



INVASIVE PLANTS OF OHIO

Fact Sheet 17

Tree-of-Heaven

Ailanthus altissima



DESCRIPTION:

This rapidly growing non-native, dioecious tree can reach a height of 80 feet. Bark is gray to brownish-gray, turning nearly black with age. Twigs are light chestnut-brown. Leaves are pinnately compound with 11-41 leaflets. Each leaflet has an entire margin except for one or more glandular teeth at the base of the leaflet. Large terminal flower clusters are pale yellow to greenish. Flat, twisted, winged fruits each containing a single central seed are produced on

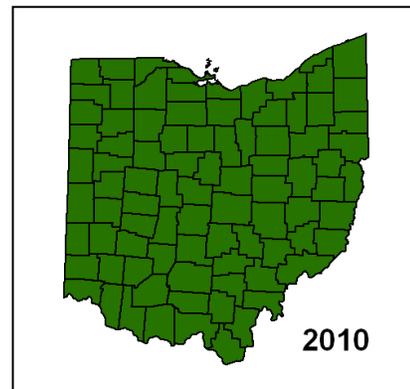
female trees in late summer to early fall and may remain on the trees for long periods of time. All parts of the tree, especially the leaves and flowers, have a “burned nut” or “rancid peanut butter” odor. Young plants can be confused with sumac and black walnut, which do not have the unpleasant odor.

Tree-of-Heaven was introduced from China as a garden plant in Philadelphia in 1784. By the mid-1800s, it was well-established as a nursery tree because of its ability to grow nearly anywhere. During the gold rush, Chinese immigrants introduced it to California as a medicinal plant. Tree-of-Heaven is found throughout Ohio and poses the greatest threat to younger, successional or disturbed forest areas.

HABITAT:

Tree-of-Heaven thrives in disturbed soils, urban and natural areas, and in any habitat except wetlands. It can be found in many urban areas, including alleys, sidewalks, parking lots, and streets. In natural areas, Tree-of-Heaven invades forest edges, successional forests, tree-fall gaps in mature woods, dunes, and old fields. It can be a major invader following timber harvests and prescribed burns.

Map based on records as of 2010.



INVASIVE CHARACTERISTICS:

One mature female tree can produce as many as 350,000 wind-dispersed seeds per year. These seeds are easily airborne or can be transported by water and birds. Germination is high. Mature trees also reproduce extensively by root suckers and



Seedlings on forest floor

sprouts from cut stumps. Sapling growth can reach 3-4 feet a year, outgrowing nearly all native trees and out-competing natives for light and nutrients. The roots give off the toxin, Ailanthone, which inhibits the growth of other plants. It is somewhat shade-tolerant and grows quickly when taking advantage of gaps in the forest canopy caused by windfalls, logging, and defoliation due to insect pests.

CONTROL:

Mechanical: Young seedlings may be pulled or dug up, preferably when soil is moist. Care must be taken to remove the entire plant including all roots and fragments, as these will typically re-grow. Cutting alone is usually counter-productive because *Ailanthus* responds by producing large numbers of stump sprouts and root suckers. Cutting large seed-producing female trees may at least temporarily reduce the spread of fruits. However, in general, mechanical control is not recommended for this species.

Chemical: Selective herbicide application is the most effective control method for woody invasive plants, especially those that have extensive root systems like Tree-of-Heaven. Herbicides can be applied to the foliage (low-volume or high-volume during the growing season), cut stems, hack-and-squirt, or to the bark of the base of the stems/trunks. Systemic herbicides such as Roundup, Glypro, AquaNeat, Garlon 3A, Razor, and Escort are effective for foliar treatment (particularly Escort), while Garlon 4, Stalker, Pathfinder, and Pathway can be used for cut-stem, hack-and-squirt, or basal bark treatment. To be most effective, most herbicides require a penetrating or sticking agent. It is relatively easy to kill the above-ground portion of *Ailanthus* trees; however, a residual herbicide is needed to kill the extensive root system. The basal bark and hack-and-squirt methods work best on larger stems during the fall and late winter/early spring. The cut stump method is useful in areas where the trees need to be removed from the site. However, felling trees is usually less effective in killing the root system, slower, and more labor intensive.

Biological: *Ailanthus* webworm (*Atteva punctella*) has been found in southwest Ohio, feeding exclusively on Tree-of-Heaven. This moth has several overlapping generations each season and may be an effective biological control. Several fungal pathogens are being investigated as potential biological controls for *Ailanthus*.

Credits and additional information:

Plant Conservation Alliance-Alien Plant Working Group
Ohio Department of Natural Resources, www.ohiodnr.gov
The Nature Conservancy, Ohio Chapter
The Ohio State University Extension, <http://woodlandstewards.osu.edu>
OIPC website, www.oipc.info