



Instructions for Treating Hemlocks with Imidacloprid

Measure the trees to be treated

Determine the trunk diameter (thickness) at breast height for each tree to be treated. Breast height = 4 ½' above the ground.

- For a rough measurement, stretch a measuring tape straight across the tree trunk to get the diameter at breast height.
- To get an accurate measurement, stretch the measuring tape around the tree trunk to get the circumference and then divide by pi (3.14) to get the diameter at breast height.
- If there are multiple trunks, measure each one and add them together to get the diameter.

Obtain the treatment product

- The product needed to treat lightly to moderately infested Hemlocks is Imidacloprid 75% WSP (water soluble powder). Use the chart below to estimate how much chemical will be needed, based on the total number of diameter inches to be treated. The minimum quantity that can be purchased is a 4-pack of **1.6 oz packets**.

Size of product package	Number of inches treated
One 1.6 oz packet	48 inches
One pack containing four 1.6 oz packets – minimum quantity sold	192 inches
One case containing four packs – 16 1.6 oz packets	768 inches

- John Deere in Cartersville 770-607-3226, White County Farmers Exchange in Cleveland 706-865-2831, or Red River Specialties in Americus 229-924-9459. Specify that you want “Imidacloprid 75% WSP in **1.6 oz packaging** for treating the Hemlock woolly adelgid” and indicate the number of diameter inches you need to treat. Then the store can tell you the appropriate product and amount to buy.

Borrow an injector

- It's a good idea to call in advance and request to reserve a soil injector 706-429-8010; Lumpkin Coalition has three injectors to lend. Another one is available from the Forestry Commission at 706-867-2898.
- A kit of tools and supplies needed to do the job properly is also available for borrowing from Lumpkin Coalition.
- At the time of borrowing, you and the hemlock helper will verify together that the injector is in good working order and all items that should be in the tool kit are present.
- You will be requested to make a refundable deposit which will be returned when the injector and tool kit are returned.

Get ready to work

Before heading into the woods, assemble your gear. Here's what is recommended. Essentials are marked with an asterisk.

Personal Protective Gear	Tools and Equipment	
Long-sleeved shirt*	Soil injector*	Hammer and rebar*
Long pants*	Adequate supply of chemical*	Shovel
Boots*	2 wide-mouthed gallon jugs*	Work apron
Rubber or neoprene gloves*	Measuring tape*	1-pint measuring cup with ounces marked
Dust mask	Calculator*	Scissors for opening packs
Goggles	Notebook and pen**	Vice grip, wrench, screw driver, pliers, needle-nose
Hand sanitizer	Spray paint*	nippers, and small gimlet (or sharp pointed tool)
Small hand towel	Bucket	for removing dirt from injector holes
	Machete or loppers	Large light-colored towel
		Ziplock baggies

Check and prepare injector

1. Visually inspect injector for any damaged or missing parts.
2. Check injector holes to be sure they're free of dirt.
3. Make sure injector setting is 5 on the calibration ring and then test that it is accurately calibrated as follows:
 - a. Using plain water and a measuring cup that shows ounces, load a few ounces of water into barrel of injector.
 - b. Pump the handle 6 times and see if you get exactly an ounce.
 - c. Repeat this several times for accuracy.

Mix the treatment solution

The **recommended formulation is 75%** water soluble powder (WSP). Before mixing the treatment solution, evaluate the level of moisture in the soil and decide if it is extremely dry (as in drought condition), dry to normal, or moderate to wet.

1. Choose open-air environment away from water sources or other sensitive areas and position yourself upwind.
2. Use gloves, goggles and a mask.
3. Use a wide-mouth, one-gallon container with ample removable lid and a lip or pouring spout for mixing.
4. Put the water into the container first. Then add the treatment product. Depending on the soil moisture level, mix in the following proportions:



IMIDACLOPRID MIXING CHART			
PRODUCT	DROUGHT	DRY TO NORMAL	MODERATE TO WET
75% water soluble powder: 1.6 oz packet -- Put entire packet into water; don't open packet.	48 oz water	24 oz water	12 oz water

5. Secure lid and shake well until all the powder and any packet covering are dissolved.
6. Be ready to load and use the injector immediately.

