



HEMLOCK RESTORATION INITIATIVE

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General Information Regarding Chemical Treatments for Hemlock Woolly Adelgid (HWA)

Note: Insecticides are toxic to invertebrates; and therefore, should be applied according to the label to minimize risks to aquatic and terrestrial organisms. There are other pests and issues that can affect the health of hemlocks, aside from HWA. This document only addresses HWA treatments.

Systemic Insecticides

- Applied so the active ingredient is absorbed into the roots or bark (depending on the method) and transported to the canopy of the tree where hemlock woolly adelgids (HWA) feed.
- Generally take several weeks to months to provide effective control.
- The two most effective systematic insecticides are imidacloprid and dinotefuran.
- Imidacloprid products act more slowly but last longer than dinotefuran.
- The number and size of hemlocks to be treated will determine how much pesticide should be purchased.
- Per acre limits: The product label specifies how much of the product you can apply per acre. Please be sure to read and follow the label to not exceed the limit per acre per year on the label. If you have several trees in close proximity and want to treat them all, you may have to spread it out over a few years, e.g., treat all trees ≥ 10 " in diameter this year and then the smaller ones next year, etc. Larger, forest grown old growth trees don't have the active live crown that open grown trees do. In a heavy HWA infestation, these trees will succumb first so it is imperative to focus on these if the larger diameter trees are priority at a site.
- **Imidacloprid 75 WSP**
 - Originally Bayer held the patent for imidacloprid under the name "Merit." However, as imidacloprid is now off-patent, it is available in numerous brand names and formulations.
 - Products should have imidacloprid listed as the active ingredient (please see product label). Products with additional active ingredients are not preferred.
 - Southern Agricultural Insecticides, Inc. sells imidacloprid 75 WSP at a reasonable price. The product is called Zenith 75 WSP. One envelope containing four 1.6-oz packets costs approximately \$22. Each packet (or "baggie") will treat up to 48 diameter inches when mixed according to the label, so one envelope will treat up to 192 diameter inches. For reference, most hemlocks are less than 24" in diameter. Shipping for one envelope should cost \$5 to \$6.
 - Other local stores and online companies may have comparable prices and products.
 - Imidacloprid may take several months to travel through the tree's vasculature & up to two years to reach maximum efficacy, but can reduce HWA populations for 5 or more years.
 - A **soil drench** application of **imidacloprid 75 WSP** is the most commonly used and economical systemic chemical treatment.
 - 75 = percent of active ingredient; WSP = water soluble packet
 - **Refer to separate HRI document for simple mixing and soil drench instructions.**

- **CoreTect Tablets**
 - Slow-release tablets that include both imidacloprid and a fertilizer.
 - Often used in sites where getting water to the trees is virtually impossible.
 - Over time rain slowly dissolves the tablets that are buried in the soil.
 - As the tablets are absorbed by the tree more slowly than with the soil drench method, avoid using CoreTect in locations where children and pets could dig them up, or for trees in more advanced stages of decline with a moderate to high HWA infestations.
 - **Refer to separate HRI document for simple CoreTect instructions.**

- **Stem Injections**
 - Imidacloprid is directly injected into the tree trunk.
 - Injections typically consist of both imidacloprid and a fertilizer.
 - Proper injection for even uptake can be difficult. It is best if a licensed professional performs stem injections, which makes this method more expensive.
 - Injections create wounds in tree, increasing the stressors from which tree must recover.
 - However, stem injections are a good treatment option when the hemlock is located within 10 feet of a stream channel.

- **Dinotefuran**
 - Brand name: "**Safari**"
 - Still under patent, and therefore, more expensive.
 - Moves into the canopy more quickly than imidacloprid.
 - Often used on trees with heavy HWA infestations and more advanced decline.
 - It is effective less than two years. However, it can be applied directly to the bark as a trunk spray, which makes it a good option adjacent to streams and in rocky areas where there is very little soil around base of the tree.
 - Where needed, dinotefuran can be used for an initial quick knock down of heavy infestations, followed by imidacloprid for longer HWA control.
 - Also effective for elongate hemlock scale control.
 - Please contact the Hemlock Restoration Initiative (HRI) for more details.

Foliar Sprays

- **Insecticidal Soap/Horticultural Oil**
 - Smothers all invertebrates on tree at time of treatment and can provide immediate control of insects; however, there is no residual effect, so HWA could re-infest tree immediately.
 - Must be applied when pest is susceptible to smothering and will not burn foliage.
 - Since the product is sprayed on the foliage, there is an increased risk of applicator contamination and increased concern with drift.
 - Appropriate for smaller, more accessible trees that could be treated frequently.
 - Not appropriate for treating large or inaccessible trees.
- **Other insecticides sprayed on foliage**
 - Such as products with imidacloprid, bifenthrin, or permethrin
 - More toxic than soaps or oils; requiring extra caution to reduce drift
 - Continue killing the insects once the spray has dried
 - May result in increased spider mite and hemlock rust mite occurrence
- For more information on foliar sprays, refer to the NC Cooperative Extension Service HWA-control recommendations, found here:

<https://www.ces.ncsu.edu/depts/ent/notes/O&T/trees/note119a/note119a.htm>

Professional Support:

While treating trees yourself costs less, experienced, licensed, professional applicators may be able to identify issues and offer solutions regarding hemlock health not covered in this document.

If you want to hire a professional to treat your trees, be sure to get the following information:

- Do they have a current commercial pesticide applicator license?
- Do they carry insurance?
- Are they an ISA-certified arborist? (optional)
- What application methods and products do they use?
- Do they have experience with the application method you prefer?
- How do they calculate their costs?
- Is there a minimum charge?
- How do they guarantee their work?
- Ask for references and compare quotes from a couple of different providers.

Applicators vary widely in terms of treatment methods and costs. The current average pricing for professional treatments is as follows:

- Imidacloprid treatment for lightly to moderately infested trees: \$0.50 - \$4.00 per inch diameter
 - Safari treatment for heavily infested trees in advanced stage of decline: \$1.50 - \$9.00 per inch diameter
- Prices may vary based on property location, number of trees, proximity to water, or difficulty of the terrain.
- Professionals may also be hired for consultation services only.

Find an ISA Arborist for your area here:

<http://www.isa-arbor.com/findanarborist/findanarborist.aspx>

Visit the Hemlock Restoration Initiative (HRI) website at SaveHemlocksNC.org for more information on treating hemlocks yourself. Upcoming treatment workshops for landowners will be posted on the events page of the website. Additionally, free hands-on training may be available by volunteering with the HRI to treat hemlock trees on NC public lands! Give back to the forest while getting educated!

Contact: info@savehemlocksnc.org

Recommendations for the use of chemicals are included in this publication as a convenience to the reader. The use of brand names and any mention of commercial products or services in this publication does not imply endorsement nor discrimination against similar products or services not mentioned by Hemlock Restoration Initiative or NCDA&CS. Individuals who use chemicals are responsible for ensuring that the intended use complies with current regulations and conforms to the product label. Be sure to obtain current information about usage and examine a current product label before applying any chemical. For assistance, contact an agent of the North Carolina Cooperative Extension Service in your county.

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