



COOLEY SPRUCE GALL ADELGID IN NORTHERN ARIZONA ABOVE 6000 FOOT ELEVATIONS

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Cooley spruce gall adelgid is a common aphid-like insect that feeds on ornamental spruce and Douglas-fir trees in northern Arizona. The gall adelgid causes unsightly galls to form on the tips of the branches of spruce trees. Young, developing galls can be mistaken for cones. A snowy and yellowing appearance occurs on Douglas-fir. The damage, though not life threatening to the trees, may cause stunting and deformation on small spruce trees.

Engelmann, Colorado blue and white spruces are the hosts for the insects' primary gall forming actions. Douglas fir is the secondary host. Both the spruce and Douglas-fir must be present in the landscape for the insect to complete its life cycle.

The female adult lays several hundred eggs on the tips of spruce trees. Soon after egg hatch, the nymphs feed at the base of the needles causing gall formation. The galls encase the feeding nymphs into chambers. Gall formation appears as a swelling and disfigurement of the stem (Fig.1). Early signs of the gall may be mistaken for cone formation. Following emergence of the adelgids, the dried galls usually remain on the stem for several years before falling off.



Figure 1. Cooley spruce gall adelgid on spruce.

Galls are not formed on Douglas-fir. Instead unsheltered nymphs called wooly adelgids, so named because of cottony tuft adornments, feed on foliage. These tufts may give the appearance of snow on the tree when infestations are severe. The foliage will have yellow flecks or spots caused by the feeding of the adelgid. When feeding is severe, foliage may drop.

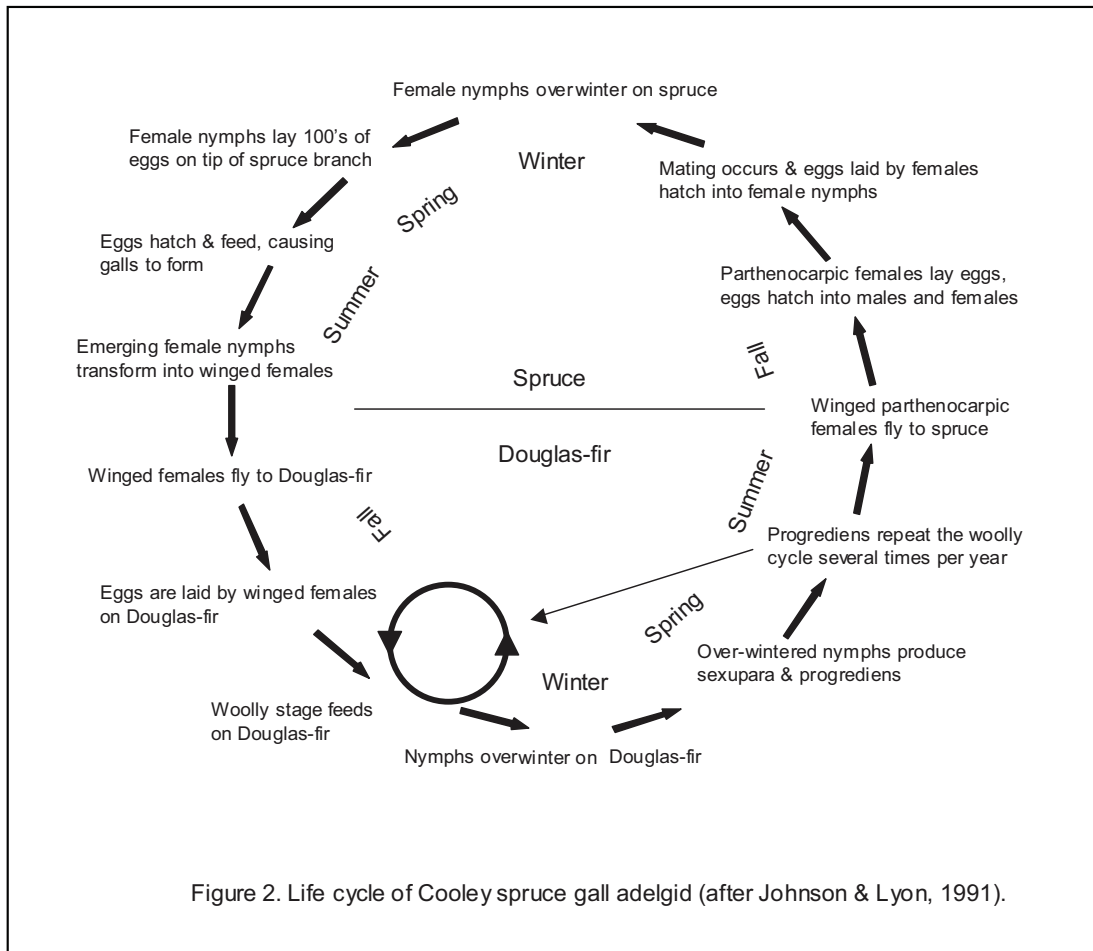
The life cycle is complex, involving two hosts and two years (fig.2):

Spruce—Winged sexupara females (parthenocarpic - reproduce without mating) migrate in the summer from Douglas-fir to spruce. The parthenocarpic females lay eggs that hatch into males and females. Mating occurs, and eggs laid by females hatch into female nymphs. Female nymphs over-winter on spruce near the tips of the branch. In the spring the female nymph lays 100's of eggs on a branch tip of spruce. When the eggs hatch they feed at the base of the needles causing a gall to form. During the summer the female nymphs emerge from the galls and transform into winged females.

Douglas-fir—Winged females fly to Douglas-fir and lay eggs on the needles. The eggs hatch and form the woolly adelgid stage (progreddiens). The woolly adelgid feeds on Douglas-fir. While in the woolly stage two more parthenocarpic generations may occur before winter. Nymphs over winter on Douglas-fir. In the spring the nymphs produce sexupara and progrediens offspring. Progrediens repeat the woolly cycle several times per year on Douglas-fir. The winged sexupara fly to spruce, starting a new cycle.

Damage caused by these adelgids is not a threat to the life of the tree. The galls on spruce and the woolly stage on Douglas-fir cause cosmetic damage only.

Removal of the galls as soon as they appear will reduce populations in subsequent years. Spraying the woolly stage with a strong stream of water may reduce the population. Neighborhoods that plant exclusively spruce or Douglas-fir will reduce infestations. If spruce is sparse or unavailable, the insect can continue the woolly stage on Douglas-fir.



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