



Japanese knotweed; T. Heutte; Bugwood.org

INVASIVE PLANT

Knotweeds

Japanese knotweed (*Reynoutria japonica*)

Giant knotweed (*Reynoutria sachalinensis*)

Bohemian knotweed (*Reynoutria x bohemica*)

Himalayan knotweed (*Persicaria wallichii*)

AUGUST 2024



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ABOUT

Knotweed species are invasive plants of significant concern in British Columbia. They belong to the Polygonaceae family and are recognized by their bamboo-like stems, heart-shaped leaves, and small white to pinkish flowers. There are several species of knotweed: **Japanese knotweed** (*Reynoutria japonica*, formerly named *Fallopia japonica*), **giant knotweed** (*R. sachalinensis*, formerly named *Fallopia sachalinensis*), **Bohemian knotweed** (*R. × bohemica*, a hybrid between Japanese and giant knotweed), and **Himalayan knotweed** (*Persicaria wallichii*, formerly classified as *Polygonum polystachyum*). These invasive plants are notorious for their rapid growth and ability to disrupt natural ecosystems. Many of these species are widespread throughout the province.

Knotweeds are listed among the 100 worst invasive species by the International Union for Conservation of Nature and are considered a top-ten invasive species for control in BC. Their ability to tolerate various soil types and climates gives them the potential to spread much further than they have so far.

All four species share similarities in appearance, biology, impacts, distribution, and control methods and will be discussed under the general term “knotweeds.”



DISTRIBUTION

Knotweeds are native to Asia and were introduced to British Columbia as ornamental plants. In BC, they are found in Vancouver Island, Central Coast, Sunshine Coast, North Coast (Haida Gwaii), Lower Mainland, Nechako, Cariboo, Thompson-Okanagan, and the Kootenays.

LEGAL STATUS

Knotweeds are classified as provincially noxious under the *Weed Control Act*. They are also regulated under the *Forest and Range Practices Act* and the Community Charter. This classification means that landowners or occupants are legally required to control the spread of knotweeds. Giant, Japanese, Bohemian, and Himalayan knotweed are all part of the Provincial Priority Invasive Species list under Regional Containment/Control.

IDENTIFICATION

A “**Key to Identification of Invasive Knotweeds in BC**”

is available online at: https://www2.gov.bc.ca/assets/gov/environment/plants-animals-and-ecosystems/invasive-species/publications/key_to_identification_of_invasive_knotweeds_in_british_columbia.pdf.

Flowers: Small, white/green flowers grow in showy, plume-like, branched clusters along the stem and leaf axils (joints).



Stems: Green, hollow stems, or canes, with varying thicknesses are upright and bamboo-like with reddish-brown or red speckles.

Stems typically grow 1 to 5 metres in height, forming large, dense thickets. Stems may persist through the winter as bare, grey or straw-coloured hollow stalks.



Rhizomes: At maturity, rhizomes are thick and woody and can spread up to 20 metres laterally. Rhizomes have reduced leaf scales every 2 to 4 centimetres. The underside of the rhizomes produces adventitious roots—specialized roots that grow from unusual parts of the plant, like stems—allowing them to penetrate the soil with significant force.

Leaves: Predominantly heart- to triangular-shaped in all species except Himalayan, which are elongated and tapered. Leaves on all species, except giant knotweed, are 8 to 10 centimetres wide and 15 centimetres long. Giant knotweed leaves are generally twice the size of the other three species. A distinguishing feature of Japanese knotweed is the zigzag pattern in which leaves are arranged along the plant’s arching stems.

Fruits: Typically dark, glossy, 8 to 9 millimetres long, and three-winged. Not all fruits are fertile.

Similar Species: Knotweeds, also referred to as “false bamboo,” are often confused with dogwood (*Cornus* spp.) and lilac (*Syringa vulgaris*) because the leaf shape of many woody shrubs and small/young trees can look very similar to knotweed. These species can be distinguished by their leaves, which grow opposite each other along woody stems.

