

**Scientific Name:** *Celastrus orbiculatus*

**Common Name:** Oriental Bittersweet

*Updated: 5/5/2016*

**A. Priority: A**

**B. Description** – *Celastrus orbiculatus* is native to Japan, Korea, and northern China and was introduced to the United States in the mid-1800s for ornamental purposes. The spectacular bright yellow and red-orange fruits of this vine continue to make it popular for cultivation. *Celastrus orbiculatus* is still widely sold for floral arrangements and wreaths providing additional avenues for spread and infestation. This plant is now found from Maine to North Carolina, and west to Illinois.

*Celastrus orbiculatus* has all of the attributes of a competitive and successful plant. It is a prolific seed producer and since the seeds are consumed by a wide variety of birds, it has the potential for long-range dispersal. It has a high rate of seed germination (up to 95 percent) with the highest rate of seed germination in lower light intensities. This ability to germinate in a closed forest canopy provides this plant with a “sit and wait” invasion strategy until it is released by a disturbance that creates optimal conditions for rapid growth. It also expands vegetatively by rhizomes and through the ability to send shoots up from the roots known as root suckering.

Oriental Bittersweet is a deciduous, woody vine that can reach 100ft in length and 7in in diameter. Its leaves are alternate, glossy and finely toothed. They are often round, 2-5 inches long, and have pointed tips. Stems are light or medium brown with light horizontal marks and a white pith. Roots are orange. Flowers are small, greenish yellow, five-petaled and clustered in the leaf axis. They bloom May-June. Fruits have a yellow-orange outer skin and 3-6 bright red seeds inside. They are clustered in the leaf axis and are often present all winter.

**C. Damage and threats** – Oriental bittersweet is an aggressive invader. It has the ability to kill other vegetation by completely covering plants, preventing photosynthesis. Additionally, due to the way it girdles and weighs down the tree, uprooting is another common outcome. Oriental bittersweet reproduces by seed and vegetatively by spreading underground roots that form new stems. Large clones can develop from one or a few seedlings. Bittersweet also sprouts from the root crown, and even small root fragments can regenerate. Plants mature quickly, and both male and female plants can produce flowers at two years of age. 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.

**D. Management Options**

**Mechanical Control:** Hand pulling established Oriental bittersweet can be difficult, particularly with the largest 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 an area will eventually achieve control, but requires commitment and follow through. Oriental bittersweet seedlings are easiest to remove when the soil is moist and the population is small. Pull steadily and slowly to minimize soil disturbance and tamp down the soil afterwards. In small infestations, larger plants can also be removed by digging if care is taken to remove all roots. This is not practical for larger infestations, however. It is important to verify whether young shoots are actually seedlings or sprouts from an established plant with extensive roots. If it is the latter, chemical control methods should be used if the entire plant cannot be readily removed by digging. Once the initial bittersweet infestation is eradicated, hand pulling may be used to remove seedlings discovered during routine monitoring. All pulled material needs to be bagged and removed to prevent vegetative regeneration. For control of more established populations of bittersweet, use a chemical control method.

**Chemical Control:** Use of a systematic herbicide is the best option to control Oriental Bittersweet. We recommend using aquatic formulations of herbicides in this region to limit potentially unwanted effects to the surrounding environment. More details provided in the management techniques below.

- a. **Foliar Spray** – This method involves spraying a dilute herbicide directly onto the plants leaves. Application needs to occur when foliage is present, sometime between full leaf and the onset of fall for full effectiveness. Caution should be taken when applying herbicide with this method as non-target plants can easily be killed by drift or overspray. Application should cover at least 80% of the leaves. To treat Oriental Bittersweet, use a 2-4% solution of aquatic triclopyr in water with a 0.5% non-ionic surfactant and apply directly to leaves until just before runoff. Air temperatures must be above 65 degrees and winds should be lower than 5 mph.
- b. **Cut Stump** – This method involves cutting the vine as close to  $\frac{3}{4}$  of an inch from the ground as possible (no more than 5in.) and immediately applying a systematic herbicide. If the vine is climbing cut it again 2-3 feet up so there is a large gap between the vines on the tree and those on the ground. It is best to use this method between summer and fall, but it may be used as long as the ground is not frozen. To treat using this method, apply a 50% formulation of aquatic glyphosate or triclopyr directly to the cut stump.
- c. **Basal Bark** - Basal bark treatment can be used on stems that are less than one inch in diameter at any time of year except during heavy sap flow in spring. It should not be used when snow or water prevent herbicide from being applied at the ground level or when stems are saturated. It is most useful during the dormant season. This method should be used judiciously since it takes a lot of chemical and can result in overspray. Apply a solution of 25 percent triclopyr and 75 percent mineral oil to the basal parts of the tree to a height of 12 to 16 inches from the ground. All treatments should be followed up the next year to monitor and control basal sprouts and root suckers.

## **E. Recommended Management Strategy**

- a.** We recommend treating all mature vines and climbing vines via the cut stump method as described above. If there are other invasives present and or foliar applications of the ground level bittersweet will need to occur, we recommend just cutting the vines as described above and waiting for them to resprout.
- b.** All smaller ground level infestations and resprouts from mechanical cutting can be foliar sprayed as described above.
- c.** Repeat cut stump and foliar applications should be conducted at least yearly to ensure control.

## **F. Additional and Updated Information**

For additional information including photographs and the most up to date control recommendations please visit [www.wachng.org/Plants](http://www.wachng.org/Plants).