

SHORE FLIES

Raymond A. Cloyd
Entomology Department, Purdue University

Shore flies are common greenhouse pests that have recently required considerable attention by greenhouse managers. Shore flies are predominantly a nuisance pest, but they can sometimes transmit fungal pathogens. Shore flies inhabit the same environmental conditions as fungus gnats and the two are often confused. The following is a description to help identify the larvae and adult stages of shore flies.

- Larvae are opaque yellowish-brown with no head capsule and about 1/4 inch long when mature.
- Adults look very much like small house flies. They are 1/8 inch long, and have black bodies and reddish eyes. They possess dark wings with 5 light-colored spots on each wing. Antennae are shorter than their head and the legs are small. Shore flies are stronger fliers than fungus gnats.

DAMAGE

Shore flies are primarily a nuisance pest, as large numbers of flies can reduce crop marketability. Shore fly damage consists of excrement ("fly specks") left on the foliage of bedding plants and other ornamentals. They also have the potential to transmit fungal pathogens such as pythium root rot. They can only damage plants indirectly by injuring plant root hairs. In most cases, shore flies generally feed only on algae.

BIOLOGY

Shore flies belong to the insect order that contains all true flies, Diptera. The common species encountered in greenhouses is *Scatella stagnalis*. They have a life cycle consisting of an egg stage, 3 larval stages, pupa stage, and an adult.

A generation can be completed in 15 to 20 days. Females lay eggs in areas where algae accumulate such as soil surfaces, benches, and greenhouse floors. A single female can lay between 300 to 500 eggs. Eggs hatch in 2 to 3 days, giving rise to maggot-like larvae that are yellowish-brown. Larvae are found just under the top layer of soil, where they feed on algae. The body is located in the soil and head in the algae. They remain in the larval stage for approximately 7 to 10 days, after which they pupate. Pupation occurs in the soil. Adults emerge in 4 to 5 days and live about 3 to 4 weeks. Adults move and fly rapidly but usually stay close to their breeding sites. The rate of development depends on temperature.

MANAGEMENT

1. Quarantine

Inspect any incoming plant material for adults and larvae. Apply insecticides to control any shore flies that are present.

2. Proper Sanitation

Shore flies breed in algae, so the elimination of algae in pots, propagation areas, on benches, and under benches will greatly reduce shore fly populations. Areas under benches can be treated with copper sulfate, bromine (Agribrom), or quaternary ammonium chloride salts.

3. Proper Fertilization

Use the minimal optimum levels of fertilizers for plant growth and avoid excess fertilizer levels to reduce algal blooms.

4. Eliminate Excess Moisture

Clean-up all free-standing water on solid

benches, on walks, and under benches. In addition, avoid overwatering plants.

5. Monitoring/Record-keeping

Shore fly infestations can be monitored by counting adults attracted to yellow sticky traps. Place sticky traps near and on the soil surface of potted plants and benches. Inspect yellow sticky traps weekly using a 10X hand lens and record the number of adults per sticky trap. Keep records on areas in the greenhouse where shore flies occur.

6. Chemical Control

Insecticides do not effectively suppress shore flies in greenhouses. This is due to the thick-skinned pupal stage (puparium) that cannot be penetrated by insecticides. One product labelled for shore fly control in greenhouses is Precision 25. Precision 25 is an insect growth regulator with the active ingredient, fenoxycarb. It controls only the larval stages, not the adults. Application rate is 4 oz./100 gal. of water.

7. Biological Control

Biological control for shore flies involves

the use of the soil-predatory mite, *Hypoaspis miles*. *Hypoaspis* attacks shore fly larvae and can control shore flies if there is no standing water. Shore fly can survive in standing water whereas *Hypoaspis* cannot. Make releases soon after shore flies are detected.

If you want to attempt biological control, use the following guidelines:

- Start on a small scale. Don't convert an entire operation to biological control until the system has been tested and proven effective.
- Consult supplier catalogs for information on the use and release rates of available biological controls.
- Find a reliable source and order at least 3 weeks before application.
- Release biological control agents upon delivery. Delaying release reduces effectiveness.
- Monitor and record the number of biological control agents and pests present before and after release in the greenhouse.

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