



Cooley spruce gall adelgid



Distribution and Hosts

The Cooley spruce gall adelgid (*Adelges cooleyi* [Gillette]) is a species of aphid that colonizes various spruces across Canada, but is most abundant in the west. In the prairie provinces its primary hosts are white, Engelmann, and blue spruces. Douglas-fir is an alternate host when growing in the same stands as spruce. Ornamental and shelterbelt trees are affected, as well as those naturally occurring in forest stands.

Symptoms and Damage

Spruce damage becomes evident in late May, when new growth on the branch tips develops into cone-shaped galls. The galls are swellings about 5 cm long, and they contain hundreds of adelgids feeding on sap. Initially the galls are green; later they turn reddish purple and dry out. Old, vacated galls have mouthlike openings and stunted, needlelike projections and are reddish brown.

The presence of the Cooley spruce gall adelgid is also indicated by white cottony specks (flocculence) that appear on affected trees in the spring and summer. During heavy infestations the flocculence (produced by the female adelgid as a protective cover for her eggs) can cover an entire tree. The adelgids also feed on needles during one portion of their life cycle, which can cause the needles to dry out and fall off.

Damage is mainly cosmetic: old galls remain on the branches for 2-3 years, making trees somewhat unsightly. If gall formation is heavy, growth and vigor may be reduced, but trees are rarely killed.

Douglas-fir is the alternate host of the Cooley spruce gall adelgid, although its presence is not essential for the buildup of large

populations. Flocculence is also evident on Douglas-fir, along with a yellowing of foliage that can lead to premature needle drop, but there is no gall formation.

Causal Agent

The nymphs and adults of the Cooley spruce gall adelgid are very small, dark insects. The complete, 2-year life cycle of the adelgid includes an alternation of generations between Douglas-fir and a spruce species; however, the insect is capable of surviving on either species when the other is not present.

The complete life cycle begins in the summer with winged females leaving Douglas-fir to migrate to spruce. There the insects reproduce without mating (parthenogenetic reproduction), and lay eggs that hatch into small, wingless male and female adelgids. These insects then mate, and the females lay their eggs on spruce. Emerging nymphs feed on the spruce needles and in the fall move to stem tips, just below the buds, where they overwinter. In the following spring the nymphs complete their development, and each parthenogenetic female lays about 200 eggs. Nymphs emerging from these eggs move to new growth to feed, causing the formation of galls. At the beginning of the second year, in the summer, winged parthenogenetic females emerge from the galls and migrate to Douglas-fir to lay eggs. The nymphs hatching from these eggs overwinter on the lower surfaces of needles and complete their development in the following spring on the Douglas-fir, before moving to spruce and restarting the life cycle.

Prevention and Control

The Cooley spruce gall adelgid has very few natural enemies, a factor that may necessitate some form of direct control when

populations are high. Removing and destroying new galls as they are formed will improve the appearance of affected trees and help to reduce insect populations, but complete control through the use of chemical sprays may be considered necessary.

For the most recent information on chemicals available for control 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 instructions and precautions listed by the manufacturer.

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