

# Identifying and Controlling Japanese Knotweed

**Be pro-active now; next year the problem will be much bigger**

**Japanese knotweed** is a rapidly growing, non-native plant that has invaded most of the properties along the Wells River, as well as other locations in Groton. It is quick to shade out native species and garden cultivars. It takes over roadsides, residences, and community areas, threatens our riverbanks, fish and wildlife habitats, and increases fire danger. It will target weak spots in buildings, crack masonry, split pipes and ravage foundations. It will infiltrate even the smallest and thinnest of cracks and wind its way through drains and septic systems, blocking and eventually breaking pipes. The damage can be extremely costly to a property owner, and its presence will lower property values, and even prevent a potential sale.

**How it spreads:** While the 6-10 feet tall stems look menacing, the real issue is the underground rhizomes that can grow lightning fast and invade new areas. Up to 2/3 of the mature plant's biomass is stored underground in its system of rhizomes. Cutting or mowing knotweed only removes the above ground portion and only serves to stimulate the rhizome to send up additional shoots. The rhizomes can go down 8 feet, so digging is unlikely to remove them, and every small piece of rhizome can produce another plant. In addition, the cut stems can generate new plants. Moving soil is one of the major routes for transmission to another location, whether it be a result of road or building construction, or the result of hurricane Irene or other flash floods. New plants spread by the July 2023 flood are already sprouting.

**How to control Japanese knotweed:** For small patches of knotweed, approaches for control include smothering for 5 years, direct injection of herbicide into stems, or foliar spray with herbicide. For large patches, which is the vast majority of the problem in Groton, the only effective control requires foliar spraying. This requires cutting stems in early July when they can already be at least 6 feet high, and then spraying the regrowing stems 6-8 weeks later when the rhizomes are further depleted of energy. Success with this approach is considered better than 85% control, not 100%, so needs to be repeated for several years. More detail of these control strategies is provided below.



Spring



Summer



Leaves and flowers

## **General Considerations for Controlling Japanese Knotweed**

*Ignoring it is not an acceptable strategy*

**Stay alert:** early detection is critical, particularly after the recent flood. The sooner it is recognized, the more likely it can be controlled. If left untreated, it can rapidly grow into a much larger, uncontrollable problem. Unfortunately, most of the knotweed patches throughout Groton are already too large for easy management.

There is no single recommended way to get rid of Japanese knotweed, but all guidelines emphasize that it requires repeated effort over several years. The preferred method depends on your site conditions, the extent of invasion and cost.

**Every landowner can control their own patch of knotweed. The most effective and easy method requires herbicide spraying.**

If you have a few small shoots, the quickest approach is a simple herbicide spray in late summer

Small patches: the plants can be smothered, injected, or sprayed with herbicide.

Large patches: herbicide spraying is the only effective method. The best approach is the cut-and-spray method as detailed below.

Limitation to herbicide spray: you cannot spray commercial herbicides close to water. This requires a Vermont-certified applicator who is also licensed to purchase alternate approved herbicides.

Mowing is an alternative approach if the site is flat, so this is not amenable to rocky land or sloping riverbanks. This requires regular mowing for several years.

If you cut or mow, ensure no canes go into the river as this will result in further invasion downstream.

An excellent recent review on the topic (from England)

<https://www.theguardian.com/environment/2023/may/16/the-war-on-japanese-knotweed>

**This document was written by the Invasive Species Working Group in Groton, Vermont**

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### **How the Invasive Species Working Group can help you**

- We can visit and survey your patch of knotweed
- We can recommend possible solutions
- We may be able to provide volunteer help
- For large patches, or near water, we can link you up with our Vermont-certified contractor

## Control of Japanese knotweed by herbicide treatment of small or large areas

This is one of the most effective methods for controlling knotweed and is applicable to most situations. It can be performed by individual landowners on their own property, and is only limited by the guideline that you must not spray close to water such as rivers or wells. That situation requires a licensed sprayer, and herbicides that are not commercially available to private landowners. Contact the Japanese knotweed working group for information on our licensed sprayer.

While very effective, do not expect 100% kill in the first year. Anticipate up to 90% success, but plan for further treatments over the following couple of years. Finally, stay alert for any regeneration in subsequent years, and treat them immediately.

