Forest Leaflet 8: White pine weevil
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Canada

White pine weevil

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Distribution and Hosts

In the prairie provinces and Northwest Territories the white pine weevil (*Pissodes strobi* [Peck]) attacks white, Engelmann, blue, and Norway spruces. It can also seriously infest jack, red, and Scots pines and occasionally black spruce and mugho pine. Although the insect will attack trees in natural stands, it much prefers open-growing, vigorous ornamental trees, plantations, or nursery stock that are 1.5–8.0 m high and have main shoots, or leaders, that are 13 mm or more in diameter.

Symptoms and Damage

In the spring the presence of adult weevils and resin beads on the last year's leader are the first signs of attack. The resin oozes from punctures caused by adult weevils inserting their elongated mouthparts through the bark of the leader and feeding on succulent inner tissues. Eggs are later laid in some of these punctures and, upon hatching, larvae tunnel downward between the bark and wood. The feeding of larvae girdles the leader and cuts off the water supply to the current year's new growth, which wilts and turns brown by mid-July. Larval feeding always kills at least 2 years of growth (current and last year's) and sometimes 3 or more, depending on how far down the main shoot the larvae tunnel. After the leader dies, one or more of the side branches nearest to the top will usually turn upward and assume leadership, resulting in a crooked or forked tree with a bushy top. Secondary organisms such as heartwood rot may gain entry through weevil-killed leaders.

This insect is one of the most destructive pests of North American forest plantations and has created havoc in plantings of its most common host, the eastern white pine. In the prairie provinces its impact can also be severe, so control measures should be instituted as soon as damage becomes apparent.

Causal Agent

Adults of the white pine weevil are dark brown beetles with white and yellow patches on their backs, each about 8 mm long with two elbowed antennae near the top of a long snout. Adults overwinter in the debris (duff) under infested trees, emerge in the spring (March–April), move up the trees to the leaders, feed on the soft inner tissues, and deposit eggs in the feeding punctures in early to mid-May. When the larvae in each leader hatch (about 2 weeks), they feed as a group in the phloem tissue between the bark and the wood of the leader and then travel downward, girdling the stem. For the next 5–6 weeks they continue to feed and mature through four larval stages. The small, legless grubs reach about 10 mm when fully grown and have reddish brown heads. At this time they excavate a cavity in the wood, which they line with wood chips. It is in this "chip cocoon" that pupation occurs. Pupae change into adults in mid-July. The adults emerge from the infested stems in late July until early September, feed for a period on the branches nearby, and then overwinter in the soil. There is only one generation each year.

Prevention and Control

White pine weevil damage may be prevented in ornamental trees by growing them under 50% shade. This shade will make the trees less attractive to the weevils, but it will also retard tree height growth. Another means of prevention is the use of chemical insecticides at 3- to 4-year intervals until the trees are over 10 m tall. If the white pine weevil is present in a neighborhood or plantation, preventive spraying of its spruce and pine should be undertaken as a matter of course. Trees previously infested and pruned of their dead parts should also be treated to prevent new attack. Leaders should be sprayed to drip point in late March or early April. The addition of molasses or a commercial spreader-sticker to the chemical spray will ensure that leaders are completely protected. Two chemical applications spaced 10–14 days apart will achieve better protection than a single application.

The pruning of infested trees can be an effective control measure for young ornamental trees, shade trees, and trees in small plantings; pruning must be completed before the adults emerge from the stem in late summer. To prevent the death of more than 2 years of height growth, a damaged leader should be cut off just above the topmost undamaged branches, either during late July or as soon as the damage is noticed, and the infested leader should then be destroyed. To train a new leader, the tips should be cut off all but the strongest of the remaining topmost branches. This untrimmed branch will rapidly develop as the new leader.

Pruning currently infested trees will not prevent future infestations. Trees should be checked annually, and any infested leaders pruned and destroyed.

For the most recent information on chemicals available for management of this pest, 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 directions and precautions listed by the manufacturer.