

At ArborLawn, one of our primary goals is to further the knowledge of our customers. This information will give you a better understanding of the needs of your trees so you will be able to make more informed decisions regarding their care.

Birch Tree Injection

Birch Leafminer

The birch leafminer, *Fenusa pusilla* (Lepeletier), is a small sawfly native of Europe that was first detected in Connecticut in 1923. It has since spread throughout northeastern North America. The larvae of the sawfly make blotch mines in the leaves of most birches (*Betula*). Severe damage may occur to paper birch (*B. papyrifera*), gray birch (*B. populifolia*), and European white birch (*B. pendula*). Black birch (*B. lenta*), yellow birch (*B. alleghaniensis*), river birch (*B. nigra*) and monarch birch (*B. maximowicziana*) are less susceptible. The adult sawfly is a small, 1/4 inch long, black, fly-like wasp. The larva is very flat, lives within birch leaves and is white with three black spots on the lower surface.



Type of Damage

Damage to birch trees is done by the larval stage as it feeds between the upper and lower layers of the leaves. This feeding produces large blotch mines in the leaves. Often, several larvae will completely mine a single leaf. Multiple generations and high populations can cause damage to almost every leaf by mid-summer. The mines turn brown and will cause the tree to look dead with wilted brown leaves. This forces the tree to re-leaf and reduces its ability to produce food for growth. This damage may also make the trees more susceptible to bronze birch borer attack. Though the adult birch leafminers are related to wasps, they do not have a sting.

Figure 1. Birch leaf damage. Early mines on left and late mines on right.

Life Cycle and Habits

Mature larvae overwinter in the soil under host trees. When the soil warms in the spring these prepupae pupate, usually in April, to transform into the adult stage. Within a few weeks the adult sawflies dig out from their earthen cells and fly to the newly expanding foliage of birches. The small black adults prefer to mate and oviposit on the upper leaves, especially in sunny areas. Mated females use their needle-like ovipositor to punch a hole in the leaf and lay eggs. Often the female withdraws the ovipositor without laying an egg. The damaged spot may turn brown as the leaf expands and hardens. The eggs are often visible in the tissues between the major leaf veins. They may appear as small raised spots on the leaf surface. Within 7 to 10 days the eggs hatch into tiny flattened larvae with wide front segments. These larvae produce a blotch mine that may join with others. The old mines may contain considerable amounts of dark fecal pellets. The larvae mature in 14 to 20 days and are about 1/4 inch long. By this time the larvae have the diagnostic small black square marks on their lower surface. Mature larvae pupate in the leaf epidermis and drop to the ground. Here they dig one to two inches into the soil to form a pupal cell. Birch leafminers usually produce two to three generations a summer.

Figure 2. Adult Birch leafminer.(X5)



Figure 3. Birch Leafminer Larva. Underside View (X5)

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Bronze Birch Borer Management

The bronze birch borer, *Agrilus anxius* Gory, is a small slender beetle that is slightly less than 1/2-inch in length. Its larva is one of the most devastating pests of white-barked birches. The larval stage feeds just under the bark of birch trees. When this larval feeding girdles a branch or tree, the result is sudden wilting and death. This native North American insect occurs on birch from Newfoundland to British Columbia and south to West Virginia, Ohio, Colorado, Idaho and Oregon.

Plants Attacked

The larvae have been recovered from most birch species but European white birch (*Betula pendula*), water birch (*B. occidentalis*), paper or canoe birch (*B. papyrifera*), and yellow birch (*B. alleghaniensis*) seem to be the most preferred hosts.



Damage

Initial damage is usually discovered when the top part of a birch tree suddenly wilts and dies. This happens when a larva girdles one of the upper branches. Careful examination of branches and the trunk usually reveals raised ridges or bumps, commonly referred to as "gouting" of the branches. These are ridges formed when a larval tunnel is closed in by callous tissue of the tree. Often, D-shaped holes are found in the bark and these may be stained with rust colored sap. These holes are emergence holes made by adult beetles. Heavy attacks and continued re-infestation result in most of the branches dying from the top down. Eventually the trunk is girdled and the entire tree dies.

Description and Life Cycle

Adult bronze birch borers are rarely observed because of their secretive behavior and rapid flight ability. The adults are slender, dark olive-bronze in color with a bright green iridescence underneath the wing covers. Males are usually about 3/8-inch long, while females may reach 1/2-inch in length. Most adults have a short white colored dash on the sides of the wing covers. The larva is atypical of most flat-headed borers in having the segment behind the head only slightly wider than the body. The slender, cream-colored larvae have two short spines (urogomphi) at the tip of the abdomen. Newly hatched larvae are about 1/16-inch long while mature larvae may be 3/4 to 1 1/4-inch long and 3/32-inch wide. Adults generally emerge from mid-May to late-June. Emerging adults leave characteristic D-shaped holes in the bark. The adults feed on leaf margins for several days before eggs are laid. Mating and egg laying activity is usually located on the sunny side of trees. Mated females seek out crevices in the bark, especially around branch scars. Occasionally eggs are placed under loose flakes of outer bark or around wounded areas. The oval eggs are creamy white when new but turn yellowish with time. The hatching larvae burrow through the attached egg shell directly into the bark within 10 to 14 days. The larvae generally bore in the cambium area but occasionally move into sapwood. The larvae usually feed laterally around the branch and tunnel in a zig-zag manner. Most larvae mature by late fall and form elongate pupation cells just beneath the bark. Farther north, many larvae overwinter and take a second year before maturing. Pre-pupae rest over winter in the pupal cell in a doubled-up position. Pupation occurs in late April into May

Control Hints

As with most wood boring insects, the bronze birch borer is extremely difficult to control, especially if an infestation is established. This pest seems to prefer birches located in unsuitable habitats. Birches generally grow in shady, cool and moist wooded areas. Thus, when birches are planted as an accent plant in sunny, dry urban lawns, they are rapidly attacked.