

European Buckthorn

(*Rhamnus cathartica*)

Best Management Practice Technical Document for Land Managers

March 2017

- DISCLAIMER -

The intent of this document is to relay specific information relating to invasive plant control practices that have been advised by leading professionals across Ontario. This document contains the most up-to-date research and knowledge available at the time of publication and reflects current provincial and federal legislation regarding pesticide usage. It is subject to change as legislation is updated or new research findings emerge and is not intended to provide legal advice. The timing suggested will differ throughout Ontario and should be tailored to your region.

Use this document after you have performed monitoring, assessed your priority areas and made sure that the control options listed in this document are allowed and appropriate on your site. For more information, please refer to the Ontario Invasive Plant Council's Best Management Practices document for European buckthorn.

Strategy and Cautions

- Remove the outlying populations (isolated plants or satellite populations) and the most prolific seed producers (female plants) first to prevent further spread.
- Small populations ($\leq 300 \text{ m}^2$) of small plants ($\leq 5 \text{ cm}$ in diameter) can be removed manually.
- Large populations of seedlings or young trees for which pulling is not practical can be treated with a foliar application of a systemic herbicide.
- Large trees ($> 5 \text{ cm}$ in diameter) should be cut at the base and stump-treated with a systemic herbicide.
- Because of the thorns, it is recommended that protective clothing, including gloves, is worn when applying manual control.

Caution: Re-sprouting can be considerable after a failed control attempt. When applying manual control, the entire root must be removed to prevent re-sprouting.

Management of Small Populations ($\leq 300 \text{ m}^2$) Excluding Large Trees ($> 5 \text{ cm}$ Diameter)

Small populations of small plants (up to 1 m tall) can be hand-pulled any time of the year. Small population of plants up to 5 cm in diameter can be removed using a weed pulling tool. The entire root crown must be removed in order to prevent re-sprouting. Disturbed soil will result from these techniques and should be tamped down or covered in a thick layer of mulch to minimize exposing new buckthorn seeds. Manual control is easiest after rain when the soil is soft and pliable. If possible, cut off berried branches in the summer, before the berries get too ripe and fall off, then come back in the fall and pull out the cut stems. Because European buckthorn leaves stay greener longer than most native plants, manual control in the fall or early winter, before the ground freezes, may be favorable as identification is easier and most of the ground vegetation will have gone dormant by this time, reducing disturbance to surrounding plants.

Management of Large Populations ($> 300 \text{ m}^2$) and Large Trees ($> 5 \text{ cm}$ Diameter)

Application of a glyphosate-based or triclopyr-based herbicide is most effective for managing large populations and large trees. A foliar application of a glyphosate-based herbicide is recommended for large populations of small trees. Large trees ($> 5 \text{ cm}$ diameter) can be cut and the stumps treated with either glyphosate (must be applied immediately following cut) or triclopyr mixed with bark oil. These plants can also be sprayed with triclopyr using a basal bark application. Since systemic herbicides need to be translocated to the roots to be effective, herbicide applications must be applied during the growing season. Pesticide drift may prohibit pesticide use near water.



Legal Considerations and Regulatory Tools for Chemical Control

Herbicides must be applied in accordance with the federal *Pest Control Products Act*, the Ontario *Pesticides Act*, Ontario Regulation 63/09 and in accordance with all label directions. Ensure you have the most current label and are aware of any re-evaluation decisions. The easiest way to find a chemical label is by using the PMRA's label search tool, which can be found by searching "PMRA label search" in any major search engine. Only licensed pesticide applicators are legally allowed to apply restricted pesticides in Ontario.

Ontario's *Cosmetic Pesticides Ban Act* prohibits the non-essential use of prescribed pesticides (Class 9) on land. Exceptions exist to allow the use of these herbicides for control of plants, such as European buckthorn, that are detrimental to the environment, economy, agriculture and/or human health. To qualify for these exceptions specific criteria must be met and appropriate ministry approval is required.

Table 1: Exceptions to the Ontario *Cosmetic Pesticides Ban Act* which may be applicable for control of European buckthorn.

Forestry:	European buckthorn aggressively invades hardwood (deciduous) and softwood (coniferous) forests and its allelopathic properties prevent native plants from growing.
Agricultural:	European buckthorn can host agricultural pests such as oat rust, crown fungus, alfalfa mosaic virus and the soybean aphid. It is also listed as a Noxious Weed under the <i>Weed Control Act</i> .
Natural resource:	European buckthorn outcompetes native species, alters soil conditions and prevents regeneration of native tree species.

For more information on these exceptions and applicable procedures, please refer to the Ontario Invasive Plant Council's Best Management Practices document for European buckthorn.

Herbicide Selection and Application

Professionals consulted for this document recommend using glyphosate-based or triclopyr-based herbicides. Herbicide needs to be applied annually until the seedbank is exhausted and/or other vegetation is sufficiently established.

Table 2: Chemical control techniques recommended by experts for European buckthorn.

Chemical Control Method	Chemical and Concentration	Timing and Application	Details
FOLIAR	Glyphosate (3 - 5% solution*).	Spring and summer. Must have growing leaves present to be effective.	For large populations of seedlings <0.5 cm diameter.
CUT STUMP	Glyphosate (95% solution*).	Spring, summer or fall. Use a paint brush or squirt bottle to apply.	Apply immediately following cut.
	Triclopyr (20% solution**) mixed with bark oil.	All year. Follow herbicide label instructions regarding temperatures at which the herbicide can be applied.	Use a paint brush or squirt bottle to apply. Can be applied to stumps days to weeks after cutting.
BASAL BARK	Triclopyr (20% solution**) mixed with bark oil.	All year. Follow herbicide label instructions regarding temperatures at which the herbicide can be applied.	Apply chemical all the way around the stem in a 30 cm high strip.

*Based on a product containing 540 g/l of chemical. **Based on a product containing 755 g/l of chemical. Please read the label in full before use to ensure that these recommendations meet the requirements of the herbicide you have selected.



Disposal

Do not compost viable plant material (berries and roots) at home or send to landfill. If your municipality has a high-heat compost program, plants can be sent there. Alternatively, solarize viable plant material by placing it in sealed black plastic bags and leaving them in direct sunlight for 1-3 weeks. Alternatively, place in yard waste bags, cover with a dark-coloured tarp and leave in the sun for 1-3 weeks. When seedlings or young shrubs are pulled, they should be disposed of in a manner that will ensure that their roots will dry out completely. When feasible, it is advised to remove limbs containing dense clusters of berries. The remaining biomass can be sent to municipal composting facilities while the seed-containing berries are best disposed of at the landfill. European buckthorn wood (other than viable seeds and roots) that has been cut can be burnt as firewood, composted or sent to municipal composting facilities.

Rehabilitation and Monitoring

Control is much more successful when heavily infested areas, often with seed-saturated soil seedbanks, are re-planted with native tree and plant species that are able to out-compete new growth. See the Ontario Invasive Plant Council's Best Management Practices document for more details. Follow-up monitoring and removal of new growth is crucial for successful control. European buckthorn seeds can remain viable in the soil for more than 5 years.

