



JEFFERSON COUNTY NOXIOUS WEED CONTROL BOARD

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BEST MANAGEMENT PRACTICES Bittersweet Nightshade (*Solanum dulcamara*) (Family—*Solanaceae*—Nightshade Family)

Legal Status in Jefferson County: Not on the state noxious weed list, no legal requirement for controlling bittersweet nightshade. The Jefferson County Weed Board recognizes that this plant is invasive and is collecting information and providing education on control. The Board encourages and recommends control and containment of existing populations and discourages new plantings.

BACKGROUND INFORMATION

Impacts and History

- Eurasian vine naturalized throughout North America along waterways, lakeshores and open areas.
- Toxic to people, pets and livestock. Consumption has caused livestock loss and fatal poisoning of children although toxin amount is variable in plants and may not always cause symptoms.
- Widespread weed along creeks, wetlands, backyards, and edges of fields and forests, usually mixed with other weedy species and at times forming dense thickets.
- Can become the dominant weed along small creeks causing channel disruption and crowding out native species such as salmonberry, red twig dogwood, willows, hazelnut, and alders.

Description

- Perennial vine or scrambling semi-woody shrub.
- Star-shaped purple flowers have 5 backward-pointing petals and stamens fused in a prominent yellow cone.
- Flowers grow in clusters along branches on short stalks extending out from the stems.
- Berries are round or egg-shaped and bright red when ripe with numerous yellow, flattened seeds; unripe berries are green and then orange.



Bittersweet nightshade with berries
Cornell University



Bittersweet nightshade flowers closeup
Katholieke University Leuven

- All stages of berries can be found on the same plants along with flowers.
- Leaves are dark-green to purplish and often with one or two small ear-like lobes near the base.
- Leaf blades are 1 to 4 inches long and leaf stalks (petioles) are 1/2 inch to 1 1/2 inches long.
- Base of plant is woody and the upper herbaceous branches die back each year.
- Crushed leaves and bark have an unpleasant smell.
- Slender branches are light green, becoming gray-brown and then furrowed on the lower stem, rarely more than 1/2 inch thick.
- Wood is creamy-white and brittle.
- The main root grows horizontally just below the surface and suckers frequently.
- Climbs onto small trees, shrubs and fences or remains low-growing depending on what is available; can climb 30 feet or higher into trees or form thickets along the ground.
- Plants grow singly or in dense patches.

Toxicity

- Entire plant contains solanine, the same toxin found in green potatoes and other members of the nightshade family.
- Also contains a glycoside called dulcamarine, similar in structure and effects to atropine, one of the toxins found in deadly nightshade (*Atropa belladonna*).
- Ripe fruits are less toxic than the leaves and unripe berries but even ripe berries can be poisonous.
- Toxin amount varies with soil, light, climate and growth stage.
- Symptoms of poisoning include: abdominal pain, headache, tiredness, flushing and irritation of the skin and mucous membranes.
- Severe cases can result in vomiting, thirst, difficult breathing, restlessness, subnormal temperature, paralysis, dilated pupils, diarrhea, blood in urine, shock, extreme weakness, loss of sensation, and occasionally death.

Habitat

- Typically grows in wet sites or near water but tolerates a wide range of conditions from relatively dry to flooded and from full sun to medium shade.
- Plants flower and produce berries more in full sun to light shade.
- Found in disturbed sites as well as relatively undisturbed wetlands and creek areas.
- Often found rooted in moist soil but growing up and over other vegetation to reach more light and take advantage of the structural support provided by shrubs and trees growing along creeks and wetlands or of fences and thickets found along edges of fields and backyards.

Reproduction and Spread

- Flowers mid-May to September.
- Fruit and seed production can be abundant and each berry contains about 30 seeds.
- Spreads to new locations by birds eating the ripe berries and by fragments of stem and root moving in soil or water.
- Moves out from a parent plant by way of suckering roots, prostrate stems rooting at nodes, and by growing up and over vegetation or structures like fences and buildings.
- Branches grow 3 to 6 feet or more each year.

Local Distribution

Found throughout Jefferson County, especially near wetlands and creeks but also in many backyards, fields, parks and roadsides.

CONTROL INFORMATION

Integrated Pest Management

- The preferred approach for weed control is Integrated Pest Management (IPM). IPM involves selecting from a range of possible control methods to match the management requirements of each specific site. The goal is to maximize effective control and to minimize negative environmental, economic and social impacts.
- Use a multifaceted and adaptive approach. Select control methods which reflect the available time, funding, and labor of the participants, the land use goals, and the values of the community and landowners. Management will require dedication over a number of years, and should allow for flexibility in method as appropriate.

Planning Considerations

- Survey area for weeds, set priorities and select best control method(s) for the site conditions. Small infestations can be effectively dug. Isolated plants should be carefully removed in order to stop them from infesting a larger area.
- For larger infestations, the strategy will depend on the land use of the site. Specific suggestions are given later.
- Generally work first in least infested areas, moving towards more heavily infested areas.
- Control practices in critical areas should be selected to minimize soil disturbance and reduce the potential for erosion. Minimizing disturbance also avoids creating more opportunities for germination of weed seeds.
- If the control site requires extensive clearing or grading, or is located near a shoreline, steep slope, stream, or wetland, contact the Jefferson County Department of Community Development to find out whether or not a permit may be necessary.
- Because bittersweet nightshade is **not** a state-listed noxious weed, control in critical areas is not exempted. Consult the Jefferson County Conservation District or the Weed Control Board before starting control of bittersweet nightshade in any critical area.

