

INTEGRATED PEST MANAGEMENT PRESCRIPTION

Knotweed

SPECIES: Japanese, Giant, Bohemian, and Himalayan (*Polygonum sachalinense*, *cuspidatum*, *bohemicum* and *polystachyum*)

Description:

Four species of knotweed are expanding exponentially in the Pacific Northwest (Japanese, Giant, Bohemian, and Himalayan). The major differences in the species are: Giant knotweed can reach up to 15 feet in height, while the others reach "only" 6 to 10 feet. Giant knotweed leaves have a distinctive heart shape and can be nearly a foot across while other species have smaller, linear leaves without a heart shape. Stems of knotweed are smooth (bamboo-like), stout, and swollen at the joints where the leaf joins the stem. The stems are hollow, but may be water-filled.

Knotweed spread is mainly by rhizomes and stem fragments; however seed spread is also a concern. The roots are rhizomes that may extend 30 feet from the parent plant and can grow as deep as 7 feet.



Impacts:

Knotweed severely degrades native plant and wildlife habitat. It spreads quickly to form dense thickets that exclude native vegetation and greatly alter natural ecosystems. Root fragments as small as 1/2" can form new plants that grow into colonies. Rainwater sweeps plant fragments into ditches, rivers and creeks, which disperses the plants throughout the community. The fast growing knotweed then takes advantage of the fresh disturbance to compete with native species and quickly shades them out.



Control Options:

Thurston County's integrated pest management emphasizes cultural, biological, and manual control methods to keep pests and vegetation problems low enough to prevent damage. When chemical control is considered, the least toxic product is recommended when no other control methods would be effective or practical.

► Manual / Mechanical

According to the Washington State Department of Agriculture Terrestrial Noxious Weed Seed and Plant Quarantine WAC 16-752-610 **it is prohibited to transport, buy, sell or offer for sale, or distribute all plants or plant parts on the quarantine list, which includes Japanese, Giant, Bohemian, and Himalayan knotweeds.**

"There have been no field trials that reported adequate control though repeated cutting. One research paper cites that cutting knotweed tops can reduce root biomass, but these roots were in small pots in a greenhouse, and may not be applicable to a field population where root expansion is not limited." Tim Miller, Ph.D., Associate Professor of Weed Science at Washington State University.

Because woody knotweeds reproduce readily from very small pieces of roots and stems, mechanical control is virtually impossible. **We do not recommend cutting, pulling, or mowing because these practices only encourage denser new growth**, but there are some common best management practices for dealing with green material from knotweed:

- Do not allow cut canes, or any part of a cut cane, to come into contact with water or soil.
- If you cut canes, allow them to air dry completely before disposing of them in the garbage. Dry canes on a surface where they will not come into contact with soil or water, such as on concrete or a tarp.
- Do not compost canes, roots, or other plant material or dispose of this material in a brush pile or with your yard waste.
- Do not mow or weed-trim knotweed; this encourages stem growth and spreads plant pieces to new areas.
- Do not dig or pull roots; this encourages knotweed to spread and increases the size of knotweed infestations.
- Do not disturb any soil where knotweed has been actively growing (even if treated with herbicides), and monitor for regrowth for at least two seasons. If regrowth occurs, re-treatment will be necessary.
- Because roots of large infestations may be connected, cooperate with neighboring property owners to control large infestations that cross property lines.

► Biological Techniques

Research has just begun in Japan to locate natural enemies of Japanese, Giant, and Bohemian knotweed. Several biological options were found, but testing on plant species closely related to knotweed will be necessary prior to any possible introduction to North America.





Bohemian Knotweed

► **Chemical Techniques**

Aquatic / Riparian Applications: Knotweed often grows in wet areas along rivers, streams, and ditches. If there is a chance for your herbicide to get into a water body, the use of an herbicide formulated for aquatic settings is required. **Aquatic herbicides are restricted for use in Washington State to licensed applicators only.** Herbicides that have been shown to be effective in controlling knotweed at aquatic infestation sites include [glyphosate](#) (Aquamaster™) or [imazapyr](#) (Habitat™). Because of the difficulty in controlling these sites, you may wish to contact a licensed applicator to develop a control plan.

