

Target Invasive Species

Tree-of-heaven *Ailanthus altissima*



Description

Tree-of-heaven is a deciduous tree that can reach 90 feet tall. The bark is gray and relatively smooth. Leaves are alternate and compound with 11-30 lance-shaped leaflets. Most leaflets have 1-3 coarse teeth at the base of the leaflet. Leaves can be distinguished from sumac (*Rhus hirta*) by 1-4 small round glands on the leaflet's underside. When the leaves are crushed, they give off a distinctive ill scent of burnt peanut butter. Trees

bloom in late spring, forming small green flowers at the ends of new shoots. Flowers develop into clusters of samaras, papery winged fruits with a flattened seed in the center. The seeds are wind-dispersed. While seedlings are highly shade intolerant, saplings appear to be more tolerant of varying light conditions. Tree-of-heaven can also reproduce asexually by sprouting from stumps or roots.

Habitat

Tree-of-heaven readily establishes on disturbed sites including vacant lots, roadsides, and railroad embankments. It can tolerate poor soils, drought and rocky conditions. It can establish in old growth forests when disturbances caused by storms or insect outbreaks create gaps in the canopy. In New Jersey, it is frequent in floodplain forests and in woods occurring on trap rock or diabase.



Threats

Tree-of-heaven can disperse rapidly due to its prolific seed production. A single tree can produce 325,000 seeds in a year. It can out-compete indigenous plants for underground resources with its long taproot. Trees keep native vegetation from establishing by producing a toxin that accumulates in the soil. Because of its rapid growth, it quickly and significantly alters plant community structure and

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disrupts the process of natural plant succession.



Control

Seedlings can be hand-pulled before the taproot becomes established. Cutting trees repeatedly over several years will stress the trees and prevent seed production. Herbicides are especially effective when applied late in the growing season because the herbicide is then taken into the root system.

The hack-and-squirt or injection method is very effective and minimizes sprouting and suckering when applied during the summer. This method requires first making downward-angled cuts into the sapwood around the tree trunk. With spray bottle squirt a straight (100%) concentration of a water-soluble triclopyr product (e.g., Garlon® 3A) into the cuts within a minute or two, applying 1-2

milliliters into each cut (typically 1-2 squirts of a trigger squirt bottle) so that the bottom of the cut is covered, but liquid doesn't run out of it. Space the cuts so that about 1-2 inches of uncut living tissue remains between them. A continuous line of cuts around the trunk would likely cause the tree to go into emergency response mode and react by producing basal sprouts and root suckers. For this reason, girdling or frilling (girdling followed by herbicide) is not recommended. This method can be used with trees of any size, though it is most productive with stems over 2 inches in diameter. Monitor the treatment area and be prepared to follow-up with a foliar application the next year to control any basal sprouts or root suckers that might emerge. Glyphosate products have sometimes been recommended for control of ailanthus using this method, but several field trials have shown consistently poor long-term control of basal sprouts and root suckers at any time of year. Other herbicides which have shown to be effective for hack-and-squirt control of ailanthus during the growing season are dicamba (e.g., Banvel®, Vanquish®), imazapyr (e.g., Arsenal® A.C., Chopper®), and 2,4-D + picloram (e.g., Pathway®). Dicamba is particularly effective in October. Herbicides should be used in accordance with New Jersey Dept. of Environmental Protection guidelines.

Sources: An Overview of Nonindigenous Plant Species in New Jersey, New Jersey Dept. of Environmental Protection Natural and Historic Resources Group, Parks and Forestry; www.state.nj.us/parksandforests/natural/invasivereport.pdf

Weeds Gone Wild: Alien Plant Invaders of Natural Areas, Plant Conservation Alliance's Plant Working Group. www.nps.gov/plants/alien/.

Photographs courtesy of James H. Miller, USDA Forest Service, United States., <http://www.invasive.org/>.

Drawing in Britton, N.L., and A. Brown. 1913. Illustrated flora of the northern states and Canada. Vol. 2: 446. Courtesy of Kentucky Native Plant Society. Scanned by Omnitek Inc, <http://plants.usda.gov/>.

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