

# Invasive Plants of Wisconsin



## Japanese Knotweed (*Polygonum cuspidatum*)

---

Authors: Brendon Panke and Mark Renz<sup>1</sup>

Herbaceous perennial, up to 10' tall. Hollow, reddish, arching bamboo-like stems are smooth and stout often persisting 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 WI:** 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 found where the leaf attaches to the stem (axils), near the tips of stems.

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

**Roots:** Plants arising from seed have a tap root up to 6' deep. Stout, rhizomes can reach 65' or more from parent plants and give rise to new stalks. Both 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. Less likely to invade forested sites with a well developed canopy. 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.

---

<sup>1</sup> Associate research specialist and assistant professor of agronomy, College of Agricultural and Life Sciences, University of Wisconsin-Madison, and Cooperative Extension, University of Wisconsin-Extension.

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

**Removal** – Pull at least 4 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 as very small amounts (0.25 oz) can re-sprout. This is not recommended for established populations because of the depth (6' tap root) and width (65' rhizomes) of the root system. Bag all cut or pulled material and dispose of in a landfill or burn to avoid potential for root material or above ground tissue to re-root.

**Mowing** – Mow or cut at least 4 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 3 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 in a landfill or burn to avoid potential for above ground tissue to re-sprout. Cut whenever knotweed reaches 2-3 ft in height and repeat through fall.

**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 and reinvade areas; 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 hand-held propane torch can be effective for treating seedlings.

**Grazing** - 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 as these can deter animals. Although grazing can help reduce the spread into un-infested areas, it has not been found to eliminate populations. Grazing will stimulate the rhizomes to re-sprout throughout the season, thus repeated grazing will be required throughout the growing season to effectively suppress populations.

**Manipulation of the environment** – Mulching or covering with a tarp can slow the spread of knotweed. Tarp must have some slack in it or the plant will stretch and break the tarp. Watch for new sprouts beyond the edge of the mulch or tarp as knotweed sprouts readily from the rhizome. Populations will need to be covered for at least two years to suppress plants, but this technique will rarely eradicate populations.

## Chemical control<sup>2</sup>

<p><b>Pre-emergence</b> – 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.</p>	
<p>Active Ingredient (A.I.): tebuthiuron</p> <p>Common product name: Spike</p>	<p><b>Rate</b> – <i>broadcast</i>: 2.5 - 3.6 lb/A (2.0 - 2.9 lb a.i./A) <i>spot</i>: 0.009 lb/ft<sup>2</sup> (0.006 lb a.i./ft<sup>2</sup>)</p> <p><b>Timing</b> – 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.</p> <p><b>Caution</b> – Any plant with a root system that intercepts a herbicide band can be damaged or killed. Do not apply more than 5 lb/A (4 lb a.i./A) in 3 years and no more than 2 applications totaling 7.5 lb/A (6 lb a.i./A) in 6 years. Applications can result in bare ground as tebuthiuron is not selective and can remain active 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 ground water contamination. Restricted to 2.5 lb/A (2.0 lb a.i./A) in sites fitting this description.</p>
<p><b>Foliar</b> – Apply directly to individual plants or broadcast across an infested area. Broadcasted foliar applications are typically the most cost effective treatment in dense infestations. It may require up to three seasons worth of herbicide applications to eradicate an infestation. Use lower rates on smaller plants and less dense populations and higher rates of larger plants and denser populations.</p>	
<p>Active Ingredient (A.I.): 2,4-D</p> <p>Common product name: Many</p>	<p><b>Rate</b> – <i>broadcast</i>: 2.0 - 2.5 lb a.e./A <i>spot</i>: 4% (0.11 lb a.e./gal)</p> <p><b>Timing</b> – For best results cut twice (in spring when it reaches 3', then again when plant flowers), then spray fall re-growth when it reaches 3'.</p> <p><b>Remarks</b> – 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 re-growth.</p> <p><b>Caution</b> –Overspray or drift to desirable plants should be avoided, as even minute quantities of the spray may cause severe injury.</p>

