

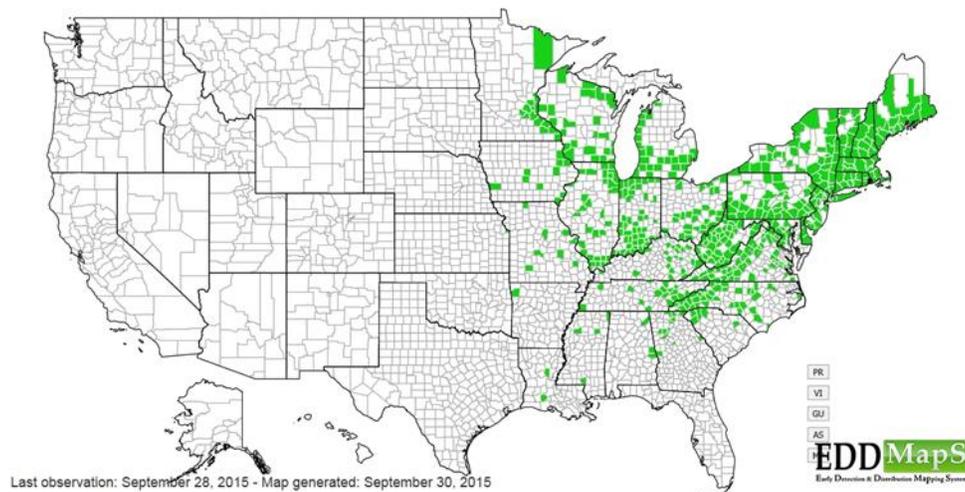
You Ain't From Around Here! Exotic Invasive of the Quarter: Oriental Bittersweet (*Celastrus orbiculatus*)

By: Jennifer Gagnon, Virginia Tech

When I was a kid in New England, my mother's decorating style was, well, let's call it late-century vegetative. As a gardener, I think the harsh winters really took a toll on her well-being. She couldn't wait to see green again, and when it was available, she brought as much vegetation into the house as she could. In early spring, she would bring in pussy willows, followed by boughs of dogwood blossoms. In the summer, she filled our home with gladiolas. In the fall, in addition to ironing colored leaves between sheets of wax paper, she would bring in boughs of what I now suspect was oriental bittersweet. It grew in abundance over the compost heap in my grandparents' yard next door.

As a young adult, I lived in the deep south and didn't think about oriental bittersweet for many years. It was when I moved to Virginia (as a middle-adult) that sightings of it brought back old memories and I learned it was most likely an exotic invasive she was decorating with.

Oriental bittersweet, also called Chinese bittersweet, Asian bittersweet, round-leaved bittersweet, and Asiatic bittersweet, is native to eastern China, Korea, and Japan. It was introduced to the United States in the mid-1800s as an ornamental. It was also planted for erosion control and wildlife food and habitat. Since 1971, it has been considered weedy in all of New England and most Atlantic coastal states.



Current range of oriental bittersweet in the US. Map by: EDDMaps.

Oriental bittersweet is dioecious, like tree-of-heaven, meaning there are separate male and female plants. Both will flower, but only the female plants will produce fruit and seeds. The male flowers produce pollen.

Gagnon. Virginia Forest Landowner Update. V. 30, No. 3. Summer 2016.

Why is this species a problem? First off, my mother was not the only person attracted to the brightly colored ripened fruits of this vine. In the fall, vines are made into decorative wreaths and floral bouquets (just look on Pinterest!). Improper disposal of these items leads to seed dispersal. People looking to buy these items or this plant can readily do so through the magic of the internet (although I was pleased to see that many sites sold the native American bittersweet instead and a few even warned against buying oriental bittersweet). Additionally, the ability of the seeds to float and the wide range of birds that eats them, aid dispersal.

Second, oriental bittersweet climbs trees by twining. This twining can girdle the stems, effectively killing the trees. If dense, heavy mats of oriental bittersweet develop in tree crowns, the risks of windthrow and ice damage increase and unsafe harvesting conditions may be created - not to mention the added labor needed to remove the vines from harvested trees.

Third, oriental bittersweet is a rapid grower and quickly outcompetes other nearby vegetation. Some studies suggest that it has a faster rate of photosynthesis than native species, allowing it to make food more quickly and thus grow faster.

