

Vermont Invasive Exotic Plant Fact Sheet

Tree-of-Heaven *Ailanthus altissima* (Miller) Swingle. Quassia Family Vermont Class B Noxious Weed

Description: Tree-of-heaven is a small to medium sized tree with smooth gray bark in the mostly tropical Simaroubaceae family. Leaves are compound, alternate, oddpinnate, with 11-25 lanceolate leaflets. Tree-of-heaven leaves may be confused with those of sumac, elderberry, or black walnut, but the leaves of tree-of-heaven can be distinguished by glands that occur in the tips of rounded teeth at the base of each leaflet. Flowers occur in panicles at the ends of branches; male flowers produce a strong odor similar to popcorn or "burnt peanut butter." The leaves when crushed also produce this distinctive, offensive odor. Seeds are centered in a papery sheath called a samara. The samaras are slightly twisted or curled, and twirl as they fall to the ground. They can be borne on the wind great distances from the parent plant.



(Gleason, Henry A. 1952. *New Britton and Brown Illustrated Flora of the Northeastern United States and Adjacent Canada*, Hofner Press, New York. Vol. 2.)

Habitat: Tree-of-heaven establishes itself readily on disturbed sites. These include vacant urban lots, railroad embankments, highway medians, fence rows and roadsides. In naturally forested areas, disturbance created by severe storms or insect infestations can open the way for tree-of-heaven infestations. It can also spread rapidly from cultivation by basal suckers to form island-like colonies. Although individual stems are short-lived, the colony can persist indefinitely.

Threats: One tree-of-heaven can produce up to 350,000 seeds in a year. Seedlings establish a taproot three months from germination enabling them to quickly outrace many native plant species in competition for sunlight and space. Tree-of-heaven also produces a toxin in its bark and leaves. As these accumulate in the soil, the toxin inhibits the growth of other plants. The root system is capable of doing damage to sewers and foundations. These factors combine to make tree-of-heaven a very aggressive invasive plant able to displace native tree and herb species.

Distribution: Tree-of-heaven is native to a region extending from China south to Australia. It was imported into the United States in 1784 by a Philadelphia gardener. It's establishment in the western states was by Chinese immigrants who use it for medicinal purposes. Due to its rapid growth and prolific seed production, it quickly escaped cultivation.

Control: Tree-of-heaven is very difficult to remove once it has established a taproot. It has persisted in certain areas despite cutting, burning and herbiciding. Therefore, seedlings should be removed by hand as early as possible, preferably when the soil is moist to insure removal of the entire taproot. Larger plants should be cut; two cuttings a year may be necessary, once in the early growing season and once in the late growing season. Initially, this will not

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Tree-of-Heaven

Quassia Family (*Simaroubaceae*)

Control continued: kill the plant; it will vigorously resprout from the roots, but seed production will be prevented and the plants will be lowered in stature. If continued over a period of several years, cutting during the growing season stresses the plants and may eventually kill them.

A glyphosate herbicide, either sprayed onto the leaves or painted onto a freshly cut stump will kill the plant. However, to ensure the herbicide gets into the root system, it is best to apply this herbicide in the late growing season while the plant is translocating nutrients to its roots. Stump application of herbicides, or girdling with application of herbicides to the cut, always results in a dead stump with an army of sprouts from the roots. Roundup, applied as a foliar spray, can then be effective in finishing the job if you have time and diligence to return to the site and spray the new shoots; this seems to kill the whole root system. This method might be seen as a way of "making the tree short enough" for foliar spray of Roundup. Glyphosate herbicides are recommended because they are biodegradable, breaking down into harmless components on contact with the soil. However, glyphosate is a nonselective, systemic herbicide and will affect all green vegetation. To be safe and effective, herbicide use requires careful knowledge of the chemicals, appropriate concentrations, and the effective method and timing of their application. Consult a natural resource specialist or agricultural extension agent for more information before attempting herbicide control of tree-of-heaven.

References:

Hoshovsky, M. 1988. *Element Stewardship Abstract: Ailanthus altissima*. The Nature Conservancy. <http://tncweeds.ucdavis.edu/esadocs/documnts/ailaalt.rtf>

*This fact sheet was adapted by permission from Virginia Department of Conservation, Richmond, VA and Recreation and the Virginia Native Plant Society, Annandale, VA.



For more information about Vermont's invasive exotic plant species or if you would like to know how you can help, please contact:

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