ECOLOGICAL CHARACTERISTICS

Habitat: Knotweeds are often found in riparian areas, stockpiled material (e.g., soil, aggregate, and mulch), derelict land, road and railway rights-of-way and gardens. They prefer moist soil and full or partial sun.



rhizomes can regenerate from depths up to 1 metre. Knotweeds in their introduced range historically spread by vegetative means from a small number of initial introductions, resulting in many infestations being clones. However, in BC, knotweeds successfully reproduce vegetatively and by viable seed.

Hybridization: Bohemian knotweed is a hybrid between Japanese and giant knotweed. Bohemian knotweed shows greater variability than its parent species. For example, its leaves are a blend of both parents, being slightly longer than wide and typically shallowly cordate (heart-shaped) at the base. Hybrid plants can produce many wind-dispersed viable seeds that germinate at rates approaching 100% in some populations.

Dispersal: Knotweeds are often spread through contaminated equipment and soil, improper disposal of removed plant material, wind, wildlife, cutting and mowing, flooding events, and human actions such as selling, purchasing, and trading knotweed plants.

Reproduction:

Knotweeds reproduce both vegetatively and by seed. Root and stem fragments can regenerate, making knotweeds very easy to spread. Reproduction can occur from as little as 0.7 grams of stem or root tissue. Buried



IMPACTS



Economic:

Knotweeds can grow through concrete and asphalt, damaging infrastructure. Recent estimates claim that knotweeds cost the UK economy £246.5 million

annually, equivalent to \$423.3 million CDN. Other impacts include a reduction in property values. In the UK, there have been instances where people can't secure a mortgage or insurance on knotweed-infested properties.

Ecological: Knotweeds rapidly grow, forming monocultures that limit resources for native plants. Their ability to outcompete native species threatens biodiversity and ecosystem functions. Additionally, knotweed roots lack the true root hairs necessary to bind to the soil, leading to erosion and stream sedimentation along the banks of creeks and rivers where they have become established.

Social: Knotweeds are a nuisance to anglers, boaters, and other aquatic recreationalists as infestations impede access to water bodies. They also affect homeowners as knotweed rhizomes and stems can push through asphalt, building foundations, concrete retaining walls, and drains, causing significant damage. Due to their rapid growth, knotweeds can impact sightlines and block highway signage, affecting motorists' safety. They have also been known to reduce the stability and integrity of rail beds, compromising train safety.



INTEGRATED PEST MANAGEMENT

IPM is a decision-making process that involves identifying invasive plant populations, assessing their risks, and developing control strategies using multiple methods, site treatments, and ongoing monitoring.

Prevention:

- ▶ Do not purchase, trade, or grow knotweed. Instead, choose regional native plants that are naturally adapted to the local environment and are non-invasive. For a list of non-invasive alternative plants, see the Invasive Species Council of BC's Grow Me Instead booklet: <https://bcinvasives.ca/play-your-part/plantwise/grow-me-instead/>
- ▶ Remove plants, plant parts, and seeds from personal gear, clothing, pets, vehicles, and equipment before leaving infested areas.
- ▶ Ensure soil, gravel, and other fill material are not contaminated with knotweed.
- ▶ Take special care when controlling knotweed near streams or ditch lines to prevent the movement of plant parts downstream.
- ▶ Bag or tarp plants, plant parts, and seeds before transporting them to a designated disposal site (e.g., landfill).

Mechanical Control:

Important: *Mechanical control alone is not usually effective for managing knotweed. Manual control should be carried out with extreme caution because of the high likelihood of spreading the plant through broken root and stem fragments. It is also time-consuming and requires consistent effort over several years. All removed plant material should be disposed of properly.*

- ▶ **Mowing** repeatedly can gradually weaken the plant by depleting its root reserves, but it often fails to completely eradicate even small patches unless done consistently over several years.
- ▶ **Digging** up knotweed can work on small and newly established populations if done thoroughly, removing all root and shoot tissue, and followed by replanting native species to prevent re-infestation.
- ▶ **Burning** is not recommended because knotweed contains a lot of water, making it difficult to burn all plant tissues, especially the underground stems (rhizomes).

