

Neighborhood Hemlock Project Planning Guide

Unified neighborhood action is the most effective way to safeguard the health, beauty, and value of the shared and private property in your community against the serious threat posed by the hemlock woolly adelgid, the invasive insect that is attacking and killing (or will attack and kill) every hemlock tree in north Georgia unless they are treated. Three keys to the success of neighborhood action are adequate planning, effective communication, and community support.

The suggestions that follow are provided to neighborhood leaders as a flexible framework that has worked well in both large and small communities. Save Georgia's Hemlocks (SGH) applauds your efforts, offers our educational and organizational support, and appreciates your sharing of experiences and improvements that we can pass on to help others.

1. Acquire an understanding of the problem and available solutions.

There are a couple ways to approach this. The best way to get started is to schedule a Hemlock Help Clinic for your neighborhood association, or at a minimum for the board of directors. It includes a PowerPoint presentation on the problem and available solutions, time for Q&A, a demonstration of using a soil injector, and take-home handout materials. If a presentation is not possible, you could post an article on the neighborhood web site, publish it in a neighborhood newsletter, or mail/e-mail it to association members. It should give an overview of the problem and available solutions and encourage members to visit our web site www.savegeorgiashemlocks.org or call Hemlock Help LineSM 706-429-8010 to learn more.

A scripted version of the slide presentation "SAVE GEORGIA'S HEMLOCKS" can be found on the [Resources](#) page of our web site. This page also contains quite a few information pieces and a series of Save Georgia's Hemlocks articles that can be shared as is or used as information sources for articles of your own.

2. Define goals, objectives, and project leadership.

The goals and objectives for a neighborhood hemlock project can be decided by the POA board, voted on by the neighborhood association as a whole, or left to the discretion of each individual property owner.

2a. Goals

This document provides the basis for a long-range plan that is both environmentally responsible and economically reasonable and will accomplish two primary goals:

- guarding the financial interests of the neighborhood concerning property values, liability associated with dead or dying trees, and cost of removing dead trees; and
- maintaining the beauty, privacy, and environmental health of the neighborhood.

2b. Objectives

Objectives are statements dealing with the main steps for accomplishing the goal. Objectives are basically items 3 – 8 below, expanded to include a schedule and the names of individuals responsible for the various tasks.

For private property, the objectives should address whether each property owner is required to treat their trees, has the option to treat their trees themselves or hire a professional of their own choice, must opt in or opt out for treatment that will be provided by or arranged by the POA, or has the option to decline treatment that will be provided by or arranged by the POA. The POA board may want to seek a legal opinion on this matter to ensure consistency with applicable covenants.

For both shared and private property, the objectives should address how the cost will be paid. For example, are there POA funds to cover the shared and/or private property? Will each property owner be assessed a certain part of the cost for treating the shared property? Will each property owner choose his own method, strike his own deal, and cover his own costs?

2c. Project Leadership

Our recommendation is that the POA Board make the high level decisions concerning goals and objectives and then appoint a Project Leadership Team to plan and implement the logistics.

The Project Leadership Team should have one person who serves as the Leader. This person will take primary responsibility for assembling a limited number of helpers, providing parameters and oversight for each step of the plan, assembling and utilizing a volunteer helpers as appropriate. Save Georgia's Hemlocks will assist with educational and organizational support. A useful document called "Full Notes for Hemlock Treatment Project Leader" can be found on the [Facilitators](#) page of our web site.



3. Assess scope of project on private and shared property.

The project leader should schedule an assessment to determine the number of acres involved, the number and sizes of the trees, and the level of HWA infestation. This information will enable the Project Leadership Team to consider the options for getting the work done and the cost associated with each option and make any necessary adjustments to the original goals and objectives.

3a. Number of Acres

Establishing the number of acres is usually easy. A POA generally knows how many acres are private and how many are public/shared. It is also helpful to know how many private properties and acres belong to non-residents or part-time residents as this can impact project coordination.

