

# Invasive Plants of Wisconsin



## Common Buckthorn (*Rhamnus cathartica*) Glossy Buckthorn (*Frangula alnus*)

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20-25' tall dioecious understory shrub or small tree. Both species commonly grow in shrub form with many stems sprouting from the same base. Leaf scars are prominent in winter. Cut branch exposes yellow sapwood and orange heartwood. **Common buckthorn** has brown to silvery bark that is somewhat shiny when young and dark grey to black and scaly when mature. Buds are found in pairs at end of branches, are covered in dark scales and resemble a hoof. Twigs often end in stout thorns. **Glossy buckthorn** has gray to brown bark with elongated lenticels lighter than the bark. Buds lack scales are hairy and found at the end of branches. Lacks thorns unlike common buckthorn.

### Legal Classification in WI: Restricted

**Leaves:** Ovate or elliptic, with prominent veins curving toward tip. Stay green late into fall. **Common buckthorn** has mostly opposite leaves, 1-2.5" long, with tiny teeth. **Glossy buckthorn** has mostly alternate leaves, 2-3" long, with entire margins and a glossy upper surface and dull underside that can be hairy.

**Flowers:** Small and clustered where the leaf attaches to the stem (leaf axil). **Common buckthorn** has fragrant, greenish-yellow, 4-petaled flowers that bloom from late spring. **Glossy buckthorn** has small, pale yellow, 5-petaled flowers that bloom from spring to first frost.

**Fruits & seeds:** Both species have abundant clusters of round, 0.25" diameter fruit. **Common buckthorn** fruit is black, and **glossy buckthorn** fruit is red to dark purple, turning nearly black when ripe.

**Roots:** Extensive fibrous root system extending from a woody crown.

**Similar species:** Alder buckthorn (*R. alnifolia*; native) is under 3' tall with thornless twigs. Lance-leaved buckthorn (*R. lanceolata*; native) is less than 6' tall, found in wet areas and on dry limestone slopes, and has alternate leaves, 2-6" long, gradually tapering to a point at the tip. Carolina buckthorn (*R. caroliniana*; native), found in the southern Midwest, is 10-30' tall with toothed, mostly alternate leaves, 2-3" long.

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**Ecological threat:**

- **Common buckthorn** invades the understory of southern oak, oak-beech, maple, and riparian woods. It also invades prairies, savannas, hedgerows, pastures, old fields, roadsides, and rocky sites.
- **Glossy buckthorn** invades wetter, often more organic soils than *R. cathartica*. Invades alder thickets, calcareous fens, wetlands, heath-oak woods, pine woods, spruce woods, pastures, fencerows, roadsides, slopes of ravines, wet prairies, marshes, sedge meadows, sphagnum bogs, and tamarack swamps.
- Both buckthorns are characterized by prolific reproduction by seed, long distance dispersal ability, wide habitat tolerance, and high levels of phenotypic plasticity (adjusting physical appearance to maximize productivity across environmental conditions).
- Both leaf out very early and retain leaves late into the growing season, providing a longer growing season than native plants.

**CONTROL METHODS:****Non-Chemical control**

**Removal** – Plants  $\leq 0.4$ " diameter are easily pulled from moist soil. Larger diameters (0.5-1.5") can be dug or pulled. To prevent re-sprouting remove above ground growth and root crown. Dig before plant produces seeds.

**Mowing** – Mowing removes above ground growth of established plants and prevents additional seed production, but rarely kills plants as established plants persist after mowing for many years. If possible, mow in the winter to avoid damaging desirable vegetation and compacting soil. If mowed material is mulched on the soil surface it can reduce seedling recruitment. Pairing mowing with another technique (such as foliar spray of herbicide) increases effectiveness. Cutting before seed is produced in summer and again after the plant has re-sprouted in fall will reduce vigor of re-sprouts the following year, but will not kill plants. If seeds present when removed, avoid movement off-site unless material can be transported without spreading fruit to other locations.

