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Hemlock Woolly Adelgid

Hemlock woolly adelgid, probably of Asian origin, is a serious pest of Eastern hemlock, Tsuga canadensis, on Long Island and in several northeastern states. Since arriving here in 1982, it has caused severe, irreversible damage to both cultivated and forest hemlocks. This adelgid feeds mainly on the young, immature, soft twigs by inserting its piercing and sucking mouthparts and removing sap. This causes premature needle drop, cessation of growth, dieback of branches and death.

Life History

The most obvious evidence of hemlock woolly adelgid infestation is the conspicuous cottony egg sacs (resembling the tip of an ear swab) on young twigs. Overwintering females, which are dark, oval, soft-bodied and about 1/10 of an inch long, lay their eggs from early March through June. Each one lays about 50 eggs in a single egg sac and then dies alongside. The eggs are the size of a dot (.), brownish-orange and clustered in groups.

Newly-hatched nymphs, or "crawlers," are reddish-brown and again the size of a dot. They settle on young twigs where they feed and mature within a couple of weeks. Some of them become wingless adults that produce a second generation on hemlock. Winged adults, about 1.55 mm long or slightly larger than a dot, leave hemlock in pursuit of another host species. Crawlers of the second generation migrate to new twigs in July, settle and become inactive until mid-October when feeding and development resume. Nymphs mature by winter and adults overwinter, completing the life cycle.

Culture of Hemlocks

It is important to water the trees during hot, dry periods, using a soaker hose. (See Home Grounds Fact Sheet D-1-37.) Do not fertilize hemlocks infested with the adelgids with a nitrogen fertilizer. It is usually common practice to fertilize a tree liberally so it can build up strength and mass to better withstand the damage inflicted by chewing insects. However, with the woolly adelgid, Dr. Mark McClure of the Connecticut Experiment Station, states that this only makes the problem worse. Experiments have shown adelgids were three times thicker on fertilized trees than on unfertilized ones. Piercing-sucking insects directly use nitrogen, one of the main components of most fertilizers, for nourishment. Using bone meal, or a humic acid fertilizer is all right.

Integrated Pest Management (IPM) Considerations

IPM is a common sense approach to pest control and plant care. It employs a number of measures to prevent, control or reduce plant problems. These include using resistant plant varieties, proper plant selection and placement, good aftercare and biological and/or mechanical controls. As a last resort, after all other remedies have been explored, a pesticide* that is least toxic to people and natural predators, can be considered. Prior to using any pesticides, plants should always be monitored for the degree of infestation and a sensible control measure considered.

** A pesticide is a substance that kills, or attempts to kill, a particular pest, e.g.* ***insect****icide,* ***fung****icide,* ***herb****icide, etc.*

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Control Suggestions

To obtain successful control, it is critical that treatments be applied with sufficient pressure to penetrate foliage and the adelgid's protective coating. Adelgids are often packed tightly together, interfering with proper coverage. Powered spray equipment must be used. Where large trees or difficult-to-reach conditions exist, contact a professional arborist. (Call Cornell Cooperative Extension of Nassau County at 516-228-0426 for a list of certified arborists.)

Control of 95-100% is common with horticultural oil, or insecticidal soap. Chemical pesticides are available. If you choose to use chemical pesticides, contact your local Cooperative Extension office for specific recommendations.

Horticultural oils at dormant rates applied in April beginning when there are 7 Growing Degree Days (GDD*) are successful. Treatments with the other pesticides, including oils at summer rates, are equally effective when applied in late April or early May, and again in late June or late September, and the following year in early June. A single application may not be sufficient. Additional applications are required when the white "woolly" covering does not dissipate within two weeks of treatment; dead adelgids lose their fluffy white appearance. Subsequent applications may also be required if trees are reinfested, principally by birds that carry immature adelgids from untreated hemlocks.

Do not use a hose-end sprayer!

Hose-end sprayers do not dissolve, mix or apply pesticides accurately or evenly. The changing rates of water pressure, different hose diameters and water temperature provide variables that prevent accurate mixing and delivery. A hand pump or powered tank sprayer, where the pesticide is pre-mixed to the proper dilution, allows for the application of a known mixture as per label instructions.

**GDD - Growing Degree Days - explained in Home Grounds Fact Sheet E-1-0.*