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Invasive plants can thrive and aggressively spread beyond their natural range, disrupting ecosystems. The *Management of Invasive Plants in Wisconsin* series explains how to identify invasive plants and provides common management options. Management methods recommend specific timings for treatment, as well as expected effectiveness. For more information, go to: fyi.uwex.edu/weedsci/category/invasive-plants-of-wisconsin.

Japanese knotweed

(*Polygonum cuspidatum*)

Japanese knotweed is an herbaceous perennial, growing up to 10' tall. Hollow, reddish, arching, bamboo-like stems are smooth and stout, and they can persist after plant dies back each year. The base of the stem above each joint is swollen and surrounded by a membranous sheath (ocrea).

Legal classification in Wisconsin:

Restricted

Leaves: Alternate, egg-shaped to almost triangular, 4–6" long, 3–4" wide. Dark green on upper surface and pale green on lower surface.

Flowers: Blooms in late summer. Flowers are numerous, highly branched, tiny, creamy white or greenish, and found where the leaf attaches to the stem (axils), near the tips of stems.

Fruits and seeds: Small, winged, triangular fruits carry very small, shiny seeds.

Roots: Plants arising from seed have a taproot up to 6' deep. Stout rhizomes can reach 65' or more from parent plants and give rise to new stalks. Plants arising from seed and rhizome also have fibrous roots.

Similar species: Giant knotweed (*P. sachalinense*) is also invasive, but grows up to 13' tall with larger leaves. The two species are known to hybridize.

Ecological threat:

- Invades upland and lowland sites that are disturbed and undisturbed.
- Poses a significant threat to riparian areas, where it can rapidly spread.
- It tolerates shade, high temperatures, high salinity, and drought.
- It can be transported to new sites as a contaminant in fill dirt or on equipment. During floods, it spreads downstream by shoot fragments, rhizomes, or occasionally by seeds. Escapees from neglected gardens and discarded cuttings are common routes of dispersal from urban areas.
- Although reported to not produce viable seed, several studies have shown that populations of knotweed in the United States can produce viable seed that readily germinate and survive in field conditions.



Non-chemical control

Removal

Effectiveness in season: < 50%
Season after treatment: < 50%

Pull at least four times a year. Rhizomes of newly established populations can be removed by digging, but care must be taken to remove all rhizomes and perennial roots since very small amounts can resprout. This is not recommended for established populations because of the depth (6' taproot) and width (65' rhizomes) of the root system. Bag all cut or pulled material and dispose of it in a landfill or burn to avoid potential for root material or above-ground tissue to reroot.

Mowing

Effectiveness in season: 50–70%
Season after treatment: < 50%

Mow or cut at least four times a year. Mow or cut whenever knotweed reaches 2–3' in height and repeat through the fall. Newly established populations can be controlled after three years, but established populations will only be suppressed. Use a mower that bags cut material or rake and bag cut material after mowing and dispose of it in a landfill or burn it to avoid potential for above-ground tissue to resprout.

Prescribed burning

Effectiveness in season: 50–70%
Season after treatment: < 50%

Spring burns can kill germinating seedlings and suppress above-ground growth of established plants, depending on fire intensity. After the fire, established plants will quickly resprout and reinvade; this management method is not recommended unless integrated with other techniques. Fire may benefit other species well-adapted to this management (e.g., prairie grasses), resulting in improved competition with knotweed. A handheld propane torch can be effective for treating seedlings.

Grazing

Effectiveness in season: 50–70%
Season after treatment: < 50%

Grazing may reduce shoot densities and height, but will not eradicate populations. Cattle, sheep, horses, donkeys, and goats will feed on Japanese knotweed. Animals prefer the young shoots as they emerge in the spring, but preference declines as stems become woody in summer. If possible, remove last season's stems before grazing since these can deter animals. Although grazing can help reduce the spread into uninfested areas, it has not been found to eliminate populations. Grazing will stimulate the rhizomes to resprout throughout the season; thus, repeated grazing will be required throughout the growing season to effectively suppress populations.

Manipulation of the environment

Effectiveness in season: 50–70%
Season after treatment: 50–70%

Mulching or covering with a tarp can slow the spread of knotweed. The tarp must not be taut or the plant will stretch and break the tarp. Watch for sprouts beyond the edge of the mulch or tarp since knotweed sprouts readily from the rhizome. Populations will need to be covered for at least two years to suppress plants. This technique will rarely eradicate populations.