<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.): aminopyralid</p> <p>Common product name: Milestone</p>	<p><b>Rate</b> – <i>broadcast</i>: 7 - 14 fl oz/A (0.08 - 0.11 lb a.e./A) <i>spot</i>: Equivalent to broadcast rates.</p> <p><b>Timing</b> – For best results cut twice (in spring when it reaches 3', then again when plant flowers), then spray fall re-growth when it reaches 3'.</p> <p><b>Remarks</b> – 14 fl oz/A can be used as long as &lt; ½ of the area is treated. Depending on the volume of solution applied per acre, typical mixtures for spot treatments are 3 - 10 mL Milestone per gallon of water.</p> <p><b>Caution</b> – 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.): glyphosate</p> <p>Common product name: Roundup</p>	<p><b>Rate</b> – <i>broadcast</i>: 3.0 – 8.0 lb a.e./A <i>spot</i>: 4 - 8% (0.16 - 0.32 lb a.e./gal)</p> <p><b>Timing</b> – For best results cut twice (in spring when it reaches 3', then again when plant flowers), then spray fall re-growth when it reaches 3'. Cut again 30 days after spraying for increased effectiveness.</p> <p><b>Caution</b> - 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: Arsenal</p>	<p><b>Rate</b> – <i>broadcast</i>: 48 - 64 fl oz/A ( 0.75 – 1.0 lb a.e./A) <i>spot</i>: 0.5 - 1% (0.01 - 0.02 lb a.e./gal)</p> <p><b>Timing</b> – For best results cut twice (in spring when it reaches 3', then again when plant flowers), then spray fall re-growth when it reaches 3'.</p> <p><b>Caution</b> - Applications can result in bare ground as imazapyr 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.): triclopyr</p> <p>Common product name: Tahoe 4</p>	<p><b>Rate</b> – <i>broadcast</i>: 64 - 128 fl oz/A (2.0 - 4.0 lb a.e./A) <i>spot</i>: 1.5 - 2.25% (0.06 - 0.09 lb a.e./gal)</p> <p><b>Timing</b> – For best results cut twice (in spring when it reaches 3', then again when plant flowers), then spray fall re-growth when it reaches 3'.</p> <p><b>Remarks</b> – Spring or summer application of this herbicide are not effective in controlling this plant and applications should only be made in the fall.</p> <p><b>Caution</b> – 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><b>Cut stump</b> – Cut stem at or below the second joint from the ground. If cutting at a joint, apply herbicide to 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 of larger plants and denser populations.</p>	
<p>Active Ingredient (A.I.): glyphosate</p> <p>Common product name: Roundup</p>	<p><b>Rate</b> – 20 - 25% (0.9 - 1.1 lb a.e./gal)</p> <p><b>Timing</b> – Anytime of year when plant is actively growing, although spring applications will likely require re-treatment. Wait for 3' of re-growth before re-treating.</p> <p><b>Remarks</b> – Mix with water. 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.</p> <p><b>Caution</b> - 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.): triclopyr</p> <p>Common product name: Tahoe 4</p>	<p><b>Rate</b> – 20 - 25% in oil (0.8 - 1.0 lb a.e./ gal)</p> <p><b>Timing</b> – Anytime of year when plant is actively growing although spring applications will likely require re-treatment. Wait for 3' of re-growth before re-treating.</p> <p><b>Remarks</b> - 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.</p> <p><b>Caution</b> – 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><b>Rate</b> – 4% in oil (triclopyr: 0.04 lb a.e./gal + 2,4-D: 0.08 lb a.e./gal)</p> <p><b>Timing</b> – Anytime of year when plant is actively growing although spring applications will likely require re-treatment. Wait for 3' of re-growth before re-treating.</p> <p><b>Caution</b> - 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>

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.

University of Wisconsin-Extension, Cooperative Extension, in cooperation with the U.S. Department of Agriculture and Wisconsin counties, publishes this information to further the purpose of the May 8 and June 30, 1914, Acts of Congress. An EEO/AA employer, the University of Wisconsin-Extension, Cooperative Extension provides equal opportunities in employment and programming, including Title IX and ADA requirements. If you need this information in an alternative format, contact Equal Opportunity and Diversity Programs, University of Wisconsin-Extension, 432 N. Lake St., Rm. 501, Madison, WI 53706, diversity@uwex.edu, phone: (608) 262-0277, fax: (608) 262-8404, TTY: 711 Wisconsin Relay.