



Photo: Steven Katovich,
Bugwood.org

Hemlock Woolly Adelgid

Signs, Impact, Management

FOREST HEALTH FACT SHEET

Wisconsin Department of Natural Resources, Division of Forestry, Forest Health Program, Revised July 2023

Hemlock woolly adelgid (HWA), *Adelges tsugae*, is an aphid-like insect that is highly destructive to hemlocks in eastern North America.

The insect inserts its long, piercing mouthpart at the base of needles to feed on a tree's stored nutrients. This feeding can weaken a tree or directly kill it when insect numbers are high.

Eastern hemlock (*Tsuga canadensis*) is the only hemlock species native to Wisconsin, and it has little resistance to HWA.

Hemlock woolly adelgid is native to eastern Asia and western North America. In these areas, hemlock trees are resistant to damage. HWA is not native to eastern North America and was accidentally transported from southern Japan to Virginia, where it was first detected in 1951.



A hemlock woolly adelgid nymph feeds on a needle. **Photo:** Lorraine Graney, Bartlett Tree Experts, Bugwood.org

Hemlock woolly adelgid has since spread through much of the hemlock distribution in eastern states, although insect spread and tree mortality appear to move more slowly in colder climates. The insect has become established in several Michigan counties along the eastern shore of Lake Michigan.

Hemlock woolly adelgid has not become established in Wisconsin but may be detected here in the future.

Signs

Hemlock woolly adelgid is difficult to detect until populations are high and the insect can be seen on lower branches. The white, cottony egg sacs can be seen at the base of needles (see top photo). Needles that are infested turn yellow and eventually fall off, leaving dead branches and thin crowns. Infested trees decline and die over several years.

Hemlock woolly adelgid lookalikes include lichens, spider egg sacs and other scale insects that are typically present on the needles and not at the base.

Life Cycle

Hemlock woolly adelgid has a complex life cycle, with two generations per year in North America. The insect is parthenogenic, which means that all individuals are female and reproduce without mating.



Lichen on a twig may be mistaken for the white "wool" of hemlock woolly adelgid. **Photo:** Wisconsin DNR

Adelgids hatch from a white, cottony egg sac that may contain as many as 300 eggs. The nymphs crawl around until they settle at the base of a hemlock needle and begin feeding. The adelgids usually will remain at that feeding site for the rest of their lives.

Impact

Hemlock woolly adelgid saliva is toxic to the tree and eventually causes needle drop and twig dieback, leaving bare branches and thin crowns. Infested trees decline, leaving them vulnerable to attack by other insects and diseases. Heavy infestations usually kill trees within four to 10 years. Some trees recover, but the reasons behind the recovery are poorly understood. Rare resistant trees have been identified in eastern states.

Eastern hemlock is a long-lived tree that is important for both ecological and economic purposes. It creates habitat for many wildlife and fish species, helps to control stream erosion and is an important ornamental tree.

In the eastern United States, the environmental impact of hemlock mortality can include altered forest structure, degraded fish habitat and increased invasion of non-native plants.

Management

Insecticide treatments are effective at protecting individual trees, although this is not practical for large forested areas. Some products can provide at least five years of protection. Horticultural oils also can be applied to smother the adelgids present on a tree.

Hemlock woolly adelgid has few native predators in eastern North America, and those predators that are present have not controlled HWA populations. Several species of specialist predatory beetles (including *Laricobius nigrinus* and *Pseudoscyrmus tsugae*) have been introduced as biological controls to help reduce HWA populations.

Tree breeding projects to find and breed HWA-tolerant trees have been taking place for many years. Field trials have shown promising results.

Preventing Introduction

Hemlock woolly adelgid is moved into new areas by wind, birds and



Hemlock mortality from hemlock woolly adelgid in North Carolina. Photo: Jason Van Driesche, Bugwood.org

accidental human-aided transport. It is important to note that the crawling nymphs are tiny and difficult to see. The best way to slow the spread of HWA and other non-native hemlock pests is to avoid bringing hemlock materials into Wisconsin. These materials include hemlock nursery stock, decorative greenery, logs and firewood from other states where HWA is present.

The Wisconsin Department of Agriculture, Trade and Consumer Protection (DATCP) has imposed an exterior quarantine on items that could carry hemlock woolly adelgid into Wisconsin ([Ch. ATCP 21.16, Wis. Adm. Code](#)). The adelgid is listed as a “Prohibited” species under the Wisconsin invasive species rule ([Ch. NR 40, Wis. Adm. Code](#)).

Firewood Movement

Infested firewood can spread HWA and other pests over long distances. To prevent spread, obtain firewood close to where it will be burned,

season the wood for at least two years, or use pest-free, certified firewood.

If a suspect HWA infestation is found, please contact the DATCP Pest Hotline at 1-866-440-7523 or DATCPPestHotline@wi.gov.

Additional information about HWA [is available online](#).



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All photos and graphics: Wisconsin DNR

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