

Cooley Spruce Gall Adelgid

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Figure 1. Infested white spruce at the University of Idaho Plant Science Farm

Cooley spruce gall adelgid damage was found on a White spruce (*Picea glauca*) at the University of Idaho Plant Science farm just outside Moscow, Idaho. The diagnosis was made from the observation of galls at or near the terminal ends of the branches (see Figure 1). Only new growth from the current year was affected. Galls were first observed early in the summer on terminal new growth as soft swollen tissue surrounding the needles. Some of these galls were green; others were beginning to turn a brownish purple. Figure 1 shows the appearance of the gall in late summer and fall. The plant itself was growing well, but damage from previous infestations was visible in slightly distorted growth caused by the loss of the terminal branch ends which induced lateral bud formation and branching and thereby formation of “shrubby” branches and asymmetrical growth habit.

Spruce galls are caused by the Cooley spruce gall adelgid (*Adelges cooleyi*). A small aphid-like insect, the Cooley spruce gall adelgid alternates its life cycle between *Picea* species and Douglas Fir (*Pseudotsuga*



Figure 2 Galls with openings where mature adelgids emerged

phytohormone response in the plant, causing the plant to form gall tissue which grows around the nymphs. The nymphs feed and grow within the gall through the early summer. From mid to late summer the galls begin to open and release the now mature adult insects. The open galls and associated needles dry out, turn brown, and harden, producing the prickly cone-like structures that are the most recognizable indication of infestation (see Figure 2).

Most infestations of Cooley spruce gall adelgid pose little lasting harm to the plant, provided re-infestations do not occur too frequently and are not too severe. Severe or repeated infestations will stunt growth and permanently deform and distort trees, since the damaged branch terminals do not generate new buds at their tips. Light infestations are of primary concern for aesthetic reasons (see Figure 3),

menziesii). Galls, however, are only formed on spruce. While most commonly found on Colorado blue spruce, adelgids will also infest white, Engelmann, Norway, and Sitka spruce. Reproductive female adelgids over-winter on the undersides of the branches. When spring comes, they emerge and move to the new growth at the branch terminals where they lay their eggs at the base of the needles. When the eggs hatch and the nymphs emerge, they feed on the tender new growth. Chemicals in their saliva induce a



Figure 3. An infested white spruce with several galls. The aesthetic appearance of the tree is spoiled by the unsightly galls and distorted growth from previous infestations.

particularly in landscape settings. The dry galls are unsightly and, when they fall off later, leave blunt tips to the branches that will no longer generate terminal growth. All new growth from a terminally infested branch must be from lateral buds, which distorts growth and produces a “shrubby” tree.

Cultural control of Cooley spruce gall adelgid is confined to removal and destruction of newly forming galls in spring. Some sources suggest avoiding inter-planting of spruce and Douglas fir; but since adelgids



Figure 4. A spruce gall with dead needles and beads of pitch protruding from the escape holes of the mature adelgids

can complete their lifecycles on either host and have been known to fly some distance to the alternate host in their winged stage, this may have little effect on reducing the likelihood of infestation. Insecticide application is the best control method for the adelgid. Horticultural oils can be applied in early spring when the insects are in the crawler stage and new growth is just beginning to unfold on the spruce and Douglas fir. Once galls have formed, any insecticidal application will be too late and ineffective. Chemical insecticides should also be applied in spring before gall formation to

catch the insects in the crawler stage. Marathon® II (active ingredient: imidacloprid) and Sevin®80WSP (active ingredient: carbaryl) are two insecticides that can be used to control adelgids on landscapes, ornamentals, Christmas trees, and nursery and greenhouse stock. Sevin®80WSP is for commercial and agricultural use only (Greenbook).

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