# *Yellow-Headed Spruce Sawfly*

Louis F. Wilson [1]

The yellow-headed spruce sawfly (*Pikonema alaskensis* (Rohwer)) is a native insect destructive to several species of spruce in the United States and Canada. It occurs from Maine and New Brunswick west through the Central Canadian Provinces and the Lake States to Wyoming and Idaho and north to British Columbia and Alaska.

This sawfly is commonly found on planted and open-growing trees; most natural and closed stands are typically free from attack. Shelterbelts, windbreaks, shade trees and ornamentals, nursery stock, young plantations, and naturally regenerated cutover areas may be damaged by the larvae.

## Hosts and Injury

The larvae limit their attack to various species of spruce. They have been collected on white (fig. 1), black, blue, red, Norway, and Engelmann spruces.

Heavily infested trees appear ragged early in the season because of needle stubs on the new growth.

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**Figure 1.—White spruce twig partly defoliated by the yellow-headed spruce sawfly. Note full-grown larvae on twig.**

Later, as the larvae move onto the old foliage, entire trees may be defoliated. When this occurs, the trees seldom recover. Young plan-

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tation trees usually are not susceptible to attack until the third to fifth year after planting. Trees older than this are very susceptible, and 3 or 4 consecutive years of moderate to heavy defoliation will kill up to 90 percent of the trees in an open stand. On trees that do not die, there is some branch killing and growth reduction.

## Description

The newly laid egg is pearly white to pale green with a thin, transparent, finely stippled shell. Its average size is 1.3 mm. long by 0.7 mm. wide.

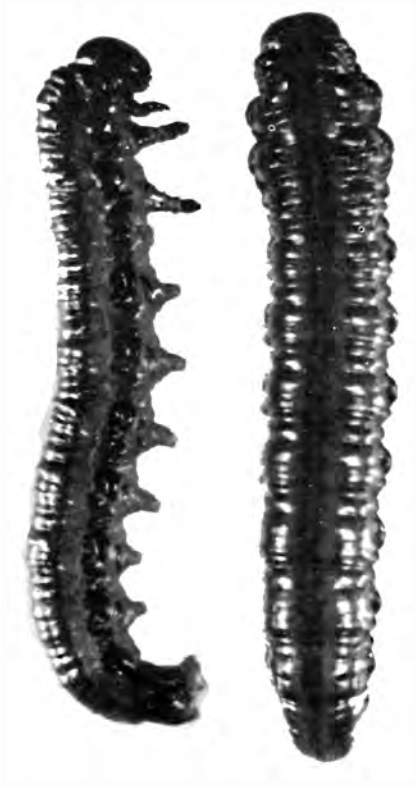

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**Figure 2.—Side and top views of fully grown larvae of the yellow-headed spruce sawfly (X 5).**

The newly hatched larva is about ⅛ inch long and has a yellow head that soon becomes orange yellow after feeding. The body is a light yellow green with no markings. When fully grown, the larva is about ¾ inch long and has a chestnut-brown or reddish-yellow head that may be mottled with various shades of brown. The body has a waxy or glossy appearance and is olive green above and lighter green beneath. Each side of the body is marked with stripes—a gray-green, longitudinal stripe just lateral to the midline of the back, a broad one beneath this, a darker one farther down, and a dark linear spot just above the leg bases (fig. 2).

The prepupa is identical in appearance to the mature larva, but becomes contracted after spinning its cocoon. The pupa at first is a light-cream color. As it ages it becomes darker.

The cocoon is a tough, dark brown, somewhat fibrous structure with soil particles adhering to its surface (fig. 3). Some cocoons may be slightly curved. The cocoon of the male pupa averages ⅖ to ½ inch long; that of the female is a little longer. One end is slightly larger and blunter than the other. Normally, a cocoon from which the adult has emerged has a circular hole at the larger end.

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**Figure 3.—Cocoons of the yellow-headed spruce sawfly (X 2).**

The adults are about 3/8 inch long. The abdomen varies from straw yellow to chestnut brown to nearly black. The thorax and head, like the abdomen, may be light or dark. The legs are the lighter shades; the ends of the hind legs are dark. The insect is flylike in general appearance, but has four shiny, transparent wings.

### Life History and Habits

Adults emerge from late May to mid-June. Eggs are deposited in shallow slits in the current season's needles, usually at the base but sometimes higher up. The eggs are well exposed. Usually there is one per needle, but as many as three have been found. Occasionally they may be laid in the tender bark of the stem between the needles.

Larvae hatch in 5 to 10 days and feed for 30 to 40 days on the foliage. Small parts of the new needles are eaten first, then the entire needles; finally when the larvae are half grown they move onto and devour the old foliage. If complete defoliation occurs, the larvae may then feed on the tender cortical tissues of the new growth. While feeding on the needles, their posterior ends curve downward or upward. Disturbed larvae exude a liquid from their mouths and characteristically arch both ends.

During July the full-grown larvae drop to the ground, enter the duff or topsoil, and spin their cocoons. They overwinter as prepupae in the cocoons and pupate in spring after the advent of warm weather. The pupal period lasts about 6 days. There is only one generation per year.

### Biotic Control

Several species of hymenopterous and dipterous parasites have been recovered from specimens of this sawfly reared in the United States and Canada. The small wasplike insect *Trichogramma minutum* Riley is an occasional parasite of the sawfly eggs. Parasitized eggs are recognized by their jet-black color. At least 10 wasplike and 5 fly species parasitize the larvae sometime during their development.

Since the cocoons are located in the duff or soil, it is supposed that a certain amount of rodent predation occurs. Mice, moles, shrews, and other small mammals are known to feed on cocoons of several other sawfly species.

Parasites and predators rarely, if ever, hold populations of this sawfly in check when other environmental factors, such as weather, are favorable to the insect.

### Chemical Control

As this publication goes to press, there are no chemical insecticides registered for use in controlling the yellow-headed spruce sawfly. Ask your State agricultural experiment station or your county agricultural agent or other local source of information whether any recommendations have been developed for chemical control of this insect.

### References

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