



JAPANESE BARBERRY

Berberis thunbergii



TARGET

This Best Management Practice (BMP) document provides guidance for managing Japanese Barberry 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— Japanese Barberry (*Berberis thunbergii*) is native to Japan and was first brought to North America in 1875 as an ornamental. It is resistant to deer browsing, and for this reason has been used widely in landscape plantings. Though prohibited in MI, Japanese Barberry (“J. Barberry”) is already 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 J. Barberry in the OOR.**

The Midwest Invasive Species Information Network (MISIN) has 29 reports of Japanese Barberry (black dots) in or within 5 miles of the Oak Openings Region (OOR, green line). The USDA PLANTS Database does not list J. Barberry in any of the OOR’s 7 counties, but J. Barberry is already present in many natural areas across the region. It has demonstrated the ability to establish and spread in healthy and disturbed habitats of the OOR (see habitat section). Indications are that this species is at the early stages of invasion in the OOR, making reporting critical to preventing further spread.

Japanese Barberry has many characteristics that contribute to its classification as an invasive, pest species. It grows quickly, with seedlings reaching up to 4’ in a single season, and forms dense stands. It leafs out early and holds its leaves late, reducing the light available to native species. J. Barberry is resistant to browsing, which increases pressure on more palatable native species. It resprouts vigorously when browsed or cut, and can alter soil pH and nitrogen levels.

In addition to its impacts on native plants, Japanese Barberry severely degrades the quality of the habitats through its association with non-native earthworms, which increase soil nitrification and litter breakdown. J. Barberry has also been found to harbor higher densities of adult deer ticks and white-footed deer mice than native shrubs. Because of this, J. Barberry has been identified as a contributing factor to the spread of Lyme disease.

SIMILAR SPECIES—Japanese Barberry is similar in appearance and habit to Common Barberry (*B. vulgaris*) and *B. x ottawensis* (a hybrid of J. Barberry and *B. vulgaris*); both of which are also invasive. Common Barberry’s leaves are finely toothed while J. Barberry’s have smooth margins. Common Barberry can be treated with the same methods outlined here.

American Barberry (*B. canadensis*) may also be mistaken for J. Barberry. American Barberry has not been recorded in the OOR, but is native to neighboring states. The leaves of American Barberry are toothed, its spines are usually three-pronged, and its flowers hang in

clusters suspended from a central stem. In contrast, J. Barberry has smooth margins, single spines, and flowers sessile to the twig.

HABITAT—J. Barberry is extremely shade tolerant and can grow in a wide range of soil types. While it prefers well-drained soils, it can be found in wetlands. It is frequently found on roadsides, stream banks, forests, woodland edges, and old fields. In the OOR, J. Barberry has been found in denser woodlands and flatwoods, within/at the edges of floodplains and streams, and along roads and ditches.

IDENTIFICATION—Habit: Compact, deciduous shrub. Multiple stems. Spiny, with arching branches. 2-10’ tall and 3-8’ wide.



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Leaves: Small (<1.5” long and <1/2” wide) and alternate, with smooth margins. Oval to spoon-shaped. Clustered along the stem. Red fall color. Leaves are often green to blue-green, but color ranges from chartreuse to burgundy depending on the cultivar.

Stems: Arching and deeply grooved. Single spine at each node. Older stems are grey while younger stems turn reddish brown in winter. Inner bark is bright yellow. Pungent odor when scraped.

Flowers: Small (1/4” wide) and pale yellow. Six sepals (petal-like) and six petals. Dangle below branches singly or in umbellate clusters of 2-5 at the nodes; flower along the entire stem. Insect pollinated.



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2 mm



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Fruits: Small, egg-shaped and bright red. 1/3-1/2” long, with dry flesh. Persist into winter. Production is highest in full sun, but shaded plants will produce fruit.

Seeds: Dispersed by birds and mammals. Germination rates drop dramatically after the first year, suggesting J. Barberry does not persist in the seed bank. Depending on the cultivar, a single plant may produce anywhere from 90-3,000 seeds each year.

Roots: Large shallow root system. Rhizomes and fine roots radiating from a root crown. (continued next page)

Japanese Barberry Timeline	J	F	M	A	M	J	J	A	S	O	N	D
Life History	Dormant		Leaf Out	Flowering		Growth		Fruits Ripen			Dormant—Fruits Persist	
Spray						Spray before leaves change color						
Stump-Cut	Treat					Treat						
Prescribed Fire				Burn								
Direct Torching			First Treatment				Follow-Up					

Rhizomes sprout away from the root crown, forming thickets of stems. Yellow in color. Pungent odor when scraped.

