

2019 HERBICIDE GUIDELINES FOR CONTROL OF KNOTWEED SPECIES ON CROWN LANDS



NOTE: The applicator must always defer to the herbicide label use instructions, paying particular attention to the mixing instructions and suitable site selection. The applicator is responsible for selecting the appropriate herbicide and for ensuring that all guidelines within the relevant Crown Land Pest Management Plan (PMP) and Provincial and Federal Regulations are followed.

Preferred Site Type(s): All sites where herbicide application is permitted (i.e. not in close proximity to waterbodies or licensed water intakes).

HERBICIDE APPLICATION METHODS FOR KNOTWEED

Application of a systemic herbicide is the most effective treatment method for established sites of knotweed due to the extensive root system and ability to spread by root and stem fragments. However, the height, extensive root system, and preferred habitat (riparian) of knotweed may present challenges for herbicide treatment. The following techniques improve treatment efficacy, and reduce the risk of herbicide drift and applicator herbicide exposure. The unique challenges presented by knotweed require innovative thinking and approaches. New techniques should meet label requirements, and be well documented and photographed.

1. Stomata Foliar Application

The stomata on the underside of knotweed leaves are greater in number and larger in size than on the upper side of leaves. The stomata present the best opportunity for herbicide uptake on the knotweed leaves. When applying foliar applications to knotweed, the underside AND upper side of the leaves should be sprayed whenever safe and practicable.

- Long wands and wand extensions should be used when treating tall knotweed clones, in order to access high foliage without spraying immediately overhead, minimizing the risk of applicator exposure to herbicide. Agriculture equipment retailers sell longer wands and wand extensions that can be adapted to fit back pack sprayers.
- Small clones less than 300 stems (<300 stems): Work around the stand perimeter, spraying the underside and upper side of the leaves.
- Large clones 300 stems or more (\geq 300 stems):

- Cautiously move into the patch taking care not to step on and break knotweed stems. Broken stems will not absorb herbicide and they will quickly re-generate, reducing treatment efficacy.
- Once in the knotweed patch, spray the underside of the leaves carefully moving backwards toward the outer edge of the clone. Note: Applicators must be careful not to move under knotweed that has been sprayed to avoid exposure from overhead drips. Hard hats should be worn during treatment and washed in clean, soapy water when finished.
- When moving out of the clone, use the natural openings in the knotweed canopy to access the upper leaf surfaces and canopy with the spray wand.
- If working in or under a knotweed canopy, applicators must pay particular attention to removing plant fragments, soil and seeds from clothing, footwear and equipment before leaving the site.

2. Dwarfed Foliar Applications

Due to the tall stature of mature knotweed, it is sometimes necessary to “dwarf” the plants prior to doing foliar applications. To dwarf the knotweed, mature stems are cut below the first node and disposed of by means that will eliminate the risk of re-growth (i.e. stem fragments must not be allowed to touch soil or water until fully desiccated), then the remaining stem stumps will regrow at a shorter, stouter stature allowing for selective foliar applications to be easily completed. The applicator should ensure that there is sufficient leaf regrowth before making foliar applications (e.g. At least one metre of vertical growth). Ideally, mature stems will be cut prior to seed formation. In the event that this is not possible, care should be taken to prevent seed spread.

3. Minimizing Drift (Shrouding/Shielding/Stem Injection)

Stem injection or shrouding/shielding with foliar applications, may be used to minimize the risk of herbicide drift into pesticide free zones or other sensitive areas.

- Tarps or garbage bags can be suspended, wrapped or draped as a buffer to adjacent sensitive areas including desirable vegetation, waterbodies or structures. This technique can also be used to protect restoration plantings that have become overgrown with knotweed.
- Shields can also be attached to the ends of spray wands to direct spray towards the target knotweed and away from sensitive areas.
- Stem injection of knotweed should not be considered as a primary treatment application on most Crown land sites because, while effective, it results in significantly greater concentration of herbicide per area and is more time consuming and costly than foliar, which is a highly effective efficient method.
- NOTE: The application of herbicide using stem injection is only permitted on the label of Roundup WeatherMAX (a.i. glyphosate) PCP#27487.

Recommended Selective Herbicides: When used properly, most grasses will be left undamaged providing competition that will help control subsequent knotweed regrowth.

