

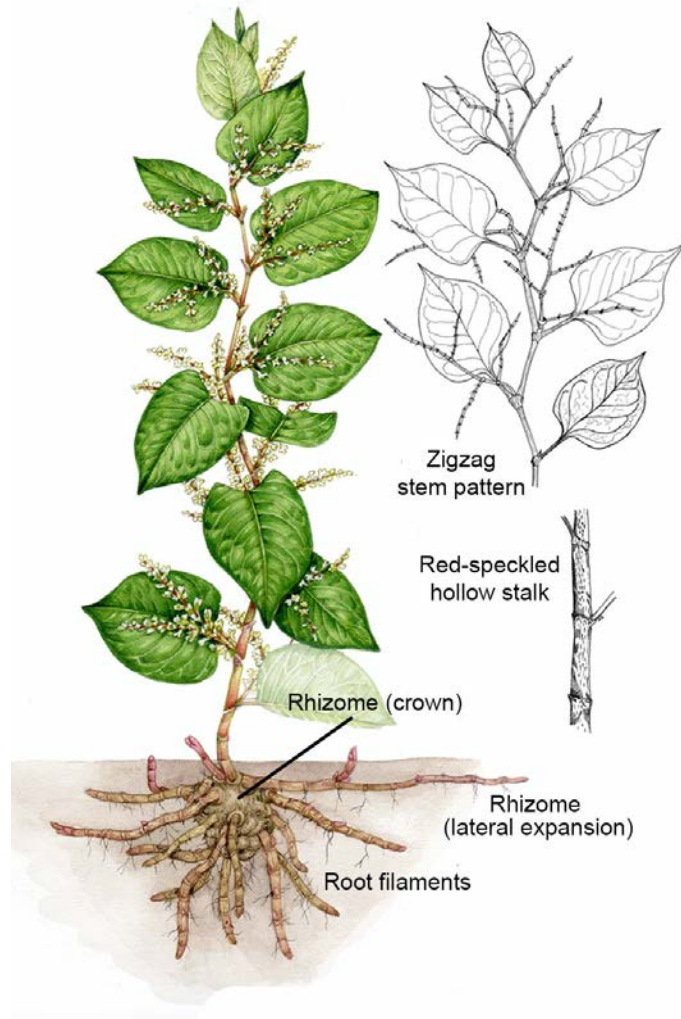
How to Protect Your Home from Japanese Knotweed

Japanese Knotweed (JKW) has invaded Pittsburgh, including Polish Hill, and it's more than a nuisance; it's an extremely aggressive plant that can cause extensive ecological degradation and expensive infrastructural damage to our houses.

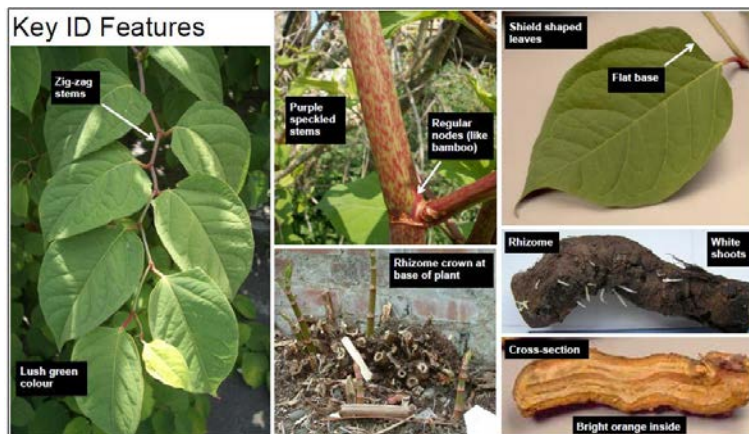
While conventional weed control methods counter-intuitively lead to further propagation, peer-reviewed field trials have shown that one method, popularly known as the flower-to-frost (FF) window, stands out as the most effective and sustainable.

Japanese Knotweed: A Pretty, but Aggressive Invasive

Japanese Knotweed (JKW), a perennial native to Japan's volcanic areas, was introduced to North America in the 1800s for its beauty and assumed ability to stabilize slopes. However, its expansive lateral root system—rhizome—has instead been found to promote erosion. Additionally, without its native co-evolved insect and fungal controls, JKW's fast and dense growth takes over, replacing biodiversity with monoculture. JKW propagates mostly via its rhizome, but seed hybridization is being studied as a potential emerging means of dispersal.



1a. Japanese Knotweed also has hybrids that are just as invasive and damaging as the original, and should be treated with the same flower-to-frost management method.



1b. Notice the alternating leaf pattern and the shield-like shape of the leaves.