### Recommended procedure:

1. Cut canes close to the ground in late June or early July if they are >3 ft tall. A brush cutter works well (weed whacker with a blade) as the canes are hollow. New growth areas may only have small plants and will not require cutting.
2. Canes can be left to desiccate where they are cut. Do not pile them up as that will retain moisture and facilitate new growth from the canes.
3. The plants will rapidly regrow, so spray all the foliage with glyphosate in late August.
4. Revisit the site after a month and respray any areas that obviously have not succumbed
5. Repeat as necessary in years 2 and 3 (cutting may not be necessary).

### Comments:

Glyphosate is an EPA-approved, non-selective herbicide; in other words, it wipes out everything it touches. It is available from many companies under various trade names including Roundup. Do not use premixed glyphosate as it is far too dilute to kill knotweed. You will need to use glyphosate at 5-8% to adequately control knotweed. Glyphosate is available in concentrations of 18% (use 35 oz/gallon for 5% solution), or super concentration of 50% (13 oz/gallon). Check closely as some herbicide products do not contain glyphosate. Use a small hand sprayer or tank sprayer depending on size of patch.

The commercially available glyphosate contains additional ingredients such as non-ionic detergents that can be toxic to amphibians and fish which precludes its use near water. An alternative form of glyphosate must be used which can only be purchased and applied by a certified person.

During spring, the energy in the rhizomes goes into new growth – an upward movement of energy. In late summer to fall, the plants send energy back to the rhizomes to over winter and provide energy for next year's growth and further invasion. Herbicide treatment should be done in late summer/fall so that it goes down to the rhizomes along with the energy.

Plants should not be sprayed with herbicide when in flower as this is detrimental to pollinators such as bees. If cut in June or July, it is unlikely to flower by the time it is sprayed.





## Control of Japanese knotweed by herbicide injection

This approach can be especially useful and very effective for treating small stands, new invasions, and to tidy up escapees from other eradication control approaches. It also has the advantage that you do not have to cut the large plants in July, although it can help to remove the dead canes just after the snow melts. The disadvantage is that it requires special equipment (the injector) that can be expensive. Several injection systems are available, but one we tested and is frequently recommended is the JK1000 system (picture below). (<https://www.jkinjectiontools.com/shop/injection-systems-and-canisters/jk1000-injection-system/>)

It is best to wait till late summer or early fall, when the Japanese knotweed canes are a half inch or more in diameter. Toward the end of knotweed's growing season, nutrients are transferred from the leaves down through the canes and on down to the rhizomes. Glyphosate injected during this time will follow the same path down to the rhizomes. And it is the rhizomes which must ultimately be destroyed if you are to be successful at knotweed removal.

### Recommended procedure:

1. Early spring: before any new growth is observed, rake out dead canes from the previous years. Just hit them with a rake and they will break off. While this step is optional, it will make future injections easier if you have to crawl under the plants
2. Spring/summer: let the canes grow
3. August: At or soon after flowering, inject the herbicide just below the second node (up from the bottom) of the knotweed cane. The canes should be at least ½ inch thick. Smaller canes cannot be injected, but if you kill the major canes many of the smaller ones will also die.
4. September/October (before frost): Inject herbicide into any canes that still have green leaves. This will significantly improve the response rate.
5. Year 2: This approach has been reported to be 95-100% successful within one year but repeat injections will be required in subsequent years if stems recur.

### Comments:

The canes raked out in spring can be piled and composted. Continuously monitor compost piles to ensure no growth. If growth reappears, best to quickly spray with herbicide (see herbicide section).

The advantage of herbicide injection over a foliar spray is that it is more selective as to what it kills. It is particularly useful where knotweed is growing intimately with desirable plants or near water. Small canes, particularly around the periphery are often too small to inject and may require a subsequent foliar spray directed only at the leaves (see foliar spray method). Some canes will regrow in year 2 and may also be too small to inject. These would also be better treated with a foliar spray.

The injection system can be expensive. The JK1000 injection tool costs about \$280. Each canister holds 16 oz (473 cc), so can do <100 stems per refill. Use glyphosate (Roundup) super concentrate (50%; not the regular concentration) which costs about \$130/gallon (about 950 stems). Use as bought; do not dilute. Minimum personal protection includes impermeable gloves, and eye protection.



