



Sawflies

Forest Health Fact Sheet

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Young sawfly larvae feed together on older needles

Sawflies are insects belonging to the ants, bees and wasps group (Hymenoptera). They are not flies and are so-named because the females possess saw-like ovipositors that cut into plants to lay eggs. Despite having ‘stingers’, which are used for egg-laying, adults do not sting. Adults do not feed but the larvae, which resemble moth or butterfly caterpillars, feed on hardwoods or conifers depending on the sawfly species. Sawflies that feed on conifers tend to be more damaging because unlike hardwoods, conifers need to retain several years worth of needles. Sawfly outbreaks are infrequent, short and often collapse on their own.

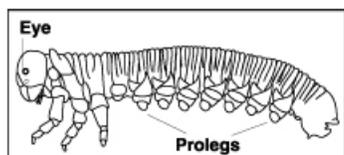
Hosts

- Conifers and hardwoods, varies by sawfly species

Many native sawfly species occur in Oregon. Several introduced species such as the European pine sawfly, have caused considerable damage in eastern states. At present, these non-native species have not established or caused widespread damage in Oregon.

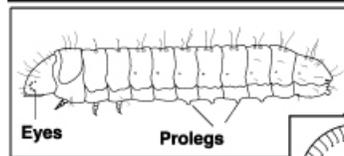
Biology

Sawfly larvae may be confused with moth, butterfly or beetle larvae. Sawfly larvae have 3 pairs of jointed legs on their thorax, similar to the others but also have 6 or more fleshy prolegs on their abdomen. Moth and butterfly caterpillars have less than 5 fleshy prolegs and beetle larvae have none. Adults look like small, stout wasps or flies. Female adults are less than 1/2” long and males are even smaller. Males can be differentiated from females by their feathery antennae.



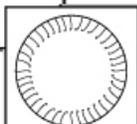
Eye

Prolegs



Eyes

Prolegs



Detail of proleg (viewed from below) showing crochets

Sawfly larvae (above) can be differentiated from moth and butterfly caterpillars (below) by their ‘legs’ and eyes.

Adapted from WSU



Arrows point to sawfly prolegs (Canada Department of Natural Resources)



Sawfly egg niches in needles (main); adult male (inset)

F. Stergale, Univ. of Udine and L.-M. Nagelisen, Dépt. de la Santé des Forêts, Bugwood.org

Females lay eggs in neat rows of niches cut along the edge of needles. Egg-laying occurs anywhere from early spring to mid fall depending on the species. Initially sawfly larvae feed together but then wander to feed singly as they age. Larval sawflies feeding together perform synchronous swaying movements to startle and intimidate predators. They may also regurgitate and dab droplets of resin on predators. Larvae can reach 1” in

length. Larvae spin cocoons and pupate in duff, upper layers of soil, or on foliage, bark and other surfaces depending on the species. Species that lay eggs in fall (Sept./Oct.) typically overwinter as eggs and those that lay eggs in spring (April/May) overwinter as prepupal larvae. Some individuals may spend 2-4 years in diapause as prepupae. At least one species of sawfly overwinters in the larval stage and will feed on warm, sunny days. Typically, there is one generation per year and development lasts 1-2 years.

Damage

In conifers older needles are often preferred, as are open-grown trees or even-aged plantations. Some sawflies prefer younger trees while others may attack pole-sized to mature trees. Larval sawfly feeding can skeletonize or completely strip foliage, but some species mine into leaves or cause galls (swollen tissues) to form.

As is typical with defoliator damage, conifers are more at risk because they do not naturally shed and reflush their full complement of leaves each year. Conifers need at least 2-3 years worth of needles to maintain growth. One year of intense defoliation that removes all or most needles many depress tree growth but as long as buds are not harmed the tree will survive. Trees are more at risk if sawfly defoliation of older needles is paired with defoliation of young needles from another insect or bark beetle attacks.

When outbreaks occur they usually last 2-4 years if not less. Outbreaks occur more frequently on poor sites or on ornamental trees.

Management

Natural

Rain or cold temperatures during larval feeding can cause the collapse of an outbreak. Other natural controls

Management highlights

- Natural controls such as rain or cold during larval feeding, natural enemies and insect diseases (e.g., NPV) often keep populations under control or result in outbreak collapse
- Products used on caterpillars such as *Bacillus thuringiensis* (Bt) do not work on sawflies

such as parasitic wasps and flies, predation and naturally occurring insect diseases such as nucleopolyhedrosis virus (NPV) can also reduce populations. NPV usually becomes prevalent as populations climb and can quickly result in the end of an outbreak.



Sawfly larval defoliation of older

Steven Katovich, USFS, Bugwood.org



Sawfly larvae with NPV virus

Steven Katovich, USFS, Bugwood.org

Silvicultural

Manual removal of larvae by clipping or a strong burst of water, early on when they are feeding together can reduce subsequent damage. Adults are not strong fliers and generally do not move far from overwintering areas. Removal of duff layers may reduce populations of some species although it may also remove habitat from their natural enemies.

Insecticides

Although they resemble caterpillars, many products used to control moth or butterfly larvae such as *Bacillus thuringiensis* (Bt) do not work on sawflies.

When using pesticides, always read and follow the label

More information:

Oregon Dept. of Forestry, Forest Health
<http://tinyurl.com/odf-foresthealth>
2600 State St. Bldg. D, Salem, OR 97310
503-945-7200

Other references:

USFS Forest Health Protection
www.fs.usda.gov/goto/fhp/fidls

OSU Forestry Extension
<http://extensionweb.forestry.oregonstate.edu/>