management practice for fungus gnats is to let the soil surface dry completely in between irrigations. This is effective because, as the name implies, fungus gnats feed on the microscopic algae that thrive on soil surfaces where water, sunlight, and nutrients are available. Removing water from the equation keeps the algae from thriving. We've observed reductions in infestations when constant sub-irrigation was ceased, though no controlled studies were performed.

Our study also examined the application of top dressings in controlling fungus gnat infestation. The theory is that these thin layers of dressings on the soil surface mechanically damage the fungus gnats as they burrow into the soilless mix to lay eggs. None of the top dressings we used reduced fungus gnat infestation with statistical significance. Our study of treatments to reduce fungus gnat infestation has shown that beneficial nematodes were very effective. The nematodes were applied to soil of infested pots as a drench and have no REI or mammalian toxicity.



**Figure 1. The leaves in the upper left and lower right corner of this pot have been skeletonized by fungus gnat larvae feeding. These leaves were in contact with the soil surface. Other symptoms on this plant are from an unrelated disease.**



**Figure 2. Captured on a potato wedge placed on the soil surface, a fungus gnat larva with clear body and black head.**



**Figure 3. Potato wedges can be used to monitor fungus gnat larva. This image is of our experimental set-up; far fewer wedges would be needed for routine monitoring.**