3b. Level of Infestation and Appropriate Treatment Material

Assessing the level of HWA infestation is necessary because it governs the kind of treatment product that is appropriate and should be done in conjunction with determining the numbers and sizes of trees to be treated (step 3b above). If the infestation is light to moderate, the recommended systemic material is Imidacloprid. The recommended treatment systemic material for heavily infested hemlocks or very large infested hemlocks (>20 inches) is Dinotefuran, marketed as Safari. Non-systemic materials or low-concentration systemic products are not recommended.

3c. Number of Trees to be Treated

The options for this decision are:

- saving *every* hemlock in the neighborhood,
- saving *only certain ones* in the neighborhood, or
- allowing each property owner to make his/her own informed choice.

Trying to save *every* hemlock is not always the best choice because of cost, poor condition of some trees, small size of some trees, or spacing that's too close for maximum tree health. Optimal spacing for mature hemlocks is 15-20 feet apart unless they're being grown as a hedge. When there are only a few trees involved, it may be good to treat them all. When there is a large number of trees, we recommend choosing only certain ones to treat.

3d. Strategy for Choosing Trees to be Treated

If the choice is made to save *only certain* hemlocks, here are some factors the Project Leadership Team or individual property owners can use singly or (better) in combination to prioritize the trees to be treated:

- **Health** – Choosing all the trees that can likely be saved by either of the two treatment products available or choosing only those trees that can be saved by the less expensive one.
- **Size** – Saving the large ones since they're the cone-makers, and then choose a number of middle-sized and small ones to save in order to provide for successional growth. We recommend setting a minimum size below which the trees will not be treated (e.g., 2, 4 or 6 inches in diameter) unless their location warrants otherwise. It is also a good idea to set a spacing guideline so that trees growing closer than a certain distance apart (e.g., 3 feet apart) would not be selected for treatment unless their location warrants otherwise.
- **Location** – Saving the trees along rivers, streams, and ponds because they're important to the health of the waterways and aquatic populations such as trout; saving trees near paths, roads, parking areas, homes and other structures to avoid the risk of dead/dying trees falling and causing damage; and saving trees that are visually important as they contribute to both the aesthetics and value of the property.
- **Cost** – Saving as many trees as available funding will allow. In this instance, it is usually a good idea to set a firm budget and monitor expenses to know when that limit is about to be reached.

4. Identify resources and limitations.

4a. Manpower

Manpower resources can be managed in one of two ways – doing it yourself (DIY) or hiring a professional.

- **Doing it yourself** relies on getting the work done by volunteers and involves purchasing the chemical, borrowing or buying appropriate application devices, understanding the treatment process, and doing the work. The project leader is advised to assemble 3-person work teams and assign each team a specific area or number of trees.
- **Hiring a qualified professional** is advised where the terrain is difficult/dangerous or when property owners are not inclined or able to do the treatment themselves. The [Contacts](#) page of the web site contains a list of local professionals who are properly licensed and insured, specialize in treating hemlocks, offer treatment methods other than trunk injection, and charge reasonable rates.

4b. Money

The cost for a hemlock treatment project depends primarily on whether treatment is done as a do-it-yourself project or a professional is hired. Additional factors affecting cost include the number, sizes, and spacing of trees to be treated and their condition; the chemical used and formulation used as well as the size and number of units purchased; the terrain; and for DIY projects the source from which the chemical is purchased.

- **Doing-it-yourself**– This is usually the most economical option. If a property owner or a group of trained volunteers does the treatment, the only out-of-pocket expenses are for purchasing the chemicals and plus a few minor expendable supplies. The amount and cost of chemicals are based on the treatment product needed and the number of trees of certain diameters.

\$0.04 - \$0.39 per diameter inch for Imidacloprid

\$0.88 - \$2.93 per diameter inch for Safari

The cost for Imidacloprid varies based on the formulation used. When there are fewer than 600 diameter inches, the 75% WSP (water soluble powder) will do the job. The smallest quantity available for purchase is called a four-pack which contains four 1.6 ounce pouches of product, costs about \$35, and treats an average of 180 diameter inches. When there are more than 600 diameter inches, a more economical formulation is a 21.4% or 22.6% flowable or liquid product called Imidacloprid 2F or 2L that is sold by the gallon, costs about \$75 per gallon, and treats an average of 1200 diameter inches.

