



Columbia Gorge CWMA Best Management Practices

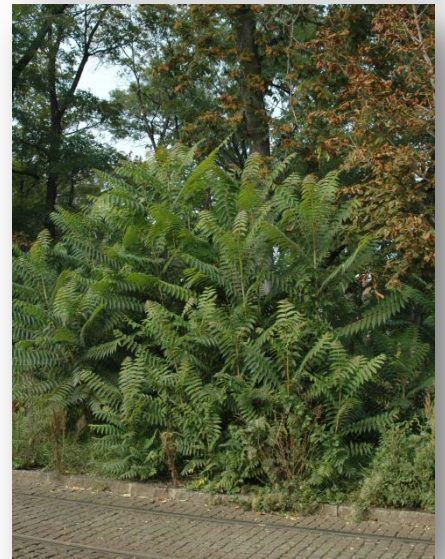
TREE OF HEAVEN

Ailanthus altissima
Simaroubaceae Family

INTRODUCTION

Identification Tips

- Tree of heaven is an introduced deciduous tree species growing up to 80 feet tall. It produces a long tap root and suckers freely when cut, making it difficult to control. Creeping roots may extend out to 50 ft in all directions.
- Plant parts have a distinct, peanut-butter or popcorn odor.
- The bark on younger stems is smooth and gray. Shallow, diamond-shaped fissures develop as it ages.
- Leaves are alternate and compound. Leaflets have mostly smooth edges with a few rounded teeth and 1-2 large glands on the leaflet margin, near the base.
- Male and female flowers form in terminal clusters on separate trees. Flower clusters may be up to 12 inches wide and are largest on male trees. Tiny individual flowers are light green to pale.
- In late summer through autumn, tree of heaven produces large clusters of papery wings (samaras), each with a single central seed. The samaras vary from greenish-yellow to red-brown and are often vibrantly colored in the fall.



Impacts

- Due to rapid growth and structural weakness, tree of heaven is considered a tree-fall hazard. Its roots damage pavement, roads, and building foundations in urban areas.
- It is allelopathic and can affect germination, growth, survival, and reproduction of other plants.
- *Ailanthus* forms dense thickets, reducing wildlife habitat, particularly in riparian areas.

Habitat & Distribution

- Tree of heaven grows in a variety of habitats and is commonly found in disturbed areas along forest edges, roadsides, fence rows, urban parks, old fields, and railroad embankments.
- It is tolerant of shade, many types of pollution, and poor soil conditions.
- It can grow in many harsh environments, including pavement cracks!

Reproduction & Spread

- This weed reproduces both by seed and vegetatively by roots and stump sprouts. New shoots can sprout up to 50 ft away from the parent tree.
- One tree can produce 325,000 seeds annually, which are then dispersed by wind and birds.
- Cut stems can form roots when left on moist ground.



CONTROL INFORMATION

Integrated Pest Management

- The preferred approach for weed control is Integrated Pest Management (IPM). IPM involves selecting from a range of possible control methods to match the management requirements of each specific site. The goal is to maximize effective control and to minimize negative environmental, economic, and recreational impacts.
- Use a multifaceted and adaptive approach. Select control methods reflecting the available time, funding, and labor of the participants, the land use goals, and the values of the community and landowners. Management will require dedication for a number of years and should allow flexibility in methods.

Planning Considerations

- Survey area for weeds, set priorities, and select the best control method(s) for the site.
- Control practices should be selected to minimize soil disturbance. Minimizing disturbance avoids creating more opportunities for weed seed germination.
- Begin work on the perimeter of the infested areas first and move inward toward the core of the infestation.
- Monitor the site and continue to treat plants that germinate from the seed bank.
- Re-vegetate treatment areas to improve ecosystem function and prevent new infestations.

Early Detection and Prevention

- Small seedlings can be pulled in moist soil. Larger infestations may require mechanical removal or the use of an appropriate herbicide.
- Dispose of cut material properly. Stem pieces can root in moist soil.

- Monitor and re-treat infestations as necessary. Ensure any existing plants do not produce and release seed.
- Prevent the spread of invasive plants by thoroughly cleaning tools, boots, and vehicles after working in or traveling through an infested area.

Manual, Mechanical, & Cultural Control

- Seedlings or small plants may be removed by hand, but once a strong root system has developed, other control methods may be required.
- A heavily shaded environment will reduce the establishment of tree of heaven.
- Avoid soil disturbance and re-vegetate disturbed areas to prevent further infestations.
- Simply cutting Tree of Heaven will not control it. A cut stump herbicide treatment (see below) will need to be utilized in order to control suckering and continued growth.

Biological Control

- There are no biological agents available at this time.

Herbicide Control

- Only apply herbicides at proper rates and for the site conditions or land usage specified on the label. **Follow all label directions** and wear recommended personal protective equipment (PPE).
- For control of large infestations, herbicide use may be effective either alone or in combination with cutting.
- Continue to monitor treatment sites areas for missed and newly-germinated. Seeds have a short dormancy and low seed-bank viability, so you should see germination rates decline quickly after the first treatment year if the seed source has been removed.
- Selective herbicides are preferred over non-selective herbicides when applying in a grassy area.
- **Minimize impacts to bees and other pollinators by controlling weeds before they flower. If possible, make herbicide applications in the morning or evening when bees are least active. Avoid spraying pollinators directly.**

Specific Herbicide Information

Herbicides are described here by the active ingredient. Many commercial formulations are available containing a specific active ingredient. References to product names are for example only. Directions for use may vary between brands.

- Use glyphosate (Roundup), triclopyr (Vastlan), or aminopyralid + triclopyr (Capstone), as a foliar spot treatment when leaves are fully emerged. Thoroughly dampen all leaves, but prevent drip and run-off.
- Cut stump treatments require a solution of triclopyr (Brushtox) or undiluted glyphosate (Roundup concentrate). Stump treatments can occur anytime, but late summer or early fall is recommended.

- For cut stump treatments, cut stems horizontally at or near ground level and immediately apply herbicide solution to cover at least 20% of the stump face.

Contractors/Licensed Applicators

- Use imazapyr (Polaris) 3% of total solution + triclopyr 20% of total solution in methylated seed oil or suitable oil for a basal ring treatment (spray a ring on the bark around the base of the tree). This solution can also be effective as a cut stump treatment.

This BMP does not constitute a formal recommendation. **When using herbicides, always consult the label.** Please refer to the Pacific Northwest Weed Management Handbook or contact your local weed authority.

Resources

<http://columbiagorgecwma.org/weed-listing/best-management-practices/tree-of-heaven/>

<http://plantscience.psu.edu/research/projects/vegetative-management/publications/roadside-vegetative-mangement-factsheets/3ailanthus-on-roadsides>

http://wric.ucdavis.edu/information/natural%20areas/wr_A/Ailanthus.pdf

http://www.fs.usda.gov/Internet/FSE_DOCUMENTS/stelprdb5410131.pdf

<http://www.nps.gov/plants/alien/fact/aial1.htm>

<http://www.nwcb.wa.gov/>