

Pest Management – Invasive Plant Control

Oriental Bittersweet – *Celastrus orbiculatus*

Conservation Practice Job Sheet

NH-595



Oriental Bittersweet. *Celastrus orbiculatus*



Oriental Bittersweet blanketing native plants

Oriental Bittersweet

Celastrus orbiculatus is native to temperate East Asia and has been considered weedy in all of New England and most of the Atlantic Coast States since 1971. Oriental bittersweet is a vigorously growing vine that climbs over and smothers vegetation which may die from excessive shading or breakage. When bittersweet climbs high up on trees the increased weight can lead to uprooting and blow-over during high winds and heavy snowfalls.

In addition, oriental bittersweet is displacing our native american bittersweet through competition and hybridization. Upland meadows, thickets, young forests, and beaches are most vulnerable to Oriental Bittersweet invasion and dominance. Similar to most invasive plants, *C. orbiculatus* has a high reproductive rate, long range dispersal, ability to root sucker, and rapid growth rates.

Description

Oriental bittersweet is a deciduous woody perennial plant which grows as a climbing vine and a trailing shrub. The leaves are alternate, glossy, nearly as wide as they are long (round), with finely toothed margins. There are separate female (fruiting) and male (non-fruiting) plants. Female plants produce clusters of

small greenish flowers, and each plant can produce large numbers of fruits and seeds.

The fruits are three-valved, yellow, globular capsules that at maturity split open to reveal three red-orange, fleshy arils each containing one or two seeds. The abundance of showy fruits has made Oriental bittersweet extremely popular for use in floral arrangements.

Similar Natives

American bittersweet (*Celastrus scandens*) is a very similar native that may be distinguished from *C. orbiculatus* by the location of its fruit - *C. orbiculatus* has small clusters in the leaf axils while *C. scandens* has clusters at its branch tips. The two species may be capable of hybridizing and since the native is relatively rare it is possible that its distinct genetic identity is threatened.

Control

Manual, mechanical and chemical control methods are all effective in removing and killing Oriental bittersweet. Employing a combination of methods often yields the best results and may reduce potential impacts to native plants, animals and people. The method you select depends on the extent and type of infestation, the amount of native vegetation on the

site, and the time, labor and other resources available to you. Whenever possible and especially for vines climbing up trees or buildings, a combination of cutting followed by application of concentrated systemic herbicide to rooted, living cut surfaces is likely to be the most effective approach. For large infestations spanning extensive areas of ground, a foliar herbicide may be the best choice rather than manual or mechanical means which could result in soil disturbance.

Recovery of natural areas highly infested with *C. orbiculatus* is unpredictable. Previous natural vegetation structure and function are often severely altered, although remnants of the flora may persist. Removal methods often further disrupt remnants of previous plant communities. A number of workers report that even with complete removal and rootkill of *C. orbiculatus*, substantial seedling regeneration occurs in following years, due to a persistent soil seed bank.

Biological Control

There are no known biological controls of bittersweet.

Mechanical Control

Small infestations can be hand-pulled but the entire plant should be removed including all the root portions. For climbing vines, first cut the vines near the ground at a comfortable height to kill upper portions and relieve the tree canopy. Try to minimize damage to the bark of the host tree. Rooted portions will remain alive and should be pulled, repeatedly cut to the ground or treated with herbicide. Cutting without herbicide treatment will require vigilance and repeated cutting because plants will resprout from the base.

Prescribed Burning

Prescribed burning for Oriental Bittersweet is not a viable option for control. It is likely that Oriental Bittersweet is actually favored by fire due to rapid growth in response to opening the canopy and the large nutrient flushes that usually occur after fires.

Chemical Control

CAUTION: ALWAYS READ THE ENTIRE HERBICIDE LABEL. HERBICIDES ARE REGULATED AND MAY ONLY BE USED UNDER SPECIFIC CONDITIONS. CONTACT YOUR STATE DEPARTMENT OF AGRICULTURE FOR USE REQUIREMENTS, RESTRICTIONS OR RECOMMENDATIONS.

Systemic herbicides like triclopyr (i.e., Garlon 3A and Garlon 4) and glyphosate (i.e., Accord, Glypro, Rodeo) are absorbed into plant tissues and carried to the roots, killing the entire plant within about a week¹. Garlon 4 is soluble in oil or water, is highly volatile and can be extremely toxic to fish and aquatic invertebrates¹. It should not be used in or near water sources or wetlands and should only be applied under cool, calm conditions. Chemical control is most effective if the stems are first cut by hand or mowed and herbicide is applied immediately to cut stem tissue.