The cost for Safari 20 SG (soluble granules) depends primarily on the size of the product. A 12-ounce bottle costs about \$110 and treats an average of 70 diameter inches. A 3-pound jug costs about \$399 and treats an average of 283 diameter inches.

The Chemical Calculator (an Excel spread sheet) on the [Facilitators](#) page of our web site can be used to estimate the amount and cost of chemicals needed. The cost for chemicals may sometimes be reduced by purchasing larger sized units or larger quantities of units.

- **Professional service** – If the POA or individual property owner chooses to contract with a properly licensed and insured professional pesticide applicator, it is recommended that more than one contractor be invited to make a site visit and provide a quote because their pricing can vary widely for the same service. There should be no cost for a quote.

\$0.50 - \$4.00 per diameter inch for Imidacloprid

\$1.60 - \$9.00 per diameter inch for Dinotefuran

The cost for professional treatment may sometimes be reduced when there are many trees, they are not spaced at great distances from each other, and the terrain is easy.

The cost difference between volunteer and professional treatment is due to the fact that volunteer treatment includes chemical cost only, while professional treatment includes chemicals, labor, and other overhead. It should also be noted that the pricing structure varies widely among the few available professionals.

The cost difference between Imidacloprid and Dinotefuran is due to the availability of many generic versions of Imidacloprid that are chemically equivalent to the original flagship brand (Bayer's Merit 75) and equally effective but much less expensive. There is no generic equivalent for Dinotefuran yet.

And the range of cost within each chemical class is due to the fact that larger trees require more chemical per diameter inch than smaller ones.

- **Cost of Not Doing the Project** – Hemlocks that are not treated will eventually die and have to be taken down and hauled away. Reliable information puts the estimated cost of removing dead trees anywhere from \$50 to \$100 per small tree and \$300 to \$1500 per large tree, depending on size, location, hazard posed, and equipment needed for the job. There are also real but harder-to-quantify costs related to loss of visual appeal and landscaping renovations that may be necessary.

4c. Time

An experienced professional can treat between 100 and 350 trees in a full 8-hour day, depending on the size and spacing of the trees, terrain, and amount of undergrowth. A 2 - 3 person team of non-professionals normally averages half that speed and usually works only 4 to 6 hours per day.

4d. Other Considerations

In making the project plan for a do-it-yourself effort, neighborhood associations are advised to consider factors besides cost, such as the number of available volunteers, urgency based on the condition of the trees, terrain, level of work effort, and the physical abilities and preferences of the volunteers. The Project Leadership Team should also review any covenants, conditions, and restrictions that may apply to the project and obtain legal counsel if necessary.

Likewise, in making the project plan for professional service, neighborhood associations are advised to consider factors other than pricing, such as good recommendations provided by the professional's clients, how soon he is available to do the work, and whether he offers any flexibility such as allowing volunteers to work alongside to achieve a lower overall cost or allowing the neighborhood association to make installment payments over a period of time.

5. Develop work plan for private and shared property.

Approaching private and shared property as separate phases of the project allows the most flexibility. It is suggested that shared property be done first, because it is easier manage the work that way and to keep track of the costs for private and shared property separate. If the do-it-yourself option is chosen, doing shared property first gives the project teams some experience as a group also allows individual property owners to observe what's being done, learn more about it, and generate support for the project.

The work plan for shared property is fairly simple, whether the decision is to DIY or hire a professional. If the POA contracts with a professional, there should be a written agreement for the rate and estimated total cost, project schedule, and payment schedule.

The work plan for private property should, at a minimum, include an explanation of the option chosen (DIY or hiring a pro), a time frame in which the work should be completed, information on the cost, and a list of the helping resources that are available, including the Hemlock Help Line (706-429-8010) and the Treatment Instructions from the [Resources](#) page of the web site. They can also include a special Hemlock Help Clinic and/or assistance from trained SGH Facilitators.

5a. Work Plan for Assessment Phase

An inspection and assessment should be made either by a professional if the decision has been made to contract for the hemlock treatment or by one or more groups of volunteers if the decision has been made to conduct a DIY project.

