

Japanese Knotweed

(*Reynoutria japonica*)

Best Management Practice Technical Document for Land Managers

March 2017

- DISCLAIMER -

The intent of this document is to relay specific information relating to invasive plant control practices that have been advised by leading professionals across Ontario. This document contains the most up-to-date research and knowledge available at the time of publication and reflects current provincial and federal legislation regarding pesticide usage. It is subject to change as legislation is updated or new research findings emerge and is not intended to provide legal advice. The timing suggested will differ throughout Ontario and should be tailored to your region.

Use this document after you have performed monitoring, assessed your priority areas and made sure that the control options listed in this document are allowed and appropriate on your site. For more information, please refer to the Ontario Invasive Plant Council's Best Management Practices document for Japanese knotweed.

Strategy and Cautions

- Japanese knotweed is regulated under Ontario's *Invasive Species Act* as a restricted species.
- Japanese knotweed reproduces mainly via rhizomes, which account for two thirds of the plants total mass and can extend more than 2 m deep and 18 m in length.
- Even a 1 cm root fragment can reproduce. It is therefore critical that manual control results in removal of 100% of the root mass and chemical control results in the death of the root mass.
- Remove the outlying populations (isolated plants or satellite populations) first to prevent further spread.
- Small populations (≤ 15 plants) can be removed by digging.
- Large populations (> 15 plants) are most effectively controlled using a systemic herbicide.

Caution: Other manual control methods including mowing or cutting, unless combined with chemical control, may increase densities by stimulating growth. These methods are not effective for long term control.

Management of Small Populations (≤ 15 plants)

Using a shovel or similar digging tool may aid in the removal of smaller plants but it is essential to remove the entire plant, including all roots. This means digging out and sifting through the soil after the main stem is removed. Any portions of the root system not removed can re-sprout. Dig as much as you can at the site throughout the spring when the plant will be at the beginning of its growing season and after a rain when the soil is most pliable. Revisit the site 2-3 times in the growing season to remove or chemically treat re-sprouts.

Management of Large Populations (> 15 plants)

Foliar spray or stem injections using a glyphosate-based or aminopyralid-based herbicide are the most effective means of control for large populations. Herbicide applications must be applied during the growing season. Single treatments are usually insufficient for complete control. At least 2 treatments per season are therefore recommended, one as soon as the leaves are fully extended (May-June) and another later in the summer (July-Aug). This must be repeated over multiple growing seasons. Older infestations will require more follow-up treatments than younger infestations. Pesticide drift may prohibit pesticide use near water.

Legal Considerations and Regulatory Tools for Chemical Control

Herbicides must be applied in accordance with the federal *Pest Control Products Act*, the Ontario *Pesticides Act*, Ontario Regulation 63/09 and in accordance with all label directions. Ensure you have the most current label and are aware of any re-evaluation decisions. The easiest way to find a chemical label is by using the PMRA's label search tool, which can be found by searching "PMRA label search" in any major search engine. Only licensed pesticide applicators are legally allowed to apply restricted pesticides in Ontario.



Ontario's *Cosmetic Pesticides Ban Act* prohibits the non-essential use of prescribed pesticides (Class 9) on land. Exceptions exist to allow the use of these herbicides for control of plants, such as Japanese knotweed, that are detrimental to the environment, economy, agriculture and/or human health. To qualify for these exceptions specific criteria must be met and appropriate ministry approval is required.

Table 1: Exceptions to the Ontario *Cosmetic Pesticides Ban Act* which may be applicable for control of Japanese knotweed.

Public health or safety:	This plant can significantly damage infrastructure.
Forestry:	Japanese knotweed can grow in heavily shaded areas, creating a monoculture, outcompeting understory native vegetation and preventing regeneration of trees and shrubs. This exception therefore applies to treed areas greater than 1 hectare.
Natural resource:	Japanese knotweed can negatively impact the environment, reduces biodiversity and degrades the quality of wetland and riparian habitats.

For more information on these exceptions and applicable procedures, please refer to the Ontario Invasive Plant Council's Best Management Practices document for Japanese knotweed.

Herbicide Selection and Application

Professionals consulted for this document recommend using a glyphosate-based herbicide for several years. If results are poor after this, switch to an aminopyralid-based herbicide. Some herbicide products have been found to kill the plant too quickly, killing off the foliage preventing the chemical from being transported to the rhizomes and therefore not killing the plant entirely. Professionals consulted recommend staying away from dichlorprop/2,4-D-based and triclopyr-based herbicides for this reason.

Table 2: Chemical control techniques recommended by experts for Japanese knotweed.

Chemical Control Method	Chemical and Concentration	Timing and Application	Details
FOLIAR	Glyphosate (1.34% to 5% solution*).	1st application when leaves are fully extended, from late May until end of June; 2nd application mid-summer and, where necessary, a late summer application for new growth.	Best for large patches and re-sprouts.
	Aminopyralid (5% solution**).		Use if glyphosate is ineffective after three years.
STEM INJECTION	Glyphosate (5% solution*).	Mid-summer to early autumn (until first frost) when cane is ½ inch or more in width. Inject near the bottom of the plant (up to 4th node) at the top of the node so there is space for the herbicide to fill up.	New shoots may split when the needle is pushed in, or the needle may go straight through.

*Based on a product containing 540 g/l of chemical. **Based on a product containing 240 g/l of chemical. Please read the label in full before use to ensure that these recommendations meet the requirements of the herbicide you have selected.

Disposal

Do not compost viable plant material at home or send to landfill. If your municipality has a high-heat compost program, plants can be sent there. Alternatively, solarize viable plant material by placing it in sealed black plastic bags and leaving them in direct sunlight for 1-3 weeks. Alternatively, place in yard waste bags, cover with a dark-coloured tarp and leave in the sun for 1-3 weeks.

Rehabilitation and Monitoring

Control is much more successful when heavily infested areas are re-planted with native tree and plant species that are able to out-compete new growth. See Ontario Invasive Plant Council's Best Management Practices document for details. Invasive knotweeds, once established, are extremely persistent and complete eradication is difficult. Follow-up monitoring is crucial for at least the following 5 years to ensure the rhizome is depleted.