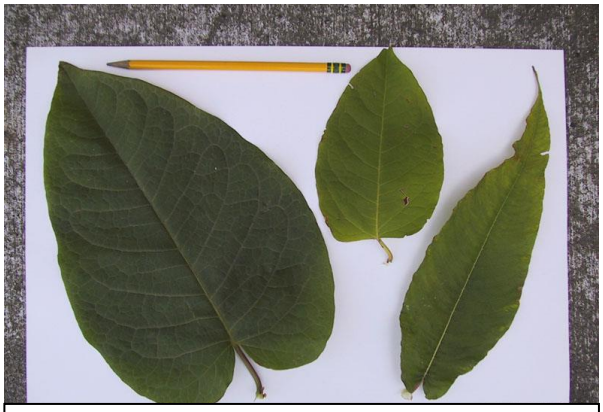
Control Options for Knotweeds

General information

The knotweeds, introduced from Asia as garden ornamentals, are perennials that grow up to 8-12 feet tall. The leaves are between 4 and 6 inches long. In late summer, the white flowers grow in branched sprays and attract many bees. The plant dies back in the winter and the tall brown stems remain standing. Knotweed tolerates a wide variety of conditions but will grow well in moist soil or river cobble, in full or partial sunlight. While it is most common in the flood zones along rivers and creeks, it also grows in roadside ditches, pastures, vacant lots, beaches, gardens, and even through cracks in paved areas.

There are four species of knotweed in the Pacific Northwest (Japanese, Giant, Bohemian, and Himalayan). Most plants observed in Whatcom County are likely to be Bohemian, a hybrid. One difference in the species can be seen in size and shape of leaves (see photo right). The stems are hollow, smooth and jointed, similar to bamboo stems, with which it is sometimes confused. Knotweed develops a deep, matted root system, with rhizomes that can grow to 30 feet or more in length, with a depth of 7 to 10 feet. Knotweed spread is mainly by rhizomes and stem fragments; however seed spread is also a concern. Knotweed usually spreads when roots are moved by floods or in soil contaminated with root fragments. Root fragments as small as ½" can form new plants that grow into colonies.



Leaves of knotweed (L to R): Giant, Bohemian, Himalayan

Manual/Mechanical Technique

Removing knotweed from the soil is nearly impossible due to the extensive root system. Digging of knotweed roots in areas larger than a square meter or two should be avoided as this can exacerbate the spread of knotweed with root fragmentation and soil disturbance. Covering plants with tarps and plastic sheets has been shown to be marginally effective but must be left in place for several years. Cutting the stems will result in new shoot emergence, but repeated cutting may eventually tax the plant of its resources and decrease the number of stems. At a minimum, cut at least 10 times per season (twice a month April through August). Regular cuttings for many years are necessary.

- **All cut knotweed stems and rhizomes need to be disposed of and sealed in sturdy plastic bags to ensure that plant fragments do not resprout.**
- **Do not dispose of <u>any</u> parts of the plant into waterways.**
- **Never put knotweed stems or roots in a home composting system.**

Chemical Recommendations

Important – Timing is Everything

The best time to chemically control knotweed with a foliar spray in Washington State is **August through early October** (when the plant is in the early bud stage). However, the plants may be over 10 feet tall by then and hard to spray without experiencing chemical drift. If this is a concern, plants can be bent or cut between May and June and will regrow to approximately 4 feet in about 6-8 weeks. This will also reduce the number of flowering stems and can help protect foraging pollinators from possible impacts of herbicide applications. Patches with hundreds of stems will probably require treatment for at least three years.

DRY GROUND APPLICATIONS

Terrestrial herbicides are for use on plants at least 50 feet away from a water body. Products containing the active ingredient **glyphosate** or **imazapyr** are considered effective for controlling knotweed in terrestrial (dry) environments. Depending on the formulation used, a surfactant (spreader/sticker) may also need to be added to the herbicide solution in order for the treatment to be effective. Please consult the product label for surfactant information. The following techniques have shown very effective control of knotweeds.

Glyphosate: Foliar applications

Spray each plant thoroughly on leaves enough to be wet but not dripping. Apply to the knotweed plants only, being careful to not apply to other non-target plants. **Use this method for late summer and fall applications only – spring applications are not effective.** If a foliar spray is the chosen option, spraying knotweed just before flower or late in the evening during flowering time can reduce the impacts on pollinating insects. Only products with concentrated formulations with at least 40% glyphosate will be effective (see "active ingredient" on herbicide label). **Pre-mixed "Ready-to-Use" products do not contain enough glyphosate for this treatment.** Mixing the solution to 2-5% rate (2.6 oz – 6.4 oz glyphosate per gallon of water) is necessary to adequately control knotweed. Repeat spot applications to any re-growth will be necessary in subsequent seasons, but to increasingly fewer plants. Follow label directions for mixing product to application strength or for surfactant information.

Glyphosate: Stem injection/cut stem treatment

Products with the active ingredient glyphosate are the only products labeled for use with hollow stem injections using a hand held injection device. Please check the label of the product first to make sure that hollow stem injections are permitted. Labels limit the number of stems to be treated to approximately 1500 stems per acre per year (assuming the injection of 5 milliliters of undiluted herbicide per stem). Stems must be greater than ½ inch in diameter and injections should be done between the 2nd and 3rd nodes (stem joints) as shown. Every stem must be injected for this treatment to be effective. Timing is from late July through the end of September.

Imazapyr: Foliar Applications

Products with the active ingredient imazapyr can be sprayed onto the plants from late June through about mid-October. Mixing the solution to 1% (1.3 oz imazapyr per gallon of water) is effective on knotweed. Apply to the knotweed plants only, being careful to not apply to other non-target plants. If a foliar spray is the chosen option, spraying knotweed just before flower or late in the evening during flowering time can reduce the impacts on pollinating insects. Follow label directions for mixing product to application strength or for surfactant information.

AQUATIC/STREAMSIDE APPLICATIONS

Knotweed often grows in areas along rivers, streams, ditches and other riparian settings. Because of the difficulty in controlling these sites, please contact a licensed applicator to develop a control plan. **Herbicide spraying over or in a water body requires the use of an herbicide formulated for aquatic settings.** These aquatic herbicides are restricted for use in Washington State to licensed applicators only. Herbicides used in an aquatic setting and *not* formulated or labeled for use there (like RoundUp®) are toxic to fish and other aquatic species and their use in water is considered an illegal application.

Your licensed applicator may also need to obtain a permit called the National Pollutant Discharge Elimination System (NPDES). In Washington State the permit is administered by Washington Department of Agriculture, or the Washington Department of Ecology, dependent upon the target weed and the type of body of water where application is occurring. More information on permits can be found online at: **http://www.ecy.wa.gov/programs/wq/pesticides/index.html**

READ AND FOLLOW ALL HERBICIDE LABEL DIRECTIONS AND RESTRICTIONS

- **Always read and understand the label of the herbicides you choose to use.**
- **More is NOT better when using herbicides, and may actually hinder the ability of the herbicide to injure the target plant if the solution is too strong. This wastes money and effort and puts more product into the environment than is necessary. ALWAYS follow the recommended rates on the label.**
- **With all herbicides, when you apply them is as important as how you apply them.**

The mention of a specific product brand name in this document is not, and should not be construed as an endorsement or as a recommendation for the use of that product. Herbicide information is taken from the WSU Pacific Northwest Weed Management Handbook and King County Noxious Weed Program, Seattle WA.