- ▶ **Grazing** by animals may temporarily reduce the plant's above-ground growth, but it must be done consistently throughout the growing season over several years.
- ▶ **Cutting** can be effective for small populations if done regularly throughout the year with constant monitoring. It should be done repeatedly until root reserves are depleted, usually several years. Cutting is most effective when followed up with herbicide application.

Biological Control: Biological control involves using an invasive plant's natural enemies—such as insects, parasites, or diseases—to reduce its population to a manageable level.

A small insect called *Aphalara itadori*, which sucks the sap from the plant, has been studied as a potential biological control in the Pacific Northwest. This insect feeds on the plant's sap, damaging the areas where new growth occurs, leading to twisted and deformed leaves and an overall reduction in the plant's size and strength.

In 2012, a detailed study was completed to ensure this insect wouldn't harm other plants, and a permit to import the insect into Canada was submitted to the Canadian Food Inspection Agency. As a result, the insect has since been approved for release in Canada. Agriculture and Agri-Food Canada continues researching the conditions for this insect to control knotweed populations.

Chemical Control: Before selecting a herbicide, it is essential to evaluate the site-specific characteristics and consider the overall goals and objectives for the area as these will guide the choice of herbicide and application strategy. Always carefully follow the instructions provided on herbicide labels, and herbicide application should be conducted by certified pesticide applicators.

- ▶ Various methods are available to selectively apply herbicides to knotweed, such as hand spraying, backpack spraying, wiping the herbicide onto the plant, or injecting it directly into the stems. For stem injection, only the Roundup WeatherMax[®] glyphosate formulation is recommended.
- ▶ Effective herbicides include imazapyr, glyphosate, triclopyr and aminopyralid.

On Crown land, pesticide application must be carried out following a confirmed Pest Management Plan (*Integrated Pest Management Act*) and under the supervision of a certified pesticide applicator. For more information, visit: <https://www2.gov.bc.ca/gov/content/environment/pesticides-pest-management>



Giant knotweed; - J. Hallworth

RECOMMENDED CONTROL STRATEGY

Due to knotweed's extensive root structure and aggressive growth and reproduction, chemical control with systemic herbicides is recommended. This method is typically the easiest, most cost-effective, and most successful. To achieve effective control, herbicide treatment for 3 to 5 years is often required.

For control of knotweed species on crown land, please review the **2019 Herbicide Guidelines for Control of Knotweed Species on Crown Lands**, available at:

https://www2.gov.bc.ca/assets/gov/environment/plants-animals-and-ecosystems/invasive-species/pest-management/2019_herbicide_summary_for_control_of_knotweeds_on_crown_lands.pdf

DISPOSAL

Note: *Disposal guidelines for invasive plants vary by region. Contact your local government for specific disposal information.*

Chemically treated knotweed canes can be left on-site to compost.

Manually removed knotweed plants, plant parts and seeds must be bagged or covered with a tarp before transporting to a designated disposal site, such as a landfill or transfer station.

It is recommended that transfer stations provide specific disposal bins for invasive plants. This helps ensure the plant material is securely transported and properly buried at landfills. All plant parts should be buried at least 5 metres deep.

Burning knotweed at home is not advised because extremely high temperatures are needed to destroy the plant completely.

Do not compost knotweed. Home composting is likely to spread this invasive species further.

Soil contaminated with knotweed plant material or seeds should be handled carefully and buried deeply or disposed of at a suitable disposal site. Disposal sites should be far from water sources and drinking wells to allow for herbicide treatment. These sites should be monitored and treated as needed.

REPORT

Report invasive species by using the mobile Report-Invasives-BC app for Apple and Android platforms, available for download at <https://bcinvasives.ca/take-action/report/>.

You can also report any invasive species through the ISCBC website, through info@bcinvasives.ca or at 1-888-933-3722.



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Thank you to the BC Ministry of Environment and Climate Change and the BC Ministry of Transportation and Infrastructure for providing project funding, and to those who advised the development of these management recommendations.

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ADDITIONAL CONTACT INFO