Invasive Plants in Pennsylvania

Tree of Heaven

Ailanthus altissima

Photo: Jessica Sprajcar, DCNR

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.

pennsylvania
DEPARTMENT OF CONSERVATION AND NATURAL RESOURCES
www.dcnr.state.pa.us

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.

Photo: Chuck Bargeron, U. Of Georgia, www.invasive.org

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.

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.

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.

Photo: Leslie Mehrhoff, U. of Connecticut, www.invasive.org

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.

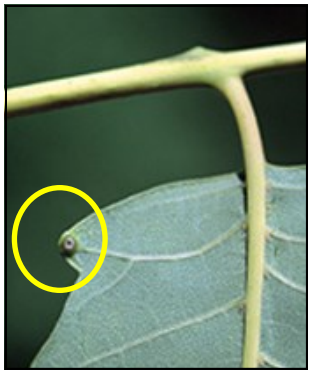

Photo: James Miller, USDA Forest Service, www.invasive.org

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.

Photo: John Cardina, The Ohio State University, www.forestryimages.org

How to Control this Species:

Elimination of this species is difficult and time consuming, due to its abundant seed, high germination rate, and frequent root sprouts.

Manual and Mechanical

While young seedlings could be pulled or dug up, the chance of getting all root fragments is difficult and can lead to re-sprouts. Seedlings can be confused with root suckers, which would be nearly impossible to remove effectively by hand.

Cutting is not recommended, as the trees will send up large numbers of root sprouts and suckers, creating a bigger problem than before.

Chemical

The most effective way to treat ailanthus is with herbicides. Foliar application of triclopyr or glyphosate, mixed with water and a non-ionic surfactant, is effective on smaller trees when applied between June and late August.

For larger trees, application of triclopyr or glyphosate with the basal bark, hack and squirt, or injection should work effectively. Cut-stump herbicide application, however, may encourage root suckering. Application rates may vary—see the references below for more specific information. Follow-up monitoring and treatment are very important. Regardless of the control method used, treated areas should be checked one or more times a year.

References:

Plant Conservation Alliance's Least Wanted List:
http://www.nps.gov/plants/alien/fact/aial1.htm

Center for Invasive Species and Ecosystem Health:
http://www.invasive.org/browse/subinfo.cfm?sub=3003

Virginia Cooperative Extension:
http://pubs.ext.vt.edu/420/420-322/420-322_pdf.pdf

For More Information:

Penn State University Vegetation Management Publications:
http://horticulture.psu.edu/research/labs/vegetative-management/publications