Chemical control

Pre-emergence

Apply herbicide directly to soil. Use lower rates and narrower bands that are more closely spaced together on smaller plants and where less dense populations are expected and higher rates and broader bands that are more widely spaced apart on larger plants and where denser populations are expected.

tebuthiuron*

Effectiveness in season: 70–90%
Season after treatment: 70–90%

Common name: Spike 20P

Rate:

broadcast: 10–20 lb/A (2–4 lb a.i./A)
spot: 1.12 oz/100 ft² (0.02 oz a.i./100 ft²)

Timing: Apply during late winter or early spring when soil is not frozen. Apply to ground infested with target species in bands 4–10' wide spaced 4–10' apart. Width and spacing will depend on the area and species to be treated.

Remarks: Tebuthiuron is also available as a liquid formulation, Spike 80DF.

Caution: Do not apply directly to water or to areas where surface water is present. Applications can result in bare ground since tebuthiuron is not selective and can remain in the soil for several years, depending on application rate. Use of this chemical in areas where soils are permeable, particularly where the water table is shallow, may result in groundwater contamination. In areas fitting this description, Spike can be used at rates as low as 2.5 lb/A (0.5 lb a.i./A), but partial control should be expected. Any plant with a root system that intercepts the area treated with this herbicide can be damaged or killed. Do not apply more than 20 lb/A (4 lb a.i./A) a year. Do not apply this product more than once a year.

*Active ingredient (a.i.)

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. Absorption of herbicide can be limited with this species, resulting in reduced effectiveness. Including a recommended surfactant at 0.25–0.5% can alleviate any potential reduction in effectiveness. Three seasons of herbicide applications may be required to eradicate an infestation.

2,4-D*

Effectiveness in season: 70–90%
Season after treatment: 50–70%

Common name: Many

Rate:

broadcast: 2.0–2.5 lb a.e./A

spot: For a 3.8 lb a.e./gal product: 4% (0.15 lb a.e./gal)

Timing: For best results, cut twice (in spring when it reaches 3', then again when plant flowers), then spray fall regrowth when it reaches 3'.

Remarks: Spring or summer applications of this herbicide are not effective in controlling this plant, and this herbicide should only be applied in the fall to regrowth.

Caution: Use aquatically labeled product if potential exists for solution to contact surface water. Use of this chemical in areas where soils are permeable, particularly where the water table is shallow, may result in groundwater contamination. Overspray or drift to desirable plants should be avoided since even minute quantities of the spray may cause severe injury to plants.

aminopyralid*

Effectiveness in season: 90–100%
Season after treatment: 70–90%

Common name: Milestone

Rate: broadcast: 7–14 fl oz/A (0.1–0.2 lb a.e./A)

spot: Equivalent to broadcast rates.

Timing: For best results, cut twice (in spring when it reaches 3', then again when plant flowers), then spray fall regrowth when it reaches 3'.

Remarks: 14 fl oz/A can be used as long as less than half of the area is treated. Depending on the volume of solution applied per acre, typical mixtures for spot treatments are 8–16 mL Milestone per gallon of water.

Caution: Do not apply directly to water or to areas where surface water is present. Remains in soil for up to one year, depending on application rate. Overspray or drift to desirable plants should be avoided since even minute quantities of the spray may cause severe injury to plants. Do not compost treated plants since herbicide can persist through composting process.

glyphosate*

Effectiveness in season: 70–90%
Season after treatment: 50–70%

Common name: Roundup

Rate: broadcast: 3.0–8.0 lb a.e./A

spot: For a 3 lb a.e./gal product: 4–8% (0.12–0.24 lb a.e./gal)

Timing: For best results, cut twice (in spring when it reaches 3', then again when plant flowers), then spray fall regrowth when it reaches 3'. Cut again 30 days after spraying for increased effectiveness.

Caution: Use product labeled for aquatic use if potential exists for solution to contact surface waters. Applications can result in bare ground since glyphosate is not selective. Overspray or drift to desirable plants should be avoided since even minute quantities of the spray may cause severe injury to plants.

imazapyr*

Effectiveness in season: 70–90%
Season after treatment: 70–90%

Common name: Arsenal

Rate: broadcast: 48–64 fl oz/A (0.75–1.0 lb a.e./A)

spot: 0.5–1% (0.01–0.02 lb a.e./gal)

Timing: For best results, cut twice (in spring when it reaches 3', then again when plant flowers), then spray fall regrowth when it reaches 3'.

