



Herbicide Control of Japanese Knotweed

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Japanese knotweed (JK) is very difficult to control. Use of herbicides is the only practical method of control. No single, one-time, herbicide application has been identified that will reliably provide 100% control (kill) of established JK. Currently, there are two methods that can effectively control JK.

- If the JK is scattered among desirable vegetation (not common), herbicide can be applied to cut stems using a “cut stump” type of application.
- If the JK is growing in a more-or-less solid stand (the normal situation), an herbicide application to the foliage is recommended.

Pesticides are registered for specific uses in specific areas/habitats. No herbicide is without risks. Read the directions (label) carefully. As the applicator, you are legally responsible for using pesticides in accordance with the label directions. References to pesticide products in this document are for your convenience and not an endorsement of one product over a similar product.

Foliar herbicide application

The best available methods for foliar-spray application of herbicide, regardless of which herbicide is used, require cutting the plants to the ground twice during the season before the herbicide is applied late in the growing season.

Preparation and timing of foliar herbicide application:

For best results cut twice and spray the re-growth after the second cutting:

- 1) Cut in spring when JK reaches 3' tall;
- 2) Then cut again when the JK re-growth has again reached over 3' tall and the plant is in flower;
- 3) Finally, spray the late-summer to fall re-growth of JK when it reaches 3' tall.

With all foliar application of herbicide, spray to completely wet the leaf surfaces, but not to the point of runoff of the herbicide.

Very small fragments of cut JK can root and grow. Be very careful of how you dispose of cut material if you remove the material from the site. Do not scatter the pieces or compost the material because of the risk of spread. In a dense stand of JK (its normal growth habit), it may be safest to leave the cut material in place on the ground within the JK stand. The JK will have no problem coming up through the dry cut stems.

Herbicides for foliar application:

With any foliar application of herbicide, adding an approved marker dye to the herbicide mix (usually at about one oz/gal.) can greatly improve your efficiency at achieving complete, but not excessive, coverage. The following four herbicides have proven to be effective at controlling JK, although all will likely require more than a single treatment. Glyphosate and triclopyr are more widely available than imazapyr and aminopyralid, which are specialty herbicides only available from a licensed dealer.

Glyphosate (e.g. Roundup®, Ranger®, Kleenup®, etc.)

- Avoid using mixtures of glyphosate and other herbicides as it can reduce effectiveness.
- Concentrate is normally sold as 40 to 50% active ingredient (a.i.). (*If the concentrate you use is outside of this range (e.g. 25% a.i.), you will need to adjust the mixing directions given below.*)
- For foliar spray of JK with glyphosate you want to use about a 6% solution of this concentrate, which will result in a mix that is 2.5% – 3% a.i. (*This is the percent of active ingredient you want to use; if your concentrate is not in the 40-50% range, calculate the dilution to achieve this concentration.*)
- To achieve this concentration, mix 8 oz. concentrate (40-50% a.i.) per 1 gallon of water.
- **Caution:** Use product labeled for aquatic use if potential exists for solution to contact surface waters. Applications can result in bare ground as glyphosate is not selective. Overspray or drift to desirable plants should be avoided, as even minute quantities of the spray may cause severe injury to plants.
- *Effectiveness* (reduction of stem density): In year one = 70-90%; following year = 50-70%
- Repeat application in the following year will be necessary to achieve complete control.

Triclopyr (e.g. Garlon 4®, Element 4®, etc.)

- Concentrate is normally sold as about 62% active ingredient (a.i.).
- For foliar spray of JK with triclopyr you want to use about a 2% solution of this concentrate, which will result in a mix that is ~1.25% a.i. (*This is the percent of active ingredient you want to use; if your concentrate is not ~62% a.i., calculate the dilution to achieve this concentration.*)
- To achieve this concentration, mix 2.5 oz. concentrate (~62% a.i.) per 1 gallon of water.
- Spring or summer applications of this herbicide are not effective in controlling JK, so applications should only be made in the fall.
- **Caution:** The “4” formulation of Garlon, Element, etc. is not approved for use over water; it is toxic to fish. If there is a potential for the solution to contact surface waters, the “3A” formulation, of the product must be used. Applications will kill or damage all broadleaved plants, but are safe to established grasses. Overspray or drift to desirable plants should be avoided, as even minute quantities of the spray may cause severe injury to plants.
- *Effectiveness* (reduction of stem density): In year one = 70-90%; following year = 50-70%
- Repeat application in the following year will be necessary.
- The active ingredient triclopyr is often sold to homeowners as a “brush herbicide”.

