



## Spruce Gall Adelgid

Most spruce trees are damaged by one of two species of gall forming adelgids (aphids); the Eastern spruce gall adelgid, *A. abietis*, and the Cooley spruce gall adelgid, *A. cooleyi*. These soft-bodied insects feed by sucking plant juices. They are small (1/16 inch) and not readily seen, but their feeding on young plant tissue causes the formation of obvious cone-like growths called galls, which stunt and eventually kill the twigs. These insects are not a serious pest under forest conditions because they injure only a small portion of the foliage. At times, they disfigure ornamentals, and continued infestations may weaken trees and make them susceptible to attack by other insect pests and disease-producing organisms.



William M. Ciesla, Forest Health Management International, Bugwood.org

### Damage

Feeding by the adelgids produces a characteristic cone-like gall. The gall's shape, size and position on the twig aid in identifying the species involved. Galls interfere with the natural formation of twigs and cause curling, stunting and the eventual death of new growth. Heavy infestations give the trees a ragged appearance and destroy their beauty. Continuous infestations can seriously devitalize trees and render them more susceptible to attack by other organisms. Some trees have a natural resistance or immunity to these adelgids, and in spite of the presence of the insects, the galls never completely develop or may not form at all.

When galls are first produced, they are green, soft and made up of many individual cells that are inhabited by the developing adelgids. The galls mature by midsummer when the cells open and the adelgids emerge. The empty galls soon dry, become brittle and turn a light to dark brown. Eastern spruce gall adelgid feeding causes the formation of pineapple-like galls about 1/2 to 1 inch long at the base of twigs. Twig growth is normal when the gall is still green. The twig dies after the gall matures. The Cooley spruce gall adelgid produces elongated, often-curved galls about 1 to 3 inches long that usually involve the entire twig.

### Eastern Spruce Gall Adelgid (*Adelges abietis* L.)

The Eastern spruce is an introduced species that commonly infests Norway spruce and is also found on white, red, black and Englemann spruce. Only females of this adelgid are known to occur. The adelgids overwinter as immature insects (nymphs) on twigs near the terminal buds and resume feeding in the spring. The adelgids mature about early May and produce a conspicuous, waxy cover under which they lay their eggs. The eggs hatch in about a week, and the young insects begin to feed on the buds that had been fed upon by the overwintering forms. Continued feeding induces abnormal growth of plant cells and progressive enlargement of the bases of infected needles. Eventually, the enlarging needles coalesce and form the characteristic pineapple-shaped gall within which the insect lives and grows.

Galls protect the adelgid from most insecticide sprays. Both adelgids and galls mature in midsummer. The galls split and the mature adelgids emerge, develop wings, fly to the needles of the same or some other spruce and lay eggs

at the base of the new growth. The eggs soon hatch and the immature forms that emerge will feed until the onset of cold weather, overwinter at the needle bases and then resume their life cycle the following spring.

## Cooley Spruce Gall Adelgid (*Adelges cooleyi*)

The Cooley spruce gall adelgid is a native insect most commonly infesting blue spruce but also found on Sitka and Englemann spruce as well as Douglas fir. Only females of this species are known. Their life cycle is similar to that of the Eastern spruce gall adelgid with a few minor exceptions. The feeding that triggers or stimulates gall formation apparently occurs at a later time than that of the Eastern spruce gall adelgid and, hence, the difference in the timing of spring treatments for the control of each species.

The Cooley spruce gall adelgid will frequently utilize Douglas fir, if present, as an alternate host. Adults may migrate to Douglas fir in late summer and lay eggs. These eggs hatch and the immature forms pass the winter there. In the spring they resume feedings, mature and lay eggs. These hatch and develop into adults that may remain on the Douglas fir or fly back to spruce to lay eggs for the next over-wintering generation.

Galls are not produced on Douglas fir. Injury appears as a yellowing and kinking of the affected needles. In severe infestations, partial to complete needle fall may occur on injured terminals.

## Adelgid Control

### Eastern Spruce Gall Adelgid (Spruce)

- Hand pick galls before August and destroy.
- Use horticultural oil for dormant spray in mid-April to early May just before buds begin to break.
- Use horticultural oil or insecticidal soap in mid- to late September when insects emerge from galls and the majority of galls are green. Several grades of horticultural oil are available. Some are strictly limited to dormant use; others can be applied to actively growing plants in spring and summer. Summer treatment can be used on most trees, but check the label to be sure.
- Never spray when trees are under stress (e.g. moisture stress) or when temperatures are expected to be 80° F or above.
- Under adverse spraying conditions, such as high heat and relative humidity, sensitive species may suffer from phytotoxicity.
- Spruce and Douglas fir may show sensitivity to horticultural oils.
- *Glaucus* evergreens (those with a bluish bloom) may temporarily lose their blue color if oil is applied, and the natural bloom may not return for one to two years.

### Cooley Spruce Gall Adelgid (Spruce)

- Hand pick green galls when first noted and destroy.
- Use horticultural oil in mid- to late April just before buds begin to break for dormant spray.
- Use horticultural oil or insecticidal soap in late July to mid-August after galls have opened but before adelgids move to alternate hosts.

### Cooley Spruce Gall Adelgid (Douglas fir)

- Use horticultural oil or insecticidal soap. Spray in early May and again in late July to early August.

Despite good cultural practices, pests and diseases at times may appear. Chemical control should be used only after all other methods have failed. For pesticide information please call UConn Home and Garden Education Center weekdays, in Connecticut call toll free 877-486-6271. Out of state call 860-486-6271.

Revised by the UConn Home & Garden Education Center, 2016.

*Issued in furtherance of Cooperative Extension work, Acts of May 8 and June 30, 1914, in cooperation with the U.S. Department of Agriculture, the Dean of the College, Cooperative Extension System, University of Connecticut, Storrs. The Connecticut Cooperative Extension System is an equal opportunity employer and program provider. To file a complaint of discrimination, write USDA, Director, Office of Civil Rights, Room 326-W, Whitten Building, Stop Code 9410, 1400 Independence Avenue, SW, Washington, DC 20250-9410 or call (202) 720-5964.*