These are the tasks for the assessment phase:

- assessing the health of the hemlocks and identify those that can likely be and should be saved;
- measuring the DBH for each chosen tree,
- applying a small pre-numbered aluminum tag to each chosen tree; and
- recording the condition, DBH, and tag number for each chosen tree on a data sheet. See sample data sheet in Attachment 2.

If the assessment is made by a professional, he or she should provide this information to the Project Leadership Team along with an estimate of the amount of chemical needed and a quote for the cost of treatment. If the assessment is made by volunteers, the data sheets should be provided to the Project Leadership Team for entry into an electronic spreadsheet that will enable them to determine the amount and cost of chemicals as well as the number of volunteers and amount of time that will be needed to actually treat the trees.

5b. Work Plan for Treatment Phase

The **treatment material to be used** will be one containing the active ingredient Imidacloprid for lightly to moderately infested trees or a fast-acting rescue product containing the active ingredient Dinotefuran (Safari 20 SG) for very large and/or heavily infested trees.

The **treatment method** is primarily soil application to place the material several inches below the soil surface within 1 foot of the base of the tree. This method is appropriate for both Imidacloprid and Safari and is much safer, more effective, and much longer lasting than foliar spray. It can be done by either soil injection (recommended as fastest and most accurate) or by soil drench (a little slower and tedious but equally accurate and effective if done correctly).

In some cases, the basal trunk spray method with a hand-pump sprayer may be used with to apply Safari directly to the tree trunk from just above ground level up to five feet.

These are the tasks for the treatment phase:

- mixing the treatment material with water and loading it into the application devices;
- locating each chosen tree listed on the data sheets;
- raking back any leaves or debris within a foot of the base to expose bare dirt;
- treating each tree with the correct dosage and marking it as treated on the data sheet; and
- replacing the previously removed ground cover.

5c. Other Considerations for Work Plan

- **Personal safety practices** are covered in the training provided prior to the assessment phase and reviewed in the training prior to the treatment phase and should be incorporated in the formal work plan. These include wearing the required personal protective equipment (PPE), ensuring proper functioning of all application devices, watching out for ground hazards, and assigning volunteers to work sites that are compatible with any physical limitations the participants may have.
- **Environmental safety practices** designed to protect ground water and waterways and limit exposure of non-target insects, animals, and plants are thoroughly addressed in the training provided prior to the treatment phase and should also be incorporated in the formal work plan. They should be closely monitored by the experienced Facilitator in each team during the actual treatment process.
- **Liability** – It is strongly recommended that the Project Leadership Team require each volunteer to sign a Release and Waiver of Liability form prior to participation in *any* aspect of this project and should be incorporated in the formal work plan. This is a standard procedure practiced by Save Georgia’s Hemlocks as well as public land managers such as the U. S. Forest Service and the Georgia Department of Natural Resources for all hemlock projects involving volunteers. If the POA already has a standard form that has been approved by its legal counsel, SGH will be glad to review it to ensure it covers any issues specific to this project; or in the absence of such a form SGH can provide several examples in common use.

5d. Project Resources

Save Georgia’s Hemlocks will serve as the primary advisor to the project leadership team. The following documents for informational support (other than those mentioned in sections above) are available on the [Resources](#) or [Facilitators](#) page of the SGH web site:

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|-------------------------------------|---|
| * Introduction to Treating Hemlocks | * Hemlock Project Checklist |
| * Hemlock FAQs | * Notes for Hemlock Treatment Team Leaders |
| * Hemlock Facts & Fiction | * One-Page Application Instructions |
| * Chemicals-Contacts-Sources | * Quick reference pocket cards for mixing and dosing |
| * Chemical Calculator Spreadsheet | * List of local Facilitators (call the Hemlock Help Line) |

The Project Leader should be thoroughly familiar with these documents. The [Resources](#) page also contains a set of easy-to-follow one-page instructions for how to mix, dose, and apply each chemical formulation by each application method.

6. Communicate with POA membership.

Because community support is important for such project from the very beginning, the POA board or Project Leadership Team should communicate with the membership to explain what the problem is, why it is vitally important to address it, what will be done to solve it, how it will be done, the expected results of the project, and how to get more information. This initial communication should also include an invitation for individuals to get involved and should be followed up by one or more informational meetings for interested members..