Early Detection and Prevention

- Bittersweet nightshade is easiest to spot from mid-May to late fall. Look for purple flowers from May to September and berries from August through early winter.
- Manually control new infestations as early as possible making sure to remove all roots.
- Monitor the control site and remove any plants returning from root fragments.
- Do not introduce soil or gravel from areas known to have bittersweet nightshade.
- Dispose of weeds carefully—if left on site they may re-grow.

Manual

- Hand pull the stem close to the ground, taking care not to break the stems or roots. This method is most effective with young plants and new infestations. Wear gloves when handling toxic plants!
- Or dig plants, removing as much root as possible. It may be necessary to use loppers to cut back dense growth in order to access roots.
- Pulling or digging work best when the soil is moist.
- Digging may not be effective where the roots are growing down between rocks or mixed in with desirable plants where it is not possible to remove enough of the roots to prevent re-growth. In those situations, another method will need to be used.
- Recheck work area because even small root or stem fragments left behind can re-sprout.
- Manual control can cause considerable sediment disturbance in and near creek beds, so measures should be taken to minimize impacts during work, and all applicable “fish windows” should be followed to avoid damaging fish habitat during spawning seasons.

Mechanical

- Mowing is not usually practical on bittersweet nightshade because of its growth form and habitat, although brush cutting may facilitate access to roots for manual removal if the plants are growing in dense thickets.
- Practical considerations aside, mowing or weed-whacking once or twice a year will not eliminate perennial plants like bittersweet nightshade because the perennial roots continue to grow. However, cutting 5 times or more each year, throughout the growing season, can reduce photosynthesis to the point that the roots are “starved out” and plants die
- Cutting to the ground can be combined with covering with heavy duty geotextile fabric (woven plastic fabric) or other covering material. Covering needs to be kept securely in place for at least two years. Do not place bark, wood chips or any other kind of mulch on top, because weeds will grow in it, and it will be more difficult to remove the fabric when the nightshade is gone. Plus, covering the fabric with mulch may encourage animals to walk across it and make holes in it. The site should be visited several times during the growing season and it may be necessary to stomp down plants which are trying to grow under the fabric. Also, the edges should be checked for escaping plants, which can be cut back or sprayed. This method of control will kill all plants so may not be appropriate if desirable plants are present on site.
- If removing dense patches, the area should be replanted with native or non-invasive plants and mulched to minimize re-invasion by nightshade and other weeds.

Biological

- Biological control is the deliberate introduction of insects, mammals or other organisms which adversely affect the target weed species. Biological control is generally most effective when used in conjunction with other control techniques. There are currently no biological control agents available for bittersweet nightshade.

Chemical

- Effective chemical control of biennial and perennial weeds can be achieved only with *translocated* herbicides (ones that move through the plant and kill the roots).
- If desirable grasses or other monocots (sedges, rushes or cattails) are present, use a selective herbicide (one that affects only broadleaved plants), or carefully spot-spray only the bittersweet nightshade.
- Herbicides are most effective on actively growing plants in warm, dry weather.
- Herbicides should only be applied at the rates and for the site conditions and/or land usage specified on the label. **Follow all label directions.**
- Treated areas should not be mowed or cut until after the herbicide has had a chance to work. This can be as long as 2-3 weeks.
- It is important to establish new vegetation after treating an area. Follow the label for the timing because some herbicides stay active longer than others.

For questions about herbicide use, and specific herbicide recommendations, contact the Jefferson County Noxious Weed Control Program at 360-379-0470 ext 205, or noxiousweeds@co.jefferson.wa.us.

SUMMARY OF BEST MANAGEMENT PRACTICES

Small Infestations in Desirable Vegetation

- Can be hand-pulled or dug.
- If manual control is not possible apply an appropriate herbicide.
- Monitor site throughout growing season and remove new plants.

Large Infestations\Monocultures

- Cut down the bittersweet nightshade with loppers, brush mowers, machetes or weed-whackers.
- Following cutting, either dig up the roots if labor is available, treat re-sprouting nightshade growth with an appropriate herbicide or cover the area with a heavy duty woven geotextile fabric or another type of material (see Mechanical section of this BMP).
- For large areas, it may be more cost-effective to apply herbicide at the appropriate time.
- When large dense areas of nightshade are removed, the bare areas created need to be re-vegetated to prevent erosion and re-invasion of nightshade and other invasive weeds
- Infested areas will require follow-up management lasting for several years to control plants re-growing from the seed bank and any remaining roots.

Riparian and Aquatic Area Control

- Focus on manual removal for small infestations if possible. Follow procedures listed above.
- When manual removal is used along creeks and ditches, take care to prevent or mitigate for erosion and turbidity problems.
- If manual control is not feasible, spot spray using an appropriate herbicide.
- **Any herbicide application over or near water can be done only by a specially-licensed applicator using an approved aquatic formulation, and may require a permit from the Washington State Department of Ecology.**

Road Right-of-Way Control

- Manually remove infestations if possible.
- If manual control is not feasible, spot spray using an appropriate herbicide.
- If bare spots are left, replant with low-growing native plants.

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