1. Active Ingredient(s): **Aminopyralid** (e.g. Milestone).

- Knotweed is not specifically listed on the Milestone label; however, it may be treated under the general application provision for broadleaf plants.
- Treatment Timing: Apply to actively growing plants. Delay application until there is sufficient foliage to allow for effective absorption (e.g. at least one metre of vertical growth).
- Method: Foliar application to actively growing plants thoroughly covering the foliage, but not to the point of run-off or dripping leaves with a delivery rate of 400 to 800 L/ha. Include a non-ionic surfactant in the tank mix. The application rate for this type of herbicide product is 0.25 to 0.5 L/ha.

2. Active Ingredient(s): **Aminopyralid and metsulfuron-methyl** (e.g. ClearView).

- Knotweed is not specifically listed on the ClearView label; however, it may be treated under the general application provision for broadleaf plants.
- Treatment Timing: Apply before bud stage or early flowering. This type of herbicide product has season long residual activity.
- Method: Best results are obtained when the spray volume is sufficient to provide uniform coverage of treated plants. For example, when treating knotweeds mix 0.23 grams ClearView plus 2 mL surfactant/L water. This will allow a delivery rate of up to 1000 L/ha to thoroughly wet the target plants. The application rates for this type of herbicide product in non-crop areas is approximately 135 to 230 grams/ha.
- This type of herbicide product can only be used as a *single treatment per site per season*.

3. Active Ingredient(s): **Triclopyr** (e.g. Garlon XRT).

- Knotweed is not specifically listed on the Garlon label; however, it may be treated under the general application provision for broadleaf plants.
- Treatment Timing: Delay application until there is sufficient foliage to allow for effective absorption (e.g. at least one meter of vertical growth).
- Method: Foliar application to actively growing plants thoroughly covering the foliage, but not to the point of run-off or dripping leaves with a delivery rate of 400 to 800 L/ha. The application rate for this type of herbicide product is 0.6 to 2.5 L/ha. Use higher rates for late summer applications when growth rates are reduced.

Recommended Non-Selective Herbicides: These herbicides will damage most, if not all, vegetation where contact is made.

1. Active Ingredient: **Glyphosate** (e.g., Roundup WeatherMAX, Vantage XRT— a large group of herbicides contain the active ingredient glyphosate).

- NOTE: Glyphosate has no residual activity or soil uptake. It will only kill green, growing plants that it comes into contact with. Glyphosate is the only active ingredient that can be applied up to one-metre away from the high water mark, within the 10-metre Pesticide Free Zone (PFZ) in B.C., in accordance with the *Integrated Pest Management Act and Regulation* and all Crown land PMPs.
- Treatment Timing: Apply to actively growing plants. Delay application until there is sufficient foliage to allow for effective absorption (e.g. at least one meter of vertical growth). Note: Efficacy will be reduced during times of drought.
- Methods:
 - Foliar application to actively growing plants thoroughly covering the foliage, but not to the point of run-off or dripping leaves with a delivery rate of approximately 400 to 800 L/ha. Include a non-ionic surfactant in the tank mix. For example, on the Roundup WeatherMAX label the application rate for controlling perennials with this type of herbicide product is 4.67 to 8 L/ha. If the delivery rate is 400 L/ha, then a dilution of 2% product would give an 8 L/ha application rate. Late summer applications to tall knotweed clones with a delivery rate of 800 L/ha require a 1% dilution to achieve the 8 L/ha application rate.
 - Stem injection applications must be made in accordance with the Roundup WeatherMAX (a.i. glyphosate) label (PCP#27487).

2. Active Ingredient(s): **Imazapyr** (e.g. Arsenal)

- Knotweed is not specifically listed on the Arsenal label; however, it may be treated under the general application provision for broadleaf plants.
- This type of herbicide product can only be used on non-crop areas and should not be considered if cropping or grazing of the site is possible.
- Treatment Timing: Apply to actively growing plants. Delay application until there is sufficient foliage to allow for effective absorption (e.g. at least one meter of vertical growth).
- Method: Foliar application to actively growing plants thoroughly covering the foliage, but not to the point of run-off or dripping leaves with a delivery rate of approximately 400 to 800 L/ha. If applying spray volumes greater than 550 L/ha a non-ionic surfactant must be added to the tank mix. The application rate for this type of herbicide product is 3 L/ha. This type of herbicide product is taken up by both the plant foliage and roots. When using selective application methods (e.g. foliar spot treatments), damage to non-target plants will be minimized, providing competition that will help control subsequent knotweed growth.