**Prescribed burning** – Spring burns can kill germinating seedlings and suppress above ground growth of established plant depending on fire intensity. After the fire, established plants will quickly re-sprout; this management method is not recommended unless integrated with other techniques. Burning stimulates seedling germination, but 5 to 6 years of repeated burning will reduce buckthorn seedbank. A five-second application of flame with a propane torch around the stem will kill plants  $\leq 2$ " diameter.

**Manipulation of the environment** – Under planting with a vigorous, shade tolerant woody species, such as sugar maple may compete with new buckthorns invasions as this further reduces the light level in forests preventing established plant growth and seedling germination.

**Chemical control<sup>2</sup>**

Pre-emergence – Apply herbicide directly to soil. These products will only damage plants that germinate after the herbicide has been applied. <i>They will not damage established buckthorn.</i> Use lower rates on areas where less dense populations are expected and higher rates on areas where denser populations are expected.	
Active Ingredient (A.I.): napropamide  Common product name: Devrinol 50-DF	Rate – 1.8 - 7.1 lb/A (0.9 - 3.6 lb a.i./A)  Timing – Apply prior to germination of seedlings. While spring applications will maximize control, fall or winter applications may also suppress seedlings depending upon environmental conditions.  Remarks – Reduced efficacy can be expected if < 0.6” of rainfall occurs within 2-3 days of application.  Caution – Do not allow this product to enter surface waters.
Active Ingredient (A.I.): pendimethalin  Common product name: Pendulum Aquacap	Rate – 90 fl oz/A (2.7 lb a.i./A)  Timing – Apply prior to germination of seedlings. While spring applications will maximize control, fall or winter applications may also suppress seedlings depending upon environmental conditions.  Remarks – Reduced efficacy can be expected if < 0.5” of rainfall occurs within 30 days of application.  Caution – Do not exceed applications of 67 fl oz/A on home lawns, parks, schools, and playgrounds. Do not allow this product to enter surface waters.
Foliar – Apply directly to individual plants or broadcast across an infested area. Broadcasted foliar applications are typically the most cost effective treatment in dense infestations. Use lower rates on smaller plants and less dense populations and higher rates on larger plants and denser populations.	
Active Ingredient (A.I.): glyphosate  Common product name: Roundup	Rate – <i>broadcast:</i> 1.7 - 3.7 lb a.e./A <i>spot:</i> 1.0 – 2.0% (0.05 - 0.09 lb a.e./gal)  Timing – When target species is actively growing and fully leafed out.  Remarks – A wick application is effective on shorter plants that are taller than desirable species, with 33-75% (1.49-3.38 lb a.e./gal).  Caution – Applications can result in bare ground as glyphosate is not selective. Use aquatically labeled product if potential exists for solution to contact open waters.

<sup>2</sup> Herbicide information is based on label rates and reports by researchers and land managers. Products known to provide effective control or in common use are included. Those that do not provide sufficient control or lack information for effectiveness on target species have been omitted. References to pesticide products in this publication are for your convenience and not an endorsement of one product over a similar product. You are responsible for using pesticides in accordance with the label directions. *Read the label before any application.*

