



IOWA DEPARTEMENT OF
NATURAL RESOURCES
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www.nps.gov/plants/alien
www.mipn.org/
www.driftlesslandstewardship.com/

CREDITS

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1	HERBICIDES*
<p>In most cases, effective control of established Oriental bittersweet populations requires the use of a herbicide. Factors that should be considered when selecting a herbicide for use on a particular site include proximity to water, presence or absence of desirable native vegetation, potential for erosion and the effectiveness of the herbicide on bittersweet. Because its leaves persist much later than many native species, fall treatment may minimize damage to desirable broadleaf plants. The following is a quick reference to some herbicide options and the pros and cons to each. It is not meant to be a comprehensive list.</p> <p>Basal bark and cut stump - Triclopyr (Garlon 4 Ultra®) 27% (not approved for use in wetlands); Use a penetrating oil (AX-IT®), unless it is already included in product. These techniques and herbicide are relatively selective. Basal bark - For plants LESS than one inch in diameter. Use any time of year, including winter months EXCEPT during heavy spring sap flow OR when snow or water prevent application at ground level OR when stems are saturated. Since stems have a small diameter, the sides must be treated so that enough herbicide will be absorbed. Less labor intensive. Cut stump - For plants GREATER than one inch in diameter, cut stems about 6 inches high and apply to outside of stem also. Use any time EXCEPT spring, while sap is flowing upward. Labor intensive.</p> <p>Injection and Foliar Spray - Triclopyr (Garlon 3A®, Renovate®) 27% for injections and 2-3% for sprays, (safe for use in wetlands and sensitive areas); Injections - Use any time EXCEPT during spring sap flow. Inject 5 ml into cambium at 3- to 4-inch intervals around entire stem at any convenient height. Somewhat labor intensive. This is an extremely selective herbicide and technique. Foliar spray - Some products already contain a surfactant; if not, add one (Cygnat Plus®, Nu-Film IR®). Apply after spring sap flow while plant is actively growing but before leaves change color. Broadleaf specific; will not harm sedges and grasses. Since it must be used during the growing season, it is not a suitable technique for high-quality sites with many broadleaf natives.</p>	
2	PRESCRIBED BURNING
<p>Prescribed burning alone will not control Oriental bittersweet, as it can resprout from the root crown. Increased light levels and nutrient flush following a burn will actually stimulate its growth, and provide exposed mineral soils, enhancing germination. Bittersweet can act as a ladder and carry fire up into forest canopy.</p>	
3	MECHANICAL CONTROL AND HAND PULLING/DIGGING
<p>Mechanical controls alone will not eradicate established Oriental bittersweet infestations, but can temporarily prevent further damage to the trees and shrubs. In combination with herbicide treatment, they can provide effective control of established populations over time.</p> <p>Hand pulling established Oriental bittersweet can be difficult, particularly with the large vines. Roots run long distances with stems emerging along the way, even in young plants. It can be hard to remove most of the root, especially in some soils. Repeated hand pulling in a newly infested area will eventually achieve control, but requires commitment and follow through.</p>	
4	CUTTING/MOWING
<p>Cutting bittersweet will not provide effective control and it will stimulate resprouting. It will, however, temporarily reduce the destructive effects on the trees and shrubs it is growing on. Vines that are left hanging in the canopy will deteriorate and eventually fall down.</p>	
5	BIOLOGICAL CONTROL
<p>No biological controls have been reported for Oriental bittersweet in the United States to date.</p>	

*ALWAYS READ AND FOLLOW HERBICIDE LABELS. Applicators must be certified to apply restricted herbicides.



IOWA DEPARTEMENT OF
NATURAL RESOURCES

ORIENTAL
BITTERSWEET

A SERIOUS THREAT TO
IOWA'S WOODLANDS



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ORIENTAL BITTERSWEET (*Celastrus orbiculatus*) is an invasive vine that is native to China, Japan and Korea. It was introduced in the United States around 1860 as an ornamental plant. Its fruiting stems are cut in fall and used for decoration, which has facilitated its spread.

WHAT ARE ORIENTAL BITTERSWEET’S THREATS TO IOWA?

- Degrades woodlands and wildlife habitat
- Grows rapidly and can spread from tree to tree in the forest canopy
- Can shade out trees that support it
- Girdles trees and shrubs, cutting off water and nutrients
- Weakened trees, weighed down by vines easily suffer damage from ice and wind storms
- When one tree falls, attached trees may be pulled down spreading vines further in woodland



Importing, selling or distributing Oriental bittersweet in any form is illegal in Iowa and subject to fine.

