



# Fungus Gnats

Fact Sheet No. 17

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## Introduction

At various times during the year, small flies (gnats) may be found flying around the house. They are often associated with house plants, and in most cases will prove to be fungus gnats. These small flies are also submitted frequently from greenhouse situations.

## Description and Biology

Fungus gnats are small, long-legged flies of the families Mycetophilidae and Sciaridae. The adults of most species are about 1/5 inch long or less. The immatures are transparent to white, slender, elongate, often blackheaded maggots that may reach a length of 1/4 inch when fully grown.

The larvae of most species feed in the soil on fungus, decaying organic material and sometimes on roots of living plants. Thus, they may develop in the humus soil of house plants or outside in leaf litter and other decaying vegetation. Larvae are usually found in the top one-inch of soil. Large numbers may be found beneath shrubbery around the home.

Adults are attracted to light and may accumulate in large numbers at windows after emerging from potted plants. They fly around when plants are disturbed and are frequently found running across the foliage and soil.

Each adult female lays about 100 to 200 eggs. Eggs are deposited in clusters on soil containing organic material and hatch in 4 to 6 days. Larvae feed for about 15 days, pupate and emerge as adults a few days later. Adults live about a week. Successive generations are produced as long as temperature and moisture conditions are favorable and food is available. A generation can be completed in about 21 to 40 days.

## Damage

Fungus gnats require high moisture conditions as well as decaying organic material. Some of the fungus feeding species may become pests in mushroom cellars. Some species become pests in greenhouses or plant beds. In the home they infest potted plants, particularly those

that are grown in a high humus content potting mix.

Larvae feed predominantly on the fungi that grows on the decaying material but may disrupt and damage roots while burrowing through the soil. They may also feed on the more tender portions of the root system and the crown of the plant, killing very young seedlings. Damaged plants will lack vigor, have poor color, and may exhibit premature leaf drop.

Adult fungus gnats are harmless and do not feed on plant tissue; however, the presence of large numbers of gnats in the home constitutes a nuisance that the average homeowner will not tolerate.

## Control

Cultural practices can aid in the prevention and/or control of fungus gnat infestations. Overwatering, water leaks and poor drainage frequently result in damaging fungus gnat infestations. Good sanitation is also important. Remove all debris and old plant material from in and around greenhouses and homes. Clean up piles of old soil and eliminate algal growths in greenhouses. To avoid accidentally introducing fungus gnats, inspect incoming greenhouse plants and new house plants for fungus gnats and treat as necessary.

Use sterile potting soil in the home. Reducing both the humus content of the houseplant potting mix and the moisture will make the soil less attractive to the gnats and decrease the number of gnats that will be produced in a given period of time. Turning the top one or two inches of soil will aid in drying. Fans can be used in atrium areas or to help dry the soil in a large number of pots. Excessive drying of the soil may be more detrimental to some plants than it is to the gnats and may not be a viable solution in some cases.

In situations where leaks or other conditions of excessive moisture exist, correction of the problem causing the moisture is the only effective solution. If no breeding sites can be found indoors, it is possible adults are being attracted indoors by lights and that the source is actually outdoors. Light traps may be helpful in these situations.

Biological controls for fungus gnat larvae are an alternative to chemical control. The insect-attacking nematodes *Steinernema carpocapsae* and *S. feltiae* are effective against fungus gnat larvae. The first of these is sold under the brand names Biosafe and Biovector by Biosys Pest Control, or Exhibit by Ciba Plant Protection. Nematodes of the second variety are available biological agent suppliers, as are soil-dwelling predatory mites of the genus *Hypoaspis*, which are also reported to control fungus gnat larvae.

Other biological control agents include the insect-attacking fungus *Beauveria bassiana* (Naturalis by Troy Biosciences) and the bacterial pathogen *Bacillus thuringiensis* var. *israelensis* (Gnatrol by Abbott Laboratories and Knocks Out Gnats by Gardens Alive).

The application of residual insecticides indoors to control fungus gnat larvae is rarely required. Use of cultural practices and/or biological controls for the larvae, plus quick-knockdown short-residual sprays for the adult fungus gnats is often sufficient. If necessary, larvae can be controlled with insecticide soil drenches or granular formulations applied to the soil surface and watered in.

Insecticides labeled for soil treatments to control fungus gnats include formulations

containing azadirachtin, *Bacillus thuringiensis* var. *israelensis*, bifenthrin, chlorpyrifos, cyfluthrin, deltamethrin, diazinon, diflubenzuron, mineral oil, permethrin, S-kinoprene, and tralomethrin. Among these, diflubenzuron and S-kinoprene are insect growth regulators which affect the larvae's ability to develop. Only a few formulations of *Bacillus thuringiensis* var. *israelensis*, permethrin, and S-kinoprene are available in homeowner -type packaging.

Insecticides to control adults gnats on house plants include formulations containing allethrin, permethrin, pyrethrins, resmethrin, or soap. Not all formulations with these ingredients are suitable for indoor use on house plants. Before purchasing or applying insecticides for this purpose, check the label to be sure the plant you want to treat (or house plants in general) is listed.

Greenhouse products to control adult fungus gnats by foliar treatments include formulations containing the active ingredients listed for soil treatments, plus some formulations containing acephate, *Beauveria bassiana*, diazinon, fenoxycarb, or methiocarb. Before purchasing or applying insecticides for this purpose, check the label to be sure the product is labeled for greenhouse use and that the plant you want to treat is listed.

When treating plants, spray both sides of the leaves, all around the stems, the surface of the soil, and outside the pot. Some formulations are designed to be used inside the house. But if the label does not say the product can be used indoors, take the plants outside to a shady spot to spray them. Do not spray in the sun, or when the temperature is higher than 85 F. In cold weather, spray in a heated garage or basement. Let the plants dry thoroughly before taking them back into the home.

### **Precautionary Statement**

All pesticides have both benefits and risks. Benefits can be maximized and risks minimized by reading and following the labeling. Pay close attention to the directions for use and the precautionary statements. The information on pesticide labels contains both instructions and limitations. Pesticide labels are legal documents, and it is a violation of both federal and state laws to use a pesticide inconsistent with its labeling. The pesticide applicator is legally responsible for proper use. Always read and follow the label.

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