

Managing Shore Flies in the Greenhouse

Shore fly adults (*Scatella stagnalis*) are a nuisance pest in the greenhouse that do not feed directly on plants. However, the presence of adults and their droppings (known as frass) on plant leaves may be objectionable to customers. Shore fly adults may be confused with the dark winged fungus gnats that are also common in the moist greenhouse environment, especially propagation houses. It is important to correctly identify whether you have fungus gnats or shore flies present because management strategies differ between these pests.

Identification Shore fly adults (*Scatella* spp.) are about 1/8 of an inch long with a robust body like a house fly, short legs, and antennae. Each shore fly wing has about five or six distinctive white or light-colored spots. Fungus gnats are long legged delicate flies.



Figure 1: Robust shore flies compared to delicate fungus gnats within circle on a sticky card.
Photo by L. Pundt

Shore fly larvae are yellowish-brown in color, lack the black head capsule characteristic of fungus gnat larvae and have forked spiracles, or breathing tubes, at their rear end. Shore fly pupae are dark brown, and spindle shaped with forked spiracles at their end.



Figure 2: Shore fly larvae (left) , shore fly larva and pupae (Photos by Joan Allen) and black headed fungus gnat larvae (on right). Photo by L. Pundt

Biology and Life Cycle: Adult shore flies lay up to 300 white, oblong eggs in algae or in very wet areas. Adult females need three days to mate and mature before they can begin to lay eggs. Eggs hatch into first stage larvae (maggots) with two forked breathing tubes at their rear. The pupae (protected with a thick skin) are found near algal mats. Shore flies develop from egg to adult in as little as 8 days at 78 F to 14 days at 68F. Adults can build-up to nuisance levels very quickly, especially under warm conditions and live for two to three weeks.

Damage: Shore fly larvae feed upon algae and do not directly feed upon plant roots. However, their frass (droppings) on plants are unsightly. In addition, their presence may be objectionable to customers and can be a nuisance to workers. Shore fly larvae have been reported to help spread soil borne pathogens such as *Thielaviopsis basicola* (black root rot) and *Pythium sp.* via their droppings but it is unclear how important this is under greenhouse conditions.

Scouting: Use yellow sticky cards to monitor for the adults. Adults are often seen resting on plant leaves. Shore flies are stronger fliers than fungus gnats and may fly up when disturbed.



Figure 3: Shore fly adults resting on leaves (on left) and their droppings (frass) on right. Photos by L. Pundt

Sticky tape may be used in propagation houses to help capture shore fly adults.



Figure 4 Mass trapping shore flies in a propagation greenhouse. Photos by L. Pundt

Cultural Controls: Shore flies are best prevented through proper cultural management. All life stages of shore flies can be found on or near algae, their food source. Proper sanitation and environmental modification are crucial to managing algae growth. Reduce the moisture and puddling water on greenhouse floors, benches, and greenhouse surfaces. The greenhouse floor should be level and drain properly to prevent the pooling of water. Avoid over watering crops, especially early in the production cycle, to allow the upper media surface to dry out between watering's. Select growing media that drains well and avoid compacting the media. Use disinfectants as part of a pre-crop cleanup program for control of algae on greenhouse surfaces and walkways.

Biological Controls: Biological controls are best used preventively in conjunction with proper cultural practices.

Rove beetles (*Dalotia coriaria*) are generalist predators that feed upon shore flies, fungus gnats and thrips pupae in the growing media. They feed upon the eggs and larvae of shore flies. Adults are best released in the evening. Consult with your supplier for more information on release rates.

Beneficial nematodes (*Steinernema* spp.) infect shore fly larvae but do not provide sufficient levels of control. They are not well adapted to the semi-aquatic environment where shore flies are breeding. Some growers are using repeated spranches with *Steinernema carpocapsae* (Millenium) at high rates against shore flies.

The beneficial hunter flies (*Coenosia attenuata*) have been commonly observed in Connecticut greenhouses. They are not commercially available from biological control suppliers but have been moved from greenhouse to

greenhouse on plant material. Hunter flies' prey on shore flies as well as fungus gnats.

Hunter flies have shiny, clear wings without any spots and are about twice as large as shore flies. This aerial predator is often found perching on leaves, waiting to ambush its prey.

The parasitoid *Hexacloa neoscatella* may also be present in unsprayed greenhouses and help to regulate populations

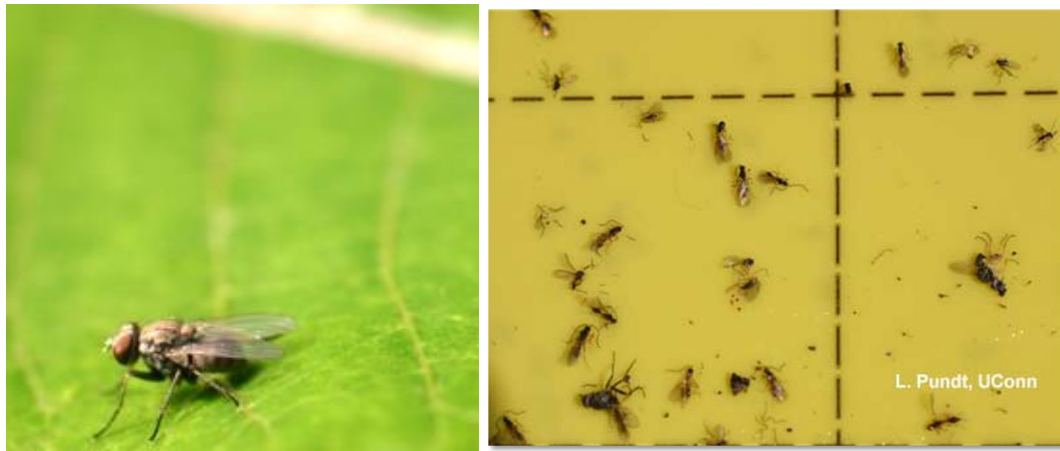


Figure 5: Beneficial Adult Hunter fly perching on leaf (on left) and *Hexacloa neoscatella* parasitoid on yellow sticky card (on right). Photos by L. Pundt

Insecticides

Repeated applications of insect growth regulators can be used to suppress shore fly larvae. Some insecticides can be used to reduce adult populations, but adult females can begin laying eggs as soon as 3 days after emerging so this is not a long-term solution.

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