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GARDEN FACTS
University of Wisconsin–Extension
Vegetable leafminers

Vegetable Leafminers

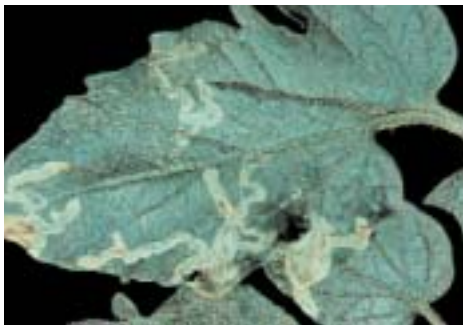
K. A. Delahaut

Dipteran leafminer with frass and damage

The term leafminer is used to describe flies, moths, sawflies or beetles in the larval stage. However, leafminers that feed on vegetables all belong to the order diptera—the flies.

Leafminers feed on the mesophyll tissue between the upper and lower surfaces of leaves. This is where the plant converts light to energy through the process of photosynthesis.

Leafminers present a more serious problem in vegetables that are harvested for their foliage, such as spinach or chard. The species discussed in this publication include the serpentine leafminer (*Liriomyza brassicae*), vegetable leafminer (*Liriomyza sativae*) and the spinach leafminer (*Pergomya hyoscyami*).



Serpentine leafminer damage

Appearance

Maggots of the **serpentine leafminer** make slender, winding mines between the epidermis of beets, cabbages, radishes, spinach and turnips. Because most of these vegetables are grown at least in part for their foliage, such damage results in an unsalable crop.

The **vegetable leafminer** presents more of a problem in greenhouse production than in field-grown crops. However, greenhouse-grown tomato and cucumber transplants are susceptible to attack. The vegetable leafminer adult is a shiny yellow-brown fly with black markings.

Hosts of the **spinach leafminer** include beets, spinach and chard as well as the common weed, lambsquarters. Adult flies are ¼-inch long, and gray in color with black bristles. The larvae are pale green maggots.

Symptoms and effects

The damage that results from leafminer activity may appear as blisters, blotchy mines or serpentine tunnels. Feces of the larvae, or frass, can contaminate leafy tissue intended for human consumption. Stunting, due to a reduction of photosynthetic leaf surface area, can also be a problem in vegetable crops not marketed solely for their foliage. Spinach leafminers produce serpentine mines initially but later produce large, undifferentiated blotches. Larvae of the vegetable leafminer may feed on more than one leaf before completing their growth.

Life cycle

Leafminers overwinter as pupae either in the soil or in infested plant debris. In spring, adult flies emerge and lay eggs on or near susceptible hosts. When the eggs hatch, the larvae immediately begin to enter the leaf and mine the mesophyll tissue between the upper and lower leaf surfaces. When the larvae have finished developing, they may remain in the plant or drop to the ground to pupate. There may be several generations of leafminers per year; however the first generation often does the most damage.

Scouting suggestions

It is important to detect leafminer damage early before the marketability of the crop is affected. Efforts to control the insects must be started before they enter the leaves where they will be hidden and protected. Leafminer eggs are laid on the lower leaf surface; this is the place to check for early mining activity.

Threshold levels that tell when to begin control have not been determined for leafminers, but the plant's stage of growth is an important factor in determining whether to implement control.

Young plants can withstand less damage than older ones. On leafy crops such as spinach, lettuce and chard, a 5% threshold level is often used.

Control

Non-chemical: Deep plowing in early spring to destroy infested weeds and plant material from the previous season can reduce the severity of leafminer outbreaks. Covering susceptible crops with floating row covers to exclude flies from laying eggs may also help. Weed hosts such as pigweed, lambsquarters, plantain, chickweed and nightshade should also be destroyed.

Parasitic wasps can provide a limited degree of natural leafminer control.

Chemical: Because leafminers are protected within the plant, insecticidal control is often difficult. In addition, some leafminer populations have exhibited resistance to organophospate insecticides making control difficult. If insecticides are used, they must be applied early in the insect's life cycle to be effective.

For pesticide recommedations, refer to the UW-Extension publication *Commercial Vegetable Production in Wisconsin* (A3422).

Author: K. A. Delahaut is an outreach specialist with the Integrated Pest Management Program at the University of Wisconsin–Madison and the University of Wisconsin–Extension, Cooperative Extension.

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