

INVADER OF THE MONTH

TREE of HEAVEN, *Ailanthus altissima*

Identification

Tree of heaven (*Ailanthus altissima*) is a rapidly growing dioecious tree that can reach over 18.3 m (60 ft.) in height. The leaves are 0.3-0.9 m (1-3 ft.) long. Each leaf is comprised of 11-25 ovate-lanceolate leaflets which are each 7.6-12.7 cm (3-5 in.) long. They are truncate at the base and are acute or acuminate at the apex. There are usually one or more coarse teeth at the base of the leaflet, and each of these teeth has a large gland beneath it. The bark of this tree is extremely smooth and pale gray in color.

The inflorescence is pyramidal in shape and is 10.0-20.3 cm (4-8 in.) long with greenish to greenish-yellow flowers [5 mm (0.2 in.)] that appear in late spring. The plants are dioecious, and the staminate flowers have an unpleasant scent. The broken twigs also have this odor. The fruits, called samaras, appear in September to October on the female trees, have a yellow-green to orange-red color that changes to brown in the winter, are 5 cm (2 in.) long and twisted in shape.



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Male Flowers



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Bark and branch pattern



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Female flowers with fruit



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Fruit in September



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Ailanthus (top) versus native *Rhus*, sumac (bottom)

Why is it a problem?

Tree of heaven, because of its rapid growth, can easily displace and out compete the native vegetation. It also produces toxins that can prevent the establishment of other plant species. The root system of the

plant can cause damage to sewers and foundations. The tree, when cut down can produce suckers and stump sprouts. It also is able to disperse quite effectively via its seeds since a single tree can produce 325,000 seeds a year to be dispersed by the wind. The sap of this species may cause myocarditis (inflammation of the heart tissue) if it is internalized (Bisognano *et al.* 2005).

Where is it?

The native location of tree of heaven is central China. It is present in Canada. In the United States, it is found in all states except Alaska, Idaho, Michigan, Wyoming, Nevada, North Dakota, South Dakota, and Minnesota. This tree has been reported in all northeastern states.

Prevention and/or Management

A. Hand pulling:

Young seedlings of tree of heaven can be pulled by hand, but they will develop a significant taproot within 3 months and then will become very difficult to remove. Thus, plants should be pulled as soon as they are large enough to grasp. Seedlings are best pulled after a rain when the soil is loose. The entire root must be removed since broken fragments may re-sprout.

B. Cutting:

Larger trees may be cut at ground level with power or manual saws. Cutting is most effective when trees have begun to flower to prevent seed production. Because tree of heaven spreads by suckering, re-sprouts are common after treatment. Two cuttings per year may be necessary, one early in the growing season and one late in the growing season. Although plants may not be killed after cutting, seed production will be inhibited and vigor will be reduced. If continued for several years, plants will be severely stressed by cutting and will eventually be killed.

C. Girdling:

Use this approach for large trees: Using a hand-axe, make a cut through the bark approximately 15 cm (6 in) above the ground, and cut completely around the trunk. Be sure that the cut goes well into or below the cambium layer. This method will kill the top of the tree, but re-sprouts are common and may require follow-up treatments for several years.

D. Herbicides:

Tree of heaven tends to be more susceptible to triclopyr than to glyphosate, especially prior to late summer. Where possible, foliar sprays are effective once the leaves are fully expanded. For larger trees, three approaches are possible: 1) Girdle the tree (see description above) with an axe, and apply undiluted triclopyr in the cut around the trunk; 2) Cut down tree and apply undiluted triclopyr into the freshly cut surfaces of the stump to prevent re-sprouting, or 3) Cut down tree and spray re-sprouts before they get too tall to spray.

BRUSH-B-GON [triclopyr (8%)]: Foliar spray: 4 fl. oz./gal

Cut-stump treatment: Undiluted

ROUNDUP [glyphosate (41%)]: Foliar spray: 2.5 fl. oz./gal

Cut-stump treatment: Diluted with equal part water (1:1)

Compiled by Rose Hiskes (rose.hiskes@po.state.ct.us), The Connecticut Agricultural Experiment Station from resources available on the Invasive Plant Atlas of New England (www.ipane.org) and the Connecticut Invasive Plant Working Group (www.hort.uconn.edu/cipwg) websites.