

Spruce Bud Scale

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Spruce bud scale (*Physokermes* spp.) is an insect usually found on Norway spruce (*Picea abies*), but will also attack blue spruce (*P. pungens*) and other spruce species. This pest sucks sap from needles, twigs and branchlets (2nd and 3rd year growth increment just behind twig) causing dieback which can weaken the tree. Mature Norway spruce trees growing in landscape environments are most susceptible to spruce bud scale damage.

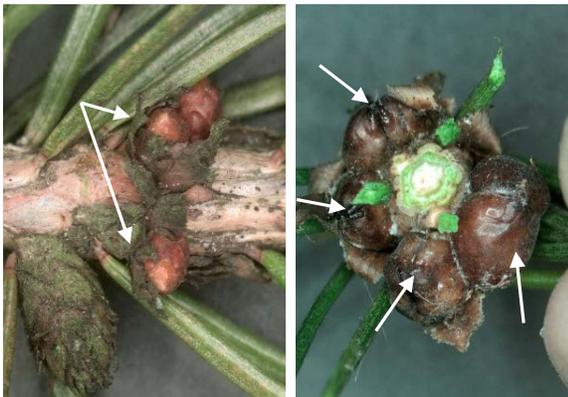
The suspected origin of spruce bud scale is Europe, which is also the native range of Norway spruce. In the United States, there may actually be several introduced species of spruce bud scale. Since the biology and physical appearance of all species on spruce is similar, species identification is rarely performed.

Identification

The most commonly observed stage of spruce bud scale is the dead, dark brown adult female. In this stage, they are often mistaken as buds (Figure 1) because of their shape, size, color, and location on the plant. They may be found singly or clustered in a group of two to eight around the nodes (Figure 2) of

Figure 1 (left): Buds

Figure 2 (right): Arrows point to Spruce Bud Scales



new or last season's growth. In the early spring, young females appear oval-shaped and cream to light brown in color (Figure 3). As eggs fill their bodies, they

Figure 3 (left): Young female scale

Figure 4 (right): Maturing female scale



become rounder and darken to a reddish-brown color (Figure 4).

During this time, if the scale population is high, infested trees may glisten in the sun with a coating of honeydew, a sticky, sugary substance secreted by the females as they feed. Flying insects such as bees and lady beetles are attracted to honeydew and the substance is also often colonized by black sooty mold fungi. The presence of these organisms can serve as a field indicator of the presence of spruce bud scale.

Biology

Eggs contained within the dead female body hatch from June to July (Figure 5). The young crawlers migrate to the needles, insert their feeding tubes, and suck sap actively feeding through September. Spruce bud scale over-winters as nymphs on the undersides of needles or clustered around terminal and lateral buds (Figures 6 and 7). In the spring, females settled at the base of buds grow quickly in size and secrete honeydew as they feed. As eggs develop and fill the body, the female becomes darker in color and eventually dies. There is one generation of this insect per year.

Figure 5: Eggs within female body

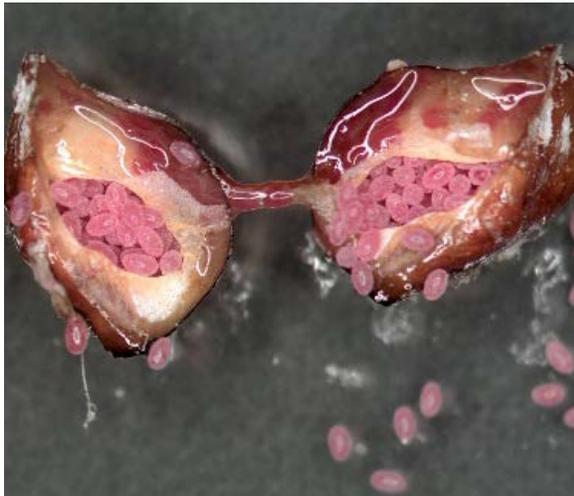


Figure 6 (left): Nymphs feeding on needles
Figure 7 (right): Overwintering nymphs



Lower branches are more often attacked than higher branches. A good field diagnostic method is to inspect the lower canopy for signs of honeydew, sooty mold, flying insects, defoliation, and abnormally long and thin internodal growth. Heavy scale infestations can significantly weaken lower branches reducing overall tree vigor and increasing susceptibility to damage from other insects and disease.

Management

When damaging levels of spruce bud scale are detected, control treatments that reduce scale populations will help trees regain vigor and produce healthy growth. Treatment options include systemic products that are applied to the soil and absorbed by tree roots and foliar sprays applied from June-July when crawlers are active. Biological control options include four species of wasp parasites that feed on adult scales.



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