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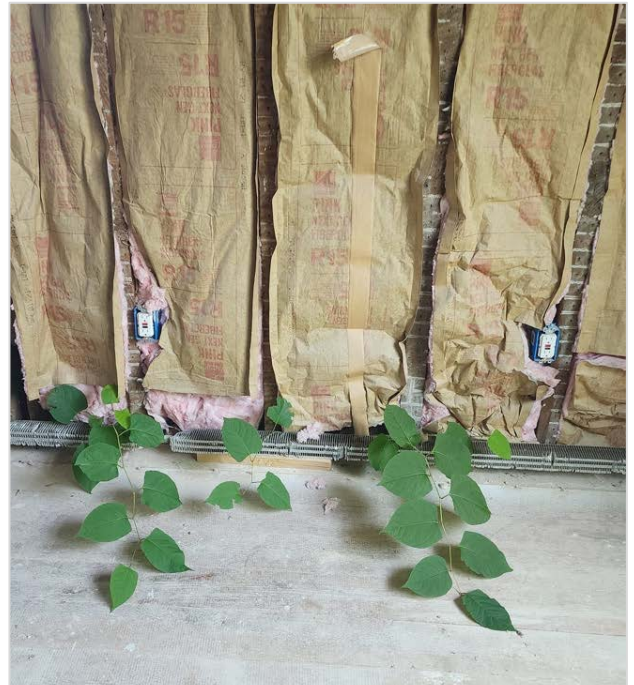
Property Damage

JKW, having evolved in volcanic rock, can also damage infrastructure. Its tenacious roots can exploit tiny weaknesses in foundation walls and other hard infrastructure, prying its way through and eventually destabilizing structures.

Once it has penetrated a wall, damage control becomes very challenging, because cutting JKW only stimulates it to grow more. Prevention is key.



2a. House wall breached by Japanese Knotweed.



2b. House walls breached by Japanese Knotweed.



2c. Retaining wall pierced by Japanese Knotweed.

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2d. A large area of Japanese Knotweed that has crowded out biodiversity in Polish Hill.

How To Avoid Making the Problem Worse

Do not cut, mow, pull, dig up, tarp, or *especially*, compost live JKW (dry stalks are harmless). Above-ground injury or barriers only temporarily deprive the plant's rhizome of photosynthetic nutrients, prompting it to spread laterally up to 50' or more underground and push up new shoots in a bid for survival. Digging it up is also very risky; each leftover live piece the size of a fingernail can become a new plant, thus leading to further infestation instead of eradication. Also be aware that bits of JKW are frequently, though inadvertently, tracked via excavation vehicles, landscaping equipment, and shared pots, plants, and potting soil.



3a & 3b. In parts of Europe and the UK, where Japanese Knotweed has been present longer than in North America, people can be fined for ignoring or improperly dealing with Japanese Knotweed on their property.

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Japanese knotweed is one of the most damaging invasive species in Canada—but many websites are dispensing management advice that could make a bad invasion even worse. The best available science shows that digging, mowing, cutting, and/or tarping Japanese knotweed is not effective and can even stimulate massive expansion in this species' root system. In fact, the only effective control method is applying glyphosate weedkiller, and it must be applied during a specific window in late summer.



3c & 3d. Other countries also discourage conventional weeding methods in favor of the flower-to-frost foliar application of diluted glyphosate.

Comparing the Effectiveness and Sustainability of JKW Control Methods

Of all JKW control methods field-tested to date—biocontrol agents, root exudates, excavation, covering, electrical treatment, and physical management methods such as mowing and cutting—the most sustainable is also the most effective and simplest: a low concentration of glyphosate-based foliar spray. It uses the least materials, has the lowest environmental impacts, and has the lowest economic costs. This method is popularly known as the flower-to-frost window method, in reference to the late summer to early fall period when it is applied.

How the Flower-to-frost (FF) Window Method Works

The flower-to-frost window method works like a Trojan horse: the glyphosate “hitches a ride” with the plant’s photosynthetic nutrients to sneak into its power center—the rhizome.

During the plant’s peak nutrient flow from leaf to rhizome (as it prepares for overwintering), a weak* solution of glyphosate is applied to the leaves. From there, the glyphosate, along with these nutrients, travels down the plant’s vascular system and into to the rhizome, where it disables the plant’s nutrient storage center. This whole process of translocation, from leaf down the cane and into the rhizome, takes about two weeks, but can be up to six weeks depending on weather and the size and health of the plant. Therefore, it’s essential to treat, at the latest, two weeks before first frost to allow a minimum of time for complete translocation to occur before frost destroys that essential vascular tissue in the leaves and canes.

