

Balsam Fir Sawfly *Neodiprion abietis* (Harr.)

Introduction

The balsam fir sawfly is another of our native insects that feeds on balsam fir. It was first recorded as a problem in Canada in 1936, and outbreaks have occurred in Nova Scotia since 1942. Although sawflies are closely related to wasps, they resemble flies and have a life cycle similar to a moth. There are four life stages: egg, larva, pupa, and adult. They are called sawflies because the adult females have an ovipositor shaped like a saw which she uses to cut into the needles of host trees and lay her eggs. The larvae feed on past years foliage and this feeding causes heavily affected trees to take on a characteristic silhouette appearance.



Balsam fir sawfly larvae. (12 mm)

Host

Balsam fir sawfly larvae feed on the foliage of balsam fir and occasionally on white and black spruce. Generally, young to middle-aged stands of open-growing balsam fir receive the most damage. Pre-commercially thinned stands are particularly vulnerable. When sawfly populations reach epidemic levels, unthinned stands of densely growing balsam fir will also be attacked.

Damage

The larvae hatch during the last week of June into the third week of July and feed for approximately one month. They begin feeding on the previous year's needles in groups of 30 to 100 larvae. As they mature, they feed singly and progress to the older needles. It is rare for them to feed on the current year's growth. The damage they cause to the tree takes three forms: defoliation, reduced vigour and growth, and tree mortality. The first years of an infestation cause the most reduction in growth. Tree mortality can result after three to five years of continuous severe defoliation.

Detection

Defoliation and yellowing on the inside foliage of the trees in the early summer are the first signs of an infestation. The larvae feed on the outside edges of the needle, leaving the central filament. By the time the larvae have finished feeding, the remaining portion of the needle shrivels, turns yellow to brick red, and then drops off. In the fall and winter, trees attacked in the previous season are bare of all but the current year's foliage. The crown takes on the characteristic silhouette appearance surrounded by this thin layer of green needles. Also, in the fall and winter, empty cocoons may be found on the foliage.

Control

There are parasites, predators, a virus, and other microbes that can cause the balsam fir sawfly population to decline. As with all biological controls, it takes time for the control agents to reach a level where they can effectively cause a population collapse. During this time, a high insect population can cause severe damage and mortality to valuable balsam fir stands. Contact insecticides applied while the larvae are actively feeding are effective. Research is currently underway to assess a number of biological control products that could be used in a large scale control program to accelerate the population decline.



Balsam fir sawfly larvae. on balsam fir twig.



Cocoons found on balsam fir twig.



Defoliation pattern caused by sawfly larvae.



Typical damage to previous season's foliage.

References

Martineau, R. 1984. *Insects Harmful to Forest Trees*, Multiscience Publications Limited, Montreal.

1989. *Balsam Fir Sawfly*. Can. For. Serv., Fredericton.

Rose, A.H. and Lindquist, Rev. 1994. *Insects of Spruces, Fir, and Hemlock*, Can. For. Serv., Great Lakes Forestry Centre, Sault Ste. Marie.

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	June	July	Aug.	Sept.	Oc.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May
Eggs	█			█								
Larvae	█											
Pupae		█										
Adults				█								