Fall and winter applications will avoid or minimize impacts to native plants and animals. Repeated treatments are likely to be needed. In areas where spring wildflowers or other native plants occur, application of herbicides should be conducted prior to their emergence, delayed until late summer or autumn, after the last killing frost occurs, or carefully targeted. If native grasses are intermingled with the bittersweet, triclopyr should be used because it is selective for broad-leaved plants and will not harm grasses. Follow-up monitoring should be conducted to ensure effective control.

Foliar Treatment: Use this method to control extensive patches of solid Bittersweet. Apply a 2% solution (8 oz per 3 gal. mix) triclopyr ester (Garlon 4) or triclopyr amine (Garlon 3A) mixed in water with a non-ionic surfactant to the leaves¹. In Rhode Island, concentrations as low as 1% in mid-summer and 0.05% in September have been very effective. Thoroughly wet the foliage but not to the point of runoff. The ideal time to spray is after much of the native vegetation has become dormant (October-November) to avoid affecting non-target species. A 0.5% concentration of a non-ionic surfactant is recommended in order to penetrate leaf cuticle. If the 2% rate is not effective try an increased rate of 3-5%. Ambient air temperature should be above 65°F.

For dense, low patches of bittersweet another alternative is to cut the entire patch to the ground early in the growing season. About one month later, apply

1-2% solution of triclopyr ester (Garlon 4) or triclopyr salt (Garlon 3A) in water to the previously cut patch using a backpack sprayer². This method has resulted in complete rootkill of the bittersweet and no off-target damage or root uptake by adjacent plants.

Cut Stem Treatments: Use this method in areas where vines are established within or around non-target plants or where vines have grown into the canopy. Cut each vine stem close to the ground (about 2 in. above ground) and immediately apply a 25% solution of glyphosate (e.g., Accord) or triclopyr (e.g., Garlon 3A) mixed with water to the cut surface of the stem¹. The glyphosate application is effective at temperatures as low as 40°F and the triclopyr application remains effective at temperatures <60°F as long as the ground is not frozen. A subsequent foliar application may be necessary to control new seedlings. Homeowners can apply products like Brush-B-Gone, Brush Killer and Roundup Pro Concentrate undiluted to cut surface using a paint brush or a plastic spray bottle.

Basal Bark Method: Use a string trimmer or hand saw to remove some of the foliage in a band a few feet from the ground at comfortable height. To the exposed stems, apply a 20% solution of triclopyr ester (Garlon 4) (2.5 quarts per 3-gallon mix) in commercially available basal oil with a penetrant (check with herbicide distributor) to vine stems¹. As much as possible, avoid application of herbicide to the bark of the host tree. This can be done year-round although efficacy may vary seasonally; temperatures should be above 50°F for several days.

¹ – Plant Conservation Alliance (PCA) Alien Plant Working Group

² – Dreyer, G. 1988. “Efficacy of triclopyr in rootkilling Oriental Bittersweet and certain other woody weeds.” Proceedings of the Northeastern Weed Science Society.

Important Note

Mention of specific pesticide products in this document does not constitute an endorsement. These products are mentioned specifically in control literature used to create this document.

Disposal

There are a few general rules of thumb that will ensure proper disposal. Be sure the plant is dead before placing in a mulch or compost pile. Either dry it out in the sun, or bag it in a heavy duty black plastic

bag. If you have flowers and/or seeds on the plant, put the flowers and seed heads into the bag head first so that there is minimal risk in dispersing seed.

Information and Recommendations compiled from:

- Dreyer, G. 1988. “Efficacy of triclopyr in rootkilling Oriental Bittersweet and certain other woody weeds.” Proceedings of the Northeastern Weed Science Society.
- Howard, Janet L. 2005. “Celastrus orbiculatus. In: Fire Effects Information System.” U.S. Department of Agriculture, Forest Service. <http://www.fs.fed.us/database/feis/>
- Invasive Plant Atlas of New England (IPANE)
- Plant Conservation Alliance (PCA) Alien Plant Working Group
- The Nature Conservancy - Element Stewardship Abstract (and references therein)