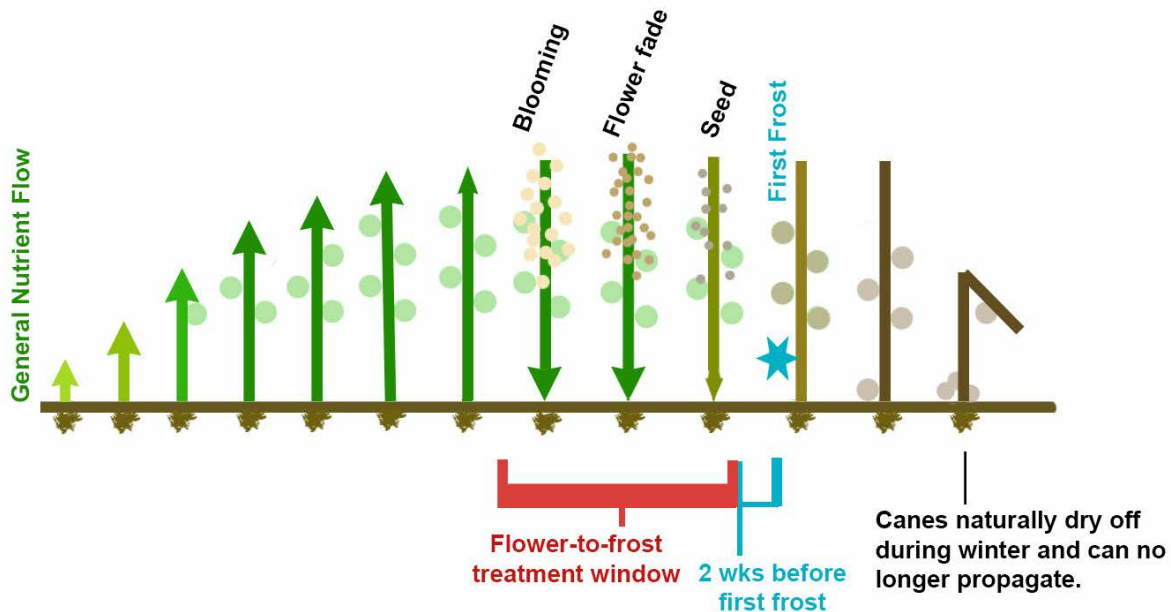


4a. Flowering is a fool-proof sign that the flower-to-frost treatment window has opened—time to treat!

This period of opportunity for treatment, beginning in mid/late summer with the telltale sign of flowering, and ending two weeks before the first frost, is known as the “flower-to-frost” window.

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Flower-to-frost Window for 2% Glyphosate Foliar Treatment of Japanese Knotweed



The **ideal treatment time** is the 4-6 week window before first frost.

During this window, glyphosate applied to the leaves rides the nutrient flow from leaf down to rhizome, where it disables the plant's energy storage.

This treatment window "opens" when the plant has reached its full height and is no longer growing new leaves, i.e. upon nutrient flow reversal.

A clearer sign that nutrient flow has reversed and the window is open is when the plant's flowers begin to bloom.

The treatment window closes two weeks before first frost; that's the last chance for the glyphosate to have enough time to reach the rhizome before frost damages the plant's vascular system.

Protecting pollinators

Waiting to treat until flowers fade helps spare pollinators (note that the time between flower-fade to first frost is shorter the further north you go in the northern hemisphere).

Treating at dawn and dusk, when pollinators are less active, also helps spare them.

Adapted from a graphic by Hannah Hudson for the Worldwide Japanese Knotweed Support Group, 2023.

*Note that a higher dose of glyphosate would only sabotage this translocation process because, similarly to drought stress or frost damage, it would destroy the plant's vascular tissue before the glyphosate could ever reach the rhizome.

Flower-to-frost (FF) Treatment Instructions

In mid/late summer (around when JKW flowers) to early fall (no later than two weeks *before* [first frost](#)*):

- Pick a non-rainy day with little or no wind and temps no higher than 85°F (heat stress makes translocation less effective). The optimal air temperature is 65°-85°F.
- Mix a 2% solution of [glyphosate](#) (see mixing instructions below).

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- Using a spray applicator, cover but don't soak, the leaves, covering as much leaf surface as possible for each JKW shoot. If you want to protect nearby desirable garden plants, use a soaked sponge to selectively "paint" JKW leaves.
- Watch for leaves to yellow within about two weeks.
- If, after two weeks, some leaves are still green, they might have been missed. A second treatment may be applied as long as it's still at least two weeks before first frost.
- Monitor annually for continued dormancy, and repeat FF treatment if/when necessary.



5a. A week or two after treatment, the JKW leaves should look yellow like this.

Mixing Your Solution

Glyphosate comes in various high concentrations, so must be diluted to obtain the 2% concentration needed for this treatment method.

