



Saskatchewan Ministry of Environment

# Forest Pest Fact Sheet

## COOLEY SPRUCE GALL ADELGID, *Adelges cooleyi* and SPRUCE GALL ADELGID, *Adelges lariciatus*

### BACKGROUND

The Cooley spruce gall adelgid and spruce gall adelgid are aphid-like insects that cause gall formations on the current year's growth of host trees. These insects feed on sap through piercing/sucking mouthparts. Trees in natural forests, as well as shelterbelts, plantations and ornamental plantings, are attacked.

### DISTRIBUTION

The Cooley spruce gall adelgid occurs throughout much of the range of its spruce hosts in Canada and the United States. However, it is more prevalent in the western part of the continent where both spruce and Douglas fir occur. The spruce gall adelgid occurs throughout eastern Canada, west to Alberta and adjacent parts of the United States.

### DESCRIPTION OF LIFE STAGES

The adults are dark brown to black insects. They are only about 1.5 mm long. There are both winged and wingless adults. Eggs are oblong and covered with a protective cottony flocculence. The nymphs are similar in appearance to the wingless adults.

Cooley winged Adults



Image: Whitney Cranshaw, Colorado State University, Bugwood.org

Cooley eggs with flocculence



Image: Whitney Cranshaw, Colorado State University, Bugwood.org

### HOST SPECIES

Cooley spruce gall adelgid attacks a number of tree species including white spruce Colorado spruce, Engelmann spruce and Sitka spruce. Douglas fir is an alternate host when growing in conjunction with the spruce hosts. In Saskatchewan, the major hosts are white spruce, black spruce and the introduced Colorado spruce. Hosts of the spruce gall adelgid include white spruce, Colorado spruce, black spruce, Engelmann spruce and tamarack. In Saskatchewan, the major hosts are white spruce, black spruce, Colorado spruce and tamarack.

## LIFE CYCLE

It takes two years for the Cooley spruce gall adelgid to complete its life cycle. Where both spruce and Douglas fir are present, a portion of the cycle is spent on each host species. However, in the absence of Douglas fir, the life cycle can be completed entirely on spruce, as is the case in Saskatchewan. In summer, winged females fly to their spruce hosts. Without mating, by a process known as parthenogenesis, females produce and lay eggs. Wingless male and female offspring hatch, mate and the females lay eggs. Nymphs emerge from these eggs and feed on the spruce needles till autumn. They then spend the winter settled near the base of buds. The following spring, nymphs develop into adult females that lay eggs. The nymphs from these eggs feed on new growth, which causes a gall formation on the developing new shoot. There can be more than 100 nymphs feeding on sap within one gall. In summer, winged adult females emerge from the galls, fly to Douglas fir and lay eggs. Nymphs hatch from these eggs and spend the winter on the under side of needles. In spring, they resume feeding, complete their development and return to the spruce host. The feeding on Douglas fir does not result in gall formation. The life cycle of the spruce gall adelgid is similar, but alternates between spruce and tamarack hosts. The feeding on tamarack does not result in gall formation.

Cooley nymphs inside gall



Image: Whitney Cranshaw, Colorado State University, Bugwood.org

## SIGNS, SYMPTOMS AND DAMAGE

The most obvious damage from the Cooley spruce gall adelgid is the formation of cone-shaped galls on developing new spruce shoots. They are approximately 5 cm long. Similar galls are formed by the spruce gall adelgid. However, they are more of a pineapple-shape and are 2 cm to 4 cm in length. In both cases, the galls are initially green, but later turn a reddish-purple colour. After emergence from the galls has occurred, galls dry out and turn brown. The presence of white cottony flocculence on twigs and needles is another sign of both of these gall adelgids. When populations are high, flocculence will be abundant on infested trees. Neither of these gall forming adelgids cause significant damage to trees in natural forests. However, heavy gall formation can stunt or kill twigs, which can disfigure valuable ornamental and Christmas trees. Chronic infestations can predispose trees to other secondary insects and disease.

Young Cooley spruce galls



Image: Scott Tunnock, USDA Forest Service, Bugwood.org

Spruce gall adelgid pineapple-shaped gall



Image: Manitoba Conservation

Older Cooley spruce galls



Image: Whitney Cranshaw, Colorado State University, Bugwood.org

## MANAGEMENT PRESCRIPTIONS

Physical removal and destruction of newly formed galls, while nymphs are still inside, can reduce populations and improve the tree's appearance. It is also beneficial to rogue out highly susceptible trees in spruce plantations to reduce populations. In high value plantings, such as Christmas tree plantations, chemical control may be necessary to protect the value of the trees. Insecticide applications should be made in early spring when buds begin to open.

## REFERENCES FOR ADDITIONAL INFORMATION

### Spruce Galls

Chrisoph Kessel - Nursery Crops Specialist

Ontario Ministry of Agriculture Food and Rural Affairs

<http://www.omafra.gov.on.ca/english/crops/facts/spgall.htm>

### Cooley Spruce Galls

by W.S. Cranshaw

Colorado State University Extension

<http://www.ext.colostate.edu/pubs/insect/05534.html>

Cooley Spruce Gall Adelgid on Colorado Blue Spruce  
Ohio State University Christmas Tree Fact Sheet

[http://bugs.osu.edu/%7Ebugdoc/Shetlar/factsheet/christmasstree/cooley\\_spruce\\_gall\\_adelgid.htm](http://bugs.osu.edu/%7Ebugdoc/Shetlar/factsheet/christmasstree/cooley_spruce_gall_adelgid.htm)