

By Douglas C. Allen

The hemlock woolly adelgid is thought to have been accidentally introduced into western North America from Japan in the early 1900s. First reports of it in the east occurred in the late 1960s, but significant damage was not observed until 1985. At this time mortality of both ornamental hemlocks and scattered patches of forest-grown hemlock in Connecticut aroused concern throughout the northeast.

Since this initial outbreak, infestations of the adelgid (pronounced ah-dell-jid) have been observed throughout southern New England, southeastern New York (Dutchess, Ulster, Orange, Putnam, Rockland, and Westchester Counties), and along the Atlantic coast from eastern Pennsylvania south to northern Virginia. Small pockets of hemlock mortality (i.e., small groups of trees) have been associated with a buildup of this insect in southeastern New York. Mounting concern in the northeast recently prompted Maine, New Hampshire and Vermont to adopt a quarantine that prohibits the free movement of hemlock seedlings and nursery stock, logs, lumber with bark intact, and chips from 13 states (including three western states) and the District of Columbia into their areas. Only material that is inspected and certified can be shipped.

Why a Quarantine?

Eastern hemlock, *Tsuga canadensis*, is an important component of both broadleaved and coniferous forest types. The wood is valued by segments of the paper industry, and the typically dense stands make excellent wildlife habitat.

Introduced insects are notorious because of their propensity to cause damage. Most are introduced without their complex of natural enemies. In the presence of suitable



Fig. 2. Egg sacs of hemlock woolly adelgid.

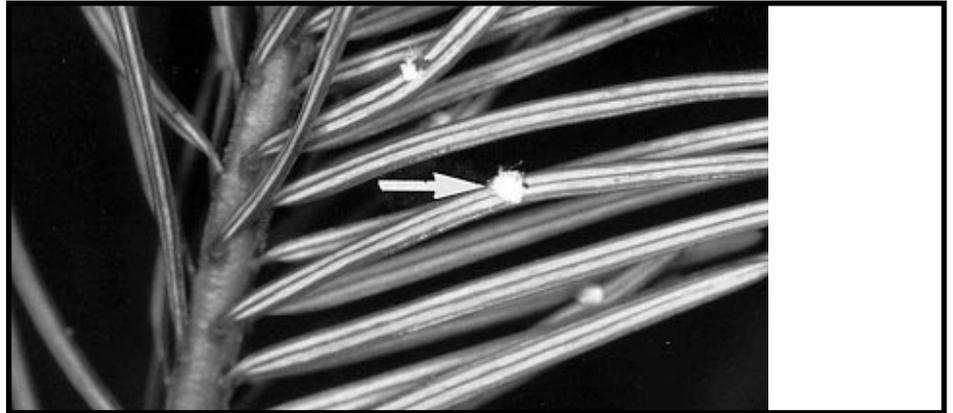


Figure 1. An adelgid on Douglas-fir.

climate and abundant food, and in the absence of natural checks on population growth, their numbers increase rapidly.

What is an Adelgid?

These sucking insects are closely related to aphids. They have complex life cycles comprising several life stages that are quite different in both form and function. They feed only on conifers. Many species (e.g., spruce gall adelgids) form cone-shaped galls on spruce, and on an alternate host (pine or fir) the insect occurs as white cottony tufts (Fig. 1). The hemlock woolly adelgid is not a gall maker and, even though winged stages occur (and presumably seek spruce as an alternate host), most of the insects recycle on hemlock and damage is limited to this tree.

Life History

The hemlock woolly adelgid has two generations each year. Adult females overwinter on hemlock branches and deposit eggs during early spring (mid- to late February in Connecticut) in spherical, white, woolly egg sacs (Fig. 2). Eggs hatch in April and the first stage nymphs, called crawlers, disperse. Nymphal development is completed in 4-5 weeks. Adult females of the second generation deposit eggs in mid-summer. Shortly after eggs hatch, the first stage nymphs become dormant until fall. They feed and develop during warm periods in autumn and winter.

Damage

Adelgids feed by inserting very fine stylets (thread-like mouthparts) into inner bark cells. These cells distribute throughout the

tree food that is manufactured in the needles through the process of photosynthesis. The stylets are hollow and function like a straw that the insect uses to suck plant sap from individual cells. When a large number of adelgids feed on a twig, many cells are destroyed and eventually the twig dies. The most obvious evidence of the insect are clusters of bright, white egg sacs (Fig. 2). These cottony, globular masses cover the female and eggs that she has laid. Feeding by high adelgid populations may cause foliage to turn first yellow-green, then brown and eventually needles drop prematurely.

What to Do

With the exception of some experimental work done in Connecticut, there have been very few attempts to control populations of the hemlock woolly adelgid. If you have a component of hemlock in your woodlot, or utilize hemlock for ornamentals, you should be aware of what the insect and its damage look like. Bring any suspected infestations to the attention of the DEC office nearest you. There is no need to panic! To date, significant mortality has occurred only in Connecticut and a few areas in New Jersey. ▲

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