



Hemlock Tree Management

Protection from the Hemlock Woolly Adelgid

Forestry Topic 63

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Hemlock Woolly Adelgid Threat

The hemlock woolly adelgid (HWA) is a sapsucking insect native to Asia that targets eastern and Carolina hemlock trees. This insect was first reported in Richmond, Virginia in 1951 and has since spread to most of the eastern U.S. from Maine to Georgia. HWA feed at the base of hemlock needles, taking necessary nutrients from the tree. HWA feeding can cause branch dieback and tree mortality in as little as two years depending on tree health and HWA density. The most obvious signs of HWA presence are wool-like wax filaments that cover and protect mature HWA and their eggs, often found on the underside of hemlock branch tips. HWA presence can be difficult to detect, so careful monitoring for HWA is recommended.



Hemlock branch tip covered in HWA "wool".

Treatment Options

Systemic Insecticide Treatments

Systemic insecticide treatments work by applying an insecticide that moves throughout the tree's vascular tissue, killing existing pest populations and making the tree uninhabitable for as long as the insecticide is active. Two active ingredients are often recommended for HWA control, dinotefuran and imidacloprid. Dinotefuran is typically recommended for heavy HWA infestations because it is fast-acting and can cause HWA mortality in as little as one month. Dinotefuran is only effective at controlling HWA populations for one to two years, so annual treatments are recommended for continuous HWA population control. Imidacloprid is better suited to light or moderate HWA infestations because it moves through the tree slowly and takes at least three months after application to be effective. However, one imidacloprid treatment can protect against HWA infestations up to seven years. A highly effective HWA treatment option combines an initial treatment of dinotefuran with a follow-up treatment of imidacloprid. Several systemic treatment options are available and detailed below.

Any time a soil insecticide treatment is applied, there is an increased chance of runoff, especially if applied improperly. Don't exceed the per acre limit of an insecticide specified on the label and don't perform treatment under unsuitable conditions, such as before a heavy rainfall. Remember to follow all pesticide label prohibitions, precautions and safety requirements during transport, storage, mixing and application.

Soil Injection

Soil injections require specialized equipment to inject a systemic insecticide directly into the soil surrounding a hemlock tree. Strategic injections around the base of a tree can maximize root uptake. Soil injection treatments are best performed in either fall or spring when soil is moist, but not frozen.

Soil Drench

Soil drench is very similar to soil injection but requires less specialized equipment. Soil drenching relies on natural pesticide dispersal based on gravity and soil moisture, rather than a pressurized injection system.

Trunk Injection

Trunk injection treatments use pressure to directly inject a tree with insecticide. This method, like all systemic treatments, relies on the natural uptake of the tree to distribute the insecticide. It is best to perform this treatment during the spring or fall when hemlocks are actively transpiring. This method is more costly than others because of the use of pressurized equipment and more costly insecticide formulations.

Basal Bark Spray

Basal bark sprays involve a direct spray of insecticide to the lower portion of hemlock trunk. Spraying the bark directly allows the insecticide to penetrate the bark in a non-invasive way, unlike trunk injections. It is best to apply this treatment in spring or late fall when soils are moist but not frozen.

Horticultural Oil

Horticultural oil treatments involve spraying the entirety of a tree and its foliage with a mineral oil-based contact insecticide to immediately suppress HWA populations. This method requires total tree canopy coverage to be effective. Trees must be sprayed twice a year to target the two generations of HWA, and treatments are only effective if the oil provides a complete barrier for the tree. This method is preferred for smaller trees in landscapes and nurseries.



Soil drenching requires little equipment.



Trunk injection with specialized equipment.

Biological Control

In general, biocontrol is seen as the most sustainable long-term solution to invasive pests. However, establishment of biocontrol species can take many years and is never guaranteed to succeed. Several species have been approved by the USDA for release as biocontrol for the hemlock woolly adelgid, but most current HWA work is focused on predatory beetles from the genus *Laricobius* and silverflies of the genus *Leucotaraxis*. These insects and their effects on the surrounding environment have been studied for several years, and they are safe and only a threat to the invasive species they are targeting. Biocontrol is not suitable for single tree or single stand sites but is appropriate for landscape-level integrated pest management by qualified personnel on state and federally-owned land.

Get Started

Contact a VDOF forester or certified arborist to discuss your hemlock management options.

For more information about services or programs in your area, contact your local VDOF office:

www.DOF.Virginia.gov



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