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HEMLOCK WOOLLY ADELGID

By Scott Salom and Eric R. Day

DISTRIBUTION AND HOSTS: Native to Asia and western North America, this adelgid was first reported in eastern Virginia in the early 1950's. It feeds on both Eastern Hemlock and Carolina Hemlock in Virginia. Since then it has spread to most of the Appalachian region of the eastern United States, see map from U.S. Forest Service on following page.

DESCRIPTION OF DAMAGE: Immature nymphs and adults damage trees by feeding on storage cell near the base of needles at its attachment point to the twigs. The tree loses vigor and prematurely drops needles, to the point of defoliation, which may lead to death. If left uncontrolled, the adelgid can kill a tree in a single year. Line drawing shows the newly settled immatures at the base of the needles.

Hemlock Woolly Adelgid, *photo from: Connecticut Agricultural Experiment Station Archive, Connecticut Agricultural Experiment Station, Bugwood.org*

IDENTIFICATION: These small insects display several different forms during their life history, including winged and wingless forms. Generally, they are brownish-reddish in color, oval in shape, and about 0.8 mm in length. Crawler stage nymphs produce white cottony/waxy tufts, which cover their bodies and remain in place throughout their lifetime. The white masses are 3 mm or more in diameter. The presence of these masses on the bark, foliage, and twigs of hemlock is a sure sign of hemlock woolly adelgid. The white cotton masses may stay on the twig long after the adelgid is gone. The hemlock woolly adelgid, *Adelges tsugae,* is in the order Hemiptera and family Adelgidae.

LIFE HISTORY: There are four forms of this insect. Each form goes through six life stages (egg, four nymphal instars, and adult). As a cool weather species, most development of these stages occurs between October and June. As temperature rises thereafter, the first instar nymphs go into a dormant stage. Eggs are laid by adult adelgids the following February or March. Most eggs develop into wingless adults that remain on the hemlock tree.

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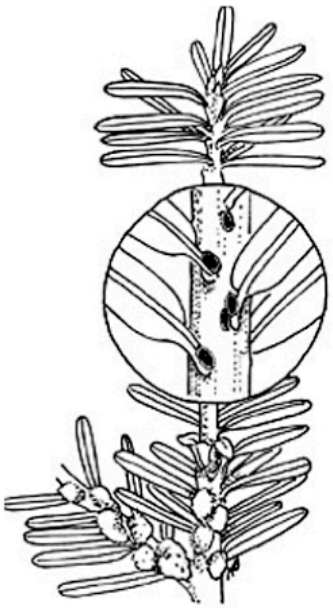


Hemlock woolly Adelgid. Small black ovals are newly settled immatures at the base of the needles

CONTROL: See the Virginia Pest Management Guide for current pesticide recommendations. See following for general comments on control.

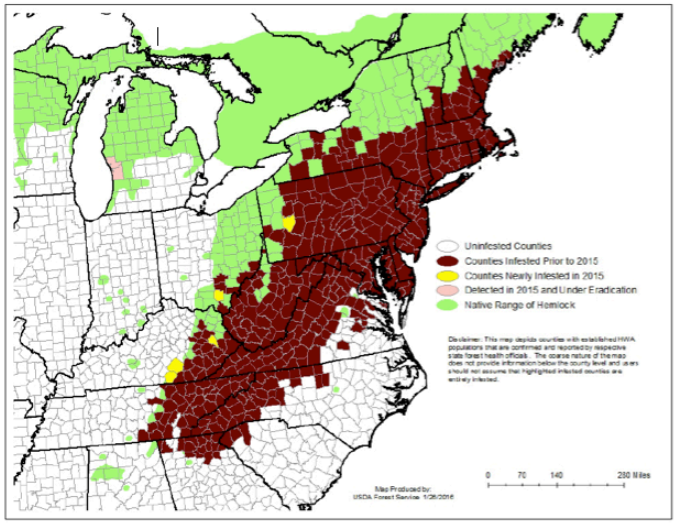
Systemic insecticides: Several systemic insecticides will provide good long-term control of this pest. Use a systemic insecticide that can be applied as a soil drench at the base of the tree or as a foliar spray. Make this application in late April when new growth starts on the tree and this will provide in many cases several years of control.

Dormant Oil: Horticultural oils, which are know as dormant oil or superior oil will smother the insect. A 1% solution is recommended from May through September and the 2% solution is recommended from October to April. Compete coverage of the tree is necessary and can result in 100% mortality of the adelgids. Only one complete application of oil is necessary per year. Soap can also be used, but may cause some burn and should be tried on a few branches first. Following treatment monitor the situation and treat again if needed.

Fertilizer: Excess fertilizer can cause more damage, as the extra nitrogen will make for more tender growth that will in-turn support more adelgids. Only add fertilizer if its suggested after a soil test.

Biological Control: Several beetle species have been imported and released as biological control agents for the hemlock woolly adelgid. Biological control agents are being released on public land throughout the range of eastern hemlock where trees are infested but are still relatively healthy. In many of these areas, targeted trees are also being treated with systemic insecticides. We are attempting to see if both pest management tactics are compatible in the same locations. Our preliminary data suggest that the predators are susceptible to pesticide poisoning by feeding on prey poisoned by insecticides. Currently no biological control agents are available for purchase for the control of the hemlock woolly adelgid.

Hemlock Woolly Adelgid Infestation



Hemlock Woolly Adelgid Distribution. Map produced by USDA Forest Service, 2016

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