Look for glyphosate that comes with isopropylamine salt (a surfactant that helps it stick to leaves), but *no other active ingredient*.

Measurements for mixing a one-gallon (128oz) solution of 2% glyphosate

- 1) Pour about $\frac{3}{4}$ gallon of water in your bucket/sprayer tank.
- 2) Measure how much glyphosate product you need, and add it to the water in your bucket/sprayer tank:
 - If you're using 41% glyphosate product: $(0.02 \times 128\text{oz}) \div 0.41 = 6.24\text{oz}$ of product
 - If you're using 43% glyphosate product: $(0.02 \times 128\text{oz}) \div 0.43 = 5.95\text{oz}$ of product
 - If you're using 50.2% glyphosate product: $(0.02 \times 128\text{oz}) \div 0.502 = 5.1\text{oz}$ of product
 - If you're using 53.8% glyphosate product: $(0.02 \times 128\text{oz}) \div 0.538 = 4.76\text{oz}$ of product(It can be helpful to remember that 1oz = 2 Tbps)
- 3) If you're using a [blue dye indicator](#) to help you see where you've already treated, measure that according to the directions on your product, and add it to the mix in your bucket/sprayer tank.
- 4) Add water to your bucket/sprayer tank until you have a combined one gallon of solution.

Mixing example, using 41% glyphosate product to make a one-gallon solution.

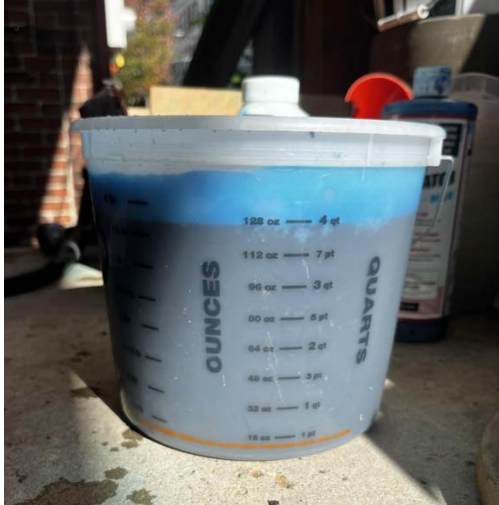


6a. 6.24oz of 41% glyphosate concentrate



6b. 1oz of blue dye indicator (optional)

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6c. Final one gallon mix



6d. Final solution in a spray tank.

Important Safety Notes: when working with glyphosate, wear protective gear; treat on a non-rainy and non-windy day so the glyphosate gets on the JKW, not on you or nearby desirable plants; keep pets and children away; spray at dawn or dusk when pollinators are less active.

Glyphosate solution dries within 30-60 minutes, remains active on the surface of live tissue for only an hour or two after application, and does not bind to the soil. If treating by a stream or river, use aquatic glyphosate to protect marine life.

After Treatment

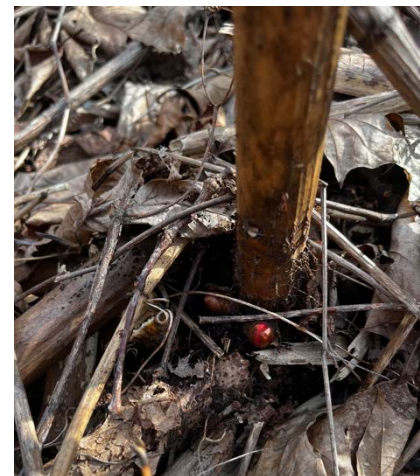


7a. Cut stalks a few inches above the ground to avoid disturbing the “root ball” or rhizome.

inadvertently stimulate multiplying growth. Instead, wait until the flower-to-frost winter to treat.

The treated stalks can be left to naturally decompose in place or, when the stalks are good and dry, by January or February, they can be cut—*not pulled!*—and removed. Once dry, Japanese Knotweed stalks are harmless so they can be composted, but all other parts of the plant—the rhizome and root filaments—remain living and, if disturbed, continue to pose an infestation risk (see “How to Avoid Making the Problem Worse” above).

So, when cutting dry stalks, make cuts a few inches above the ground (depending on the soil, rhizome parts can stick out of the ground). Also, watch under foot for visible regrowth, especially in late winter/early spring; disturbing this live plant material would



7b. Japanese Knotweed regrowth is seen in red, pushing up from the rhizome, at the foot of a dry stalk.

Research is ongoing to find bio-control methods, as well as to study post-treatment habitat restoration.

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For questions on glyphosate treatment of JKW, contact Claude LaVallée (claudelavallee@me.com)

Main Sources:

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Special thanks to Hannah Hudson, moderator of the Worldwide Japanese Knotweed Support Group (Private Fb Group).