Fourth, this species can grow in a wide range of environments. The vines grow in abandoned and agricultural fields, coastal beaches, dunes, early successional forests, forest edges, pastures, plantations, rights-of-way, along roadsides, in salt marshes, fence rows, vacant lots, yards, and gardens. While oriental bittersweet grows best in the sun, it can tolerate dense shade.



When available, the locations of the flowers and fruits are the best way to tell the difference between oriental and American bittersweets. Oriental bittersweet flowers and fruits are in the leaf axils all along the stems (left). American bittersweet fruits and flowers are located only on the tips of branches (right). Photos by Leslie Mehrhoff, University of Connecticut.

Finally, oriental bittersweet is reducing the extent of the native American bittersweet. This is in part due to its faster growth rates and higher seed production. But it also hybridizes with American bittersweet, resulting in a loss of genetic integrity.

If you are planning a control effort, you definitely want to be able to tell the two species apart so you can protect the native one. The most consistent characteristics to use are the flowers and fruits. Oriental bittersweet flowers and fruits are borne in the leaf axils all along the stems; American bittersweet flowers and fruits are borne only at the tips of branches. Of course, these characteristics are only useful when the plants are flowering or when the females are fruiting. In addition, the hybrids are notoriously difficult to identify.

How to Identify Oriental Bittersweet

Growth: Deciduous, woody, sprawling, twirling vine or trailing shrub.

Leaves: Alternate arrangement; shape varies widely – from round, to oblong, to long tapering points; finely toothed edges; glossy surfaces.

Stems: Many-branched, light brown to gray (new branches may be green); smaller branches dotted with tiny light-colored bumps (lenticels); older vines can be up to 4" thick and 60' long.

Flowers: Inconspicuous, small, 5-petaled, greenish-yellow; clusters of 3-7, appear in leaf axils in May – June.

Fruits: Clusters of 1-3 fruits attach at axils along stem; green in summer, become bright yellow/orange in late summer; outer membrane splits in September, bending back to reveal a bright red fleshy inner fruit containing 1-2 seeds which can persist through winter.

How to Control Oriental Bittersweet:

First, make certain you are treating oriental bittersweet, not the native American bittersweet. If you're not certain, contact your local Extension office.

- Small, localized infestation can be mechanically controlled with hand-pulling. However, be certain to remove all roots. Cut climbing vines near the ground and pull roots.
- Vines climbing up trees are best controlled using a combination of mechanical and chemical methods. Cut vines at ground level. Immediately apply herbicide to cut stumps – triclopyr amine (e.g., Garlon 3A) or glyphosate (e.g., Accord) mixed with water, in winter, early spring or fall, when native plants are dormant.
- For large infestations that cover extensive areas of ground, apply triclopyr ester (e.g., Garlon 4) or glyphosate (e.g., Rodeo, Roundup, Accord) herbicide, mixed with water and a non-ionic surfactant, to the leaves in the fall, after the first hard frost or in early spring, when native plants are dormant.

If desirable grasses, sedges, lilies, or other monocots are present, consider using a monocot-safe triclopyr-based herbicide. And always follow the label on whichever herbicide you choose.



The leaves of oriental bittersweet are quite variable, ranging from round, to oblong, to long tapering points (pictured, left). Flowers appear in leaf axils in May or June (center). Smaller branches are dotted with small white lenticels (right). Photos by: Chris Evans, University of Illinois (left and center), and James Miller, USDA Forest Service (right).

As with any invasive species control efforts, be certain to monitor the area after control, be prepared to retreat if necessary, and reclaim the site with native vegetation.

The etymology of this species is pretty straightforward. The genus *Celastrus* is from the ancient Greek *kelastros* (the name for an evergreen tree) and *orbiculatus* means round. The common name is actually more interesting and accurate. McMillian defines bittersweet as involving or causing feelings of happiness and sadness at the same time. And oriental bittersweet evokes both of these feelings in me – happiness stemming from good memories from my childhood; sadness stemming from the amount of money and work required to prevent it from taking over my barnyard.

Jennifer Gagnon is a Project Associate;
jgagnon@vt.edu; 540/231-6391.

Oriental bittersweet climbs shrubs and trees, preventing sunlight from reaching the crowns and eventually leading to mortality. Photo by: Nancy Lowenstein, Auburn University.

