

Forest Pests

Invasive Plants and Insects of Maryland

Invasive plants and insects can be problematic for forest landowners. From vines that take over disturbed areas, forest edges, and tree canopies to insects that defoliate and girdle trees, these pests not only decimate the natural ecosystem, they are difficult to control and can be expensive to eradicate. This informational sheet discusses the vine commonly known as Oriental bittersweet.

Oriental Bittersweet (*Celastrus orbiculata* (Thunb.))



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DESCRIPTION

Oriental bittersweet is a perennial vine from the Stafftree (*Celastraceae*) family. It is known by several different common names that include Asian bittersweet, Asiatic

bittersweet, and round-leaf bittersweet. It is considered a thin, deciduous vine that climbs and can become a trailing shrub. The leaves are alternating, round, and glossy, with finely toothed serrate margins. The vine spreads quickly and typically infests areas of disturbance, forest edges, roadsides, hedgerows, and right-of-ways. Growth of the vine can be as high as 12 feet per year.

Oriental bittersweet has female (fruiting) and male (non-fruiting) plants. Pollination occurs mainly through insects, usually bees. The female plants prolificly produce fruit and seeds. Once established, the seed reserves in the soil become extensive and germination can occur for one to two years.

ORIGIN & SPREAD

Oriental bittersweet is native to Eastern Asia. It was introduced to the U.S. in the 1860's as an ornamental, and was first recorded in the wild in Connecticut in 1916. To this day it is still a popular ornamental vine. Because of its popularity and rapid growth, Oriental bittersweet is naturalized in 21 states that range from Maine to Wisconsin, and South Carolina to Missouri.



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Oriental bittersweet can move quickly across an area. The vine grows over natural vegetation and climbs trees. As it spirals up a tree, the vine girdles and kills it. The vine can suppress or kill a tree by blocking out the sun or topple the tree over because of the extra weight of the vine. Unlike other invasive vines, Oriental bittersweet is shade tolerant and seed germination is more successful in areas of lower light intensity (i.e. forest floor).

CONTROL OPTIONS

Hand Control

Once established, control of Oriental bittersweet is a long-term intensive process. There are manual, mechanical, and chemical methods of addressing infestations, and usually some combination of the three is most effective. When detected early, hand pulling and grubbing the vine and roots can be effective. It is important that all plant matter pulled up be bagged and disposed of in a landfill to discourage re-establishment. It is very difficult to get all of the roots. Remaining roots can continue to resprout throughout the season and repeated pulling and grubbing will eventually exhaust the stored energy in the roots and the vine will die. Repeatedly mowing the infestation or heavy grazing by goats can also produce similar results over several years.

Equipment & Herbicide Control

Larger infestations will usually require the use of herbicides or, in some cases, heavy equipment. Since Oriental bittersweet is a climbing vine, equipment like skidsteers or brush hogs can be used to pull up thick areas of vines or cut the stems. Re-establishment

can occur from the cut stems sprouting, seed germination, or any missed vine pieces left in the dirt. If the equipment is not completely cleaned on site, spread of the vine can occur when the equipment is transported.

Oriental bittersweet is most commonly controlled with herbicide. As with all invasive plants, control methods are currently being researched and documented. Table 1 shows some of suggested uses of herbicides as found in Miller, Manning, and Enloe (2010) and Swearingen et al (2010). The most commonly used herbicides for controlling Oriental bittersweet include glyphosate (e.g. Accord[®] XRT) and triclopyr (e.g. Garlon[®] 4). The following methods are some of the most common ways of applying herbicide to the vine.



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Cut Stem Method

Simply cut the vine at ground level and apply the herbicide directly to the rooted section of vine. This is generally done with a paint brush or plastic spray bottle. Once applied, the herbicide is absorbed throughout the root system. This method is preferred when the infestation is surrounded by other desirable species.

Foliar Spray Method

This method is common for very large infestations where there are no other desirable species. Generally, an herbicide solution is sprayed on the foliage just enough to wet it, not drip. The herbicide is absorbed through the leaves and is carried to the root system.

Basal Spray

Sometimes applying herbicide directly to the stem is effective. Basal sprays are herbicides mixed with oil and a penetrant that are applied to the lower 12 – 20 inches of the stem. Always read the herbicide label to ensure that the correct oil and penetrant are used. Some herbicide products, such as Pathfinder[®] II, are already mixed and are ready to be applied.

Stem Injection

Stem injection is a common method for applying herbicide to larger vines (> 1” in diameter). Herbicide is typically injected into the vine through a downward incision made by an axe or saw. The incision should cut through the bark and into the inner bark. The herbicide is then applied to the incision and the vine carries the herbicide down to the roots.

SUMMARY

When dealing with Oriental bittersweet, it is important to remember that these applications will not completely control the infestation on the first attempt. Several attempts may be needed over several years. Seeds remain viable in the soil for a couple of years and pieces of vines or roots may take hold and begin to grow vines again.

Table 1. Herbicide Suggestions for Controlling Oriental Bittersweet Infestations.

Application Method	Active Ingredient	Brand Name	Percent Solution	Time of Year
Cut Stem	Glyphosate	Accord [®] XRT	25% in water and surfactant	Air above 45°F
Cut Stem	Glyphosate	Roundup [®] Pro	Undiluted	Year – round
Cut Stem	Triclopyr	Garlon [®] 4	25% in water and surfactant	Air above 45°F
Cut Stem	Triclopyr	Brush-B-Gone [®]	Undiluted	Year – round
Cut Stem	Triclopyr	Brush Killer [®]	Undiluted	Year – round
Cut Stem	Triclopyr	Vine X [®]	Undiluted	Year – round
Foliar Spray	Triclopyr	Garlon [®] 3A	3% in water and surfactant	July to October
Foliar Spray	Triclopyr	Garlon [®] 4	3% in water, and surfactant	July to October
Foliar Spray	Glyphosate	Accord [®] XRT	3% in water, and surfactant	July to October
Foliar Spray	Clopyralid	Transline [®]	0.5% in water	Year – round
Basal Spray (stems <1” dia.)	Triclopyr	Garlon [®] 4	20% in a basal oil product	Year – round
Basal Spray (stem<1” dia.)	Triclopyr	Pathfinder [®] II	Undiluted	Year – round
Stem Injection (large vines)	Imazapyr	Arsenal [®] AC	Follow label	Not in March or April
Stem Injection (large vines)	Triclopyr	Garlon [®] 3A	Follow label	Not in March or April
Stem Injection (large vines)	Glyphosate	Accord [®] XRT	Follow label	Not in March or April

Use pesticides wisely. The information in this sheet is intended to illustrate methods that are currently being practiced and does not endorse or promote any of the herbicide products listed. Please be sure to read herbicide labels, even if you have experience with the herbicide, as labels are updated frequently. All information in this sheet is based on the information of the herbicide labels at the time of printing. Please contact the Maryland Department of Agriculture (MDA) if you have any questions about pesticides. The MDA website (www.mda.md.state.us/plants-pests) contains a searchable pesticide database where you can search for pesticides, applicators, dealers, and businesses.

REFERENCES

- Miller, James H.; Manning, Steven T.; Enloe, Stephen F. 2010. A management guide for invasive plants in southern forests. Gen. Tech. Rep. SRS–131. Asheville, NC: U.S. Department of Agriculture Forest Service, Southern Research Station. 120 p.
- Swearingen, J., B. Slattery, K. Reshetiloff, and S. Zwicker. 2010. Plant Invaders of Mid-Atlantic Natural Areas, 4th ed. National Park Service and U.S. Fish and Wildlife Service. Washington, D.C. 168pp.