

Pest Profile



Photo credit: (Left) William M. Ciesla, Forest Health Management International, Bugwood.org; (Right) William M. Ciesla, Forest Health Management International, Bugwood.org

Common Name: Western Spruce Budworm

Scientific Name: *Choristoneura freemani*

Order and Family: Lepidoptera, Tortricidae

Size and Appearance:

	Length (mm)	Appearance
Egg		The eggs are oval and light green. The adult female deposits about 150 eggs in masses of 25 to 40 eggs on the underside of the host tree needles. The eggs overlap one another like shingles. The eggs are the size of a pinhead.
Larva	Mature: 25-32mm	The larvae go through six instars or stages between successive molts with the first instar occurring between hatching and the first molt. When the caterpillars first hatch, they are yellow-green with brown heads. The newly hatched larvae create a structure made of silk under bark or lichen and spend the winter in these structures. In the next three instars, the larvae have black heads and collars with orange or cinnamon-brown bodies. The fifth instar larvae have reddish-brown heads that are marked with black triangles and collars. The body is a pale olive-brown marked with small-whitish spots. The mature caterpillars have tan or light chestnut-brown heads and collars. The body is olive or reddish-brown with large ivory-colored areas.
Adult	Length: 13 mm Wingspan: 22-28 mm	Both sexes of the adults are similar in appearance; however, the female can be larger. The wings can be variable in color and can range from a gray or orange brown with the wings possibly being banded or streaked. A few individuals might have a conspicuous white dot on the wing edge.
Pupa (if applicable)	13 mm	The mature caterpillar tie tips of twigs or foliage together with silk and pupate on the branch tips or other locations on the tree. When the pupa is first formed it is yellow-brown in color, but later

		turns a reddish-brown. The pupa is broad in the front and narrows in the rear.
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Type of feeder (Chewing, sucking, etc.): The larvae have chewing mouthparts.

Host/s: The western spruce budworm has a variety of hosts in a mixed-conifer forest. This commonly includes Douglas-fir, grand fir, white fir, subalpine fir, corkbark fir, blue spruce, Engelmann spruce, white spruce, and western larch. The larvae will also occasionally feed on Pacific silver fir, mountain hemlock, western hemlock, lodgepole pine, ponderosa pine, western white pine, limber pine, and whitebark pine. Coniferous trees that are planted as ornamentals, such as Norway spruce and Scotch pine, have also been host to western spruce budworm.

Description of Damage (larvae and adults): In addition to feeding on the foliage, western spruce budworm larvae feed heavily on male flowers and developing cones of host trees. This can result in declines in seed production and has a serious impact on seed orchards, seed production areas, and forest sites that have difficulty regenerating naturally. Unlike other cone or seed feeding insects, western spruce budworm can potentially feed on multiple cones, with newly developing conelets that are fed upon shriveling up and falling from the tree. Extensive feeding on buds and foliage can result in a reddish-brown hue on the tips of branches and top killing of trees can occur. Top killing can seriously impact young trees, causing stem deformity, multiple leaders, or even death of the entire tree. In mature trees, budworm defoliation usually just reduces growth, but repeated defoliation can lead to top killing and tree death.

References:

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