WHERE IS ORIENTAL BITTERSWEET FOUND?

- Grasslands, open woods, woodland edges, closed-canopy forest, roadsides and fence rows
- Most productive in full sun, but seedlings are extremely shade-tolerant and can be found in woodlands

SIMILAR SPECIES: AMERICAN BITTERSWEET

The native American bittersweet (*Celastrus scandens*) has elliptical rather than rounded leaves. The flowers and fruit of the female plants occur in a single clump at the tips of the stems rather than spread along the stems. The fruit is orange in the fall and not red like the non-native Oriental bittersweet.

American bittersweet can also be distinguished from Oriental bittersweet by its leaves when they are just beginning to emerge from the bud. Oriental bittersweet leaves are folded flat along

the mid-vein. American bittersweet leaves curl along the edges and look like a rolled up scroll.

REPRODUCTION/DISPERSAL

Oriental bittersweet reproduces by seed and vegetatively by spreading underground roots that form new plants. Bittersweet sprouts from the roots, and even small root fragments can regenerate into a new plant. Most plants bear either male or female flowers but a few will also produce perfect flowers with both male and female parts. Plants mature quickly, and both male and female plants can produce flowers at two years of age. Mature female plants produce a prolific fruit production in full sun.

Bittersweet fruit is eaten by birds and small mammals. Although it is nutritious, it is not eaten until late in winter. The seed is retained in the gut of birds for a long time, aiding in long-distance dispersal of the species. Humans also disperse this invasive plant when they compost ornamental wreaths that are composed of its fruiting stems.

The seeds are able to germinate under conditions with very low light. Plants growing in shade persist until more light becomes available. Once they have access to increased light, fruit production increases rapidly.

WHAT DOES ORIENTAL BITTERSWEET LOOK LIKE?

Oriental bittersweet is a deciduous, woody vine, that can reach nearly 100 feet in length and 7 inches in diameter. The plant climbs by coiling around trees, shrubs and other objects available to support it.

LEAVES:

Alternate, glossy and finely toothed, often rounded but variable in shape, from 2 to 5 inches long with pointed tips, yellow fall color and retained late in the season



STEMS/ROOTS:

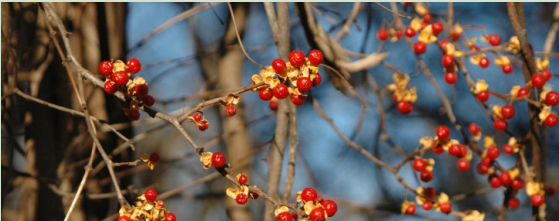
Light or medium brown stems with white pith, noticeable light horizontal marks, may climb up to 60 feet high in trees. It has a deep extensive root system and the roots are bright orange.

FLOWERS:

Small, greenish yellow, five-petals, cluster in the leaf axils, male and female flowers usually occur on separate plants, bloom in May and June

FRUITS/SEEDS:

Bright red fruits, yellow outer seed capsules cover the fruit, fruits are clustered with 3-6 seeds in leaf axils of female plants, persist through winter.



CONTROL

Preventing seed production and dispersal is critical in controlling this species, but stopping its destructive impacts on the trees and shrubs that support it is also extremely important. A combination of mechanical and chemical methods is useful in meeting all of these goals.

In addition, because of this species’ potential for long distance spread, monitoring lands around the source is highly recommended.

PLANNING A CONTROL PROGRAM

Assessing both the scope of the problem and any available resources is a critical first step:

- Map known populations. Is the species widely distributed throughout the property, or is it just beginning to appear?
- Does it occur on high value sites?
- Prioritize high value sites where success can be achieved for treatment.
- Choose appropriate control methods, given site conditions and available resources.
- If using herbicide, be sure to read the product label before finalizing plans. Is there potential for harm to non-target species?
- Do these control methods require any permits (i.e. herbicide application in wetlands, prescribed burning)?
- Prevent further spread; focus on mature plants, particularly plants in full sun with abundant fruit.
- Eradicate smaller satellite populations as soon as you find them.
- Treat lower value infested areas as resources permit.
- Monitor treated sites to prevent reinvasion.

BEST SURVEY PERIOD

Oriental bittersweet is easiest to locate for mapping or control in late fall. Its leaves turn a conspicuous yellow and persist into November, after the leaves of most native species have fallen. Monitoring should encompass an area up to a half mile or more from the focal area of management, because of this species’ potential for long distance dispersal. The fruit on female plants is also recognizable.