

Spruce and Giant Conifer Aphids

by Mark Schultz and Ed Holsten, Entomologists, USDA Forest Service, Alaska Region, State and Private Forestry. Special thanks to Liz Quadra, Cooperative Extension, State of Alaska, for her helpful review.

Additional information on this insect can be obtained from your local USDA Cooperative Extension Service office, Alaska Division of Forestry office, or from:

Forest Health Protection
State and Private Forestry
USDA Forest Service
2770 Sherwood Lane, Suite 2A
Juneau, Alaska 99801-8545
Phone: (907) 586-8811

Forest Health Protection
State and Private Forestry
USDA Forest Service
3301 "C" Street, Suite 522
Anchorage, Alaska 99503
Phone: (907) 743-9455

or:

<http://www.fs.fed.us/r10/spf/fhp/fhpr10.htm>

The U.S. Department of Agriculture (USDA) prohibits discrimination in all its programs and activities on the basis of race, color, national origin, sex, religion, age, disability, political beliefs, sexual orientation, or marital or family status. (Not all prohibited bases apply to all programs.) Persons with disabilities who require alternative means for communication of program information (Braille, large print, audiotape, etc.) should contact USDA's TARGET Center at (202) 720-2600 (voice and TDD).

To file a complaint of discrimination, write USDA, Director, Office of Civil Rights, Room 326-W, Whitten Building, 1400 Independence Avenue, SW, Washington, DC 20250-9410, or call (202) 720-5964 (voice and TDD). USDA is an equal opportunity provider and employer.

Spruce and Giant Conifer Aphids



The purpose of this brochure is to describe the life history of the spruce and giant conifer aphids and to present the homeowner with some guidelines for minimizing damage from these insects to ornamental spruce.

Spruce Aphid

Sitka spruce is periodically subjected to attack by the spruce aphid, which can produce severe needle drop and death of the tree. Spruce aphid outbreaks are usually preceded by mild winters, and normally last for a short time, perhaps two or three years.

Life History

Spruce aphids are small green insects about 1 to 2 mm long (Cover photo) and overwinter as wingless females. These females produce live young that grow to maturity within three weeks and then begin producing their own progeny. Since spruce aphids can reproduce throughout the year, large colonies may develop during mild winters. Aphid damage may become apparent in March or April before the new spruce growth begins. Populations continue to increase until early summer, when many of the aphids develop wings (Figure 1) and fly off to

Figure 1. Adult winged spruce aphid that is feeding.



Figure 2. Yellow patches on needles are the first sign of aphid feeding. Discoloration is more intense in spring and early summer.

infest new spruce. By midsummer the populations may reach a low point. This decline in aphid numbers during the late summer is due to numerous factors including migration by winged individuals, increased parasitism, and changes in the chemistry of the spruce needles. In the fall, the aphids may increase in number and infest the shoots that were produced earlier in the year. This second peak in September and October is usually not as damaging as the spring population, but significant defoliation may still occur if the autumn is a mild one.

Damage

Aphids derive their nutrition from plants by piercing the tissues and sucking the juices from the needles. The spruce aphid prefers older needles and does not attack the new growth until late summer when the newest foliage hardens and begins to resemble the older needles. Spruce aphids begin their infestations in shaded portions of the lower crown, rarely affecting the leader and upper crown except in epidemics. The first signs of feeding are yellow patches on the needles

in the late winter or early spring (February–March). The needle discoloration intensifies in the spring and early summer (Figure 2) and is sometimes accompanied by a black fungal growth that looks like soot. The affected needles will later turn brown and drop prematurely (Figure 3), leaving only the tips of the new growth unaffected. This feeding reduces the vigor of the tree, causes growth loss, and if severe, may kill the tree. Aphid feeding is usually limited to spruce growing along beach fringes or near the water (Figure 4), although on occasion trees inland will be attacked and defoliated.

Giant Conifer Aphid

Adult giant conifer aphids are pear-shaped, 2 to 5 mm long and brown colored. Adults (Figure 5) have long legs and winged adults will be present in early to mid summer. These aphids feed on branches and stems, and are seldom seen on foliage. They are usually seen about the same time as spruce aphid. The female deposits eggs in mid-summer on foliage and branches. Eggs deposited late in the year overwinter and hatch the next year. Trees that have large conifer aphids often have spruce aphids.



Figure 3. Unaffected new growth.



Figure 4. Defoliated Sitka spruce on Mayflower Island, Douglas, Alaska. Attacked in 2000 and photographed in 2001.

Damage

Giant conifer aphids derive their nutrition also from sucking juices, but they feed on green branches, not needles. Spruce aphids are much more numerous on trees than the giant conifer aphid. Trees that are only infested with giant conifer aphid are hard to pick out from uninfested trees. Spruce aphids and giant conifer aphids tend to infest the same trees. Giant conifer aphid contributes to the decline of spruce aphid infested trees, but alone usually do not cause major damage.

Guidelines For Reducing Damage

Sitka spruce growing in plantations and other artificial settings such as urban areas are the most susceptible to aphid damage. It is important to insure that trees in those situations have the best possible growing conditions. Care should be taken to avoid injuring the roots, either mechanically or through soil compaction. Soil should

neither be placed on top of nor removed from the area beneath the crown of the tree. In order to avoid moisture stress, adequate water should be provided to the trees throughout the growing season. Spring fertilization also helps to promote tree vigor and to minimize the effect that defoliators such as aphids might have on a tree. The Alaska Cooperative Extension Service should be consulted for specific information on the type and amount of fertilizer to be applied.

Normally, harsh winter weather is the most important natural control for spruce aphids. In years when the winter is mild, homeowners should expect aphid damage to occur, and must recognize the importance of early detection of the insects. Aphids build up before the damage is noted, and in order to be effective, controls should be carried out before extensive defoliation has occurred. This requires careful periodic examination of the needles, beginning in February after a mild winter. Aphids will first appear on shaded portions of the lower crown, and can easily be controlled if apprehended at this early stage.



Figure 5. Giant conifer aphid adult.

Alternatives: When aphids are sighted, several alternatives are available for their control:

A high-pressure water spray will dislodge many of the aphids and knock them to the ground, but this will need to be repeated frequently during the season.

A spray of 2 percent solution of mild dishwashing detergent or insecticidal soap in water is fairly effective when aphid populations are low.

Many commercial insecticides are available and very effective against needle aphids.

For tree taller than 25 feet some chemical options are available and effective. A systemic insecticide (one which will travel through the plant tissues) is best, and should be considered if the tree is being significantly attacked (i.e., live aphids present and a considerable amount of the crown defoliated from prior year(s)).

When using any insecticide all label Instructions should be followed very carefully.

CAUTION: Pesticides can be injurious to humans, domestic animals, desirable plants and fish, or other wildlife—if they are not handled or applied properly. Use all pesticides selectively and carefully. Since approved uses of a pesticide may change frequently, it is important to check the label for current approved and legal use. Follow recommended practices for the disposal of surplus pesticides and pesticide containers. Mention of a pesticide in this publication does not constitute a recommendation for use by the USDA, nor does it imply registration of a product under Federal Insecticide, Fungicide, and Rodenticide Act, as amended. Mention of a proprietary product does not constitute an endorsement by the USDA.