

Spotted Knapweed

(*Centaurea stoebe*)

Description:

Spotted Knapweed (*Centaurea stoebe*) is an aggressive, perennial plant that can live up to 9 years. It grows from 2 to 5 feet in height, producing from 1 to 15 stems from a stout tap root. The stems and leaves are covered with fine hairs, giving the plants a light colored, almost white appearance at times. The leaves grow from 2 to 6 inches long, and are once or twice divided and deeply lobed. The stem leaves have few lobes or are linear, growing smaller toward the top of the plant. The pink to purple flowers are single at the ends of clustered branches. Black tips on the fringed flower bracts are distinctive and help distinguish Spotted Knapweed from its close relative, Diffuse Knapweed. Plants flower from June to October, producing up to 400 or more seeds per flower stalk. Bracts of the flower heads open when dehydrated, 2 to 3 weeks after maturity, and movement of the wind or passing animals can flick the loosely held seeds up to 3 feet away from the parent plant.



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Impacts:

Spotted knapweed is one of the most dominant weed species in the western United States. Millions of acres of prime range and native habitat are infested throughout the northern Rocky Mountain states, Oregon and Washington. This species will form dense stands on any open ground, excluding more desirable forage species and native plants. Elk habitat in Montana has been reduced on knapweed dominated range land by as much as 98%, resulting in the loss of up to 220 elk per year. Spotted knapweed contains allelopathic compounds that inhibit the ability of competing plants to germinate and grow. Infestations reduce bio-diversity and increase soil erosion and stream sedimentation. Control success is hampered by seed longevity. Weeds of the *Centaurea* genus have more negative impacts to natural and agricultural ecosystems than any other.

Control Options:

Thurston County's Integrated Pest Management emphasizes cultural, biological, and manual control methods to keep pests and vegetation problems low enough to prevent damage. The goal of Thurston County's pesticide use policy is to minimize the use of pesticides by utilizing and providing information about the most effective control options that are available and practical.

► Cultural / Habitat

The most effective control of Spotted Knapweed is prevention. In some situations, cultivation combined with re-seeding, fertilization and irrigation have been part of an effective control regimen. Above all, prevent plants from going to seed. To prevent plants from spreading from known infestations, carefully clean vehicles, boots, clothing, and pets after visiting infested areas.

► Manual / Mechanical

Large, stout tap roots make Spotted Knapweed difficult to remove manually. Small, isolated infestations can be dug out if the soil is damp or sandy. Be careful to collect and dispose of all the pieces of roots and crown to prevent them from re-establishing, and double bag flowering parts to prevent seed spread. Mowing is largely ineffective because knapweeds are persistent and the remaining tops of the plant produce flowers below the mowed height.



► Biological

Biocontrol agents have been used in Washington with varying degrees of success. However, they are dependent on heavy densities of host plants to survive and are sensitive to adverse climatic conditions. Infestation levels of Spotted Knapweed in Thurston County are low enough to control by methods which encourage complete control of all infestations in the county, which in turn will not allow bio-controls to persist.

► **Chemical**

Spot spraying with **glyphosate** (example: Roundup Pro®, Glyphos®, etc.) is effective in controlling Spotted Knapweed. Glyphosate products can be used to treat individual plants or small patches. Currently, products containing the active ingredient glyphosate are the only herbicides for the control of Spotted Knapweed considered “low in hazard” by Thurston County’s pesticide review process for the potential for chemical mobility and persistence.



Thurston County has observed that most ready-to-use, pre-mixed products do not contain sufficient active ingredients to be as effective as concentrated products that are then mixed with water to create a specific finished concentration. The following instructions are for products containing 41% glyphosate which will be mixed down to a specified dilution rate. Be sure to read your label carefully, and make adjustments to rates accordingly.

Foliar applications of glyphosate (ROUNDUP PRO™):

- Spot applications with glyphosate products are effective. Spot application means the herbicide is applied only to the plants and not on the surrounding plants or soil. Spray each plant thoroughly on the stems and leaves enough to be wet but not dripping.
- Glyphosate is non-selective, and will injure any plants that it comes in contact with, including grass.
- Keep people and pets off treated areas until spray solution has dried.

For selective control of knapweed in agricultural settings (pastures, hayfields, etc.): an herbicide containing the active ingredient **aminopyralid** (example: Milestone™, Milestone VM™, etc.) may be a preferred choice. Aminopyralid products will not harm grass and can be used around livestock (provided all label precautions are followed). **Do not use plant material or hay from treated areas for mulch. Likewise, do not use manure from animals that have grazed or eaten hay from treated areas.**

Aminopyralid is currently sold in agricultural labeled herbicides that are only to be used in areas listed on the label, and are available in farm supply stores. Aminopyralid products are considered moderate in hazard by Thurston County’s review process for the potential for chemical mobility and persistence.

Herbicide & Method	Product Rates	Mix
RoundUp Pro® Spot/Foliar	2%	To 1 gallon of water add 2.66 oz. RoundUp Pro®, apply to foliage at or beyond bud stage.
Milestone ® Spot/Foliar	1 tsp per 1000 ft²	To treat a 1,000 sq. ft. area: Using a 2 to 4 gallon backpack or tank sprayer, add half of the water needed to cover all plants with one tea-spoon Milestone™, agitate, then add water to reach desired amount (0.5 - 2.5 gallons total volume, depending on quantity and size of plants). Lightly spray all knapweed plants in 1,000 sq. ft. area, then continue lightly spraying the knapweed until the tank is empty and all plants have been thoroughly covered. The addition of a non-ionic surfactant (at least 80% active ingredient) is recommended to enhance herbicide activity.

Timing: Apply either glyphosate or aminopyralid anytime plants are actively growing. For most effective treatments, apply before plants bloom and produce seed. Applications of aminopyralid are also effective in the fall before a killing frost.

READ AND FOLLOW ALL LABEL DIRECTIONS AND RESTRICTIONS. Obey all label precautions and safety measures. Always use personal protective equipment that includes coveralls, waterproof gloves, shoes plus socks, and protective eyewear. Use of brand names does not connote endorsement and is for reference only; other formulations of the same herbicides may be available under other names. Information provided is current as of the date of the fact sheet. Pesticide product registration is renewed annually and product names and formulations may vary from year to year.

REFERENCES:

- Oregon Dept. of Ag. Noxious Weed Plant Profiles: http://www.oregon.gov/ODA/PLANT/WEEDS/profile_spottedknapweed.shtml
- IVM Technical Bulletin: Spotted, Diffuse & Russian Knapweeds, Bio-Integral Resource Center, Berkeley, CA;
- WA State Noxious Weed Board’s Written Findings; http://www.nwcb.wa.gov/weed_info/Centaurea_biebersteinii.html
- Weed Technology, 1998. Vol. 12:353-362;



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