

## Japanese knotweed, *Polygonum cuspidatum*

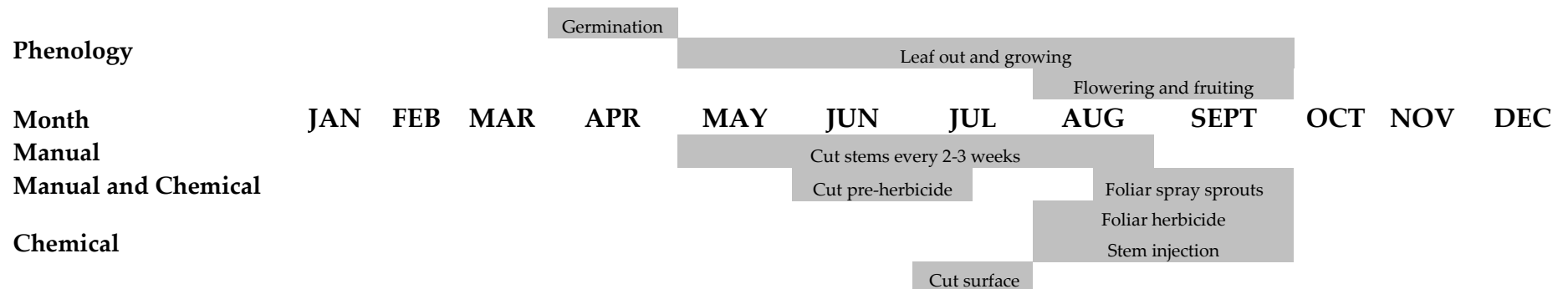
### Species Biology and Phenology:

**Habitat:** Japanese knotweed can tolerate a variety of adverse conditions including full shade, high temperatures, high salinity, and drought. It is shade tolerant but growth is inhibited in shade and understory. Japanese knotweed is found near water sources, in low-lying areas, waste places, roadsides, and utility rights of way. It thrives in moist, open to partially shaded habitats and poses a significant threat to riparian areas, where it can survive severe floods. Dense populations are often found along stream and riverbanks.

**Reproductive Strategy:** In the United States, plants reproduce primarily by vegetative growth but have also been found to reproduce by seed. Japanese knotweed produces a significant number of seeds (>100,000 seeds/stem if all flowers are pollinated and set seed) but very few seeds germinate and few seedlings survive. Rhizomes, or horizontal plant stems, produce shoots above ground and roots below that can reach 45-60 feet in length and 6 feet in depth. Extensive rhizomes contribute to the difficulty in controlling Japanese knotweed manually. Until large reservoirs of energy in the root system are depleted, Japanese knotweed will continue to send up new shoots can produce new plants from the nodes.

**Dispersal:** Japanese knotweed can be transported to new sites as discarded cuttings, as contaminant in topsoil, and via water, especially springtime flooding. Small pieces of root or stem can sprout to create new plant populations. Keeping Japanese knotweed from entering waterways during manual removal is essential to slowing the dispersal of the plant.

