

HEMLOCK WOOLLY ADELGID

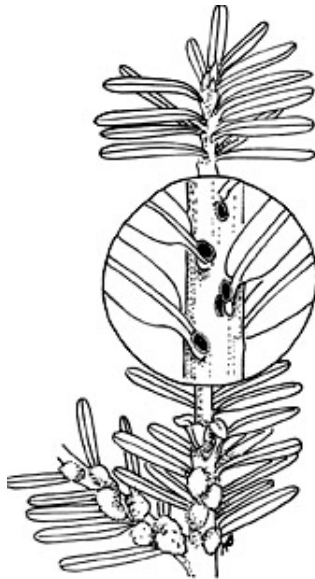
Hemiptera: Adelgidae, *Adelges tsugae* Annand

By Eric R. Day and Scott Salom

DISTRIBUTION AND HOSTS: Native to Asia and western North America, this adelgid was first reported in eastern Virginia in the early 1950's. Since then it has spread to much 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. When not at serious risk to the tree, presence of the dirty white globular masses of woolly puffs attached to the twigs or base of needles reduces the value of ornamentals.

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.

Hemlock Woolly adelgid, close up shows the newly settled immatures at the base of the needles.

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

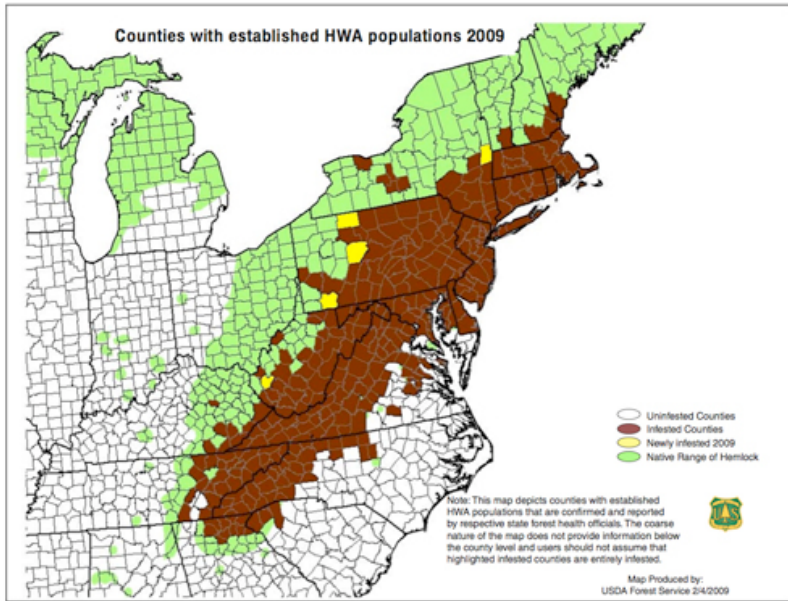
between October and June. As temperature rises thereafter, the first instar nymphs go into a dormant stage. Eggs are laid by adult adelgids the following February or March. Most eggs develop into wingless adults that remain on the hemlock tree.

CONTROL: See the Virginia Pest Management Guide for current pesticide recommendations.

SYSTEMICS: 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.



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



Hemlock Woolly Adelgid Distribution. Map produced by USDA Forest Service, 2009

this species originally came from Japan. Currently, researchers are investigating the prospects of identifying and importing natural enemies for use against this pest.

FURTHER READING:

Johnson, W.T. and H.H. Lyon. 1991. *Insects That Feed on Trees and Shrubs*. Cornell Univ. Press, N.Y. 560 pp.

McClure, M.S. 1989. Evidence of a polymorphic life cycle in the hemlock woolly adelgid, *Adelges tsugae* (Homoptera: Adelgidae). *Annals Entomological Society of America* 82:50- 54.

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DORMANT OIL: Horticultural oils, which is also known as dormant oil or superior oil will smother the insects. A 1 percent solution is recommended from May through September, and a 2 percent solution from October to April. Complete coverage of the tree is necessary and can result in 100 percent mortality of the adelgids. Only one complete application of oil is necessary per year. Soap can also be used, but may be toxic to the trees. Following treatment, monitor the situation. Tree fertilization can result in more damage, as adelgid populations are known to flourish on with excessive nitrogen

BIOLOGICAL CONTROL: Several beetle species have been imported and released as biological control agents for the hemlock woolly adelgid. Most releases are done on

public land and are meant to support control efforts in the forest setting. It is believed that