Additional communications should include, at a minimum, an overview of the work plan for the assessment and treatment phases, any needed help or materials that might be contributed by the membership, progress made, and results achieved. The Project Leadership Team should be prepared to receive phone calls from members with questions, and any questions that the team is not comfortable to handle can be referred to the Hemlock Help Line.

7. Identify local Facilitators and other volunteers and schedule training for DIY project.

Recruitment of Facilitators and other volunteers is the responsibility of the Project Leadership Team. Training and supervision of the assessment and treatment volunteers are best done as a shared responsibility of the Project Leadership Team and SGH. In the best of all possible worlds, the individuals who do the assessment will also volunteer to do the treatment as this kind of continuity not only contributes to the efficiency of the overall project but also prepares the participants to be more knowledgeable sources of hemlock information within their community in the future.

- **Facilitators** – The importance of having trained local SGH Facilitators in your own neighborhood cannot be overemphasized because of their ability to help get the job done well, quickly, and economically. Facilitator training* is provided by SGH, takes 4 - 5 hours (including classroom instruction and hands-on demo/practice), and can be scheduled any time or place that’s convenient for the participants.

Facilitator functions can include (1) helping the neighborhood decide whether to DIY or hire a professional; and if the DIY option is chosen, (2) helping neighbors determine the level of infestation for their trees as this dictates what kind of treatment is appropriate; (3) telling neighbors where to look on our web site to find places to buy chemical, obtain application equipment, and get treatment instructions; and (4) serving as team leaders for the volunteer treatment teams.

In many counties there are individuals who have taken the Volunteer Facilitator training offered by SGH and would be willing to volunteer for a hemlock treatment project. SGH can provide a list of these individuals to the Project Leadership Team. If the DIY option is chosen, there should be one trained and experienced Facilitator in each volunteer team per day. If the professional option is chosen, one experienced Facilitator per 50 properties should be available to assist in an advisory role.

* SGH's Facilitator training is approved by the State of Georgia for licensed pesticide applicators and arborists to receive continuing education credits.

- **Volunteers** – In addition to SGH Facilitators, many counties have active Master Gardeners and/or Master Naturalists who would be glad to take part in such a project to earn some of the service hours that are required annually to maintain their certification. It would be especially beneficial for these individuals who are held in a position of authority by the public and are frequently consulted for advice to participate as they could be of great service in helping spread the word to community members who may not yet be aware of the hemlock problem and available solutions and providing reliable information to others who are aware but may be working from inaccurate or out-of-date sources.
- **Training** -- It is strongly recommended that ALL volunteers participate in the basic training provided by SGH. It is well worth the effort in terms of doing the tasks correctly and in the least amount of time.

Training for the assessment phase takes about an hour and covers how to judge the level of HWA infestation, measure the trunk diameter correctly, tag the trees properly, and record the necessary information on the data sheets. It should be scheduled for the morning of the day the assessment volunteers will do (or start) the assessment.

Training for the treatment phase takes 1 to 2 hours and covers how to mix the chemicals with water and load the mixture into the application device, use the Quick Reference Card to determine the correct dosage needed per tree, use the injector or hand-pump sprayer properly to apply it, mark each treated tree, and necessary information on the data sheets, as well as personal and environmental safety.

8. Purchase treatment materials and buy or borrow application equipment for DIY.

8a. Treatment Material

Acquiring the treatment material is normally the responsibility of the Project Leadership Team. There are many sources for purchasing the systemic treatment products, including the Internet. A partial list of sources is provided on the [Contacts](#) page of our web site. Treatment products can normally be delivered within 1 or 2 days after the order is placed

It is advisable to contact several sources to compare pricing. It's also a good idea, when contacting a supplier, to tell the supplier up front approximately how many diameter inches are to be treated; the chemical, formulation, and number of units needed as this information may lead to a better price quote.

Bayer's original Imidacloprid product for HWA is called Merit 75, but there are about a dozen generic products (both powder and liquid) that are chemically equivalent, equally effective, and much less expensive. For a list of generic product names under which Imidacloprid is sold, see the [HWA Controls](#) page of our web site and then click on [Chemical Controls](#).

