

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION

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Frequently Asked Questions about Chemical Control of Hemlock Woolly Adelgid (HWA)

What chemicals can be used to manage HWA and how are they applied?

The most effective treatment method for control of HWA is the use of insecticides. There are two insecticides used in New York for HWA control – imidacloprid and dinotefuran. The insecticides are applied to the bark near the base of the hemlock tree and are absorbed and spread through the tissue of the tree. When HWA attaches itself to a tree to feed, it receives a fatal dose of the pesticide. To minimize the risk of impacts to non-target species, the basal bark spray application method is used as opposed to soil drench, soil injection, or trunk injection methods.

In New York, dinotefuran (trade name Safari®) is best used as a basal bark spray. Safari® moves much more rapidly than imidacloprid into the tree canopy. However, the treatment is only effective for a single year. Therefore, it is recommended that Safari® be used for older trees and any tree that has severe crown thinning, so that HWA is rapidly reduced and the trees can recover with time to absorb imidacloprid for more long-term protection. Various imidacloprid products have also been registered in New York for use as a basal bark spray, a method that is faster and easier than injections. The advantage to using this application technique is that both imidacloprid and Safari can be applied as a mix, thereby affording fast protection for up to 7 years with one application and saving time.

Are the insecticides toxic to pollinators or mammals?

The insecticides used to treat hemlocks infested with HWA are known as *neonicotinoids*. Neonicotinoids have been implicated in harming populations of pollinators (such as bees), but bees do not pollinate hemlock trees. Therefore, for tree species such as ash or hemlock, which are pollinated by wind (not insects), systemic insecticide treatments can be anticipated to have no impact on pollinator species. Because the neonicotinoids block the specific neural pathways that are more abundant in insects than birds or mammals, the insecticides are more selectively toxic to insects. In addition, the basal bark spray application method keeps the insecticides in the trees and out of the soils and groundwater. When correct procedures are followed, the risk of impacts to non-target species is negligible.

Why are insecticide treatments done only in the spring and fall?

Systemic insecticides are proven as the more effective way to treat hemlock with HWA. Systemic insecticides are applied in spring and fall when the soils are moist, hemlocks are actively growing and water uptake by the trees is greatest. Optimum time for spring treatment begins when the soil thaws. Fall treatments can begin with the wetter September weather and usually end near the end of October or in early November when soil temperatures drop.

How long do the insecticides persist in the environment after treatment?

Dinotefuran is a highly water soluble and upwardly mobile compound compared to imidacloprid. The use of a trunk spray application method will mitigate environmental contamination with this insecticide. Although less adsorbant to organic matter than imidacloprid, any residues leaching from bark with subsequent rainfall would bind to soil organic matter or be degraded by light on the soil surface. Even with imidacloprid's potential to persist in the soil, it has a low potential for bioaccumulation due to high photodegradation tendency (breaks down in sunlight) and high water solubility (easily dissolves in water).

Has HWA management been successful in NYS?

To support the protection of hemlocks across the state, HWA was listed as a prohibited species in New York under 6 NYCRR Part 575 making it unlawful to possess, transport, sell or introduce the insect. In addition, DEC monitors the distribution and spread of HWA by annual aerial and ground surveys as well as reports from partners and the general public. DEC has been involved in biological control efforts against HWA since the 1990s, with several approved natural enemies of HWA having been released at locations in the Finger Lakes and Catskills regions. In 2017, DEC provided funding for the development and operation on an in-state biological control laboratory at Cornell University associated with the New York State Hemlock Initiative, in order to enhance the production of these biological controls and their release in New York.

In the past 3 years DEC has also treated infested hemlock trees with insecticides at a few select locations where the control is likely to slow the spread of HWA, or where the hemlocks provide a significant public value. New York State Office of Parks, Recreation, and Historic Preservation has treated many hemlocks trees at a number of State Parks. Both chemical and biological control options are critical in the long term fight against HWA.

Do the insecticides have an impact on groundwater or streams?

The amount of insecticides applied in a treatment area has an influence on the concentration of the chemicals in streams, a fact which is carefully considered in regard to frequency and extent of applications to meet management goals while providing minimal environmental impact.

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