



**Oriental Bittersweet**

*Celastrus orbiculatus* Thunb.  
Staff-tree family (Celastraceae)

**NATIVE RANGE**

Eastern Asia, Korea, China and Japan

**DESCRIPTION**

Oriental bittersweet is a deciduous woody perennial plant which grows as a climbing vine and a trailing shrub. Stems of older plants 4 inches in diameter have been reported. 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 in axillary clusters (from most leaf axils), 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 have made Oriental bittersweet extremely popular for use in floral arrangements.



**NOTE:** Because Oriental bittersweet can be confused with our native American bittersweet (*Celastrus scandens*) which is becoming less and less common, it is imperative that correct identification be made before any control is begun. American bittersweet produces flowers (and fruits) in single terminal panicles at the tips of the stems; flower panicles and fruit clusters are about as long as the leaves; the leaves are nearly twice as long as wide and are tapered at each end. Oriental bittersweet produces flowers in small axillary clusters that are shorter than the subtending leaves and the leaves are very rounded. Comparing the two, American bittersweet has fewer, larger clusters of fruits whereas Oriental bittersweet is a prolific fruiter with lots and lots of fruit clusters emerging at many points along the stem. Unfortunately, hybrids of the two occur which may make identification more difficult.

**ECOLOGICAL THREAT**

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 (*Celastrus scandens*) through competition and hybridization.



**DISTRIBUTION IN THE UNITED STATES**

Oriental bittersweet currently occurs in a number of states from New York to North Carolina, and westward to Illinois. It has been reported to be invasive in natural areas in 21 states (CT, DE, IL, IN, KY, MA, MD, ME, MI, MO, NC, NH, NJ, NY, PA, RI, TN, VA, VT, WI, and WV) and at least 14 national parks in the eastern U.S.

**HABITAT IN THE UNITED STATES**

Oriental bittersweet infests forest edges, woodlands, fields, hedgerows, coastal areas and salt marsh edges, particularly those suffering some form of land disturbance. While often found in more open, sunny sites, its tolerance for shade allows oriental bittersweet to invade forested areas.

**BACKGROUND**

Introduced into the U.S. in the 1860s as an ornamental plant, oriental bittersweet is often associated with old homesites, from which it has escaped into surrounding natural areas. Oriental bittersweet is still widely planted and maintained as an ornamental vine, further promoting its spread.

## **BIOLOGY & SPREAD**

Oriental bittersweet reproduces prolifically by seed, which is readily dispersed to new areas by many species of birds including mockingbirds, blue jays and European starlings. The seeds germinate in late spring. It also expands vegetatively through root suckering.

## **MANAGEMENT OPTIONS**

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.

### ***Biological***

No biological controls are currently available for this plant.

### ***Chemical***

Systemic herbicides like triclopyr (e.g., Garlon® 3A and Garlon® 4) and glyphosate (e.g., Accord®, Glypro®, Rodeo®) are absorbed into plant tissues and carried to the roots, killing the entire plant within about a week. This method is most effective if the stems are first cut by hand or mowed and herbicide is applied immediately to cut stem tissue. Herbicide applications can be made any time of year as long as temperatures are above 55 or 60 degrees Fahrenheit for several days and rain is not expected for at least 24 hours. 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. Herbicidal contact with desirable plants should always be avoided. 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.

Glyphosate products referred to in this fact sheet are sold under a variety of brand names (Accord®, Rodeo®, Roundup Pro® Concentrate) and in three concentrations (41.0, 50.2 and 53.8% active ingredient). Other glyphosate products sold at home improvement stores may be too dilute to obtain effective control. Triclopyr comes in two forms – triclopyr amine (e.g., Garlon® 3A, Brush-B-Gone®, Brush Killer®) and triclopyr ester (e.g., Garlon® 4, Pathfinder®, and Vinex®). Because Garlon® 3A is a water-soluble salt that can cause severe eye damage, it is imperative that you wear protective goggles to protect yourself from splashes. Garlon® 4 is soluble in oil or water, is highly volatile and can be extremely toxic to fish and aquatic invertebrates. It should not be used in or near water sources or wetlands and should only be applied under cool, calm conditions.

### ***Basal bark application***

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 stems. 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 degrees F for several days.

### ***Cut stem application***

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 stem. The glyphosate application is effective at temperatures as low as 40°F and a subsequent foliar application may be necessary. The triclopyr application remains effective at low 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 stems. Using a paint brush or a plastic spray bottle, apply herbicide to the cut surface.

### *Foliar application*

Use this method to control extensive patches of solid bittersweet. It may be necessary to precede foliar applications with stump treatments to reduce the risk of damaging non-target species. During foliar applications some of the herbicide is also absorbed through the stem for additional (basal bark) effect. 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 leaves. 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 sprayer. This method has resulted in complete rootkill of the bittersweet and no off-target damage or root uptake by adjacent plants.

### **Manual and Mechanical**

Small infestations can be hand-pulled but the entire plant should be removed including all the root portions. If fruits are present, the vines should be bagged in plastic trash bags and disposed of in a landfill. Always wear gloves and long sleeves to protect your skin from poison ivy and barbed or spined plants. For climbing vines, first cut the vines near the ground at a comfortable height to kill upper portions and relieve the tree canopy. Vines can be cut using pruning snips or pruning saw for smaller stems or a hand axe or chain saw for larger vines. 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.

**USE PESTICIDES WISELY:** Always read the entire pesticide label carefully, follow all mixing and application instructions and wear all recommended personal protective gear and clothing. Contact your state department of agriculture for any additional pesticide use requirements, restrictions or recommendations.

**NOTICE:** mention of pesticide products on this page does not constitute endorsement of any material.

### **CONTACTS**

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### **SUGGESTED ALTERNATIVE PLANTS**

Several attractive native vines are available that provide nectar, seed and host plant material for butterflies, hummingbirds, and other wildlife. These include American bittersweet (*Celastrus scandens*) which is native to the eastern U.S. and should only be planted in areas where Oriental bittersweet is not well established or has been successfully controlled, to prevent hybridization with the native species. Other good alternatives include trumpet honeysuckle (*Lonicera sempervirens*), trumpet creeper (*Campsis radicans*), passionflower vine (*Passiflora lutea*), Dutchman's pipe (*Aristolochia macrophylla*) and native wisteria (*Wisteria frutescens*)\*.

\*If you wish to plant wisteria, make certain that it is the native species. Two commonly planted ornamental wisterias, Chinese wisteria (*Wisteria sinensis*) and Japanese wisteria (*Wisteria floribunda*), are exotic and aggressive invaders.

### **OTHER LINKS**

- <http://www.invasive.org/search/action.cfm?q=Celastrus%20orbiculatus>
- <http://nbii-nin.ciesin.columbia.edu/ipane/icat/browse.do?specieId=27>

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## PHOTOGRAPH

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