Dinotefuran is sold only as Safari 20 SG locally (or TransTect 70 WSP in other parts of the country). Unfortunately, there are no generic versions at this time.

8b. Application Equipment and Supplies for DIY

Acquiring the application equipment and expendable supplies is normally the responsibility of the Project Leadership Team. Provision of other durable supplies may be a shared responsibility of the Project Leadership Team and SGH. See the Project Checklist in Attachment 3.

- **Soil Injectors** – It is recommended that one soil injector be provided to each treatment team and that a spare be on hand in case a unit needs to be taken out of service for repair. SGH will assist the Project Leadership Team in locating injectors, testing them for proper function, and performing any repairs necessary during the project.

Soil injectors are primarily available at Georgia Forestry Commission offices, but in some cases they are housed at the Cooperative Extensive Office, and some neighborhood association also have them for lending. While the Kioritz soil injector is no longer manufactured or available for purchase, it is still available to borrow, and some counties have also added a newer back-pack style device called the Nu-Arbor injector. To find out where to borrow an injector, see the [Contacts](#) page of our web site for a list of units in or near your county. When you borrow an injector, a refundable deposit of \$250 is normally required by cash or check. The lender may also specify a desired return date. The competition for injectors is normally less on week days than weekends.

- **Soil Drench Equipment** – If a soil injector is not available, the soil drench method may be employed to apply either Imidacloprid or Dinotefuran in the soil, using a thin 3-foot piece of iron rebar, a 1-gallon mixing jug, and an additional pouring jug or bucket.

- **Hand-Pump Sprayer** – If Safari will be applied by basal trunk spray, it is recommended that one hand-pump sprayer and a 1-gallon mixing jug be provided to each treatment team and that a spare sprayer be on hand in case a unit needs to be taken out of service for repair.

9. Execute work plan and maintain appropriate records.

The Project Leadership Team is responsible for execution of the work plan and maintenance of appropriate records.

9a. Tracking the Work Plan

Whether the project is done by a professional or DIY, the work plan should provide a way for the Project Leadership Team to track each step as it is completed, make adjustments or follow-ups as needed, and publish short reports periodically to the POA board and membership to show progress as it occurs.

9b. Tracking Expenses

Expense tracking should include keeping tabs on expenses such as the purchases of chemical, application equipment, refundable deposits for borrowing injectors, personal out-of-pocket expenses to be reimbursed by the POA, any accrued expenses to be paid to a professional at the end of the project, as well as any outstanding receivables owed by POA members to the POA.

9c. Maintaining Treatment Records

If the treatment is done DIY, it is very important for the Project Leadership Team to consolidate the data sheets and maintain records on the specific properties and shared spaces treated or not treated, number of trees and diameter inches treated, specific chemical used on each tree, total amount of chemicals actually used, the number of volunteer who participated, number of hours worked, and anything else the POA board may want to report back to association members.

If the treatment is done by a professional, their invoice at the end of the project should include the specific properties or areas treated, number of trees and diameter inches treated with either Imidacloprid or Dinotefuran, amount of chemicals actually used, number of days or hours worked, and total cost.

10. Follow-up

10a. Monitoring

Trees treated with Imidacloprid normally have a residual protection period averaging 5 to 6 years, while those treated with Dinotefuran have an average residual protection for 1 to 2 years. However, it is important to monitor the treated trees at least annually to ensure the treatment remains effective for the normal protection period. Although rare, individual trees sometimes don't respond to the treatment in the expected manner and may become re-infested sooner. This may result from any of several factors, but the cause can usually be diagnosed and remedied if caught in time.

10b. Interim Treatment

Certain categories of trees need interim treatment, and the project plan should incorporate the following:

- **Trees 22" or less in diameter that are treated with Imidacloprid** should be retreated with Imidacloprid 5 years later *except* in the unlikely event that a reinfestation occurs sooner. If this occurs, they should be retreated immediately.
- **Trees greater than 22" in diameter that are treated with Imidacloprid** should be retreated with Imidacloprid the following year in order to give them the concentration of active ingredient they need for full period of protection, and then they normally won't need it again for another 5 years.
- **Trees that are treated with Dinotefuran** should be retreated with Imidacloprid the following year and then can normally be maintained on a 5-year cycle of Imidacloprid thereafter. The only exception to this is if there's a pressing reason Imidacloprid cannot be used (e.g., a tree that is growing in the middle of a stream or a root zone that is inaccessible), Dinotefuran treatment by basal bark spray should be repeated every two years.
- In addition, any **trees that appear not to be responding properly** to treatment should be diagnosed and retreated immediately. Also, any trees that become reinfested earlier than the end of the normal protection period should be retreated immediately.

