

Vermont Forest Health



Hemlock Woolly Adelgid in Vermont:

Recommendations for Landowner Response

Department of Forests, Parks, & Recreation
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vtforest.com

Hemlock woolly adelgid (HWA) is a serious pest that threatens the ecological, economic and aesthetic values that Vermont receives from hemlock trees. Management measures will be considered for two different settings: first, trees in a landscaping/ornamental situation and secondly, natural, forested areas. Some general concerns will also be discussed.

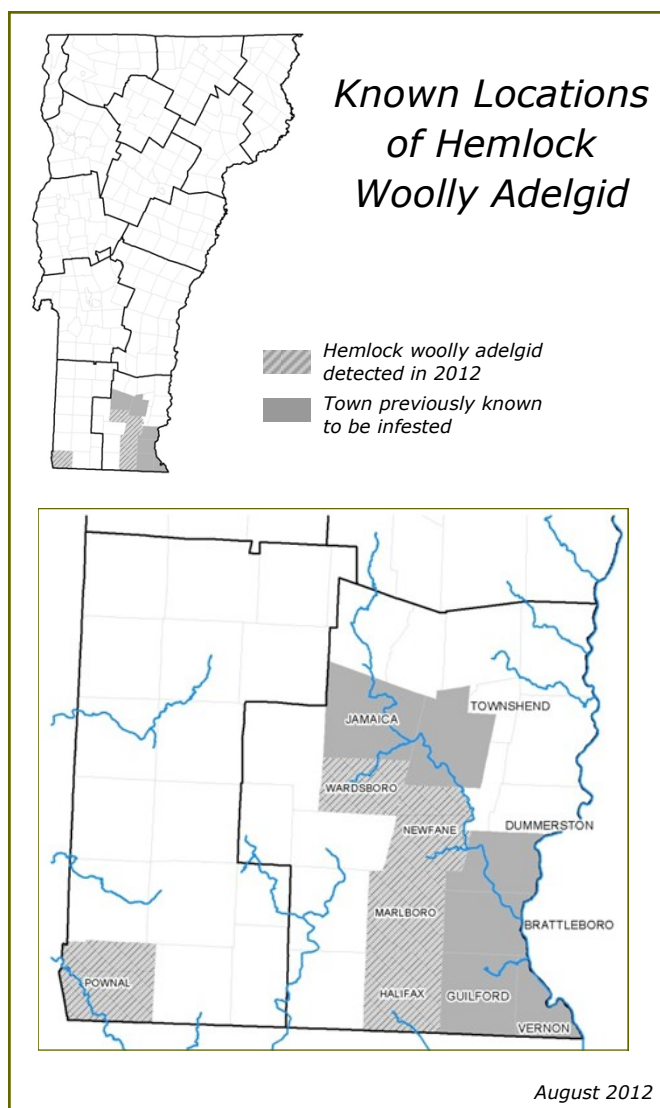
General Considerations

- *Don't move infested or potentially infested material.* State law regulates the movement of plant pests.
- *Take down or empty birdfeeders and bird baths from April to the end of August, or move them at least 100 feet from hemlocks.* Birds are known to carry adelgids.
- *Adelgids are most likely to be spread from April to the end of August.* Limit activity in infested areas during this time. Brush off and wash clothing, vehicles, and equipment after working in infested areas.
- We don't know how destructive HWA will be in Vermont. *Our cold temperatures are expected to reduce its impact.*
- *Light infestations of HWA are hard to detect.* Insect populations may be concentrated at the tops of a few trees or on scattered branches.

Landscape/Ornamental Setting

Several effective measures can be used for ornamental yard trees. Some can be carried out by homeowners and some must be applied by certified pesticide applicators. Cultural treatments can reduce adelgid numbers. However, chemical insecticides may be necessary to reliably protect infested trees.

Stressed trees succumb to HWA more quickly than healthy trees. Keep your trees as healthy as possible by watering them during drought, properly mulching them, and avoiding mowers and string trimmer damage. Don't fertilize infested trees; excessive nitrogen encourages adelgids.



Homeowners can reduce the numbers of adelgids and, possibly, the amount of damage in a tree, by knocking the fuzzy, white "ovisacs" off branches with a strong stream of water from a hose, or by pruning infested branches. Do any cutting from August to February, when adelgids are less likely to be spread.

Wherever possible, dispose of debris from infested hemlocks on-site. The movement of hemlock material originating in an infested area is regulated by quarantine. Do not move it to an uninfested town. Plan ahead. Call the Forest Biology Lab or your local Department of Forests, Parks and Recreation office if you need advice.

Infested hemlock debris can be safely disposed of by several methods. After one of these treatments, debris may be disposed of in plastic bags at the local landfill.

- Burn the cut branches, if safe to do so, and only with a burn permit from the Town Fire Warden.
- Drench cut stems and branches with soapy water (1/4 cup of liquid soap/1 gal water). This suffocates the insects.
- Cover debris for three weeks with a clear plastic tarp. This method is only effective if daytime temperatures are above 50° F.

Several insecticides are effective in landscape settings for individual or small groups of trees. *Read and follow the label carefully.* The decision to use chemicals should be based on public and environmental safety, value of the trees, and cost of the treatment.

Insecticides don't provide long-term protection, and treatments will need to be repeated. Trees may need to be prioritized; because it may not be feasible to protect all trees. So as not to serve as a reservoir, untreated trees that become infested should be removed and disposed of as described above.

