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Additional information on this insect can be obtained from your local Alaska Cooperative Extension office, Alaska State Forestry office, or from:

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Willow Leafblotch Miner



Willow leafblotch miner (*Micurapteryx salicifoliella* (Chambers))

Willow leafblotch miner is a moth (Lepidoptera: Gracillariidae) native to North America that has been observed within its natural range throughout interior Alaska. The largest recorded outbreaks have occurred predominately in the upper Yukon River Flats. The larvae feed upon the inner tissue of the leaves of various willows (*Salix* spp.). Although outbreaks of willow leaf miner have been recorded multiple times over the last few decades, relatively little is known about what controls their population levels, or to what extent the insects cause permanent damage.

Description

Mature larvae are 4-7mm long and pale yellow in color. Adults are small gray moths with mottled areas of light and dark gray to brownish gray on the forewings. Their wingspan is 10-11mm and their antennae are approximately as long as their wings. The eggs of the willow leafblotch miner are pale green, and 0.5mm in diameter. They are laid solitary on the underside of willow leaves.

Life History

Willow leafblotch miner is known to affect at least ten of the 37 species of willows found in Alaska. In particular little-tree (*Salix arbusculoides*), Barclay (*S. barclayi*), Bebb (*S. bebbiana*), grey leaf (*S. glauca*),

and sandbar willows (*S. interior*) have all been identified as species actively attacked by the leaf miner. Populations of the leaf miner fluctuate in a rough cycle that develops into an outbreak approximately every ten years. Population levels are controlled by localized weather patterns and populations of natural predators. Individual eggs are laid on the underside of the leaves in early summer, and the larvae, when hatched, feed upon the upper surface and move inside the leaves. Mature larvae exit the leaves through narrow slits made in the lower surface, and spin silken coverings on the leaf surface or on the ground prior to pupating. The adult moths emerge in August and overwinter, laying their eggs the following spring at bud break.

Willows that have dense hairs on the underside of the leaves, such as felt



Figure 1. An example of "leaf blotch" mines caused by the larvae of the willow leafblotch miner. Areas where larvae have been feeding typically turn red or brown.

leaf willow (*S. alaxensis*), appear to be protected by preventing egg attachment to the underside of the leaves. Species of willow with variable amounts of hair on the bottom of their leaves appear to be protected in proportion to their amount of hairs.

Damage

The leaf miners create areas of necrotic blotches (i.e. dead and discolored tissue) on the upper surfaces of the willow leaves. Damage can become severe enough to kill the leaf or the entire branch, and feeding can result in the complete defoliation of the tree. Because willows are well-adapted to disturbances they can often recover unless defoliated for several consecutive years. Mortality has been observed, but due to the limited economic value of willow throughout North America, little research has been conducted to quantify the impact of the willow leafblotch miner. In Alaska, willows play an important ecological role, providing a critical food source to several wildlife species, including moose (*Alces alces*). The affect of willow leafblotch miner damage on the nutritional quality of willows as wildlife forage is currently not well understood.

Guidelines for Reducing Damage

Control methods on a landscape scale are expensive, therefore, natural cycles are responsible for limiting population growth. Since the willow leafblotch miner is a native pest, there are mechanisms that

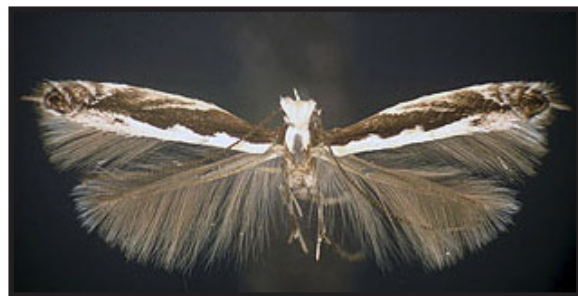


Figure 2. An adult specimen of the willow leafblotch miner. The image depicted is roughly ten times larger than the actual size of a typical moth of this species..

already exist which act to control population outbreaks (e.g. predators, parasitoids, and weather cycles).

In urban areas where trees are grown in more isolated, artificial conditions the homeowner may wish to select one of the following control alternatives:

Alternative 1: If leaf miner feeding is low to moderate and willows are vigorous and showing little leaf discoloration, damage is minimal. The use of pesticides is usually not warranted, but the following steps should be taken:

1. Care should be taken to avoid damaging the trunk, injuring the roots, altering the drainage patterns, or severely compacting the soil. Make sure that trees receive adequate water throughout the growing season. Excess soil should not be placed on top of or removed from the area over the root zone. Such actions can cause water stress and/or soil oxygen depletion to the tree.

2. Spring fertilization helps promote



Figure 3. Several species of willow side-by-side along the Dalton Highway, AK. The damaged foliage is visible in susceptible species of willow.

tree vigor. Any complete lawn or garden fertilizer high in phosphorus is adequate. Fertilization should begin in the spring and continue through the summer. Stop fertilization before the tree goes into fall dormancy. This feeding program may not be necessary every year. Fertilizer uptake, soil type, rainfall, weather, and grass cover all will determine the frequency of reapplication.

Alternative 2: If the willow shows signs of heavy damage (extensive leaf discoloration, leaf drop, etc.), Chemical control may be warranted. In the current year of defoliation, it is best to insure that the trees receive adequate moisture in order to re-flush leaves. There are foliar and systemic pesticides available for controlling leaf miner populations. When using pesticides it is important to read and follow all label directions. Contact the University of Alaska Cooperative Extension Service for recommended insecticides and information on how to apply them.

Alternative 3: When planting consider using those species of willows not targeted by the leafblotch miner or consider replacing current susceptible willows with non-susceptible species.

CAUTION: Pesticides can be injurious to humans, domestic animals, desirable plants, and fish or other wildlife—if they are not handled or applied properly. Use all pesticides selectively and carefully. Since approved uses of a pesticide may change frequently, it is important to check the label for current approved and legal use. Follow recommended practices for the disposal of surplus pesticides and pesticide containers. Mention of a pesticide in this publication does not constitute a recommendation for use by the USDA, nor does it imply registration of a product under Federal Insecticide, Fungicide, and Rodenticide Act, as amended. Mention of a proprietary product does not constitute an endorsement by the USDA.

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