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Cooley spruce galls: characteristics and control

Whitney S. Cranshaw¹

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Quick Facts

Cooley spruce galls are common and conspicuous on blue spruce; however, the galls cause little or no harm to the health of the tree.

The galls are produced by aphid-like insects, Cooley spruce gall adelgids.

Cooley spruce gall adelgids require two hosts to complete their normal life cycle—spruce and Douglas-fir.

Once the galls begin to form, insecticides usually are ineffective because the insects are protected within the galls.

The best times to spray for insects are in the spring before new growth starts or in the fall when overwintering stages of the insect have returned to the tree.

Cooley spruce galls are commonly found formed on the new growth of spruce trees. These galls are produced by insects called Cooley spruce gall adelgids (woolly aphids). Galls appear early in the season as 2-to 4-inch "cucumber-shaped" growths. The galls are light green during late spring and early summer but dry out and become brown starting in mid-July. The galls often are mistaken for seed cones (Figure 1).

Cooley spruce galls are very conspicuous and frequently cause considerable concern to homeowners when they are detected. However, the galls usually do not cause any serious harm to the tree. Extremely heavy infestations may cause minor retardation of tree growth and some distortion; however, in most cases old galls are covered by new growth the following season and become almost unnoticeable a few years after they are formed.

Life Cycle

Cooley spruce gall adelgids normally require two hosts (Douglas-fir and spruce) to complete their entire life cycle (Figure 2). This typically

requires a year on both spruce and Douglas-fir.

On spruce, woolly aphids overwinter as immature females underneath young branches. In the spring, females mature and lay several hundred eggs near developing buds. Eggs hatch at about the time of bud break and young nymphs migrate to the new spring growth where they feed at the base of growing needles. Saliva introduced into the plant causes changes in plant development that produce galls.

The insects develop within chambers inside the galls and gradually increase in size. During the period when the insects are actively feeding, the galls stay green and are not readily observed. By mid-summer the galls dry out, the chambers open and winged forms of the insects emerge. These winged forms leave the original tree and most migrate to Douglas-fir trees. The abandoned galls continue to dry out and become increasingly noticeable a few weeks after the insects leave.

On Douglas-fir, eggs are laid on the needles and several generations of "woolly aphids" are produced. Yellow spots and bent needles result from feeding damage and the trees appear speckled with tiny cotton-like forms of the insect. No galls are produced on Douglas-fir.

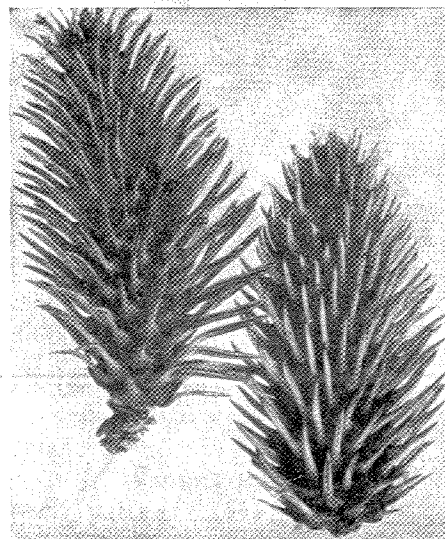


Figure 1: Galls from blue spruce trees.

¹Whitney S. Cranshaw, Colorado State University Cooperative Extension entomologist and assistant professor, entomology (8/89)

Late in the summer some of the woolly aphids develop wings and fly back to spruce to deposit eggs, which produce the overwintering population. Others are wingless and remain on Douglas-fir trees, where they produce other overwintering forms.

Research to date indicates that the adelgids leaving spruce must develop on Douglas-fir before returning to spruce. However, observations in Colorado suggest that spruce to spruce movement also may occur.

Certain patterns of infestation are commonly observed on spruce. Most galling typically takes place on the more shaded sides of trees (north, east). Also, individual trees appear to vary greatly in their susceptibility to galling. Some trees, usually those that have a greener coloration, tend to be more heavily infested than other trees. This suggests that resistance to galling is a widespread characteristic among spruce trees.

Control

Control of Cooley spruce gall is rarely needed to protect tree health. However, insects may need to be controlled to prevent aesthetic injuries that can make trees less attractive.

Control of the insects must occur before galls have begun to form. Dormant oils, applied prior to the development of new shoot growth in the spring can kill the overwintering stages. Use of dormant oils is not without disadvantages since they may temporarily remove the waxy "bloom"

that gives the trees their distinctive color. To reduce this discoloration problem use no more than 5 quarts of oil per 100 gallons of water (3 tablespoons/gallon). (Use of dormant oil sprays is discussed in Service in Action sheet 5.569, *Spray oils for insect and mite control on woody plants*.)

