



## Yellow-headed spruce sawfly



### Distribution and Hosts

The yellow-headed spruce sawfly (*Pikonema alaskensis* [Rohwer]) is native to North America. In Canada, its range extends from coast to coast and into the Northwest Territories. Its hosts include all native and exotic species of spruce: white, black, Engelmann, Colorado or blue, and Norway. Trees are especially susceptible when growing openly in shelterbelts, as ornamentals, in plantations, along roadsides, in nurseries, and occasionally in young naturally regenerated open-growing forests.

### Symptoms and Damage

The yellow-headed spruce sawfly damages its hosts by causing repeated defoliations. Trees become susceptible to attack 3–5 years after planting and may be reinfested annually until they are 8 m or more in height. Young open-grown trees are preferred as egg-laying sites; this sawfly rarely causes injury to naturally grown and closed forests.

Egg-laying females attack trees in early-to-mid June, soon after the bud caps fall. Newly hatched larvae feed first on the new needles and then on older foliage. This feeding damage appears more intense in the upper portion of the tree crown, and may result in complete defoliation of the upper shoots and branches. After the feeding cycle is complete, the remaining partly chewed needles and needle stubs impart a brownish color and ragged appearance to the tree. One year of severe defoliation causes a reduction in shoot growth and stem thickness, while two or more years result in dead branches and top kill, and sometimes the tree dies.

### Causal Agent

The adult yellow-headed spruce sawfly is wasp-like in form, reddish brown in color,

and 8–10 mm long. Females begin laying eggs in June when new shoot growth is 2–3 cm long. A single egg is deposited in a slit in the bark at the base of each needle; it hatches after 5–10 days into a small yellowish larva, 3–4 mm long, with a yellow-brown head. It feeds and develops to maturity over the next 30 to 40 days. The larva is mature, 16–20 mm long, with a reddish-brown head and a dark green glossy body with lighter longitudinal stripes along the back and sides of the body. When disturbed, the larva exudes a liquid from its mouth while arching both ends of its body in a characteristic alarm reaction.

When mature, the larva drops to the ground and spins a cocoon in the soil where it overwinters. There is no silken webbing associated with the feeding sites. In the following spring, the larva transforms to a pupa and emerges from the cocoon a few days later as an adult sawfly, completing a one-year life cycle.

### Prevention and Control

The yellow-headed spruce sawfly has many natural parasitic and predaceous insect enemies that attack it in the egg, larval, and cocoon stages. Small rodents and shrews may prey upon the sawfly in the cocoon stage, while feeding larvae and adult sawflies may fall prey to birds. These natural enemies, however, seldom appear able to keep sawfly populations in check.

Defoliated trees may produce fewer shoots in the following year, thereby causing a reduction in egg-laying and feeding sites and subsequent starvation of larvae. Ornamental trees that have been severely attacked for one or more years may require some pruning to encourage new growth and reshape the tree crown.

When trees are small and few in number, it may be convenient to remove the colonies of feeding larvae by hand. This should be done during mid-to-late June while the larvae are still small and feeding on current-year foliage. Young larvae may also be washed off the foliage with a strong jet of water.

Once populations become established, they tend to attack the same trees repeatedly. Control of the sawfly in this situation may require the use of insecticides. Several insecticides are registered and effective for control of the larval stage, and should be applied (in a water-base solution) during the second to third week of June, when the majority of larvae are still less than 10 mm long. All infested foliated areas of the tree crown must be treated at that time.

For the most recent information on chemicals available for control of this insect, call Agriculture Canada's Pesticides Directorate in Ottawa (toll-free) at 1-800-267-6315.

Chemical pesticides are toxic to humans, animals, birds, fish, and beneficial insects. Follow all instructions and precautions listed by the manufacturer.

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Illustration: G. Weber  
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Forestry Canada  
Northwest Region  
Northern Forestry Centre  
5320 - 122 Street  
Edmonton, Alberta  
T6H 3S5

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