

# PUTTING AN END TO FUNGUS GNATS and their larvae



## Fungus Gnat Info:

Fungus gnats become a nuisance indoors when adults emerge in large numbers as mosquito-like insects from potted plants or flower boxes containing damp soil rich in humus. Larvae or maggots, which feed in soil high in organic matter, can injure the roots of most plants. Plant symptoms may appear as sudden wilting, loss of vigor, poor growth, yellowing and foliage loss. Along with the larvae, fungus gnats get their name from bringing over fungal spores to a new root system, which they then infest, colonize and destroy.

Adult fungus gnats are about 1/8" to 1/10" (2.5 mm) long, grayish black, slender, mosquito-like and delicate with long legs, antennae and one pair of wings. Identification can be made by the vein patterns in the wings. Dark-winged fungus gnat adults have eyes that meet above the base of the antennae. Larvae are legless, thread-like, and white, with shiny black heads, up to 1/4" (5.5 mm) long and transparent.

Fungus gnats reproduce in moist, shaded areas in decaying organic matter such as leaf litter. The life cycle is about four weeks, with continuous reproduction in grow spaces where warm temperatures are maintained. Larvae not only feed on decaying organic matter, but on living plant tissue, particularly root hairs and small feeder roots. Brown scars may appear on the chewed roots. The underground parts of the stem may be injured and root hairs eaten off. Below we list some of the best methods to fight off and prevent this nasty little pest.

## Yellow (not blue) Sticky Strips

The traps are designed to trap adult fungus gnats and whiteflies. Place anywhere that adult flies congregate. Riddle the area with these! We find that putting 1 strip on each side of a stem works well.

## AzaSol:

This is a great way to deal with fungus gnats and their larvae as preventative maintenance. A routine spray, as well as a root drench through regular feeding will cut down on the population if not keep it all the way removed. AzaSol is the water soluble form of Azadirachtin.

### AzaSol Application Rates:

**Root Zone Dosage:** 1 tsp per gallon to be applied as a preventative. More about how to use this application on separate "info sheet."

**Quart size foliar application:** In a quart mix 3 tsp. of AzaSol and a few drops of wetting agent with RO water. Shake and apply. Wait 5 days and reapply by increasing dose to 4 tsp of AzaSol with wetting agent and water. If spraying indoors we recommend raising the lights or spraying while the lights are off (for at least a 3 hour period.) Outdoors spray early in the morning or at dusk. Use within 24 Hours. 2-3tsp/gallon for moderate infestations. 4 tsp/gallon for high infestations.

## Nematodes:

These microscopic worms are pretty awesome. They only effect soft-bellied insects like fungus gnat larvae (no animals - so don't worry!) Nematodes get sucked up into the guts of the larvae, and begin to colonize and multiply and multiply and multiply until they finally burst open the stomach of the larvae (dealing it out a very nasty death) and releasing more nematode colonies into the medium in the process.

### Nematode Application Rates:

Apply 1 Million (1 packet) Nematodes per each "grow light" in your grow space. Each packet of nematodes is dropped and mixed into a 1 Gallon container of water (pH as normal) then hand applied to each plant. Then remove sponge and toss into reservoir.

## Gnatrol Powder:

Comprised of Bacillus thuringiensis, a beneficial bacteria that rots out the gut of its prey (soft-bellied insects like the fungus gnat larvae.) Effective for 48 hours, reapplication may be necessary.

### Gnatrol Application Rates:

Mix 1/4 - 3/4 tsp./Gal. Make sure to apply and let it soak in and then FLUSH out. Best used as a Drench. See other "info sheet" on Drenches.

## Orthene 97% WP

This is the harshest stuff that we have found. It will kill larvae, root aphids, and just about anything else in the medium. Make sure you apply, then FLUSH 3-5 hours after application. Apply to one plant first, then apply to rest of garden.

### Orthene 97 Application Rates:

Mix 3/4 tsp per gallon. After application, make sure to FLUSH 3-5 hours later.

## Bonide Tree & Shrub Drench

Contains Imidacloprid. Works best before the population gets too large.

### Bonide Application Rates:

Mix 1-3 tsp per gallon.

# HOW TO FIGHT OFF ROOT APHIDS



## Root Aphid Info

Root aphids colonize and suck juices from roots in many mediums including rockwool, “grow rocks”, coco, and soil. If plants appear to wilt, to have stunted growth, or have unhealthily coloured foliage and lose leaves prematurely, and the normal problems (pH, over-watering, nutrient levels, etc.) are not responsible, then suspect root aphids. Root aphids are voracious eaters, and are known to be persistent, so it requires some discipline to eliminate them. Some experts suggest treatment every other day, for a minimum of six treatments.

Root Aphids are small light green or off-white oval-like creatures with or without wings, which live on the roots of plants. Just like their counterparts above ground, they feed by sucking sap, but from roots instead of stems or leaves. There are several species of Pemphigus (root aphids), and unfortunately, when they are feeding in the soil there are few, if any, winged adults around to warn you. Many times root aphids will appear with or without wings, but in either case will not fly.

Once a problem has been identified with the plants, the first thing growers will notice on the infected root system is the white wax that looks like snow-flocking covering the infected spot. The affected roots often split. Root aphids tend to build up populations at the edge of rootballs. Female aphids give live birth to nymphs, and a clustering of aphids builds up on concentrated areas of the root system. Small populations are not a problem; however, when populations become high, the plants are reduced in vigor.

## AzaSol:

After ingesting **AzaSol** an insect can't feed. They feel full all the time. The insects cannot shed their skin to molt, and they can't form a pupae. Ultimately the insects end up paralyzed and they die.

### **AzaSol Application Rates:**

Start with 1-2 gallons of Reverse Osmosis (purified) water and add AzaSol (1-4 tsp per gallon in the reservoir). Mix it well inside the bucket, and then add the concentrated solution to the reservoir. Mix into your reservoir. Example: In a 20 gallon reservoir one would mix 1-2 oz. of AzaSol in a separate container of 1-2 gallons of water and then add that concentrate into the reservoir. Mix well.

Use every week in hydro or soil (1-2 oz. to 20 gallons) and then after control is established, maybe every other week as a preventative. We recommend using with Patrol for an even more lethal combination.

## Monterey Garden Insect Spray:

Monterey Garden Insect spray is OMRI listed for Organic Gardening. Its key ingredient is Spinosad.

### **Monterey Garden Insect Spray:**

Start with 4 tsp per gallon, wait 3 days and then hit them with 8 tsp per gallon.

## Bonide Systemic:

This is the harshest stuff that we have found. It will kill larvae, root aphids, and just about anything else in the medium. Make sure you apply, then FLUSH 3-5 hours after application. Apply to one plant first, then apply to rest of garden.

### **Systemic killer Application Rates:**

Mix 1 oz. per 10 Gallons of solution or 1/2 oz. per 5 Gal. After application, make sure to FLUSH 4-5 hours later. Repeat as necessary.

## Nematodes:

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### **Nematode Application Rates:**

Apply 1 Million (1 packet) Nematodes per each “grow light” in your grow space. Each packet of nematodes is dropped and mixed into a 1 Gallon container of water (pH as normal) then hand applied to each plant. Then remove sponge and toss into reservoir.

## Botaniguard ES:

Botaniguard is a biological insecticide, Beauveria Bassiana. Very safe and labeled for fruits and vegetables. It has a unique mode of action, spores infect insect through its cuticle (skin). It kills the insect by filling its entire body cavity with fungal mass.

### **Botaniguard ES Application Rates:**

1/4 tsp per gallon. Can be used up to the day of harvest.