PLEASE READ GENERAL GUIDELINES FOR INVASIVE SPECIES REMOVAL DOCUMENT FIRST

Japanese Knotweed (*Polygonum cuspidatum*) Removal Protocol
As recommended by the Nantucket Invasive Plant Species Committee

Eradication of the invasive plant Japanese knotweed can be accomplished with a variety of techniques. The choice of the best method depends on site characteristics and the size of the infestation. A combination of techniques is often required. The techniques presented here are those that have been employed by the Nantucket Invasive Plant Species Committee (NIPSC).

Mechanical removal is often preferred as a first step in invasive plant removal, particularly for small infestations. However, it is very difficult to completely remove all knotweed roots and rhizomes and those left in the soil often resprout. Therefore, follow up treatments are generally required. Roots and rhizomes can become very large and are persistent at sprouting even after removal, so proper disposal can also be challenging. The decision to use mechanical removal techniques must be balanced against the negative effects of soil disturbance, the challenge of proper disposal of plant materials and the high costs of such techniques. The NIPSC does not recommend mechanical removal of knotweed roots and rhizomes except in cases of very small stands.

A variety of chemical herbicides are available for controlling knotweed. The NIPSC recommends using Rodeo (a glyphosate herbicide with water based surfactants) or its equivalent within 100 feet of any wetland resource areas. Spraying of herbicides is not generally recommended because of the increased likelihood of herbicide drift impacting non-target species. Instead, foliar/stem wiping or clip and drip methods of application are recommended. **Be sure to read and follow all safety instructions and application recommendations included on the herbicide label. See Appendix A for information on the MA pesticide regulations. All herbicide concentrations below are given for the active ingredient. Check the herbicide label for the product concentration.**

The NIPSC recommends the following protocols for knotweed removal. Other techniques may be more appropriate in certain circumstances (see Appendix A for other techniques). All knotweed material removed from the site should be disposed of in the digester at the Town Landfill.

Mechanical (recommended for very small stands)
(1) Cut and remove all above ground, dead knotweed prior to plants initiating growth in the spring. Metal blade weed whackers work well to cut dead knotweed stems. Dead material can be bagged and placed into the household trash at the landfill. Any loose material should be placed directly into the digester at the landfill.

(2) Dig out knotweed roots and rhizomes as deep as necessary (generally one to two feet) removing as much as possible.

(3) Sift soil to remove knotweed roots and rhizomes. Take care to avoid breaking up the root material. Even small pieces that are allowed to pass through the sifter can resprout. Replace the sifted soil within the removal area, adding additional soil as necessary to restore site to original contours.

(4) Chip roots and rhizomes into ≤ 1" pieces prior to disposal. Chipped material can be bagged and placed into the household trash bin at the landfill. Loose material should be placed directly into the digester at the landfill.

(5) Resprouts can be hand dug or treated with one of the chemical methods below. Several years of follow up treatments will likely be required.

Combined Mechanical and Chemical – foliar or stem wiping (recommended for larger stands) Be sure to read and follow all safety instructions and application recommendations included on the herbicide label.

(1) Cut and remove all above ground, dead knotweed prior to plants initiating growth in the spring. Metal blade weed whackers work well to cut dead knotweed stems. Dead material should be bagged and placed into the household trash bin at the landfill. Loose material should be placed directly into the digester at the landfill.

(2) Cut the stems frequently during the growing season to reduce the plants' energy reserves and increase the effectiveness of herbicide treatment. Be sure to clean all cutting equipment thoroughly after each use. Cut stems can be left on site provided they will not come into contact with water or moist soils. Otherwise, cut stems should be disposed of in the digester at the landfill.

(3) In late summer/early fall allow shoots to re-grow 12 to 18". Using a wand applicator such as a Red Weeder (see Appendix A) or a hand held sponge, wipe foliage with a 20% glyphosate solution or plus 1% spreader/sticker (this is an adjuvant added to help herbicides "stick" to the surface of leaves and to penetrate their waxy coating). If plants are tall (> 18") they can be "topped" prior to wiping as long as enough foliage is left for application. Late summer/early fall application is recommended as plants are transporting materials from the leaves and stems to the roots at this time allowing for maximum killing of root material.

(4) Repeat steps 2 through 4 each year for three to five years, or until knotweed has been eradicated.

Combined Mechanical and Chemical – clip and drip (recommended for smaller stands and plants within vegetated wetlands) Be sure to read and follow all safety instructions and application recommendations included on the herbicide label.

(1) Cut and remove all above ground, dead knotweed prior to plants initiating growth in the spring. Metal blade weed whackers work well to cut dead knotweed stems. Dead material should be bagged and placed into the household trash bin at the landfill. Loose material should be placed directly into the digester at the landfill.

(2) Do not cut stems during the growing season as cutting results in a large number of small diameter stems. This increases the time and effort required for treatment.

(3) In late summer or early fall cut knotweed stems close to the ground and between two leaf nodes. Place approximately 5ml of 50% glyphosate solution into the cut stem using a laboratory squirt bottle or carefully directed spray bottle. Alternatively, apply 50% glyphosate solution directly to the top of the cut stem using a sponge or small paint brush. Be sure to apply herbicide immediately after cutting to prevent surface cells from sealing. Late summer/early fall application is recommended as plants are transporting materials from the leaves and stems to the roots at this time allowing for maximum killing of root material.

(4) Cut stems can be left on site provided they will not come into contact with water or moist soils. Otherwise, cut stems should be disposed of in the digester at the landfill.

(5) Repeat herbicide application in late September on any new sprouts or shoots.

(6) Repeat for three to five years or until knotweed is completely eradicated.

* Note that the clip and drip method works best for stems > ¼“in diameter. Use a stem/leaf wiping method for smaller stems.

Appendix A

Massachusetts Pesticide Program
http://www.mass.gov/agr/pesticides/

iMap Invasives: The Nature Conservancy's Element Stewardship Extracts by species
http://www.imapinvasives.org/GIST/ESA/index.html

University of Connecticut's Invasive Plant Atlas of New England
http://nbii-nin.ciesin.columbia.edu/ipane/

Plant Conservation Alliance's Alien Plant Working Group
http://www.nps.gov/plants/alien/factmain.htm

The Red Weeder
http://www.redweeder.com/

New England Wild Flower Society Native Plant Sales
http://www.newfs.org/store

Nantucket Biodiversity Initiative's Invasive Plant Species Committee
http://www.nantucketbiodiversityinitiative.org

Morphological Differences Between Native and Introduced *Phragmites*
http://www.invasiveplants.net/phragmites/morphology.htm