### Species Phenology and Treatment Options:



## Treatment Methods:

Category	Method	Method Description	Considerations
MANUAL		<ul style="list-style-type: none"> <li>• Manual treatment is most effective for small populations or small plants, in areas where chemicals are not permitted or wanted, or in combination with chemical treatments</li> <li>• Manual treatment of Japanese knotweed is not typically recommended as the primary method of treatment because of the aggressive nature of the plant, except for very small populations</li> <li>• Manual treatment of Japanese knotweed can be very labor intensive and often requires several repeated efforts over several years, sometimes up to 5 years</li> </ul>	
	Digging	<ul style="list-style-type: none"> <li>• Remove entire plant including rhizomes with digging tool</li> <li>• Collect pulled plant material</li> <li>• Dispose of material in landfills or burn</li> </ul>	<ul style="list-style-type: none"> <li>• Appropriate for young and small populations only</li> <li>• Roots can be extremely delectate and extend to 6' below the surface making them extremely difficult to remove</li> <li>• Requires repeated action (likely several years)</li> </ul>
	Mowing/ Cutting	<ul style="list-style-type: none"> <li>• Use machete, lopper, pruning shears, mower, weed whacker/brush saw</li> <li>• Cut at least 4 times during growing season (May-August)</li> <li>• Repeat for at least 5 years</li> </ul>	<ul style="list-style-type: none"> <li>• Will reduce plant vigor- not recommended as primary method of control</li> <li>• Most effective if used with follow-up foliar herbicide application</li> </ul>
	Hand Pulling	<ul style="list-style-type: none"> <li>• Pull juvenile plants by root crown</li> </ul>	<ul style="list-style-type: none"> <li>• Appropriate for small populations</li> <li>• Requires repeated action (maybe several years)</li> </ul>
	Smothering	<ul style="list-style-type: none"> <li>• Cut stems down to the ground surface</li> <li>• Loosely cover area with geotextile fabric or triple layer of UV-stabilized plastic sheeting</li> <li>• Extend covering 7 m beyond edge of infestation and weigh down with heavy object such as cinder blocks</li> <li>• Monitor and treat stems that emerge at the edges of the covering</li> </ul>	<ul style="list-style-type: none"> <li>• Long term success has not been demonstrated</li> <li>• Can be very expensive and high maintenance</li> <li>• Requires frequent monitoring</li> </ul>
CHEMICAL	Active ingredients commonly used in herbicides: glyphosate and/or imazapyr		
	Stem Injection	<ul style="list-style-type: none"> <li>• Cut stems that are over ½ inch in diameter</li> <li>• Cut stems when plant is flowering</li> </ul>	<ul style="list-style-type: none"> <li>• High initial kill rate requiring less follow-up treatment</li> <li>• More labor intensive than foliar spraying</li> </ul>

	<ul style="list-style-type: none"> <li>• Immediately after cutting stem inject with herbicide</li> <li>• Follow-up within 2-3 weeks</li> </ul>	<ul style="list-style-type: none"> <li>• Herbicides (active ingredient): glyphosate and/or imazapyr</li> </ul>
Foliar Application	<p><i>If foliar spraying only:</i></p> <ul style="list-style-type: none"> <li>• Foliar spray in August-September when plant is flowering</li> <li>• Spray leaf surfaces with low volume backpack sprayer, or high volume mist blower</li> <li>• Mature plants will be tall and may require the use a step ladder or truck to spray</li> </ul> <p><i>If cutting and foliar spraying:</i></p> <ul style="list-style-type: none"> <li>• Use machete, lopper, pruning shears, mower, weed whacker/brush saw</li> <li>• Cut at least 6 weeks (late June or early July) before flowering</li> <li>• Spray sprouts with hand held sprayers, low volume backpack sprayer, or high volume mist blower</li> </ul>	<p><i>Low Volume Motorized Mist Blower</i></p> <ul style="list-style-type: none"> <li>• Herbicides (active ingredient): imazapyr and/or glyphosate</li> <li>• Mist blower should not be used near waterways and in sensitive areas due to drift</li> <li>• mixed with non-ionic surfactant</li> </ul>
		<p><i>Low Volume Backpack Sprayer</i></p> <ul style="list-style-type: none"> <li>• Herbicides (active ingredient): imazapyr, and/or glyphosate with non-ionic surfactant</li> </ul>
Cut Surface	<ul style="list-style-type: none"> <li>• Cut stems in mid July just below the 2<sup>nd</sup> or 3<sup>rd</sup> node above the soil surface</li> <li>• Apply herbicide immediately after cutting the exposed surface using a sponge, brush, hand-held squirt bottle or directly pouring</li> <li>• Follow up into August and treat any missed stems</li> </ul>	<ul style="list-style-type: none"> <li>• Usually less effective than other herbicide application methods</li> <li>• May require several follow up treatments</li> <li>• Very labor intensive for large patches</li> <li>• Herbicides (active ingredient): glyphosate with non-ionic surfactant</li> </ul>