

Hemlock Woolly Adelgid

Order: Hemiptera

Family: Adelgidae

Scientific name: *Adelges tsugae*

Life cycle: *A. tsugae* is a small (0.74 mm), reddish-purple, aphid-like insect that covers itself with a white, waxy secretion. *A. tsugae* has a sexual cycle and an asexual cycle. The sexual cycle occurs on spruce, the primary host, and has not been reported in North America. The asexual cycle occurs on hemlock, the secondary host. There are two asexual generations per year on hemlock and an adult female can produce 50-300 eggs in her lifetime. Spring generation adults lay eggs in woolly sacs. The eggs hatch and second generation crawlers attach to hemlock needles, where they become dormant during the summer growing season. In the fall they become active and feed and develop during the winter months (atypical of most insects). The insects have piercing-sucking mouthparts and attach themselves to twigs at the base of newly developed needles where they probe xylem parenchyma cells.



Photo Credit: Linda Williams, Wisconsin DNR
HWA egg sacs

egg mass

lady beetle attacks eggs

Impact: the entire range of eastern and Carolina hemlocks (*Tsuga canadensis* and *T. caroliniana*) is at risk for infestation. Insect feeding leads to decreased tree vigor and premature needle drop. If left uncontrolled an adelgid infestation can kill a tree in three to four years. Trees of all sizes and ages are susceptible but natural stands are most vulnerable. Eastern hemlock is a long-lived species and plays a role in many specialized ecological niches, such as those of birds, small mammals, amphibians and invertebrates. It is also important to the nursery and wood products industries.

Control: a lady beetle native to Japan (*Pseudoscymnus tsugae*) is an effective predator and has been released in eastern Hemlock forests. One of the best control tactics is the use of horticultural oils. These can be applied as either a dormant oil spray or as a summer spray. In order for these to be effective, they must be applied on the entire plant and may need to be reapplied later in the growing season. Another effective product is a chemical pesticide known as Imidacloprid (Merit). It works best as a systemic and can be introduced into the plant via soil or trunk injection. Insecticidal soap, malathion or diazinon can be used effectively for control if the infested tree is thoroughly drenched with the pesticide once or twice a year.