

PEST ALERT



State of New Hampshire
Department of Resources and Economic Development
Division of Forests and Lands
Forest Protection Bureau—Forest Health Section

HEMLOCK WOOLLY ADELGID
Adelges tsugae

The hemlock woolly adelgid (HWA) is a small aphid-like insect that feeds on hemlock (*Tsuga* spp.). This insect was introduced to Virginia in the early 1950's from Japan and has since spread north to Maine and south to Georgia. Left untreated HWA can kill trees in the northeast within 10 years. Trees weakened by HWA often succumb to other diseases and woodboring insects such as hemlock borer.

Description: This insect can be recognized by the presence of a dry, white woolly substance on the young twigs of hemlock. This "wool" can generally be found year round, but it is most abundant and conspicuous in the spring when egg masses are present. The wool covers the insect in all but its earliest life stages. As they feed their woolly covering expands—the "wool" is a waxy material that comes out of pores on the insect's body.



Life Cycle: Hemlock woolly adelgid completes two overlapping generations a year. During March and April, adults of the overwintering generation each lay up to 300 eggs within their woolly covering. Crawlers hatch from April through May, and then settle on the twigs near the bases of the needles where they insert their piercing and sucking mouthparts. There they feed throughout their development. This spring generation matures by the middle of June, and deposit an average of 75 eggs each. The crawlers hatch in early July and settle on the new growth. They are generally settled and dormant by the beginning of August. In mid October feeding resumes and the characteristic woolly covering begins to develop. Nymphs feed during the winter and mature by spring.

Cultural Control: Because birds, squirrels and deer are important dispersal agents, any effort to discourage these animals from visiting hemlocks—such as removing bird feeders in the spring and summer—will reduce the risk of those trees becoming infested. Care should also

be taken when moving any material from infested areas onto uninfested property. Plan any hemlock cutting in and around infested areas for August through February to limit risk of spreading this insect.

Maintaining good growing conditions can play an important role in the survival of hemlock. Because hemlock is often shallow rooted, it is particularly prone to stress in dry periods. Therefore, during periods of drought, important ornamental hemlocks should be watered to ensure that they receive 1 inch of water per week (including rainfall) over the area beneath the dripline of the crown. Apply water slowly to allow uptake by the tree. Pruning and reducing crowding of target trees may encourage new shoot growth and help support vigor. Although fertilizer may improve the growth and vigor of uninfested trees, the added nitrogen also enhances adelgid survival and reproduction—*do not fertilize hemlocks in or near adelgid infested areas.*

Chemical Control: Chemical control is an important part of managing the health of HWA infested ornamental hemlocks. It is important to understand that periodic treatments will be necessary over the life of the infested tree to maintain its health and value as an ornamental. The initial decision of whether to use chemicals should weigh the value of the trees relative to the anticipated cost of long term treatments. Consider identifying individual trees or groups of trees that have special value or significance on the property and concentrating control efforts on those trees. Several pesticides are registered for control of HWA. Some are available for homeowner use, while others are available for commercial use only by a licensed pesticide applicator. Systemic insecticides with the active ingredient imidacloprid can be applied as a soil drench or soil injection. Research from the Connecticut Agricultural Experiment Station demonstrates that the lowest labeled rate is effective on trees up to two feet in diameter at breast height; larger trees require the higher labeled rates. Systemic insecticides with the active ingredient dinotefuran can be applied as a spray on the stem. Horticultural oils can also be sprayed on the foliage but complete coverage can be difficult and it may also kill natural predators leading to outbreaks of spruce spider mites.

Caution: For your own protection and that of the environment, apply pesticides only in strict accordance with laws, labels and precautions. Special care should be taken near water when using these pesticides.

Quarantine: This insect is subject to quarantine and movement of hemlock material is restricted. Details are available online: <http://nhdfi.org/forest-health/hemlock-woolly-adelgid.aspx>