



Leafminer Pests of Greenhouse Crops

Leafminers larvae damage crops by mining between the upper and lower leaf surfaces. Small flies in the family Agromyzidae are common insect pests of greenhouse-grown crops. The American serpentine leafminer (also known as the chrysanthemum leafminer), (*Liriomyza trifolii*), serpentine leafminer attacks chrysanthemum and gerbera daisy. It caused serious problems in the greenhouse cut mum industry in the 1980's and was notoriously difficult to control. Other species reported include the serpentine leafminer (*Liriomyza brassicae*), pea leafminer (*Liriomyza huidobrensis*) and the vegetable leafminer (*Liriomyza sativae*).

The daylily leafminer, (*Ophiomyia kwansonis*) is host specific to daylilies. As the larvae feeds within the leaves, it produces silver mines up and down the leaf, or in zigzags or loops. Pupation occurs within the mine. This introduced leafminer was first reported in Florida in 2011. It has since spread to CT and many other states thru movement of infested plant material.

Feeding Damage Damage is generally aesthetic, and plants are rarely killed. Damage is more severe on seedlings or young plugs and can affect the salability of plants.

Identification, Biology and Life Cycle

Adult leafminers resemble houseflies and are 1/4 inch long with black bodies and yellow heads. Most have yellow markings on their bodies that are helpful to distinguish leafminer adults from shore fly adults. Adult females pierce young leaves with their ovipositor (an egg-laying structure), and feed on the liquid that exudes from this wounded leaf tissue. Females insert their eggs into leaves. The small larvae are typically bright yellow to brown. As larvae feed within the leaf tissues, they create serpentine mines.

Figure 1 & 2: Leafminer adults and serpentine leaf mine. Unknown species. Photos by L. Pundt.



In general, leafminer females lay approximately up to 200 eggs during their 2 to 3 week lifespan. Eggs hatch in 5 to 6 days, and larvae feed beneath the leaf cuticle for about two weeks. The final larval instar creates an opening in the leaf and then falls to the ground. Larvae burrow into the growing medium to pupate. Pupae are brown, and adults emerge within a two-week period. The length of the life cycle depends on the leafminer species, host plant and temperature. For example, it takes 64 days to complete the life cycle at 59°F but only 14 days at 95°F. Overlapping generations can occur.

Scouting

Inspect incoming plants for signs of leafminer activity. When visually inspecting plants, look for any egg-laying punctures, which appear as white spots on the tops of leaves. Use yellow sticky cards to monitor leafminer adult populations, especially on susceptible plant material. Adults may be observed walking on plant leaves and flowers. Yellow markings on their bodies are helpful to distinguish leafminer adults from shore fly adults.

Cultural Controls

Avoid over fertilizing plants, particularly with nitrogen. Over fertilized plants are more attractive to adult females for egg laying. Remove weeds, plant debris and infested leaves before leafminers pupate. Hopper tape may be used to trap out adults provided parasitic wasps are not being released.

Biological Controls

Commercial biological control agents for leafminers include parasitic wasps, *Diglyphus isaea* and *Dacnusa sibirica*.

Diglyphus isaea is a small (~1/10 inch long) black wasp with short antennae. It is an ectoparasitoid; females paralyze the host before laying one or more eggs next to the leafminer larvae. Adult females attack second instar leafminer larvae within the leaf mines. It also host feeds on host fluids of the larvae. When scouting, look for short mines with the dead leafminer larvae inside the mines. Look for signs of parasitism: round holes in the leaf mine where the parasitic wasp adults have emerged. This small parasitic wasp works better at high temperatures (above 68° F) in the spring and summer when pest populations are high.

Dacnusa sibirica is a small (~1/10 inch long) braconid wasp with long antennae. It is an endoparasitoid; females lay eggs directly into leafminer larvae. This wasp uses odors emitted from leafminer droppings to locate larvae within damaged plant tissue. *Dacnusa* is better adapted to lower temperatures (60° F), short days, and low light levels than *Diglyphus*.

Release the adult parasitic wasps in the morning or evening. Apply weekly. Consult with your supplier for release rates. Remove yellow sticky cards before

making releases, for the parasitic wasps are attracted to them. Replace the cards 3 to 4 days after making releases.

Chemical Controls

Using insecticides to control leafminer populations may be difficult because several species have developed resistance to a number of commonly used insecticides. Applications of pyrethroid-based insecticides may be required every 3–4 days to kill adults as they emerge from pupae in the growing medium. Apply insecticides in the morning, when females are actively laying eggs, for the wet sprays may disrupt their ability to deposit eggs in leaf tissue. Several pyrethroid-based insecticides have repellent properties that may deter adult females from laying eggs, minimizing damage to plant leaves. Insecticides with translaminar properties, including several insect growth regulators, may also be effective in killing the larvae within leaf mines. Consult the most recent edition of *New England Greenhouse Floriculture Guide* for more specific up-to-date recommendations. It is available from the Northeast Greenhouse Conference and Expo at: <https://www.negreenhouse.org/>

See the [New England Vegetable Management Guide](#) for information on spinach and beet leafminers on chard, beet and spinach transplants.

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