REPRODUCTION AND DISPERSAL—Reproduction of Japanese Barberry is vegetative and by seed. The tips of branches will root when in contact with the ground, clonal shoots grow below ground, and seed can be dispersed some distance by birds. Wild turkey and grouse are known to use the fruits heavily and may contribute to its spread.

REPORTING—Identified as a Target species in the OOR. Reporting Japanese Barberry is essential for its control. J. Barberry is easy to identify year round—it leafs out before other plants, retains its leaves late, has conspicuous fruit, and is otherwise recognizable by its distinctive profile and spines. Report J. Barberry at www.misin.msu.edu and also to the county or local CWMA or CISMA.

CONTROL—The best control is integrated control. A general management strategy would be to remove or reduce the above ground portion of the plant and then apply a follow-up treatment to re-sprouts. Systemic herbicides may be able to provide effective control in a single step. An annual follow-up is essential in the treatment of J. Barberry, and monitoring should include an area of at least 20' around the original patch.

Chemical: Herbicide is arguably the most effective control for J. Barberry. The following recommendations have been compiled from groups working in MI, MA, CT, MN, and NY. 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. Apply to actively growing plants after spring sap flow begins. Herbicides should be used with 0.5-1% of an appropriate non-ionic surfactant (e.g. Cygnet Plus®, LI-700, Nu-Film IR®, etc.) or oil-based adjuvant (e.g. SprayTech® Oil, AX-IT®) depending on the formulation.

Stump Cut—Cut stem 2" above ground and immediately apply glyphosate or triclopyr to the cross-section of the stump. Best for small to medium populations.

Basal Bark—Apply 25% triclopyr and 75% horticultural oil to a band of bark around the stem extending 12-15" up from the ground. Most effective on younger stems with thin bark. Do not use when bark is wet or when snow or water prevent application at ground level.

Mechanical: J. Barberry has shallow roots and hand pulling may be applied to seedlings and small plants. Gloves are necessary protection from J. Barberry's spines. Larger plants can be dug out.

Herbicide	Trade Names	Concentration
Glyphosate	Accord®, Rodeo®, Roundup®	Spray—1-3% Stump—27%
Triclopyr	Garlon 3A® or 4 Ultra®, Pathfinder®, Remedy® Ultra, Vastlan™	Spray—0.5-3% Stump—25-27%

When pulling/mowing/digging, be sure to remove the entire root crown and as much of the roots as possible to prevent resprouting. Tamp down the soil afterward and cover it with leaves, if possible. Cutting/mowing at least once per growing season can keep J. Barberry from fruiting, but will not kill established plants. Mowing can be an effective way to knock back J. Barberry in preparation for an herbicide or fire treatment. In all mechanical removal scenarios, ensure equipment is cleaned and all plant material is disposed of appropriately (see Disposal below).

Biological: J. Barberry is resistant to browsing. To date, it has no approved biological controls. However, a native moth, the barberry geometer (*Coryphista meadii*) has been known to defoliate J. Barberry, and the tephritid fly is being tested as a potential control species in Europe.

Prescribed Fire: Prescribed fire can help to control J. Barberry. Seedlings and small plants can be killed by late spring burns with good fuel. Larger plants may require repeated fires. It is recommended that fire be used in conjunction with herbicide follow-up, or vice versa.

Direct Torching: Direct flame treatment with propane torches has been used to control J. Barberry. Cut J. Barberry near the ground and after stems have resprouted, apply direct flame to the stems/root crown for 3-40 seconds at 100K or 400K BTU (until stems become carbonized and begin to glow). One study found that labor costs from direct-torching were at least 4x higher than those from herbicide application, though both treatments were equally effective.

DISPOSAL

- If no fruit is present: stems and roots can be left on site if roots are not in contact with the soil.
- If fruit is present: fruit should be incinerated, or sealed in plastic bags and disposed of in a landfill.
- Ensure all non-fruit plant parts are dead before composting, either by drying completely or liquefying in plastic bags.
- Due to J. Barberry's ability to sprout from root fragments, do not remove soil from the site unless it is being disposed of in a landfill.



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