

Sawflies of Trees and Shrubs

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Sawflies are a group of insects related to wasps and bees. Their name is derived from the saw-like ovipositor the adult female uses to lay eggs. Adult sawflies are inconspicuous wasp-like insects that do not sting.

The larval or immature stage of sawflies are plant feeders and look like hairless caterpillars (the immature stage of butterflies and moths). The most distinguishing character between sawflies and



Figure 1: Caterpillar showing prolegs.

caterpillars is the number of prolegs (fleshy, leg-like projections) on the abdomen. Caterpillars have 2-5 prolegs on the abdomen (Fig. 1), while sawflies have 6 or more (Figs. 5, 11). Sawflies often feed in groups and can quickly defoliate portions of their host plant. There are many different species of sawflies and each prefers specific plants or groups of related plants. Some of the more common sawflies that feed on trees and shrubs in Minnesota are described in this publication.

Evergreen Plants

European Pine Sawfly, *Neodiprion sertifer* (Fig. 2)

Appearance: Larvae are gray-green with a black head and legs. They have a single, light longitudinal stripe down the back, two light green stripes and one dark green or black stripe on each side, and are 18-25 mm (3/4 - 1") when full grown.



Figure 2: European pine sawflies on mugo pine.

Hosts: Mugo, Scot's, red, and jack pines are preferred; eastern white, Austrian, and ponderosa pines may also be fed on if they occur near a preferred host.

Damage: Larvae feed in groups on the previous year's needles and eat all previous-season needles on a single branch before moving to another branch to continue feeding. They will vacate a

tree for a new host once all previous-season needles have been eaten. Larvae never eat new needles, but may feed on the bark of new shoots. European pine sawfly seldom kills trees since new foliage is never eaten; however, repeated defoliations can slow growth. Feeding on bark of new shoots may cause twig mortality but it is rarely serious.

Life History and Habits: Overwinter as eggs in the previous season's needles. Larvae begin feeding around mid-May and continue through June. After feeding, larvae pupate in the soil or on the tree and adults begin appearing in early September through late fall. Adults lay eggs in the current season's needles near the ends of branches where they overwinter. There is one generation per year.

Introduced Pine Sawfly, *Diprion similis* (Fig. 3)

Appearance: Larvae have black heads, a yellow-green body with a black double stripe and many yellow and black spots; they are 20-25 mm (3/4 - 1") when full grown.

Hosts: White pine is preferred, but they will also feed on Scot's, jack, and red pines.

Damage: First generation larvae eat the previous year's needles; second generation larvae feed on both new and old needles. Young larvae feed in groups and eat only the outer, tender parts of the needle while older larvae feed singly and eat entire needles and bark if foliage is absent. Defoliation is usually most severe in the upper half of trees, but entire trees can be defoliated if populations are high.



Figure 3: Introduced pine sawfly.

Life History and Habits: Overwinter as prepupae in the soil. First generation larvae begin feeding from late May/early June to early July; second generation larvae feed from late July through early September.

Redheaded Pine Sawfly, *Neodiprion lecontei* (Fig. 4)

Appearance: Full-grown larvae have reddish brown heads and yellow bodies, with six rows of irregular black spots and are 20-30 mm (3/4 - 1") long.

Hosts: Many species of pines; however, red and jack pines that are less than 15 feet tall are preferred.

Damage: Larvae feed in groups and can completely



Figure 4: Redheaded pine sawflies.

defoliate a tree from the top down. Young trees are preferred and stressed trees are especially vulnerable to damage.

Life History and Habits: Winter is spent as a pupa in the soil. First generation larvae feed between mid-

June and late July; second generation larvae feed between mid-August and late September.

White Pine Sawfly, *Neodiprion pinetum* (Fig. 5)

Appearance: Larvae are pale yellow with black heads and have four rows of black spots from the head to their posterior end; they are about 25 mm (1") when full grown.

Hosts: Eastern white pine is preferred, but they will also feed on red pine.

Damage: Larvae feed in groups on both new and old needles, generally defoliating one branch before moving to another. Larvae attack trees of all sizes and because they feed on both new and old needles, trees can be completely defoliated.

Life History and Habits: Overwinter as prepupae in the soil. Adult females lay eggs in needles in the spring. Larvae feed from late June to early August. After feeding, larvae drop to the ground and pupate. There is usually one generation per year.

Larch Sawfly, *Pristiphora erichsonii* (Fig. 6)

Appearance: Larvae have black heads, gray-green bodies with white undersides, and are 16 mm (1/2") long when full grown.



Figure 6: Larch sawflies.

Hosts: Tamarack and various larch species.

