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Tree-of-Heaven *(Ailanthus altissima)*

The tree-of-heaven (*Ailanthus altissima*) is an invasive tree originating from Asia. It was first introduced to the United States in 1784 in Pennsylvania and has since spread into Connecticut. Tree-of-heaven is the primary reproductive host of the spotted lanternfly (*Lycorma delicatula*). Management of tree-of-heaven is recommended to control the spotted lanternfly.

Identification

Tree-of-heaven is a fast-growing tree that can reach 80-100 feet in height. It has pinnately compound leaves with 10-40 leaflets. The leaflets have smooth (not serrated) margins, with one or two protruding bumps at their base. The bark on larger trees is light brown to gray, resembling the skin of a cantaloupe. On small trees and stems, the bark is smooth and green. Tree-of-heaven has white flowers from late May through June. The female flowers will become fruits/seeds (samaras) which turn from green to orange in the summer. Tree-of-heaven with orange fruits can be easily identified from a distance. The flowers and crushed leaves give off an offensive odor that some describe as rotten peanut butter. Tree-of-heaven is not shade tolerant and is often found in disturbed habitat such as urban areas, roadsides, and woodland edges. It reproduces via seed or by root suckers which may create dense colonies of trees. Tree-of-heaven is allelopathic, meaning it inhibits other plants around it from growing.

Close-up of seeds (samaras). Photo: Dave Jackson

Tree-of-heaven can look similar to our native sumac and walnut trees. Tree-of-heaven leaves can be distinguished from sumac by its size, as sumac only grows 10-20 feet in height. Staghorn sumac has

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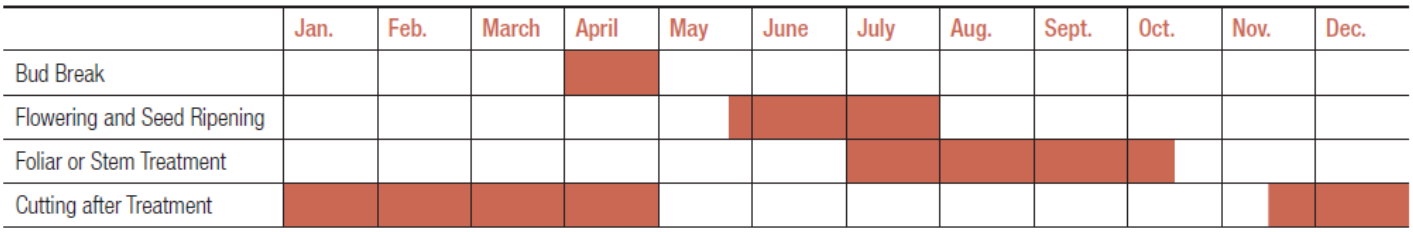

Tree-of-Heaven Management Calendar (UPenn Extension)

serrated leaf edges, and all species of sumac have upright clusters of red, fuzzy fruits. Walnut leaflets are not parallel with each other and do not have bumps at their base.

Management

Tree-of-heaven is difficult to control. Proper timing of treatments is critical to successful eradication, and it may take multiple years to completely kill the tree. Options to control or kill tree-of-heaven include a variety of mechanical and chemical controls. Young seedlings without a taproot can be pulled by hand, taking care to remove the entire root system, or they may resprout. Seedlings may be confused with small suckers, which are connected to a larger root system and are nearly impossible to pull by hand.

Large trees may be girdled or simply cut down, but the tree will re-sprout and send up suckers. Without chemical treatment, the plant will have to be continually cut down for several years before completely dying. Cutting or girdling is most effective when the tree is flowering, around June to early July. Persistence is required for success.

Most herbicide applications should be made after July 1st, until the tree begins to show fall color. There are several effective herbicides that can be used on tree-of-heaven, including dicamba, glyphosate, imazapyr, metsulfuron methyl, and triclopyr. Glyphosate and triclopyr are recommended because of their little risk to non-targeted plants and lack of soil activity. Tree-of-heaven is generally more sensitive to triclopyr than glyphosate, especially before late summer.

Timing is important to ensure that the herbicide will reach the roots. Some chemical treatments may require a licensed professional applicator. If cutting is chosen to manage tree-of-heaven, it is best to treat it with an herbicide first and allow symptoms to develop before cutting. This will minimize resprouting and root suckering. For shorter trees, foliar sprays, such as glyphosate, can be used where there will not be contact with non-target plants. Foliar sprays are also useful for initial treatment of extensive, dense infestations, and they are ideally applied after leaves are fully expanded.

Trees with a diameter of less than six inches can be treated with basal bark

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herbicide applications. An herbicide such as triclopyr can be sprayed in a continuous 12-inch-wide band around the base of the tree. It does not require cutting and is most effective in late winter, early spring, and summer.

Larger trees can be treated with the "hack-and-squirt" method of application. Concentrated herbicide solutions are applied to several cuts that are made in the stem, leaving living tissue between each cut. The living tissue will then move the herbicide to the roots. This treatment is highly selective and is unlikely to impact non-target plants.

Established tree-of-heaven stands will require multiple treatments to eliminate entirely, as initial treatments may only weaken the root systems.

Spotted Lanternfly Control

Removal of tree-of-heaven is an effective way to keep spotted lanternflies (SLFs) from reaching high population numbers and from spreading to new areas. However, if there is reason to keep the tree, SLF may be controlled with systemic insecticides. These insecticides are absorbed into the tree and kill insects which feed upon the treated tree. These insecticides, such as dinotefuran and imidacloprid, are usually applied by professional applicators. They can be applied by trunk injection or spray, soil drench or injection, and foliar sprays. Systemic insecticides should be applied when the tree is actively growing but after flowering is over to protect pollinators.

Sources

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