Invasive Plant Hit List: Tree-of-Heaven

by Jeff Stringer

Tree-of-heaven (*Alianthus altissima*) is a fast-growing tree from Asia that has spread throughout the United States. It produces abundant wind-blown seed that can readily germinate and grow rapidly into a large tree. It can establish in the understory of mature forests, and, in the open, it can outgrow many native tree species. If you're a woodland owner and have on or adjacent to your property a tree-of-heaven that is three or more inches in diameter, you will probably find it establishing along roads, trails, and any disturbance in your woodlands (tree falls, harvested openings). This species can be aggressive and can outcompete many native species. Sustainable woodland management requires:

1) scouting for mature trees on or around your property,
2) killing the mature trees if they are on your property (and asking neighbors to kill theirs), and
3) killing small trees as they establish themselves in your woodlands.

Tree-of-heaven
Photo courtesy: Above: Great Smoky Mountains National Park Resource Management Archives, USDI National Park Service, www.forestryimages.org
Right: Tree-of-heaven bark. Paul Wray, Iowa State University, www.foretryimages.org

Identification

Tree-of-heaven is a gray, smooth-barked tree that can reach 80 feet tall. It has pinnately compound leaves and produces yellow or pinkish flower clusters that mature to form dry gray or brown clusters of winged seed. If you break a young twig, it has a pungent odor many find unpleasant. All professional foresters can identify tree-of-heaven, or you may contact the UK Forestry Extension Department for tree identification services at 859.257.7597 (forestry.extension@uky.edu).

Removal

In most woodlands, this tree species occurs as scattered trees or in small groups. In both cases, getting rid of tree-of-heaven requires the use of individual tree treatments. Because tree-of-heaven has a nasty habit of producing root suckers (small trees arising from roots), simply cutting trees or pulling them up (unless they are very small) may not be completely effective. Because of this danger, herbicides are generally necessary to ensure complete control. Three techniques are commonly used for individual tree removal: foliar spray for small trees and for larger trees, cut stump and hack and squirt. Table 1 shows the herbicides that can be used for control and how they can be applied.

Small Trees (less than head high)

Foliar Spray: mid-June to mid-September. Use recommended rates for foliar application (e.g., glyphosate at dilute solutions of 1 to 2% active ingredient, wetting leaf surfaces until runoff). Backpack sprayers with cone nozzles are commonly used for this application.

Large Trees

Cut Stump Treatment: all year except mid-February through April. Cut the tree and spray any of the listed herbicides at or near full-strength or as the label specifies for cut stump treatment. Weaker

Tree-of-heaven
Photo courtesy: Chuck Bargeron, University of Georgia, www.forestryimages.org

Tree-of-Heaven

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foliar solutions cannot be used. Typically herbicides are applied with a backpack sprayer or handheld spray bottle. The stumps should be treated when they are fresh (within a couple of hours of cutting). Waiting will reduce herbicide effectiveness for many herbicides. On trees smaller than 10 inches in diameter, spray the entire stump. On larger trees, treat the outside three inches of the stump. If you cut the tree and do not spray the herbicide when the stump is fresh, you can soak the stump with Garlon 4 (see label instructions for full basal application). However, leaving the stumps untreated for long periods of time increases the risk of root suckering and is not recommended.

Hack and Squirt: all year *except* mid-February to April. All herbicides listed can be used. Use a hatchet to cut slits around the stem through the bark into the wood (see label directions for spacing of slits). Using a handheld spray bottle, apply strong concentrations of herbicide (see label) directly into each slit. You may see on labels a reference to tree injection or the use of a "Hypo-Hatchet." These techniques are similar to the hack and squirt.

Watch to see that treated trees die over the course of a growing season. Reapply if necessary the next year. Check your woods for new seedlings, especially after a disturbance occurs, and foliar spray or pull up any newly established seedlings. If you have any questions, contact your local professional forester.

Hack and squirt herbicide treatment
Photo by Jeff Stringer

Table 1. List of some commonly used herbicides for tree-of-heaven control.[1]

Active Ingredient	Common Brands	Treatment	Cautions
glyphosate	Roundup, Accord, and others[2]	foliar, cut stump (fresh), hack and squirt	• Make sure that you follow label directions. • Mix and apply the chemical in the proper manner and at the recommended times. • Protect your eyes during mixing and application (where necessary) and check label for personal protective equipment and other precautions.
triclopyr-amine	Garlon 3a	foliar, cut stump (fresh), hack an squirt	
triclopyr-ester	Garlon 4	basal bark, cut stump (fresh and dry)	
Picloram/2,4-D	Pathway	foliar, cut stump (fresh), hack and squirt	
imazapyr	Arsenal	foliar, cut stump (fresh), hack and squirt	

[1] Other herbicide brands can be used for tree-of-heaven control. The herbicides that are listed are those that have widespread and traditional use.
[2] There are currently a large number of brand names for glyphosate herbicides. Many are for use in fields or fencerows. Few such as Accord are labeled for use inside a forest (see Kentucky Woodland Magazine July 2006 issue for more information on glyphosate herbicides).

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