OAK OPENINGS REGION BEST MANAGEMENT PRACTICES

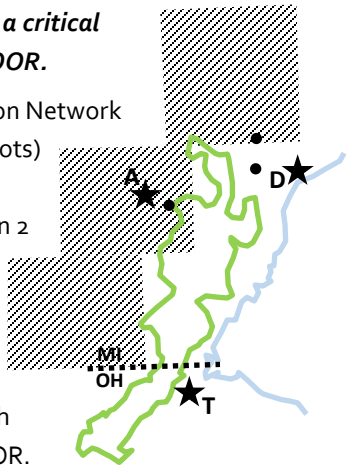
BLACK SWALLOW-WORT

Cynanchum louiseae

ALERT

This Best Management Practice (BMP) document provides guidance for managing Black Swallow-Wort in the Oak Openings Region of Northwest Ohio and Southeast Michigan. This BMP was developed by the Green Ribbon Initiative and its partners and uses available research and local experience to recommend environmentally safe control practices.

INTRODUCTION AND IMPACTS— Black Swallow-Wort *(Cynanchum louiseae)* is native to Europe and was first brought to North America in the mid to late 1800s, presumably as an ornamental or horticultural specimen. Black Swallow –Wort (B. Wort) seeds are still available for sale, and pods may be collected inadvertently by members of the public. B. Wort is now widely distributed in North America and is found throughout OH and MI. ***Educating nursery growers, plant distributors, landowners, and the public is a critical prevention measure for B. Wort in the OOR.***



The Midwest Invasive Species Information Network (MISIN) has 4 reports of B. Wort (black dots) in or within 5 miles of the Oak Openings Region (OOR, green line). It is reported in 2 of the OOR's 7 counties, as well as one neighboring county (black stripes). B. Wort is currently absent in most of our natural areas, but it has demonstrated the ability to establish and spread in both healthy and disturbed habitats of the OOR. Indications are that this species is at the early stages of invasion in the region making reporting critical to preventing further spread.

B. Wort has an aggressive growth habit and its twining stems easily blanket and smother native plants. B. Wort produces anti-bacterial and anti-fungal compounds, protecting itself from many pathogens. Herbivory is discouraged by its roots, containing compounds toxic to mammals (haemolytic glycosides). Additionally, it contains allelopathic compounds which suppress the growth of other, native plants. B. Wort is detrimental to monarch butterflies and other insects—monarchs lay their eggs on B. Wort because it resembles milkweed, but the caterpillars are unable to survive on B. Wort. Finally, B. Wort encourages generalist arbuscular mycorrhizal fungi at the expense of specialized mycorrhizal species necessary for native plants.

Through its inhibition of native plants and its effect on bacteria, fungi, and insect populations, B. Wort severely degrades the quality of the habitats in which it becomes established.

SIMILAR SPECIES—B. Wort is similar in appearance and habit to Pale Swallow-Wort (*V. rossicum,* "PSW"). PSW's petals are elongated, pink, and hairless. PSW is not native to the United States and can also be treated with the control methods outlined here.

Several species native to the OOR may be confused with B. Wort. Native dogbanes (*Apocynum* spp.) are upright with bell-shaped flowers at the stem tips. Native milkweeds (*Asclepias* spp.) have more elaborate flowers, stiff stalks, and milky sap. In the OOR, B. Wort is the only plant in the milkweed family that grows as a vine. Just south of the OOR, it could be confused with Honeyvine (*C. laeve,* native), which is a vine, but has heart-shaped leaves and white flowers.

HABITAT—B. Wort tolerates a wide range of light, temperature and soil conditions, but is most aggressive in open, upland habitats. It can tolerate some flooding but not prolonged inundation. B. Wort forms beneficial associations with arbuscular mycorrhizal fungi, and is more productive in soils with these fungi. In the OOR, B. Wort has been found on sand dunes, in and along edges of floodplains, near vernal pools and ponds, and along roads, ditches, and streams.

IDENTIFICATION—Habit: Herbaceous perennial vine. 2-8' tall.

Leaves: Simple and opposite. Oval to oblong with a pointed tip and smooth margins. 2-5" long and 2-3" wide. Dark green with a glossy, waxy coating. Herbal smell when crushed.

Stems: Sprawling or twining and will climb adjacent plants. Unbranched. Covered with downy hairs. Sap is clear and watery.

Flowers: Small (1/4" wide) purple-black flowers. Clustered in groups of 6-10 in leaf axils. Five triangular petals covered in fine hairs. Slight "rotting-fruit" odor. Able to self-pollinate.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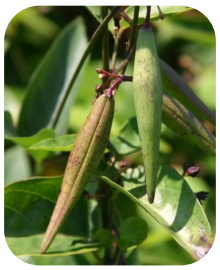
Fruits: Slender, elongate, hairless seedpods, 1.5-3" long and 1/4" wide. Resemble milkweed or dogbane pods. Green, turning brown with age. Split lengthwise when ripe. Many seeds per pod.

Seeds: Flat and brown with tufts of 1" silky filaments. Ovoid and 1/4" long.

