

Scientific Name: *Ailanthus altissima*

Common Name: Tree-of-Heaven

Updated: 5/5/2016

A. Priority: A

B. Description – Tree-of-Heaven is native to a region extending from China south to Australia and was imported to the United States in 1784 by a Philadelphia gardener. It is a small to medium-sized tree with smooth, gray bark that can achieve a maximum height of up to 100 feet. Leaves are alternate along the stem and are compound, composed of 11-40 leaflets oppositely arranged along the leaf stem with a terminal leaflet. Each leaflet is two to five inches long, lance-shaped, with a pointed tip and blunt base. Most leaflets have one to three coarse teeth near their base. When crushed, the leaves produce a distinctive, odor that has been described as scorched peanut butter.

The tree flowers in July and August, with flowers occurring in panicles (branched flower cluster) at the ends of the branches. Each greenish-yellow flower has five sepals and petals. Seed production is enormous, up to 300,000 seeds per tree on mature trees; the seeds are encased in a distinctive papery sheath called a samara. The samaras are slightly twisted or curled and can be carried for considerable distances by the wind.

C. Damage and threats – Tree-of-Heaven readily establishes on disturbed sites such as vacant lots, railroad embankments, highway medians, fence rows, and roadsides. In forested areas, canopy gaps can open the way for the invasion by tree-of-heaven.

It is an aggressive competitor that propagates by both seeds and underground runners, and once established, it can grow several feet per year. Seedlings establish a taproot three months from germination allowing this plant to outcompete most native plants for sunlight and space. Tree-of-heaven also produces a toxin that can accumulate in the soil and inhibit the growth of other plants, which can allow it to form dense monocultures.

D. Management Options

Mechanical Control: Tree-of-Heaven can be controlled but not killed with mechanical controls, including pulling, stumping, or periodic mowing. Mechanical control is not recommended, as the trees will vigorously re-sprout unless the entire root system is removed. Cutting will not kill the shrubs and will stimulate extensive re-sprouting from the roots.

Chemical Control: Use of a systematic herbicide is the best option to control Tree-of-Heaven. We recommend using aquatic formulations of herbicides in this region to limit potentially unwanted effects to the surrounding environment. More details provided in the management techniques below.

- a. Foliar Spray** – This method involves spraying a dilute herbicide directly onto the plants leaves. Application needs to occur when foliage is present, sometime between full leaf and the onset of fall for full effectiveness. Caution should be

taken when applying herbicide with this method as non-target plants can easily be killed by drift or overspray. Application should cover at least 80% of the leaves. To treat *Ailanthus*, use a 2-4% solution of aquatic triclopyr in water with a 0.5% non-ionic surfactant and apply directly to leaves until just before runoff. Air temperatures must be above 65 degrees and winds should be lower than 5 mph.

- b. Cut Stump** – This method involves cutting the stump as close to the ground as possible (no more than 5in.) and immediately applying a systematic herbicide. It is best to use this method between summer and fall, but it may be used as long as the ground is not frozen. To treat using this method, apply a 50% formulation of aquatic glyphosate or triclopyr directly to the cut stump.
- c. Hack and Squirt** - Use an ax to make downward-angled cuts (45 degrees) into sapwood around the tree trunk as close to the ground as possible. Immediately squirt 1-2oz of a 50-60% solution of aquatic triclopyr or glyphosate into the cuts so that the bottom of the cut is covered, but liquid does not run out. Space the cuts so that about 1 to 2 inches of uncut living tissue remains between the cuts since a continuous line may cause an emergency response in the plant resulting in basal sprouts and root suckers.
- d. Basal Bark** - This method should be used judiciously since it takes a lot of chemical and can result in overspray. It has been used successfully in situations where no other technique is easy such as cliff faces or other exposed sites. Apply a solution of 25 percent triclopyr and 75 percent mineral oil to the basal parts of the tree to a height of 12 to 16 inches from the ground during the late winter/early spring or summer. All treatments should be followed up the next year to monitor and control basal sprouts and root suckers.

E. Recommended Management Strategy

- a.** We recommend treating all mature species first (>5in DBH) via the hack and squirt method prior to seed onset in July. This will ensure that seed production will not occur in the current year. Additionally, some smaller root suckers may also die in the process effectively limiting the amount of foliar spray needed for the next phase of treatment.
- b.** Secondly, foliar application of all resprouts and smaller saplings should occur. Ideally, this should be conducted in the late spring following the hack and squirt treatment. By conducting this treatment second, you are insuring that if any sucker sprouts do come up, you are treating them. Additional Hack and squirt should also be conducted at this time on any trees that were missed or did not die from the previous treatment. Depending on the size of the saplings, cut stump or basal bark applications may need to occur on species that are too tall to effectively foliar spray.
- c.** The process described in b above should be repeated at least once each year for three years to ensure control.

F. Additional and Updated Information

For additional information including photographs and the most up to date control recommendations please visit www.wachng.org/Plants.