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Plant Invaders of Mid-Atlantic Natural Areas

Swearingen, J., K. Reshetiloff, B. Slattery, and S. Zwicker. 2002. Plant Invaders of Mid-Atlantic Natural Areas. National Park Service and U.S. Fish & Wildlife Service, 82 pp.



Paul Wray

Tree of Heaven

Ailanthus altissima

Origin: Central China

Background

Introduced by a Pennsylvania gardener in 1748 and into California by immigrants during the gold rush years, Tree of Heaven, also called stinking sumac, was available commercially by 1840.

Distribution and Ecological Threat

Widely distributed across the United States, Tree of Heaven occurs in 42 states, from Maine to Florida and west to California. It is an extremely common tree in urban areas where it can cause damage to sewers and structures but poses a greater environmental threat because of its invasiveness in cultivated fields and natural habitats. A prolific seeder, Tree of Heaven grows vigorously, establishing dense stands that displace native plants. It produces chemicals that kill or prevent other plants from growing in its vicinity.

Description and Biology

- Plant: a rapidly growing, deciduous tree in the mostly tropical quassia family (Simaroubaceae). Mature trees can reach 80 feet or more in height. *Ailanthus* has smooth stems with pale gray bark, and twigs that are light chestnut brown, especially in the dormant season. Tree of Heaven is dioecious, meaning plants are either male or female. The wood of *Ailanthus* is soft, weak, coarse-grained and creamy white to light brown in color. All parts of the tree, especially the flowers, have a strong, offensive odor, which some have likened to cat urine or rotting peanuts or cashews.
- Leaves: large compound leaves, 1 to 4 feet in length, composed of 11 to 25 smaller leaflets and alternate along the stems. Each leaflet has one to several glandular teeth near the base.
- Flowers, fruits and seeds: large clusters of small greenish flowers are produced during June; in the late summer, female trees produce flat, twisted, papery fruits called samaras that may remain on the trees for long periods of time; an individual tree can produce up to 325,000 seeds per year.
- Spreads: reproduces by seed and by vigorous re-sprouting, especially in response to injury such as cutting or breaking.
- Look-alikes: staghorn sumac (*Rhus typhina*), ash (*Fraxinus* species) and black walnut (*Juglans nigra*). The sumac has fuzzy, reddish-brown leaves and stems. All ash species have opposite leaves. Black walnut leaves are toothed, large green fruits fall from the tree.



Britt Slattery, USFWS

Prevention and Control

Correct identification of Tree of Heaven is essential. Native shrubs are often confused with it. Elimination of *Ailanthus* requires diligence, due to its abundant seed production, high seed germination rate and vigorous vegetative reproduction. Targeting large female trees for control will help reduce spread by seed. 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 almost certainly re-grow. Extensive research has been conducted on herbicidal methods of control for Tree of Heaven and include leaf, bark and cut stem applications.

Native Alternatives

box elder (*Acer negundo*)



Britt Slattery, USFWS

smooth sumac (*Rhus glabra*)



Chris Miller, NRCS

black walnut (*Juglans nigra*)



Dennis Woodland, UWI

green or white ash
(*Fraxinus pennsylvanica* or *americana*)



Kitty Kohout, UWI

fringetree (*Chionanthus virginicus*)

staghorn sumac (*Rhus typhina*)



R. Harrison Wiegand



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[[Home](#)] [[Contents](#)]



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