

Invasive Plants in Pennsylvania

Tree-of-heaven

Ailanthus altissima



Leslie Mehrhoff, Univ. of Connecticut

Background:

Also known as Chinese sumac, stinking sumac and tree of hell, this tree is native to China. It was brought to Philadelphia in 1784 by an amateur gardener. By 1840 it was commonly available from nurseries. Ailanthus is the subject of the well known book, "A Tree Grows in Brooklyn," by Betty Smith.

Range:

Tree of heaven is very common in the northeast and Midwest, through parts of the southeast, southwest and west coast.



Kelly Sitch, DCNR - BOF

Description:

This rapidly growing tree can reach a height of 80 feet, with up to a six-foot diameter trunk. Leaves are pinnately compound with 10 to 41 leaflets with smooth leaf margins. When crushed, the leaves and other plant parts have a rancid smell like cat urine or burnt peanut butter.

Flowering occurs in early summer, when large clusters of yellowish flowers develop above the leaves. Fruit produced on the female trees are tan to reddish, single winged, papery seeds, called samaras. They may remain on the tree throughout late fall.

Habitat:

Ailanthus is extremely tolerant of poor soils and will even grow through cracks in pavement. Trees are not shade tolerant. They will quickly colonize forest edges, fields and roadsides.

Ecological Threat:

This tree produces chemicals in its roots that prevent the establishment of other plant species nearby. Its fast growth limits habitat for other species. Its root system may be extensive and has been known to cause damage to sewer lines and building foundations.

Biology and Spread:

Tree of heaven spreads by hundreds of thousands of seeds per tree and through vegetative sprouting. A cut or injured ailanthus tree may send up dozens of root suckers and resprouts, creating large clonal colonies.

Look-A-Likes:

The native trees most likely to be confused with ailanthus are the sumacs (*Rhus* spp.). One way to tell them apart is the small glands on the underside of ailanthus leaves (see photo below). Staghorn sumac leaves do not have this gland, but have toothed leaf margins, while ailanthus' leaf edges are smooth. Sumac fruits are fuzzy and red.



James Miller, USDA Forest Service

Young ailanthus may also be confused with black walnut (*Juglans nigra*) because of the compound leaves and shield-shaped leaf scars. However, the flowers, seeds and smell of ailanthus should give it away.



Staghorn Sumac

John Cardina, The Ohio State Univ.

Tree-of-heaven (*Ailanthus altissima*)



Tree-of-heaven sprout (Photo by Brett Pifer, DCNR - BOF)



Tree-of-heaven in flower.

Tree-of-heaven (*Ailanthus altissima*)



Tree-of-heaven seeds (Photo by Kelly Sitch)

Tree-of-heaven Treatment Guidance

Unless the seedling is extremely small (less than 6-8 inches tall), cutting or breaking of *Ailanthus* stems should **not** be considered an effective treatment for an infestation.

Herbicide applications should take place from July 1st until *Ailanthus* leaves turn colors in the fall. One potential treatment method is basal bark application of triclopyr and oil (pre-mixed sold as Pathfinder II).

Hack and squirt can also be effective, given that each stem is not entirely girdled or damaged (a small portion should be left intact) while treating.

A native biocontrol measure developed from a *Verticillium* fungus is currently being field tested and may soon be available. Initial results indicate that this control is extremely effective at controlling tree-of-heaven.