Terrestrial Applications: Products containing the active ingredient glyphosate are also effective for controlling knotweed in terrestrial (dry) environments. Several products containing glyphosate have been reviewed and are considered “low in hazard” by Thurston County’s pesticide review process.

Thurston County has observed that most ready-to-use, pre-mixed products do not contain sufficient active ingredients to be as effective as concentrated products that are then mixed with water to create a specific finished concentration. The following instructions are for products containing 41% glyphosate which will be mixed down to a specified dilution rate. Be sure to read your label carefully, and make adjustments to rates accordingly.

Herbicide & Method	Product Rates	Mix
RoundUp Pro® 41% Active Ingredient Spot/Foliar	2%	To 1 gallon of water add 2.66 oz. RoundUp Pro®, apply to foliage at or beyond bud stage.
RoundUp Pro® 41% Active Ingredient Stem Injection	100%	Using a hand-held injection device, inject 6 mL per stem of this product full strength into each cane in between the second and third internodes.

Foliar applications of glyphosate (ROUNDUP PRO™):

- Using a spot application, spray each plant thoroughly on the stems and leaves, enough to be wet but not dripping. Spot application means the herbicide is applied only to the knotweed plants and not on the surrounding plants or soil.
- A 2% glyphosate product (after mixing for use) is necessary to adequately control knotweed. Repeat applications to re-growth will likely be necessary in subsequent growing seasons. Follow label directions for mixing product to application strength.

Hollow stem injection using glyphosate:

Roundup Pro™ has a supplemental label approved for knotweed control using a stem injection treatment on terrestrial sites. Individual knotweed stems may be treated by injecting up to 6 milliliters of undiluted Roundup Pro™ directly into the hollow stem. A hole suitable for injecting the herbicide should be made through both sides of the stem (to allow water and pressure to vent and prevent blow-back) using an awl or other convenient pointed tool about 6 inches above the ground, just below a node. (Nodes are circular thickenings or scars surrounding the stem where leaves are or were previously attached.) The herbicide is then injected into this hole. Each stem of the knotweed plant must be treated. The label limits treatment to 1,700 stems per acre.

Timing

The best time to control knotweed with glyphosate in western Washington is in July or August, when the plant is in the flower bud to blooming stage. However, for foliar treatment, the plants may be over 10 feet tall by then and hard to spray without significant chemical drift. Volunteer groups have found that bending the stalks over prior to treatment has allowed more thorough and effective treatment



Himalayan Knotweed

READ AND FOLLOW ALL LABEL DIRECTIONS AND RESTRICTIONS.

Use of brand names is not an endorsement and is for reference only; other formulations of the same herbicides may be available under other names. Information provided is current as of the date of the fact sheet. Pesticide product registration is renewed annually and product names and formulations may vary from year to year.

References:

“Controlling Knotweed in the Pacific Northwest”, Jonathan Soll, The Nature Conservancy, January 16, 2004

Written Findings of the Washington State Noxious Weed Control Board: http://www.nwcb.wa.gov/weed_info/written_findings/CLASS%20B%20PDFs/Polygonum%20bohimicum%202004.pdf

Knotweed Control on the Skagit River, 2002 Results and Recommendations, Lindsey Brandt, TNC of Washington

Integrated Pest Management Plan for Freshwater Emergent Noxious and Quarantine Listed Weeds, WA State Departments of Agriculture and Ecology, Revised July 2004 (Pages A-15 through A-35)

Biology and Management of Knotweeds in Oregon: A Guide for Gardeners and Small-Acreage Landowners. Oregon State University EM 9031 June, 2011



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