Treat high value trees. Trees that are not infested may be protected with a systemic insecticide, described below. Valued trees that are infested can often be saved with treatment.



If daytime temperatures are above 50° F, adelgids can be killed by covering with a clear tarp.

Photo credit: Ron Kelley.



Low-pressure foliar application equipment is appropriate for homeowners.

Photo credit: Bugwood/National Park Service.

Foliar spray is a common application method. For shrubs, hedges, and short trees, low pressure pumps are available and appropriate for homeowner use. To properly treat tall trees requires specialized, high pressure equipment that is not as readily available for homeowners. Care should be taken to avoid drift; follow label instructions.

Foliar sprays of horticultural oil or insecticidal soap have a low toxicity to applicators and non-target organisms, and have been shown to be effective when applied properly. They kill by suffocating soft-bodied insects like adelgids; it is essential to completely drench the infested foliage. The best times to spray are from April to May and August to mid-October. Different types of oils and soaps can burn foliage, so follow directions on the label. These materials don't provide long term protection; reapplication may be needed.

Several contact or ingestion insecticides can also be applied by foliar spray, including imidacloprid, bifenthrin, permethrin, and deltamethrin. As with the soaps and oils, thorough coverage is essential. The use of these pesticides kills beneficial insects and leads to increased levels of spider mites and hemlock rust mites. Contact or ingestion insecticides are sometimes mixed with horticultural oil or insecticidal soap to provide for more complete control of HWA and help suppress any mite infestation.

For **systemic treatments**, insecticide is applied by soil injection, soil drenching, trunk injection, or trunk spray. Systemic treatments have a time lag before control begins. The rate of insecticide to use is determined by tree size. *Systemic treatments are well suited for trees that are still healthy enough to have good water movement that will carry the material throughout the tree.*

Soil drenching can be done by homeowners without specialized equipment. Imidacloprid and dinotefuran products are often labeled for this application technique. Follow label directions and use when there is adequate soil moisture for good uptake but not so much that there will be run off. Don't use this technique near water or in rocky, porous soil. Where there is a risk of run off, create an earthen berm. Rake leaves away from the tree, then slowly pour the properly mixed solution over the soil 6 to 12 inches from the base of the tree.

Soil and trunk injection methods are generally performed by professional applicators, as they require specialized equipment and training. Soil injection is very similar to soil drenching, but uses a pressurized injecting tool to introduce the material into the soil.

The trunk injection technique uses specialized equipment to inject insecticide through the bark and into the tree. Imidacloprid products are commonly used for trunk injection. Although this method is no more effective than soil application, it can be used near water, or in rocky, porous soils, because the insecticide is delivered directly into the tree. Trunk injection is generally more expensive than soil application and leaves wounds which may affect tree health.

A relatively new application technique is to spray the trunk with an insecticide that can penetrate the bark. A dinotefuran product has been labeled for this method. A low pressure pump sprayer can be used. The tree is not wounded and there is little threat to ground water. Trunk application techniques may be available to homeowners, depending on the product and application equipment selected.



Soil drenching (left) can be done by homeowners without special equipment. Soil injection (right), as well as trunk injection and high pressure foliar sprays, are generally performed by professional applicators.

*Photo credit: Bugwood/
National Park Service &
FPR staff.*

Natural Forested Setting

Where HWA does not yet occur, there is no need to alter forest management in anticipation of the insect. Its full impact on New England forests is not well understood. We do know that it takes years to affect tree health, and that infested trees in New England are surviving for long periods of time.

Healthy hemlocks, growing on deeper soils with good water availability, are more likely to survive infestation. Maintain the hemlock component on these sites, release young hemlocks, and avoid significant disturbance.

Where softwood cover is critical, consider diversifying species composition by releasing or planting other conifers.



Even unthrifty hemlocks provide habitat benefits in deer wintering areas and near water.

Photo credit: FPR Staff.

Where HWA is present, *forest landowners and managers are encouraged not to engage in premature salvage cuts.* Infested trees take years to succumb. Premature salvage may have unexpected consequences and will remove the potentially resistant trees that scientists are looking for. Premature cutting is particularly discouraged in deer wintering areas and near water. Even unthrifty hemlocks provide habitat benefits that will disappear if the trees are removed.

In infested stands, it's preferable to conduct harvests between August and March, when the insect is immobile. If harvesting is done between April and August, power washing equipment will slow the spread of adelgids to new locations. *The movement of hemlock wood products originating from infested counties is regulated by quarantine.* For more information see: <http://www.vtfpr.org/protection/hwawoodproductconsiderations.cfm>

Insecticide treatment methods are generally impractical for HWA in the forest. However, in forested recreation areas, and other locations where the hemlock component is critical, systemic insecticides recommended for landscape use may protect infested trees. Applicators need to be aware that there is often a maximum amount of product per acre that can be used.

Biological controls hold some promise but are not currently available to the public.

Information for managing forests with HWA can be found at: <http://na.fs.fed.us/fhp/hwa/silvi-mgt/silvi-mgt.shtm>

**ALWAYS READ AND FOLLOW LABEL
DIRECTIONS WHEN USING INSECTICIDES.**



**For more information,
contact the Forest
Biology Laboratory
at 802-879-5687 or:**

Windsor & Windham Counties.....	Springfield (802) 885-8845
Bennington & Rutland Counties.....	Rutland (802) 786-0060
Addison, Chittenden, Franklin & Grand Isle Counties.....	Essex Junction 802) 879-6565
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