Caution: Use product labeled for aquatic use if potential exists for solution to contact surface waters. Applications can result in bare ground since imazapyr is not selective and can remain in the soil for several months to more than a year, depending on application rate. Overspray or drift to desirable plants should be avoided since even minute quantities of the spray may cause severe injury to plants.

triclopyr*

Effectiveness in season: 70–90%
Season after treatment: 50–70%

Common name: Garlon

Rate: broadcast: 64–128 fl oz/A (2.0–4.0 lb a.e./A)

spot: 1.5–2.25% (0.06–0.09 lb a.e./gal)

Timing: For best results, cut twice (in spring when it reaches 3', then again when plant flowers), then spray fall regrowth when it reaches 3'.

Remarks: Spring or summer applications, of this herbicide are not effective in controlling this plant and applications should only be made in the fall.

Caution: Use product labeled for aquatic use if potential exists for solution to contact surface waters. Use of this chemical in areas where soils are permeable, particularly where the water table is shallow, may result in groundwater contamination. Overspray or drift to desirable plants should be avoided since even minute quantities of the spray may cause severe injury to plants.

*Active ingredient (a.i.)

Cut stump

Cut stem at or below the second joint from the ground. Apply herbicide solution to the surface remaining rooted in the ground. If cutting between joints, apply 5mL of herbicide into the hollow stem rooted in the ground. Use lower rates on smaller plants and less dense populations and higher rates on larger plants and denser populations.

glyphosate*

Effectiveness in season: 90–100%
Season after treatment: 50–70%

Common name: Roundup

Rate: For a 3 lb a.e./gal product: 20–25% (0.6–0.75 lb a.e./gal)

Timing: Apply any time of year when plant is actively growing, although spring applications will likely require retreatment. Wait for 3' of regrowth before retreating.

Remarks: Applications can also be injected directly into the stem. Inject 2–5mL (0.002–0.005 lb a.e.) between ground and the top of the second basal joint (node) from the ground.

Caution: Use product labeled for aquatic use if potential exists for solution to contact surface waters. Applications can result in bare ground since glyphosate is not selective. Overspray or drift to desirable plants should be avoided since even minute quantities of the spray may cause severe injury to plants.

triclopyr*

Effectiveness in season: 90–100%
Season after treatment: 50–70%

Common name: Garlon

Rate: 20–25% in oil (0.8–1.0 lb a.e./ gal)

Timing: Apply any time of year when plant is actively growing, although spring applications will likely require retreatment. Wait for 3' of regrowth before retreating.

Remarks: Applications can also be injected directly into the stem. Inject 1mL of a 50% (0.0004 lb a.e.) solution or 0.5mL (0.0004 lb a.e.) of an undiluted solution between ground and the top of the second basal joint (node) from the ground. Products containing this active ingredient can have different instructions for mixing. Labels will recommend mixing the product in a water- or oil-based carrier (e.g., basal bark oil). Consult the label to determine the appropriate carrier.

Caution: Use product labeled for aquatic use if potential exists for solution to contact surface waters. Use of this chemical in areas where soils are permeable, particularly where the water table is shallow, may result in groundwater contamination. Overspray or drift to desirable plants should be avoided since even minute quantities of the spray may cause severe injury to plants.

triclopyr + 2,4-D*

Effectiveness in season: 90–100%
Season after treatment: 50–70%

Common name: Crossbow

Rate: 4% in oil (triclopyr: 0.04 lb a.e./gal + 2,4-D: 0.08 lb a.e./gal)

Timing: Apply any time of year when plant is actively growing, although spring applications will likely require retreatment. Wait for 3' of regrowth before retreating.

Caution: Do not apply directly to water or to areas where surface water is present. Use of this chemical in areas where soils are permeable, particularly where the water table is shallow, may result in groundwater contamination. Overspray or drift to desirable plants should be avoided since even minute quantities of the spray may cause severe injury to plants.

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 instead of a similar product. You are responsible for using pesticides in accordance with the label directions. *Read the label before any application.*

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