<p>Active Ingredient (A.I.): triclopyr</p> <p>Common product name: Tahoe 4</p>	<p>Rate – <i>broadcast</i>: 128 - 256 fl oz/A (4.0 - 8.0 lb a.e./A) <i>spot</i>: 1.0 – 2.0% (0.1 - 0.2 lb a.e./gal)</p> <p>Timing – When target species is actively growing and fully leafed out.</p> <p>Caution – Can volatilize, avoid application during high temperatures and low humidity, especially when the application contacts impervious surfaces. Overspray or drift to desirable plants should be avoided as even minute quantities of the spray may cause severe injury. Use aquatically labeled product if potential exists for solution to contact open waters.</p>
<p>Active Ingredient (A.I.): triclopyr + 2,4-D</p> <p>Common product name: Crossbow</p>	<p>Rate – <i>broadcast</i>: 128 - 192 fl oz/A (triclopyr: 1.0 - 1.5 lb a.e./A + 2,4-D: 2.0 - 3.0 lb a.e./A) <i>spot</i>: 1.0 - 1.5% (triclopyr: 0.01-0.02 lb a.e./gal + 2,4-D: 0.02-0.03 lb a.e./gal)</p> <p>Timing – When target species is actively growing and fully leafed out.</p> <p>Caution – Can volatilize, avoid application during high temperatures and low humidity, especially when the application contacts impervious surfaces. Overspray or drift to desirable plants should be avoided, as even minute quantities of the spray may cause severe injury.</p>
<p><b>Cut stump</b> – Cut a stem of a plant near the base and apply herbicide to the cut surface that remains rooted in the ground. Do not use this method if there is heavy sap flow or snow covers the cut surface. Use lower rates on smaller plants and higher rates on larger plants.</p>	
<p>Active Ingredient (A.I.): glyphosate</p> <p>Common product name: Roundup</p>	<p>Rate – 20 - 50% (0.9 - 2.25 lb a.e./gal)</p> <p>Timing – Anytime of year.</p> <p>Remarks – Mix with water. In temperatures below freezing solution can become unusable. Most effective in fall through mid-winter.</p> <p>Caution - Applications can result in bare ground as glyphosate is not selective. Use aquatically labeled product if potential exists for solution to contact open waters.</p>
<p>Active Ingredient (A.I.): imazapyr</p> <p>Common product name: Stalker</p>	<p>Rate – 6.0 – 9.0% (0.12 - 0.18 lb a.e./gal)</p> <p>Timing – Anytime of year.</p> <p>Remarks – May be mixed with antifreeze (ethylene glycol) in cold weather to avoid freezing.</p> <p>Caution - Avoid application to the soil as herbicide is not selective and can remain active in the soil for several months to over a year depending on application rate. Use aquatically labeled product if potential exists for solution to contact open waters.</p>

<p>Active Ingredient (A.I.): picloram</p> <p>Common product name: Tordon</p> <p>Some products containing picloram are restricted use in Wisconsin.</p>	<p>Rate – 50 - 100% (0.3 - 0.5 lb a.e./gal)</p> <p>Timing – Anytime of year.</p> <p>Caution – Known to leach through soil into ground water under certain conditions. Use of this chemical in areas where soils are permeable, particularly where the water table is shallow, may result in ground water contamination. Persists in soil for up to one year, especially active on legumes. Do not compost treated plants as herbicide can persist through composting process. Overspray or drift to desirable plants should be avoided, as even minute quantities of the spray may cause severe injury.</p>
<p>Active Ingredient (A.I.): triclopyr</p> <p>Common product name: Tahoe 4</p>	<p>Rate – 20 - 30% in oil (0.8 - 1.2 lb a.e./ gal)</p> <p>Timing – Anytime of year.</p> <p>Caution – Can volatilize, avoid application during high temperatures and low humidity, especially when the application contacts impervious surfaces. Overspray or drift to desirable plants should be avoided as even minute quantities of the spray may cause severe injury. Use aquatically labeled product if potential exists for solution to contact open waters.</p>
<p>Active Ingredient (A.I.): triclopyr + 2,4-D</p> <p>Common product name: Crossbow</p>	<p>Rate – 4% in oil (triclopyr: 0.04 lb a.e./gal + 2,4-D: 0.08 lb a.e./gal)</p> <p>Timing – Anytime of year.</p> <p>Caution - Can volatilize, avoid application during high temperatures and low humidity, especially when application contact impervious surfaces. Overspray or drift to desirable plants should be avoided as even minute quantities of the spray may cause severe injury.</p>
<p>Hack-and-squirt – Using a hand axe, make cuts ever three to four inches at 6-18” above the ground at the same level and apply solution into the cut area. Do not use this method if there is heavy sap flow. Use lower rates on smaller plants and higher rates on larger plants.</p>	
<p>Active Ingredient (A.I.): glyphosate</p> <p>Common product name: Roundup</p>	<p>Rate – 50 - 100% (2.25 - 4.5 lb a.e./gal)</p> <p>Timing – Anytime of year.</p> <p>Remarks –In temperatures below freezing solution can freeze and be unusable.</p> <p>Caution - Applications can result in bare ground as glyphosate is not selective. Use aquatically labeled product if potential exists for solution to contact open waters.</p>

