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EXTENSION SERVICE

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Identification and Management of Invasive Knotweeds

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What are invasive knotweeds?

Background

Invasive knotweeds were introduced to the United States as ornamentals and forage from the Northeastern regions of Asia in the late 1800s. They have been documented in West Virginia since the early to mid 1900s and continue to spread at a rapid rate. Persistent stands of knotweed are taking over stream and river banks, roadsides, woodlots and cropping areas throughout the state. They are highly invasive and highly damaging because of their abilities to spread and regenerate via extensive underground rhizomes, to displace native plants and to affect the soil hydrology. In addition, they may also depreciate land value and tie up considerable amounts of landowner time and resources once established. The damage associated with this plant far outweighs any benefit, such as food, medicinal use or forage for honeybees.

Identification

Invasive knotweeds can be easily recognized by their hollow stems, tall-growth, prominent broad leaves and vibrant displays of white flower clusters during fall months. Although the invasive knotweeds are collectively referred to as Japanese knotweed, two parent species and a third hybrid species are prevalent in West Virginia. The two parent species are giant knotweed (*Polygonum sachalinense*) and Japanese knotweed (*Polygonum cuspidatum*), and the hybrid species is Bohemian knotweed (*Polygonum* x *bohemincum*).

Giant knotweed has large, soft leaves with fine hairs on the edges. A fully expanded giant knotweed leaf can easily cover a sheet of printer paper, and has distinct, heart-shaped lobes. A Japanese knotweed leaf is usually less than half the size of a giant knotweed leaf, with a leathery texture and a spade-shaped top (no distinct lobes). Bohemian knotweed has characteristics that fall in between those of its parent species. This hybrid is considered to be even more invasive, which may have led to its population explosion in the region. Based on field observations, Bohemian knotweed is considered to be the dominant invasive knotweed species in West Virginia (personal communication 2013. T. Curran; Ret. Army Corps Engr.).

How can they be controlled?

Similar approaches may be followed to manage all three invasive knotweed varieties. Before choosing a control method, it's worthwhile to formulate a long-term management strategy. Consider the age and extent of the infestation, sensitivity of the area to a control method and availability of resources such as equipment and professional services, if needed.

Mechanical control methods

Frequent removal of top-growth by repeated cutting may eventually kill a knotweed colony by depleting its underground food reserves. The success of this method will depend upon the frequency, timing and number of mowing events. Allow the knotweed to grow fully in spring, then cut it back. Repeat the process several times during the growing season. Mechanical methods such as digging, grubbing, hoeing and cultivating that disturb the soil are not recommended unless all the underground parts are completely removed and burned. While they are eco-friendly, these control methods are time-consuming and labor intensive for managing well-established stands of invasive knotweeds.

Biological control methods

Effective biological control agents for knotweed are not yet available. Biological control agents such as the Japanese knotweed psyllid (an insect that would consume the weed), are being researched and may be available in the future. Small-ruminants such as goats and sheep are only marginally effective since these plants are not their preferred forage.

Chemical control methods

Chemicals can provide a cost-effective method of knotweed control if applied carefully and systematically. Isolated knotweed infestations may be easily managed by a land owner, but professional assistance may be required to manage large-scale infestations. Stands older than two to three years may require multiple herbicide applications over successive years. Older stands also respond better to herbicides if they are cut back after complete emergence in spring, allowed to regrow, then treated with a herbicide in late summer or early fall (July – September). This integrated approach will also make it easier to attain good spray coverage and minimize overhead spraying. Do not apply herbicides under drought-like soil conditions.

Two types of chemical applications, stem injections and foliar applications, may be considered. Stem injections are appropriate if the knotweed stand is relatively sparse (has no more than 2500 canes per acre) and is confined to areas less than an acre. If the stand is dense or the occupied area is large, foliar applications are more effective.

Effective herbicides for invasive knotweed control are glyphosate and imazapyr. Glyphosate is available as Roundup® (various formulations) for terrestrial use, or Rodeo® for aquatic use (while spraying near water). Various generic formulations are also available for both purposes. Imazapyr is available as Arsenal® for terrestrial use, or Habitat® for aquatic use. Glyphosate may be used for both stem injections and foliar applications, whereas imazapyr may be used only for foliar applications.

If using glyphosate, check the label to determine the concentration of active ingredient in the formulation. Our research has indicated that it takes approximately 4.5-5.0 lb acid equivalent per acre of glyphosate to provide acceptable levels of knotweed control. If using 4 lb/gal (41%) glyphosate formulation, this would roughly equate to a 4% spray solution (5.1 oz product/gal water) and if using a 5.5 lb/gal (49%) formulation of glyphosate, it would take a 3% spray solution (3.8 oz product/gal water). Add a surfactant (sticker) such as methylated seed oil (MSO) at the

rate of 1.25 oz/gal water, especially if a generic formulation is used. Do not use 'ready-to-use' formulations since most are not concentrated enough to control invasive knotweeds. A foliar spray can be applied using a backpack sprayer capable of producing fine spray droplets. Spray in a manner to wet most (>80%) of the foliage without creating dripping droplets. Avoid drift injury by spraying while there is no wind, and keep a safe distance from sensitive plants. Late morning applications on a hot and humid day often produce good results.

To achieve satisfactory results using a stem injector, apply 3-4 mL of the concentrated glyphosate to the base of as many knotweed canes as possible, slightly above the soil level.

Imazapyr is best applied by a professional due to its persistent nature and potential to cause injury to nearby desirable vegetation through root uptake. Foliar applications as described above may be carried out by using a 2% solution (2.6 oz product/gal water) of Arsenal® or Habitat®. The surfactant (MSO) should be added to the tank at a rate of 1.5 oz/gal of water for Arsenal® and 2.5 oz/gal of water for Habitat®.

Control follow-up

Monitor the treated area during the following season for regrowth. Repeat applications may be required to achieve high levels of control, depending upon the age and density of the knotweed stand. After knotweed is controlled, the exposed areas may be reseeded with a desirable seed mixture. Monitor until sufficient cover is attained to minimize re-infestation and to prevent other invasive weeds from establishing. If imazapyr was used, collect soil samples and test for seed germination to ensure the absence of herbicide residues. If a grass mixture is established, herbicides such as triclopyr (Garlon®, Remedy®) or aminopyralid (Milestone®) may be used to control emerging knotweeds or other broadleaf weeds. As always, read and understand the label instructions prior to applying any chemical pesticide (herbicide, insecticide, fungicide, etc).

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