Soaps also have given good control on the overwintering stage of Cooley spruce gall aphids in other areas of the country. This use still must be considered experimental in Colorado (see Service in Action sheet 5.547, *Use of soap and detergents for insect control in Colorado*).

Several insecticides also can control Cooley spruce gall aphids (Table 1). These insecticides can be applied in late September-October after the insects have returned and settled on the tree. More commonly, sprays are applied in spring prior to the development of new growth.

Removal of old galls will not affect spruce gall infestations since the insects have left the tree by the time galls turn brown and become conspicuous. Gall removal need be done only if it significantly helps the appearance of the tree.

Table 1: Insecticides for control of Cooley spruce gall adelgids.

acephate (Orthene)	diazinon
carbaryl (Sevin)	malathion
chlorpyrifos (Dursban)	insecticidal soaps

Always read and follow mixing and usage instructions on the label.

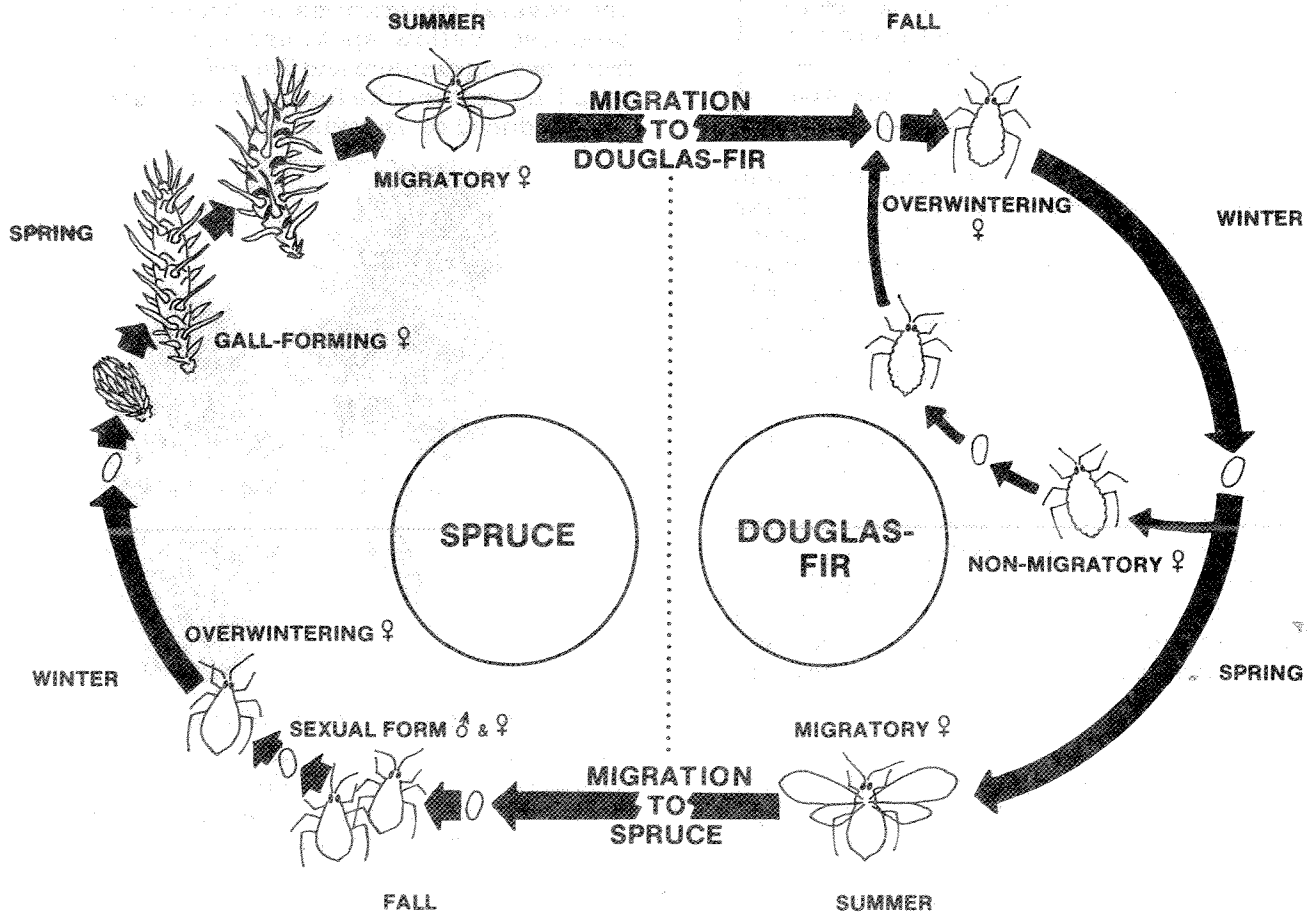


Figure 2: Life cycle of the Cooley spruce gall adelgid.