**JK 1000 injection system**

## Control of Japanese knotweed by smothering

If you wish to avoid the use of herbicide, and if the area is small (~200 sq ft), you can smother the knotweed. This approach is not feasible directly on riverbanks.

The canes need cutting at ground level to avoid sharp stems piercing the plastic sheet (best with lopper). Smothering knotweed that is intermingled with brush is very difficult unless the brush is also removed. The presence of trees could prevent the efficacy of this approach. Smothering on slopes is feasible but covering it with mulch is not. As the plastic can be degraded by sun, covering on a slope is only practical if it is in the shade. In our test patch, we found this approach was labor intensive, particularly when obtaining and covering with woodchip or other mulch.

### Recommended procedure:

1. Allow knotweed to grow in spring which will deplete the rhizomes
2. Cut the knotweed at ground level in June/July
3. Pile canes on an impervious surface such as a tarp until they desiccate
4. Apply a layer of mulch, grass clippings or other cushiony material (or an old tarp) to prevent sharp canes puncturing the plastic
5. Cover the entire area with the biggest heavy-duty black plastic (6 ml). If overlapping sheets, ensure 2 ft overlapping plastic, and extend 5-10 feet beyond the known knotweed patch
6. Weight edges down with rocks or logs
7. Cover with woodchip or other mulch to protect plastic from sun which can photodegrade plastic
8. Leave in place for 5 years minimum, then area can be replanted.

### Comments:

It is important to protect against puncturing the plastic sheet as knotweed will find any hole to grow through. Using a lopper to cut at ground level reduces the sharp edges and may reduce the need to mulch below the plastic.

In our test site, we did not have 6 ml plastic so covered with 2 x 4 ml plastic. And a 40 ft wide sheet limited concern for overlapping strips. This approach was complicated by mixed brush which also had to be removed as wrapping plastic around the brush was not feasible and would have allowed holes through which the knotweed could grow.

A further problem was the patch went down a slope and while this was covered with plastic, it would not support additional mulch on top, but being in the shade it will probably be protected from photo-degradation.

Overall, this approach was labor intensive, but after it was done, nothing further was required except to keep an eye on it and ensure no knotweed escaped through the plastic or around the edges (some did!). These would then need to be sprayed but it would require very targeted and far less herbicide.



## **Control of Japanese knotweed by mowing**

There are different opinions regarding the efficacy of mowing probably related to the frequency of mowing. Cutting once or twice each year as common for road crews along the right-of-way is much more likely to enhance growth and spread, and will definitely not kill the plant. In contrast, much more frequent cutting will certainly limit growth and may eventually kill the knotweed.

Mowing Japanese knotweed in relatively flat terrain such as a field or lawn can control and starve out the plant. It is important to mow it frequently (weekly or biweekly) and as low as you can set the mower. The rationale is that by mowing it regularly and not allowing it to establish a canopy of leaves you are forcing it to use the stored energy in the root system to grow new shoots. Every time you mow, you are forcing it to use more of that stored energy. Also, by not letting it establish leaves it cannot feed the underground rhizome system. This method takes time and diligence, and may take several years, but by being consistent you will weaken the colony of knotweed and eventually it will starve itself out and die.

### **Recommended procedure:**

1. Start by letting the knotweed grow to early summer. This will help to deplete the energy from the rhizomes.
2. Cut the canes at ground level and remove to an area where they can desiccate (tarmac, tarp). Once dry they can be burned or composted.
3. Begin a weekly or biweekly program of mowing, and keep mowing until the first frost.
4. Continue regular mowing as soon as any shoots reappear the following year, and in any subsequent years.

### **Alternate procedure:**

1. Begin mowing early spring as soon as the knotweed appears
2. Keep mowing weekly or biweekly until the first frost
3. Continue regular mowing as soon as any shoots reappear the following year, and in any subsequent years.

### **Comments:**

Limitations: the ground needs to be level so it can be mowed. Riverbanks, rocky or other uneven ground would not be amenable to this method.

Simply mowing on the periphery of a knotweed patch will not work as it will keep invading from the main plant. This approach needs to be applied to an entire knotweed patch.

Continuously monitor compost piles to ensure no growth. If growth reappears, best to quickly spray with herbicide (see herbicide section), or remove the offending plant and burn.