

JAPANESE KNOTWEED

(*Polygonum cuspidatum* Sieb. & Zucc.)

BACKGROUND

DISTRIBUTION:

Japanese knotweed has been found in almost every county within the State of Washington. Japanese knotweed is designated as a Class 'B' Noxious weed in the State of Washington. It ranges from Alaska to California east through most of the upper Midwest, and has heavily infested the northeast region of the United States and areas of the south and southeast. Japanese knotweed is found in natural areas, parks, gravel bars, and along riverbeds and stream banks, rights-of-way, and roadsides. It is also found in riparian areas and upland sites. Japanese knotweed thrives in moist soils, or where roots are able to grow into moist soils. Plants often become established after being discarded from cultivated gardens, or as escapes from abandoned home sites. The spread of Japanese knotweed also occurs from mechanical mowing and the unintentional transport of cut rhizome segments into neighboring landscapes.



BIOLOGY:

Japanese knotweed, a member of the buckwheat family (*Polygonaceae*) is an upright, herbaceous, shrub-like perennial that often grows to heights in excess of 10 feet. As with all members of this family, the base of the stem above each joint is surrounded by a membranous sheath. Stems of Japanese knotweed are smooth (bamboo-like), stout, and swollen at the joints where the leaf joins the stem. Although leaf size varies depending upon environment conditions, age, and other factors, they are normally about 6 inches long, and 3 to 4 inches wide, broadly oval to somewhat triangular, mostly pointed at the tip, and are alternate on the stems. The stems are hollow, but may be water-filled depending upon soil moisture levels and where it is growing. The lower one to two nodes may often be full of water. The small, pale greenish-white flowers occur in attractive, branched sprays in summer and are followed by small winged fruits. When they appear, seeds are triangular, shiny, very small about 1/10 inches long. Seed may not be borne under all growing situations, and normally not under conditions found outside the native range of Asia. Plants grow quickly and often form large thickets or patches. The roots are rhizomes that may extend 30 feet in length. Buds along the length of rhizomes may develop into new stems depending upon environmental and cultural conditions. Digging around the base of established plants encourages new vegetative buds to develop along the rhizome system.

Nodes around the root crown and shoots along the rhizomes appear in early spring around March. Above ground plant parts are usually killed by the first frost in fall. The plant can usually be injected anytime during the growing season with the preferred time being early June, when most

all the canes have developed. The injection method relies less upon weather conditions than other control methods, as the herbicide is contained within the canes of the plant.

Japanese knotweed is able to spread by sprouts from rhizomes of established plants and from sprouts arising from stems that have been severed from the mother plant. Roots and stems are able to develop when stem nodes come in contact with soils that support plant establishment.

Note: Care must be taken during control operations to prevent placing viable plant material or disposing of cut Japanese knotweed stems in areas that may lead to further infestations. Use of bio-barriers such as thick cardboard, tarps, or other non-permeable materials would be preferred materials to prevent wider spread of Japanese knotweed. Once plants have completely become devitalized, the barrier can be removed.

CONTROL STRATEGIES:

The following information is designed to provide control options depending upon:

- **The type of infested site**
- **Level of infestation**
- **Equipment available**

Herbicide choices and rates vary depending upon **SPECIFIC SITE** and **APPLICATION METHOD**.

Note: Manual methods such as grubbing, cutting, and removal of top growth have not been successful for long-term control and may actually exacerbate the problem further by encouraging new growth from rhizome segments. Vinegar (5% acetic acid), and salt applications to cut surfaces have been completely ineffective in providing long-term control.

CONTROL STRATEGIES AND RECOMMENDATIONS

DISCLAIMER:

The following information is provided from summary of data from numerous experimental studies and commercial operations carried out over the last several years in southwestern Washington State. Consult the labels of products listed within the recommendations for specific restrictions and use guidelines, as well as local or state regulator officials regarding any labeling, licensing and permitting that may be needed by the applicator for specific applications.



The intent of this work was to focus on riparian areas, where Japanese knotweed seems to propagate more rapidly. Recommended methods resulted from proven results and factors

surrounding ESA issues, environmental and total program cost.