<p>Active Ingredient (A.I.): imazapyr</p> <p>Common product name: Stalker</p>	<p>Rate – 6.0 – 9.0% (0.12 - 0.18 lb a.e./gal)</p> <p>Timing – Anytime of year.</p> <p>Remarks – May be mixed with antifreeze (ethylene glycol) in cold weather to avoid freezing.</p> <p>Caution - Avoid application to the soil as herbicide is not selective and can remain active in the soil for several months to over a year depending on application rate. Use aquatically labeled product if potential exists for solution to contact open waters.</p>
<p>Active Ingredient (A.I.): picloram</p> <p>Common product name: Tordon</p> <p>Some products containing picloram are restricted use in Wisconsin.</p>	<p>Rate – 50% (0.3 lb a.e./gal)</p> <p>Timing – Anytime of year, except during drought conditions.</p> <p>Caution – Use of this chemical in areas where soils are permeable, particularly where the water table is shallow, may result in ground water contamination. Persists in soil for up to one year, especially active on legumes. Do not compost treated plants as herbicide can persist through composting process. Overspray or drift to desirable plants should be avoided, as even minute quantities of the spray may cause severe injury.</p>
<p>Active Ingredient (A.I.): picloram + 2,4-D</p> <p>Common product name: Pathway</p> <p>Some products containing picloram are restricted use in Wisconsin.</p>	<p>Rate – 100% (picloram: 3% + 2,4-D: 11.2%)</p> <p>Timing – Anytime of year.</p> <p>Caution – Use of this chemical in areas where soils are permeable, particularly where the water table is shallow, may result in ground water contamination. Persists in soil for up to one year, especially active on legumes. Do not compost treated plants as herbicide can persist through composting process. Overspray or drift to desirable plants should be avoided, as even minute quantities of the spray may cause severe injury.</p>
<p>Basal bark – Apply herbicide in a ring around the entire stem. Applications should be made at least 6” wide (6-18”) to the base of a woody stem. Ideal for stems ≤6” in diameter. Use lower rates on smaller plants and higher rates on larger plants.</p>	
<p>Active Ingredient (A.I.): imazapyr</p> <p>Common product name: Stalker</p>	<p>Rate – 6 - 12% in oil (0.12 - 0.24 lb a.e./gal)</p> <p>Timing – Anytime of year.</p> <p>Caution - Avoid application to the soil as herbicide is not selective and can remain active in the soil for several months to over a year depending on application rate. Use aquatically labeled product if potential exists for solution to contact open waters.</p>

Active Ingredient (A.I.): triclopyr  Common product name: Tahoe 4	Rate – 1.0 – 5.0% in oil (4 - 20 lb a.e./100 gal)  Timing – Anytime of year.  Caution – Can volatilize, avoid application during high temperatures and low humidity, especially when the application contacts impervious surfaces. Overspray or drift to desirable plants should be avoided as even minute quantities of the spray may cause severe injury. Use aquatically labeled product if potential exists for solution to contact open waters.
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This series of fact sheets was created in cooperation with University of Wisconsin-Extension team Horticulture.

This material is based upon work supported by the Cooperative State Research, Education, and Extension Service, U.S. Department of Agriculture, under Award No. 2009-45060-06000.

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