Load the treatment solution into injector

1. Place injector at angle under a tree to be treated.
2. Pull filter out slightly and pour slowly.
3. Remove clogs as necessary.
4. Use towel to wipe off spillage from hands and injector.
5. Begin using injector immediately.



Apply the treatment

1. Insert injector into the soil 3-5 inches above the spray holes (not the injector tip) to deliver treatment solution into the feeder root mass within 12-18 inches of base of tree.
 - a. NEVER put your foot on the metal baffle to push the injector tip into the ground because it will break. It is a gauge used to control the injection depth.
 - b. NEVER force the injector into the ground. Avoid rocks and large roots when inserting the injector. Find a place where the tip will go in easily or, if the soil is too difficult, either moisten the soil to soften it or use a hammer and rebar to make a hole.
 - c. If roots are close to surface, insert injector more shallowly so the treatment solution is delivered at or above level of roots.



2. Make one injection hole for each inch of diameter. Space injections evenly in four quadrants (or like a clock face) around the tree. Use a minimum of 4 evenly spaced injection holes to dispense the required amount of solution.
3. Depending on the soil conditions and trunk diameter, use the chart below to determine how many times to pump the handle to dispense the correct amount of solution into each injection hole. Be sure to use the same column in this Dosing Chart as you used in the Mixing Chart.

IMIDACLOPRID DOSING CHART			
INCHES DIAMETER (DBH)	DROUGHT	DRY TO NORMAL	MODERATE TO WET
1-11	4 pumps / hole	2 pumps / hole	1 pump / hole
12-18	6 pumps / hole	3 pumps / hole	1.5* pumps / hole
19-22	8 pumps / hole	4 pumps / hole	2 pumps / hole
23-27	12 pumps / hole	6 pumps / hole	3 pumps / hole
28+	12 pumps / hole	6 pumps / hole	3 pumps / hole
This size tree should be treated two years in a row.			

*To get the equivalent of 1.5 pumps per hole, you would do 1 pump in half the holes and 2 pumps in the other half and try to distribute these two levels evenly around the tree.

4. Mark each tree with a small dot of spray paint or a tag as treatment is completed. Devise your own method for keeping track of the large trees that need two consecutive years of treatment.
5. Rake heavy ground cover or litter layer that was removed back into place around the tree.
6. If there is solution in the tank, do not pause using the injector for more than 10 minutes because the product begins to fall out of suspension and can clog the spray holes. If you need to pause for 10 minutes or more, pour unused solution into a sealed water-tight container away from sunlight. Then triple-rinse the injector with clean water under a Hemlock tree until the discharge runs clear to prevent clogs from sedimentation in lower parts of the injector.
7. Periodically, after all the solution in the tank is used up, correlate the number of oz dispensed with the number of dbh inches measured to check accuracy of calibration and adjust as necessary. Also, check to see that all bolts and screws are tight and calibration ring is still set on 5 cc.
8. If injector has to be disassembled in woods, do so over a light-colored towel to avoid losing springs and bearings.

Clean the equipment and disposal of packaging / unused chemical

1. During continuous use, if you notice a difference in the injector pump action or the amount of solution being dispensed, check the holes and clean them with a gimlet or other sharp pointed tool if necessary.
2. When finished using injector, pour any unused solution around treated trees or into a sealed water-tight container with a screw top and store in a place that is away from sunlight and not subject to freezing temperatures. DO NOT pour unused solution into a stream or down a drain.
3. Triple-rinse the injector with clean water under a Hemlock until discharge runs clear. DO NOT flush the injector or pour the rinse water into a stream or down a drain.
4. Remove any debris from tip area, and rinse outside of injector to remove chemical residue and dirt.
5. Use towel to be sure entire injector is clean and dry.
6. Mixing containers and buckets should be triple rinsed and dried.
7. Used packaging should be placed in garbage bag for disposal.
8. Place any unopened packets of powder back into the original pack envelope, seal it in a zip-lock bag, and store in a clean, dry place away from sunlight.
9. Unopened packets of chemical can be shared with neighbors or saved for future use.

Return the injector and tool kit

Please return the injector and the tool kit by the agreed upon date. Upon return, you and the hemlock helper will again inspect the injector and tool kit to ensure it is still in good working order and all tools are accounted for. There is no charge for the disposable supplies used. Then your deposit will be returned with LC's thanks.

If you have questions, call the Hemlock Help Line 706-429-8010