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# European Pine Sawfly: biology and control

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The European pine sawfly (*Neodiprion sertifer*) was introduced into the northeastern U.S. sometime prior to 1925 and is now a common pest in plantations and ornamental pines throughout the northeastern and north central states. It is not a true fly but belongs to a non-stinging group of wasps. Trees are seldom killed, but large numbers of sawflies can cause severe needle loss, making trees unsightly as ornamentals.

## Damage Symptoms

Initial damage appears as brown, dried and curly, threadlike tufts of needles; later, entire old needles will be missing (except needle sheaths) (Fig. 1).

## Similar Damage

Caterpillars of the pine tussock moth and hemlock looper may cause similar defoliation, but damage is not confined to new growth.

## Hosts

Scots and red pine are commonly attacked in the Lake States but other pine species, including Mugho and Austrian, are susceptible.

## Identification

Eggs are yellowish tan to brown, halfmoon-shaped structures, 1/16" long (2-3 mm), embedded in the needle, usually in a single row of 6-8 eggs (Fig. 2). Newly hatched larvae (3-4 mm long) have a shiny black head capsule and dark green body. When mature, the larva is about 7/8" long (20-22 mm), with a black head capsule and a gray-green body with several light and dark longitudinal stripes. Eight pairs of fleshy prolegs are present on the abdomen (Fig. 3).



Fig. 1. Typical sawfly damage in late spring showing loss of the previous year's needles.



Fig. 2. Sawfly eggs embedded in the needles.



Fig. 3. A colony of sawfly larvae feeding on needles in May.

\*Extension Specialist, MSU, 1975-1981. Photos courtesy M. Keith Kennedy.

Adults are thick-waisted, stout-bodied wasps with clear wings; they are approximately 5/8" long (16 mm). Females possess a sawlike, egg laying structure at the tip of the abdomen; males have feathery antennae.

## Life Cycle

Eggs are deposited in a series of slits cut in the needle by the female's sawlike ovipositor in mid to late September. Larvae hatch from the overwintered eggs in early to mid May (May 15-20) and skeletonize the old needles, leaving only the central core. Larger larvae consume entire needles, often stripping single branches or entire trees of the previous year's foliage. They do not feed on the new needles of the current year. In mid-to-late June, the mature larvae drop to the ground where they spin a golden-brown cocoon in the duff. The adults emerge in September to mate and lay eggs. There is only one generation a year.

## Destructive Stages

All of the foliar damage is caused by the larval ("caterpillar") stage feeding only on mature foliage of the previous year.

## Tree Stress

The European pine sawfly belongs to the "spring" group of sawflies which feed early in the spring before the new foliage has completely appeared. Since they consume only needles of the previous year's growth, a tree is never completely defoliated. However, repeated defoliation over several years, or other stresses such as drought, can kill the tree or predispose it to attack by other insects or diseases.

## Control

**Biological:** A virus extract, as yet unavailable commercially, provides excellent control of this pest. It is not difficult to prepare a homemade stock solution of this virus for use in biological control of European pine sawfly. This solution is harmless to humans and

the environment. The stock solution consists of virus particles suspended in water, and is prepared directly from diseased larvae. Use freshly killed, diseased larvae; do not use the old "mummified" larvae. Freshly killed larvae are easily recognized because they are soft, black and hang upside down from the foliage. In this condition, the larvae are literally sacs full of virus particles.

To prepare 1 pint of stock solution, collect 100 medium-to-large larvae and place them in chlorine-free water (distilled or rain water). The larvae are allowed to disintegrate in the water until the following spring or until the virus particles settle out. Before using the stock solution, filter out the larval remains using a fine screen or cloth (nylon stocking material).

Apply the virus shortly after the sawfly larvae hatch from the eggs. Use 1 teaspoon of stock solution to each 6 gallons of water. Add 5 level teaspoons of powdered milk to each gallon of spray solution to improve spreading and sticking of the virus spray. Thoroughly soak the foliage of the entire tree. Best results are obtained if spraying is done in early morning or late evening when winds are calm and humidity is higher.

This procedure generally provides about 90% control. Initial mortality usually occurs within 4 days, but heavy mortality rarely occurs before 10 days. Less than 100% control is actually an advantage because it provides for natural control in the future.

**Cultural:** Young larvae can be removed by hand and destroyed if trees are small. Crush larvae or place in a plastic garbage bag for disposal.

**Chemical:** Foliar sprays of insecticides applied to sawfly colonies just after larval hatch, early to mid-May, or anytime thereafter, will provide good control. Use an insecticide such as acephate (Orthene), carbaryl (Sevin), or malathion or a commercial or homemade soap spray. Use a miticide such as dicofol (Kelthane) with carbaryl to prevent spider mite problems. One application is usually sufficient. Consult the pesticide label for specific application rates and safety precautions.

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