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CONTROL STRATEGIES AND RECOMMENDATIONS

APPLICATION METHODS:

FOLIAR APPLICATION

Foliar Applications are those applications made with spray equipment designed to apply small droplets over the entire plant (stems and leaves). These may be made with backpack applicators or hose-end sprayers. Applicators should use care to treat only the target species, and not desirable neighboring vegetation. Foliar applications on new growth from rhizome segments and cane nodes, have been found to be effective on plants within the first 3 to 4 weeks of growth (Less than 4 feet in height). On established root wads, the spraying of new growth may take several applications over several years to achieve control. Not recommended in riparian areas.

Herbicide Rates and Uses:

Aquamaster®	All Sites	Rate: 8% v/v*
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Note: Depending upon size of infestation, foliar applications may require re-treatment during the growing season and possible follow-up treatment in successive years.

*Volume to Volume

CUT STEM APPLICATION

Cut stem applications are made by cutting the Japanese knotweed stem between the first and second internode, and delivering an herbicide into the *'well'* created by cutting the internode in half. Approximately 10-20 mls are delivered into the well using this method. Depending upon the site, several herbicide options (Listed below) exist for this application method. **Note:** Follow recommendations noted above under Biology for care of cut plant material to avoid further spread of the weed. **Herbicide Rates and Uses** for Cut Stem Application include the following:

Roundup Pro®	Upland Sites	Rate: 50% + 50% water
Aquamaster®	Riparian Sites	Rate: 50% + 50% water
Roundup Pro + Arsenal ® (Growing Season Only)	Upland Sites Only	Rate: 50% + 25% + 25% Water
Roundup Pro + Garlon 3A™ (Growing Season)	Upland Sites	Rate: 50% + 25% +25% Water

Note: Cut stem applications have proven to be about 95% effective on mature plants. After regrowth to 4 feet on remaining stems a cut stem or injection application should remove any regrowth.

STEM INJECTION

Supplemental label has been approved for several states; please check with your states pesticide registration division.

The injection process in riparian areas has been the most effective against plant regrowth, as well as selective to the Japanese knotweed and posed no threat to the native flora. The use of Aquamaster injected into each cane gave total control with no regrowth occurring following

treatment for 22 months. With this method there is no need to cut the canes, simply inject them and walk away. If 38 of 50 canes are injected, expect the twelve that were NOT injected to survive and reproduce. **EACH CANE HAS ITS OWN SEPARATE RHIZOME SYSTEM.** Even though the injection process is initially time consuming, it is more cost effective than several trips to the same site for foliar applications made over years with minimum results.

Stem injection applications are those applications made just below the first or second node above the ground. Typically, a Japanese knotweed probe is used to create a small opening on either side of the stem just below the node. This allows water to escape while the syringe metered to inject **5 cc/mls** of herbicide treatment, delivers the treatment dose on a downward diagonal through one of the two holes closest to the applicator. The second hole then may allow pressurized water to escape if the node is full of water. Plants will normally take up herbicide within 20 minutes of injection. **Herbicide Rates and Uses** for Stem Injection include the following:

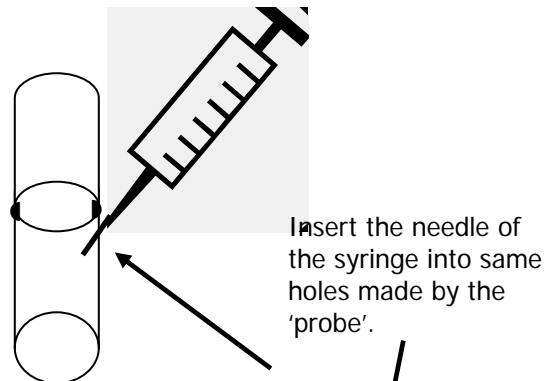
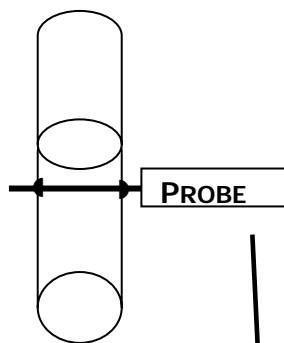
Commercial application tools are now available for this method.

Aquamaster®

Riparian Sites

Rate: 100% (5cc/mls)

JAPANESE KNOTWEED CANE(S)



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