

Section III: Invasive Plant Profiles

Tree of Heaven - *Ailanthus altissima*

Identification

Tree of heaven is a rapidly growing small tree but can reach up to 80 feet in height and 6 feet in diameter. It has pinnately compound leaves that are 1-4 feet in length with 10-41 leaflets (Figure 22). Tree of heaven resembles the sumacs and hickories, but is easily recognized by the glandular, notched base on each leaflet (Figure 23). The thick twigs are light brown in color with large lenticels, and have large, heart-shaped leaf scars. Young twigs emit a strong odor, somewhat like peanut butter, when broken. The small yellow flowers occur in terminal clusters on female plants (Figure 24). The winged fruit can be from yellow to brilliant orange in color, turning dry and brown when ripe (Figure 25). Thickets of tree of heaven tend to be circular in shape.

Habitat and Distribution

Tree of heaven, native to Asia, was first introduced into America in 1748 by a Pennsylvania gardener. It was widely planted in cities because of its ability to grow in adverse conditions. Quickly escaping cultivation, tree of heaven has spread throughout the eastern United States, with the exception of the coastal plain areas.

Tree of heaven is extremely tolerant of poor soil conditions and has been known to grow even in cement cracks. Acidic, compacted, or nutrient poor conditions do not inhibit colonization. It commonly invades urban areas, roadsides, rights-of-way, fencerows, forest edges, savannas, open forests, canopy gaps, and other disturbed areas (Figure 26). It is very drought and flood tolerant but cannot grow in shaded conditions. The light, winged seeds can travel distances of 300 feet or more. Most reproduction is asexual, via cloning.

Impact

The ability to reproduce both by seeds and by sprouts allows tree of heaven to spread and quickly dominate disturbed areas. Dense clonal thickets displace native species and can rapidly take over fields and meadows, restricting light to the understory. Tree of heaven has alleopathic properties which aids it in displacing other species.



Figure 22



Figure 23



Figure 24



Figure 25

Response to Disturbance

Promoted by high light environments
 Promoted by soil disturbance
 Re-sprouts vigorously after being cut
 Establishes easily after disturbance

Reproduction

Primary means – Seed and clonal growth
 Mature after 10 years from seed
 Mature within two years from sprout
 Abundant seed production (greater than
 300,000/plant)
 Insect pollinated
 No significant seed banking
 Dioecious - male and female flowers on
 separate plants

Seed Dispersal

Wind blown seeds

Growth Habits

Tree
 Shade intolerant (although it can persist
 somewhat until disturbance)
 Flood tolerant
 Poor soil tolerant
 Drought tolerant
 Prefers disturbed areas
 Cold hardy
 Alleopathic

Response to Prescribed Fire

Not a control option
 Not a fire hazard
 Re-sprout from roots after fire



Figure 26

Control Recommendations

Large trees. Make stem injections and apply Garlon 3A, Pathfinder II, or Arsenal AC in dilutions to cut spacings specified on the herbicide label (midsummer best, late winter somewhat less effective). For felled trees, apply these herbicides to stem and stump tops immediately after cutting.

Saplings. Apply Garlon 4 as a 20-percent solution in commercially available basal oil, vegetable oil, or crop oil (2.5 quarts per 3-gallon mix) with a penetrant (check with herbicide distributor) to young bark as a basal spray.

Seedlings and saplings. Thoroughly wet all leaves with one of the following herbicides in water with a surfactant (July to October): Arsenal AC as a 1-percent solution (4 ounces per 3-gallon mix), Krenite S as a 15-percent solution (3 pints per 3-gallon mix), Garlon 4 as a 2-percent solution (8 ounces per 3-gallon mix), or Escort XP at 1 ounce per acre. (See **Herbicide Quick Reference page 40-42**)