Roots: Deep taproot and extensive shallow roots. Fleshy and white. Short underground rhizomes, but sprouting is uncommon.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B. Wort Time-line	J	F	M	A	M	J	J	A	S	O	N	D
Life History	Winter Dieback			Emergence		Flowering—Fruiting			Seed Dispersal		Winter Dieback	
Cutting Only						Cut to prevent seed devel.						
Cut and Spray						Cut		Spray				
Foliar Spray						Glypho-sate 1/2		Glyphosate 2/2 or Triclopyr 1/1				
Stump-Cut					Treat when stems alive							
Cut and Cover	Can begin any time, leave in place at least 2 years											

REPRODUCTION AND DISPERSAL—B. Wort reproduces primarily by seed, though it can sprout from rhizomes or fragments of root crown. Though plants do not reach maturity for several years, high density stands of B. Wort can produce 2,000 seeds/m^2 or more. Seeds are wind-borne and can be spread several hundred feet from the parent plant. They can persist in the soil for up to 5 years. Some seeds may be polyembryonic and produce multiple seedlings. Humans may inadvertently spread B. Wort seeds through hay or by mistaking them for native milkweeds. ***Thoroughly cleaning equipment is a critical prevention measure for B. Wort in the OOR. Land managers should consider incorporating pre– and post-project equipment cleaning into contracts.***

REPORTING—Identified as an Alert species in the OOR. Reporting B. Wort is essential for its control and early detection rapid response is critical since it currently seems to be absent from most of the OOR. B. Wort is easiest to identify when in flower, in late summer when it turns yellow, or in winter when dead stalks and seed pods persist. Report B. Wort at www.misin.msu.edu and also to the county or local CWMA or CISMA.

CONTROL—The best control is integrated control. Management plans should focus on prevention of fruiting, followed by chemical damage to the roots and rhizomes where conditions permit the use of herbicides. Annual follow-up is essential in the treatment of B. Wort, and monitoring should include an area of at least several hundred feet around the original patch.

Chemical: The following recommendations have been compiled from groups working in MI, ME, WI, RI, NY, and Canada. It is the responsibility of the applicator to ensure compliance with herbicide labels and regulations when planning chemical treatment. Follow-up treatments should take place six weeks after cutting or initial application.

Foliar Spraying—Best for large, dense populations or as follow-up after cutting. Due to B. Wort's waxy cuticle, herbicides must be used with 0.5-1% of an appropriate non-ionic surfactant (e.g. Cygnet Plus®, LI-700, etc.). Multiple treatments in a season are necessary because initial applications will only kill the top layer of vines.

Stump Cut—Cut stem 2" above ground and immediately apply herbicide to the stump (top). Best for small to medium populations.

Mechanical: Due to its extensive root system, pulling B. Wort is ineffective. Digging may be applied to small populations, but only if care is taken to remove the entire root crown.

Herbicide	Trade Names	Concentration
Glyphosate	Rodeo®, Roundup®, Accord® *Two foliar treatments per season	Spray—1-5% Stump—50-100%
Triclopyr	Garlon 3A® or 4 Ultra®, Renovate® *One foliar treatment per season	Spray—1-3% Stump—25-100%

Removing the root crown can be more effective than herbicide use, but is labor intensive. The site will need to be monitored for at least 3 years post-digging. Cutting and mowing can be used to prevent fruiting, but these treatments will result in dense re-sprouting and are not long-term solutions. The ideal time to cut B. Wort is after pods begin to form, but before seeds start to ripen, as this may prevent the plant from flowering again. Cutting/mowing will have to be repeated several times. Avoid areas where B. Wort is releasing seeds unless equipment is cleaned carefully afterward. Be cautious, as B. Wort vines can tangle in machinery. Pods can be removed by hand, but this method is labor intensive, and will only prevent seed dispersal, not kill the plant. Cutting stems to the ground and covering the infested area in thick plastic or geotextiles is labor and cost intensive, but can effectively control B. Wort if left in place for several growing seasons. B. Wort can easily grow through holes in plastic sheets or out from under sheets, so covered areas must be monitored frequently.

Biological: Two leaf-eating moth species (*Hypena opulenta* and *Abrostola asclepiadis*) are being researched as potential biological control agents for B. Wort. *Hypena opulenta* has already been released in Ontario and was approved for use by the USDA in September, 2017. Grazing is not a viable control option, as B. Wort may be toxic to livestock.

Prescribed Fire: Fire alone will not control B. Wort and may actually stimulate its growth. Before applying prescribed fire, other control actions should be taken. However, fire can top-kill large vines, reduce fruit production, exhaust the seedbank, reduce cover, and make areas more accessible for ground-level herbicide treatment. Caution: B. Wort can act as a ladder fuel, carrying fire into the canopy.

DISPOSAL

- If flowers/pods present: seal all plant material in black plastic bags and leave in direct sunlight for 1-3 weeks, or burn.
- If no flowers/pods present: dry plant parts thoroughly before burning or taking to a landfill.
- Do not leave root crowns and root fragments in contact with the ground.
- Do not remove soil from the site unless it is being disposed of in a landfill.

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