Birch Leafminer: Biology and Control
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Biology and Control

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Birch leafminer *(Fenusa pusilla)* is perhaps the most common insect pest of birch in the northern United States. Few trees escape attack in years when this leaf-mining sawfly (a type of wasp) is abundant. The following will acquaint you with the biology of this insect and various methods of controlling it.

DAMAGE SYMPTOMS: Blistering and browning of birch foliage in late May and early June or mid-July.

HOSTS: Paper, gray, European white and cutleaf birches seem to be preferred. Black, yellow and river birches are less susceptible.

IDENTIFICATION: The sawfly adult is black, 3-4 mm long (⅛ inch), with dark, translucent wings. The flattened, white larvae are 1-6 mm in length with a brown head capsule and very small legs. Tiny black squares are present on the lower body surface near the head.

LIFE CYCLE: Birch leafminer adults emerge from earthen cells in early to mid-May when birch foliage is half-to-fully expanded. The black adults can easily be seen hovering around host trees or moving about on foliage. Mated females insert eggs singly in the upper surface of expanding leaves with their saw-like ovipositor (a modified stinger). Egg hatch occurs in 7-10 days and larvae begin to feed or "mine" in the tissue between the leaf surfaces producing the characteristic blistered or translucent spots on the leaves.

Initially, larvae feed singly, but as they develop, individual mines may coalesce (come together) creating large, hollowed-out areas containing several miners. Larvae feed for approximately two weeks, enlarging the mine until most of the leaf is damaged. Mature larvae chew an exit hole in the leaf mine, drop to the ground and construct earthen cells for pupation. The pupal stage may last for several weeks.

Figure 1. Browning of birch foliage in early June by birch leafminer larvae.

A second adult generation emerges in late June to early July but damage is usually restricted to newly developed leaves of the upper tree canopy. However, all leaves may be attacked in years when leafminers are extremely abundant. A third generation occurs in mid to late August. Mature leafminer larvae overwinter in earthen cells 1-2 inches below the soil surface and pupate in late April of the following spring.

DESTRUCTIVE STAGES: All of the foliar damage is caused by the feeding activity of the larval stage. Adults cause no damage except for tiny oviposition (egg laying) scars.

Figure 2. Birch leafminer adult.

Figure 3. Birch leafminer larva, note flattened appearance of larva.

TREE IMPACT: Tree mortality from birch leafminer is rare in ornamental plantings. However, heavy attack by this miner puts severe stress on the tree by reducing the leaf area available for photosynthesis. Birches under such stress are probably more susceptible to attack by other insects, especially bronze birch borer, and disease.

The first, or spring, generation of miners may attack nearly 100% of the available foliage, producing an unsightly browning of the trees. These damaged trees will put out new leaves, but this often coincides with the emergence of second generation leafminer adults in late June.

CONTROL: Since most of the damage is done by the spring generation, early control is imperative where valuable ornamental trees are involved. Controls aimed at the second generation may also be effective. Late summer (August) applications are not effective.

Several control techniques for birch leafminer are discussed below.

Foliar sprays of carbaryl (Sevin), diazinon, phosmet (Imidan), lindane or malathion, should be applied in early to mid-May (May 10-15) to control ovipositing adults. Two applications at a 10-day interval are recommended. After mines appear, use a systemic material such as acephate (Orthene), dimethoate (Cygon*) or an all-purpose spray which contains the systemic oxy-demeton methyl (Metasystox-R*). Use any of these materials in early July for second generation adults and larvae.

Soil Treatments — Granules. Di-sulfoton (Di-syston) is available for consumer use in 1% and 2% granular formulations under several labels. These should be worked into the top 1-2 inches of soil around the base of the tree and thoroughly watered in. For best results, apply just before leaf flush begins in the spring. Note that the percent of active ingredient is very low and results may not be as good when compared to 15% granular di-sulfoton, (a restricted use pesticide available only to certified licensed applicators).

Cartridges. A 2% di-sulfoton cartridge is sold for use in a root feeder device. The feeder uses an attached hose to dissolve the cartridge and delivers the liquid solution through a metal tube to the tree root system. Effectiveness is similar to the 2% granules discussed above. See the label for specific instructions.

*Cygon is sold in Michigan by several pesticide companies: B. G. Pratt, Black Leaf, and Bonide. Metasystox-R is a common component of many "all purpose sprays": Isotox (Ortho); Noculate 3 Insect Spray (B. G. Pratt), Systemic plus (Black Leaf), or Systemic Spray (Science). This information is included to assist the consumer in locating the chemical and does not constitute an endorsement of a particular company or product.

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