# Latest Info on Hemlock Wooly Adelgid Treatment

*For the first time, due to the completion of research that has been on-going for the past 10 years or so, we now know what, when and how to treat HWA. The adelgid can be defeated on a local, per tree or per stand basis. It is cheaper to treat than remove a dead tree!*

**Here's what we know:**

1 - **Trunk injection** is the least effective method of treatment. (This is the method we all started with. It was better than nothing and the only hope at the time but we now know much better materials and methods are available).

2 - **Biological methods (beetles)** are hopeful for the future but useless on a timely basis. The hemlocks will all be dead by the time bio control takes effect, if it ever does

3 - **Horticultural Oil and soap** are effective as a spray but they only kill the adelgids that are present on a tree at the time it sprayed. It has no residual effect and is not practical far from a road that will support large sprayers.

4 - **Soil drench** with Merit or Safari, depending on the situation, is most effective.

5 - **Trunk spray**, oddly enough, is effective. Also, in the odd department, soil drenches are best applied close to the base of the trunk. Trunk spray is effective near water where a soil drench would not be advised because of leaching.

6 - **Large trees** are the hardest to turn around so they may require treatment in two subsequent years. 1st, Safari, then Merit soil drenches.

## Here's what you need to know:

## Soil Drench works best in most cases.

There are two materials presently available for soil drench that will deliver positive results in a cost effective manner. One, **Safari (Dinotefuran)** is quick acting but effective for only up to two years. The other **Merit (Imidacloprid)** is not quick acting, it does not become effective until the second year after application, but it lasts up to eight years and becomes stronger as time passes. Safari should be professionally applied.

**1 - For trees that are heavily infested, use Safari. It works in two to six weeks.**

**2 - For trees that have been treated in the past or are not heavily infested, use Merit.**

**MERIT …… SLOW BUT LONGLASTING**
**SAFARI …. QUICK BUT MORE EXPENSIVE**

These two products give us a team that works. Best time of year to treat is Feb, March, April. Second best is Oct, Nov.

There is also a new product called Coretect tablets. It is Merit in tablet form. Handy for use in distant, tough forest areas. You put the tabs in the ground around the tree and wait for rain. Lugging water is a killer in tough terrain.

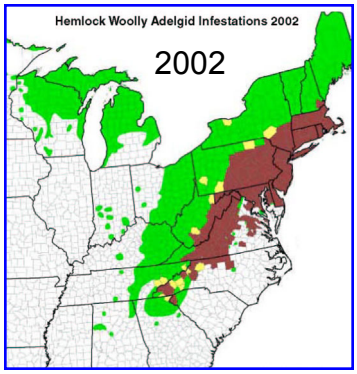
# HWA Background Notes

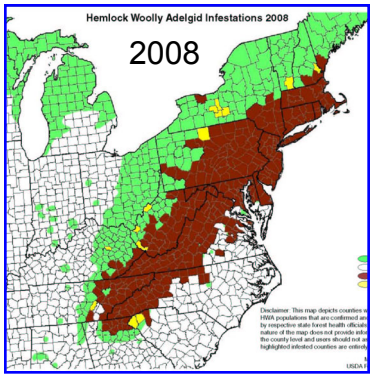
The **hemlock woolly adelgid (HWA)** Adelges tsugae was first described in western North America in 1924 and first reported in the eastern United States in 1951 near Richmond, VA.

Research scientists using molecular genetics have recently determined that several distinct populations of HWA occur in Asia and western North America and we now know that HWA populations found in the East originated from southern Japan. In their native range, these populations of HWA cause little damage to the hemlock trees they feed on as natural enemies and possible tree resistance has evolved with this insect pest.

In the absence of these natural control elements in eastern North America, this introduced insect pest attacks both eastern (Canadian) and Carolina hemlock which are often damaged and killed within a few years of becoming infested. HWA is now established from northeastern Georgia to southeastern Maine and as far west as eastern Kentucky and Tennessee.

**HWA Distribution 2002 - 2008**




The Great Smoky Mountains National Park contains over 800 acres of old-growth eastern hemlock (Tsuga canadensis), more than any other National Park Service unit. Hemlock forests are widely distributed over almost 90,000 additional acres in the park.

The Smokies also have some of the largest eastern hemlocks known, commonly exceeding 150 feet tall and as much as 6 feet in diameter. In 2002, HWA was identified in the park. This insect has now been identified throughout the park and has the potential to eliminate hemlock trees from the landscape.

The Shenandoah National Park has lost almost 95 percent of its hemlocks due to HWA.

## HWA Life Cycle:

The hemlock woolly adelgid completes two generations per year on hemlock. Adults that mature from overwintering nymphs lay 50 to 300 eggs in a cottony white mass on young twigs during March and April. Nymphs hatch during April and May and settle on twigs near the base of the needles where they insert their piercing-sucking mouthparts. The nymphs mature in June and some of the adults of this generation are winged individuals that are unable to reproduce on hemlock. The remainder of the nymphs mature into wingless adults that produce a second generation on hemlock. The nymphs of the second generation hatch in early July and enter a nonfeeding dormancy until October when feeding resumes.

Nymphs feed and develop during the winter and mature the following spring. Feeding by hemlock woolly adelgid causes the needles on infested branches to desiccate, turn grayish-green, and drop from the tree. Dieback of major limbs can occur within two years and progresses from the bottom of the tree upward. Trees may die within four years, but some survive longer with only a sparse amount of foliage at the very top of the crown (McClure 1995; McClure et al. 2001).

## Ex Situ Conservation Project:

In 2003 the USDA instituted an ex situ conservation program aimed at preserving the existing gene pool of hemlocks for replanting at a time in the future when HWA is under control. They started with Carolina Hemlock by collecting, processing and cataloging seed that was then sent to cooperators in Chile and Brazil for nursery growing and eventual planting into ex situ conservation banks. Phase two, devoted to Eastern Hemlock, began in 2005. Mountainous regions of Chile and Brazil closely replicate the conditions found in eastern hemlock forests. These efforts should provide a safe haven for a source of eastern and carolina hemlock seed for the future. HWA can only live on hemlocks. So, worst case scenario, one day they will run out of food and die. At that time, seed trees saved *in situ* here can begin to reseed. Additionally, seed from the ex situ trees, from Chile and Brazil, can be introduced to the new hemlock forest.