10c. Full-Cycle Retreatment

Following initial and/or interim treatment, most trees can be maintained on a 5-year retreatment cycle using Imidacloprid.

11. Frequently Asked Questions

10a. When should you treat hemlocks?

The short answer is "as soon as possible." Spring is generally considered the best time to treat, with fall being the second best time. However, with our typically mild winters in the South, trees can be treated with Imidacloprid year-round except when the ground is frozen or saturated or during times of extreme drought. The manufacturer of Safari recommends using it from February 1 through November 15, although this is not a rule specified on the product label.

10b. Should you treat them all at once or only as each one is determined to be infested?

It is advisable to treat *all the hemlocks you want to save* at the same time. Here are the reasons:

- It is not always possible to be sure which trees are infested and which ones are not because part of the year the HWA egg sacs are not very obvious or the infestation may be high up in the tree where it's hard to see from the ground. So the prudent assumption is that if the adelgids are present on *any* trees, they're also on other trees where they can't be seen.
- The HWA infestation spreads amazingly quickly in the south, traveling 15 to 25 miles per year. So if you discover adelgids on even one of your hemlocks or there's an infestation anywhere within 25 miles, they will very soon be on the others, and it is best to go ahead with treatment at the beginning of an infestation rather than waiting until it becomes serious and expensive.
- From a practical standpoint, most POAs or individual property owners find it more manageable to do the treatment project all at one time rather than piecemeal – having to inspect individual trees on a weekly basis, making multiple purchases of chemicals, or borrowing an injector multiple times is not the best approach. Doing a DIY project all at once also makes it easier to keep up with the retreatment schedule. Or if a professional is hired to do the work, it is usually less expensive if they do it all at one time instead of making multiple trips to the property.

10c. What about the trees not chosen for treatment?

Any untreated hemlocks will eventually be killed by the adelgids and have to be cut down. This is best done during the assessment phase but can also be done during the treatment phase or shortly thereafter. Here are the reasons for this practice:

- Untreated trees continue to serve as hosts for the woolly adelgids and facilitate quicker reinfestation of the treated trees once the chemical potency begins to decline.
- Dying and dead trees are unsightly and can negatively impact the beauty and property values in the neighborhood.
- Dying and dead trees can pose hazards such as falling on people or structures or increasing the risk of a forest fire.

Note that it is not necessary to burn, chip, shred, or haul away the cut trees. Unless they create a visual problem, they can be left to decay where they fall because once the tree is cut, the sap dries up and any adelgid that is attached by its feeding stylet dies of starvation. If the choice is made not to cut the untreated trees immediately, they should at least be girdled so they and the attached adelgids will die quickly; then they can be felled at a later time.

10d. How do Imidacloprid and Dinotefuran behave?

When either product is applied by soil application, the application points should be no deeper than 3-5 inches in the soil, within 12 inches of the trunk, and even spaced around the tree.

- **Imidacloprid** – In normal organic soil, Imidacloprid spreads only about 6 – 12 inches from each injection point, so there is very precise control over where the chemical goes. It has a relatively slow uptake rate to reach full strength in the entire tree – 6 to 12 to 18 months – depending on the size of the tree; the larger the tree, the longer the time required for treatment to reach full strength and gain control over the adelgids. However, it provides an average protection period of 5-7 years before retreatment is necessary.
- **Dinotefuran** – This product is more soluble than Imidacloprid and can spread farther in the soil, but applying it in the soil on the side away from a sensitive area such as a waterway normally solves this problem. Alternatively, the basal trunk spray method can be used to keep the material entirely out of the soil and is thought by some to be absorbed by the tree a little faster than soil application. It is very fast acting, normally gaining control over the adelgids in as few as 3 to 8 weeks but has a short residual protection period of only 1 to 2 years, after which it is usually possible to change over to an Imidacloprid treatment regimen.