Damage: Adult egg-laying activity in new shoots can cause shoots to become curved or curled as they grow. These curved shoots are an indicator of impending larval

feeding. Larvae feed in groups on tufts of needles found on short shoots of older twigs. Because larvae don't feed on the single needles of elongating shoots, 100% defoliation seldom takes place. Trees usually re-foliate but



Figure 5: White pine sawfly.

James Hanson, USDA Forest Service

repeated, heavy feeding can cause thin foliage and reduced growth.

Life History and Habits: Winter is spent in the soil as a prepupa. Adults emerge and lay eggs on currently elongating shoots on branches. Larvae then move to feed on tufts of needles (beginning around early June) found on short shoots of older twigs; they feed for about three weeks. All stages of this insect may be found at once due to the long period of emergence by the adults; larval feeding may continue into September. There is one generation per year.

Yellowheaded Spruce Sawfly, *Pikonema alaskensis* (Fig. 7)

Appearance: Full-grown larvae have yellow or reddish brown heads and olive-green bodies with six gray-green stripes. They are 18 mm (3/4") in length.

Hosts: Isolated white, black, and blue spruce such as those found in most landscapes are preferred.

Damage: Larvae prefer new needles, but older larvae will eat previous season's needles when new foliage is scarce. Three or four years of consecutive defoliations can kill a tree.

Life History and Habits: Overwinter as prepupae in the soil. Adult females deposit eggs in the current year's needles and larvae appear and begin feeding in late May to mid-June; larvae feed from four to six weeks and complete development by late July. There is one generation per year. Yellowheaded spruce sawfly should not be confused with the spruce budworm caterpillar that also feeds on white spruce in the spring. Spruce budworm occurs very early in the spring feeding on newly emerging foliage. Webbed foliage is also common with spruce budworm.

Deciduous Plants

Blackheaded Ash Sawfly, *Tethida cordigera* (Fig. 8)

Brownheaded Ash Sawfly, *Tomostethus multicinctus*

Appearance: Blackheaded larvae have black heads and legs, are white/yellow and about 18 mm (3/4") when full grown. Brownheaded larvae are green/yellow-white, have a brown head capsule, and are 14-20 mm (1/2 - 3/4") in length.



Figure 8: Blackheaded ash sawflies and damage.

Hosts: Ash.



Figure 7: Yellowheaded spruce sawfly and damage.

Damage: Larvae are voracious feeders. They consume entire leaves, and heavily infested trees may be completely defoliated in a very short time.

Life History and Habits: Overwinter as prepupae in the soil. Adults emerge, lay eggs in leaves, and larvae begin feeding in early May through June. There is one generation per year.

Dusky Birch Sawfly, *Croesus latitarsus* (Fig. 9)

Appearance:

Larvae are yellow-green with black blotches on their sides and have a black head; they are about 24 mm (1") long when full grown.

Hosts: Birch.

Damage: Larvae feed in groups around the edges of leaves. Heavy defoliation by this insect is rare.

Life History and Habits: Overwinter as prepupae in the soil. First generation larvae feed from May to early July. A second, overlapping generation may occur and feed through September.

Mountain Ash Sawfly, *Pristiphora geniculata* (Fig. 10)



Figure 10: Mountain ash sawflies.

eat entire leaves, leaving only the mid-veins. They defoliate an entire branch before moving to another. Trees usually survive even when completely defoliated. However, repeated heavy defoliations will reduce tree vitality and could cause death.

Life History and Habits: Overwinter as prepupae in the soil. Adults emerge to lay eggs over about a 6 week period beginning around early June. First generation larvae are active from mid-June through early August. Second generation larvae are usually found in late August or September.

Willow Sawfly, *Nematus ventralis* (Fig. 11)

Appearance: Larvae are black or greenish black with large yellow spots along their sides. They have black heads and are 18 mm (3/4") when full grown.

Hosts: Willow and to a lesser extent poplar.

Damage: Larvae feed in groups, initially eating small holes in leaves and eventually consuming entire leaves. Occasionally, heavy defoliation takes place, but this is uncommon.



Figure 9: Dusky birch sawflies.

Life History and Habits:

Overwinter as prepupae in the soil. Larvae first appear in May and feed through June. A second generation occurs in July, feeding until the end of the summer. Willow sawfly may be confused with the imported

willow leaf beetle which also defoliates willows (see Leaf Beetles in Urban Landscapes FS-6342-A).

Pear Sawfly (Pear Slug), *Caliroa cerasi* (Fig. 12)

Appearance: Larvae are slimy and slug-like, and shiny olive green in color. They are 12 mm (1/2") when full grown.

Hosts: Plum, cherry, cotoneaster, pear, mountain ash, and hawthorn.

Damage: Larvae feed on the upper leaf surface, leaving only the leaf veins. Heavy defoliation gives the tree a scorched appearance and leaves may drop prematurely.

Severe defoliation can adversely affect tree health.

