

# Willow Leafminer

*Micruapteryx salcifoliella*

(Willow Leafblotch Miner)



The willow leafminer (*Micruapteryx salcifoliella*) is a small gray moth native to North America. The caterpillars of this moth feed on willow leaves periodically causing extensive damage to willow stands (photo 2) in the province. In 2011, an inter-provincial outbreak of this insect damaged vast tracks of willow stands in Alberta.



Aerial view of willow leafminer damage

## How to Recognize Willow Leafminer Damage

- Dead and discoloured areas (necrotic blotches) on the upper surface of leaves, normally in June. These blotches are distinct at first but connect together later (Photo 3).
- Caterpillars of this moth (Photo 3) feed on the upper surface of willow leaves first and then begin feeding inside (mining) the leaves between upper and lower surfaces of leaves.
- Damaged leaves turn reddish brown (Photo 3).
- Premature drop of damaged leaves.
- Damaged area of the leaf is found hollow with caterpillar droppings and sometimes with a small (4-7 mm long), flat, pale yellowish caterpillar mining between upper and lower layers, if the damaged leaf is pulled apart.
- Mature caterpillars make cocoons to enter into a transition stage (pupa) in July during which the adult moths develop. The cocoon has a cellophane-like covering with a ring of denser silk around its margin. Cocoons are mostly located on the upper surface near the tip of the leaf (Photo 4).

## References

Furniss, Malcolm M., Edward H. Holsten, M. Joan Foote and Mark Bertram. 2001. Biology of a Willow Leafblotch Miner, *Micruapteryx salcifoliella* (Lepidoptera: Gracillariidae) in Alaska. *Environ. Entomol.* 30(4): 736-741

Kruse, Jim and Nicholas Lisuzzo. 2010. Willow Leafblotch Miner. Leaflet R10-TP-150, USDA Forest Service, [www.fs.fed.us/r10/spf/fhp](http://www.fs.fed.us/r10/spf/fhp)

Photos by Tom Hutchison, Forest Health Officer

## Additional Information

For further information contact your local SRD office or call toll free at 310-0000 or visit our website at [www.srd.alberta.ca](http://www.srd.alberta.ca)

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Photo 3



Damaged willow leaf with coalesced brownish blotches and mature caterpillar (see arrow).

## How to distinguish willow leafminer from other pests

### Leaf Spot (Fungal Disease)

- Usually small, black spots on damaged willow leaves; spots may be raised and surrounded by a yellow band (tar spot).
- No hollow area inside the leaf under the leaf spot.
- No flat caterpillars inside the leaf.

### Willow Leaf Beetle

- Eat all but the upper layer of the leaf and veins.
- Either gray or yellowish brown beetles or black larvae feeding on leaves.

### Flea Beetle

- Small black larvae feeding on willow leaves leaving only the mid-rib, main veins and sometimes the upper layer of the leaf.

- Willow leaves with holes and small (5 mm), shiny black or steel blue beetles that jump when disturbed.

### Herbicide Damage

- Leaves discolour but no hollow area inside the leaf.
- No flat caterpillars inside the leaf.

### What Tree Species Are Attacked by This Pest?

- They feed only on species of willow.
- Most willow species are attacked by willow leafminer. Some willow species such as Feltleaf Willow that have underside of leaves covered felt-like with dense hair are not attacked by this insect.

### What Kind of Damage do They Cause?

- Affected leaves may drop prematurely.
- Damaged parts of leaves affect plant nutrition and affect tree growth.
- Severe infestations may result in branch kill.

- If consecutive years of severe leafminer damage occurs, willows under stress may be killed.
- May affect forage for wildlife, if large-scale defoliation occurs due to leafminer damage.

### Life History of Willow Leafminer

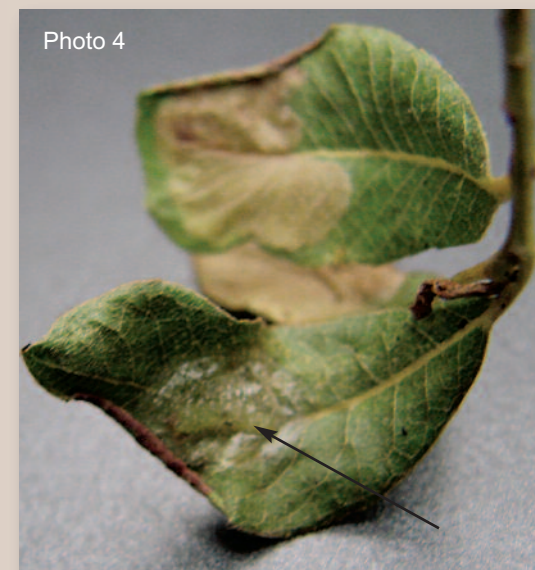
- Eggs – pale green, tiny (0.5 mm in diameter) and laid individually in early summer at willow bud break on the underside of willow leaves.
- Caterpillars (larvae) when hatched feed on the upper surface of the leaf and then move between the upper- and lower surfaces of leaves to feed. Caterpillar stage occurs in June. Young caterpillars are tiny (less than 1 mm long); mature caterpillars are small (4-7 mm long), flat and pale yellow in colour. They make narrow slits on the lower surface of the leaves and make silken coverings to pupate (Photo 4).
- Pupa is a transitional stage during which the caterpillar does not feed and begin transforming into a tiny moth.
- Adult moth is small, gray colour and wingspan of about 10 mm, with long antennae. Head is covered with dense hair pointing forward. Forewings are mottled with light and dark gray to brownish gray areas. Adults emerge in July-August, overwinter, and emerge in the spring to mate and lay eggs.

### How to Control Willow Leafminer

- Usually control measures are not necessary because leafminer outbreaks in most cases are controlled by natural enemies such as parasitoids, predators, and unfavourable weather conditions.

- Keeping willows healthy and vigorous help to mitigate leafminer impact. This can be done by avoiding soil compaction, stem and root injury and water-logging.
- Applying fertilizer during spring and watering willows during droughts will also help to keep leafminer impact to a minimum.
- Use leafminer resistant willow varieties to avoid leafminer problem.
- If willows of high value are at stake you may consider use of a systemic insecticide to reduce leafminer populations. Visit the Pest Management Regulatory Agency website ([www.hc-sc.gc.ca/cps-spc/pest/index-eng.php](http://www.hc-sc.gc.ca/cps-spc/pest/index-eng.php)) for a list of pesticides that are currently registered in Canada to control willow leafminer. Always follow label instructions in using any pesticide to avoid undesirable effects of pesticides on non-target organisms.

Photo 4



Pupal cocoon with cellophane-like cover (see arrow).