In either case, property owners are advised to keep an eye on their trees to ensure control is gained within the expected timeframe and to detect any signs of early reinfestation.

NOTE: The information provided here concerning chemical treatments is based on product labels and advice from experts, including various public land managers, product representatives, and the University of Georgia. It is the user's responsibility to read and follow the label instructions when using pesticide treatments.

For more information, please call the Hemlock Help LineSM 706-429-8010 or visit www.savegeorgiashemlocks.org.

Attachment 1. Project Time Line Work Sheet

Phase	Major Tasks	Time Requirement	Start/Finish Dates
I. Assessment	1. Identify volunteers & acquire supplies for assessment phase.		
	2. Train volunteers for assessment.	2 hours	
	3. Do (or start) assessment same day as training & record info on data sheets.		
	4. Enter data into spreadsheet.	1 day	
	5. Make decisions about conduct of project, finalize project management plan and time line, and get necessary approvals for project.		
II. Treatment	1. Identify volunteers & acquire supplies & equipment for treatment phase.		
	2. Train volunteers for treatment.	2 hours	
	3. Do (or start) treatment same day as training & update info on data sheets.		
	4. Enter data into spreadsheet.	1 day	
	5. Communicate outcome of project to property owners & handle any outstanding receivables/payables.		
III. Follow-up	1. Each spring for 4 years after initial treatment, monitor treated trees for response to treatment & signs of early reinfestation.		
	2. Immediately upon discovery, give appropriate interim treatment to trees found not to be responding properly to treatment or becoming reinfested before end of normal protection period.		
	3. Twelve months after initial treatment, give interim Imidacloprid treatment to trees that are greater than 22" DBH or were initially treated with Dinotefuran.		
	4. Schedule next full-cycle treatment project 5 years after initial treatment.		

Attachment 3. Items Needed for Hemlock Project

Assessment Phase

Items Needed	Provided by
Coffee for morning training session and bottled water for day's activity	Project Leadership Team
Site map and participant list for each team, indicating assigned holes/areas and team member names	Project Leadership Team
Golf carts	Project Leadership Team
Instructions for assessment activities	SGH
Participant sign-in/ liability waiver forms on clipboard with pen	SGH
Name tags & permanent markers	SGH
Work bag for each team, containing the following: Work apron with pockets Diameter tape Clipboard with pen and data sheets Numbered metal tags, aluminum nails, and small hammer	SGH
Roll of flagging tape and push pins for each team	Project Leadership Team
Appropriate clothing: Long sleeved shirt, long pants, sturdy footwear Jacket, gloves, hat as needed for the weather	Each participant
Sack lunch and drink	Each participant

Treatment Phase

Items Needed	Provided by
Coffee for morning training session and bottled water for day's activity	Project Leadership Team
Site map and participant list for each team, indicating assigned holes/areas and team member names	Project Leadership Team
Golf carts	Project Leadership Team
Instructions for treatment activities	SGH
Participant sign-in/ liability waiver forms on clipboard with pen	SGH
Name tags & permanent markers	SGH
Chemicals	Project Leadership Team
Tarp/plastic sheeting, measuring cups, & gallons of warm water for mixing site 2 jugs for mixed chemicals per team & cloth bag to carry them in	SGH
Work bag for each team, containing the following: Work apron with pockets Diameter tape Laminated dosing card Clipboard with pen and data sheets Nitrile gloves for anyone handling chemicals Funnel & paint filters for loading chemicals into injectors Mask & goggles for anyone spraying Safari Hand sanitizer and hand towels Ziploc bag for used funnel, filters, gloves, and tape/push pins removed	SGH
Equipment for each team: Soil injector per team Spare injector parts & tools Hand-pump sprayer(s) if needed Small rake for clearing around base of trees	SGH
Appropriate clothing: Long sleeved shirt, long pants, sturdy footwear Jacket, gloves, hat as needed for the weather	Each participant
Sack lunch and drink	Each participant