Imazapyr (e.g. Arsenal®, Chopper®, Habitat® and Stalker®)

- Imazapyr must be purchased from a licensed company that sells pesticides and may require an applicator’s license, but it is quite effective.
- Concentrate is normally sold as about 27% active ingredient (a.i.).
- For foliar spray of JK with imazapyr you want to use about a 1% solution of this concentrate, which will result in a mix that is ~0.27% a.i.
- To achieve this concentration, mix 1.25 oz. concentrate (~27% a.i.) per 1 gallon of water.
- Spring or summer applications of this herbicide are not effective in controlling JK, so applications should only be made in the fall.
- **Caution:** Use product labeled for aquatic use (Habitat®) if potential exists for solution to contact surface waters. **Applications can result in bare ground as imazapyr is not selective** and, unlike the other two herbicides, can remain active in the soil for several months to over a year depending on application rate. Overspray or drift to desirable plants should be avoided, as even minute quantities of the spray may cause severe injury to plants.
- *Effectiveness* (reduction of stem density): In year one = 70-90%; following year = 70-90%

- Repeat application in the following year may be necessary.

Aminopyralid (Milestone®)

- Aminopyralid must be purchased from a licensed company that sells pesticides and may require an applicator's license, but it is quite effective.
- Concentrate is normally sold as about 41% active ingredient (a.i.).
- For foliar spray of JK with aminopyralid, mix 8 to 16 ml (0.25 to 0.5 oz) Milestone® per 1 gallon of water.
- **Caution:** Do not apply directly to water or to areas where surface water is present. Aminopyralid remains active in the soil for up to one year depending on application rate. Overspray or drift to desirable plants should be avoided, as even minute quantities of the herbicide may cause severe injury to plants. Do not apply excessive amounts of herbicide, i.e. amounts that run off of leaves. Do not compost treated plants; the herbicide can persist through composting process. Unlike imazapyr, aminopyralid should be safe for established grasses.
- *Effectiveness* (reduction of stem density): In year one = 90-100%; following year = 70-90%
- Repeat application in the following year may be necessary.

Cut stem or “cut stump” herbicide application

Applying herbicide to cut stems can be a very selective way to treat JK if there is concern about damage to non-target species. Cut each stem at or below the second joint from the ground. If the stem is cut at a joint, apply the herbicide to the surface of the stem that remains rooted. If the stem is cut between joints, apply 5mL of herbicide into the hollow stem. This method can be very selective and highly effective; however, it is considerably more labor-intensive than foliar spray application.

The cut stump herbicide application method can be used any time of year, although it may be least effective in the spring and require a repeat application. Wait until the resprouts have grown to at least 3 feet tall before re-applying the cut stump treatment.

Glyphosate (e.g. Roundup®, Ranger®, Kleenup®, etc.)

- Concentrate is normally sold as 40 to 50% active ingredient (a.i.).
- For cut stump treatment of JK with glyphosate you want to use about a 25% solution of this concentrate, which will result in a mix that is 10% – 12.5% a.i.
- To achieve this concentration, mix 1 part concentrate (40-50% a.i.) to 3 parts water (e.g. 1 quart concentrate to 3 quarts water to make 1 gallon).
- *Effectiveness* (reduction of stem density): In year one = 90-100%; following year = 50-70%
- Repeat application in the following year is likely to be necessary.

Triclopyr (e.g. Garlon 4®, Element 4®, etc.)

- Concentrate is normally sold as about 62% active ingredient (a.i.).
- For cut stump treatment, the triclopyr concentrate is mixed with an agricultural oil (such as Bark Oil Blue®), not with water.
- For cut stump treatment of JK with triclopyr you want to use about a 25% solution of this concentrate in the oil, which will result in a mix that is ~15% a.i.
- To achieve this concentration, mix 1 part concentrate (~62% a.i.) to 3 parts oil (e.g. 1 quart concentrate to 3 quarts Bark Oil Blue® to make 1 gallon).
- *Effectiveness* (reduction of stem density): In year one = 90-100%; following year = 50-70%
- Repeat application in the following year is likely to be necessary.