Life History and Habits: Overwinter as prepupae in the soil. Larvae begin appearing in early June and feed for about 1 month, then drop to the soil to pupate. A second generation can begin in early August.



Figure 12: Pear sawflies and damage.

Roseslug Sawfly, *Endelomyia aethiops* (Fig. 13)

Appearance: Larvae are light green with orange heads and are about 13 mm (1/2") when full grown.

Hosts: Rose.

Damage: Larvae feed on the upper leaf surface, leaving only the leaf veins. Populations of this insect are generally low, so severe defoliation is rare.

Life History and Habits: Overwinter as prepupae in the soil. Adults emerge, lay eggs in the leaves, and larvae appear and feed from mid-May through June. There is one generation per year.



Figure 11: Willow sawfly.



Figure 13: Roseslug sawfly.

Management

It is important to regularly inspect plants that you suspect may encounter sawfly damage. Early detection of a sawfly population will allow for easier control and reduced damage to the host plant. The average dates listed in this publication for sawfly occurrence should be used as guides for determining when to begin looking for a particular sawfly species. However, variation will occur from season to season so adjustments may be necessary. The decision of whether to attempt control for a sawfly population will depend on the following - consider all factors before making a final decision.

1. Plant Condition - Healthy, mature plants are better able to withstand defoliation damage from sawflies. Plants that are newly planted/transplanted or that are in poor health have the potential to suffer more severe injury.

2. Sawfly Population - The size and distribution of the sawfly population will also aid in determining if control measures should be taken. Large, widespread populations have the potential to produce more severe defoliation. Smaller, more restricted populations (i.e. sawflies occurring on only a single branch) are less threatening and should be monitored to determine if damage is increasing or remaining static.

3. Sawfly Age - Treatments should be attempted only if sawflies are 1/2 full-grown size or less. If sawflies are full grown, treatment is not necessary since they are finishing or have finished feeding; most damage to the plant has already taken place by this time.

4. Time of Year - For deciduous plants, late season defoliations (i.e. late August - September) usually have little effect on tree health, as the plant will not try to produce new leaves and it has stored most of the reserves it needs for the following season. Defoliations at other times of the year may present problems for health and/or aesthetic reasons. Evergreen plants typically keep their needles for several years (depending on species) so defoliation time may be less important here as anytime of the year could produce health-threatening damage.

5. Sawfly Species - Severity of defoliation will vary depending on the life history and habits (i.e. number of generations, feeding on new or old growth, etc.) of the specific sawfly species in question. The individual descriptions in this publication should aid in determining the defoliation potential.

6. Host - Because most evergreens keep their needles for several seasons, losing some or all of their needles in one year may present problems in future seasons. For this reason, in general, defoliation on evergreens should be taken more seriously than on deciduous plants.

If it is determined that control measures are needed, use the following as a guide for selecting the best method:

1. Mechanical Control - Examples here include methods such as hand picking larvae from plants, physically dislodging them by using forceful water sprays, or other means of nonchemical control. Population size and distribution will determine the effectiveness or suitability of the chosen method.

2. Biorational Insecticides - Insecticidal soap-best for low populations of young larvae. A note here - *Bacillus thuringiensis* (BT) **will not** control sawflies. Strains of this biological insecticide are effective against various caterpillar pests (larvae of butterflies and moths), but will not control sawfly larvae.

3. Conventional Insecticides - Any of the insecticides listed in Table 1 will provide good control of sawflies. These products should be considered only after all other management tactics have been explored.

If it is determined that chemical control measures are needed, they should be directed toward the young larvae. Young larvae are much more susceptible to chemical applications than larger, more mature larvae. This is especially true when using biorational products such as insecticidal soap. If larvae are nearly full grown, control measures should not be attempted as chemicals will not be as effective, and most of the damage that the plant will sustain has already been done. Finally, because sawflies often feed in groups, chemical applications should be directed only to the areas they are feeding on; entire tree sprays are unnecessary unless populations are widespread throughout the plant. A list of chemical options for sawfly control is given in Table 1.

A final note on control. The best control for sawflies or any other pests is preventive measures related to plant health. Correct plant selection, proper site selection when planting, and then continued recommended cultural care will ensure that plants are in excellent health. The better condition a plant is in, the more damage it can tolerate without affecting its health status.

Table 1. Chemical Options for Sawfly Control

acephate (Orthene)
carbaryl (Sevin)
insecticidal soap (M-Pede)
malathion (Malathion)
diazinon (Diazinon)
chlorpyrifos (Dursban)

Read all directions carefully before buying insecticides and again before applying them. Be sure the insecticide you plan to use is labeled for the plant you are treating or if the product is generally labeled for trees and shrubs, that the label does not exclude the plant. Information on the label should be used as the final authority.

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Produced by the Educational Development System, Minnesota Extension Service.

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