

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 strategy of Thurston County's IPM policy is to minimize the use of pesticides.

► 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 populations of seedlings (10 to 20) or larger plants (3 to 5) can be dug out, more if the soil is damp or sandy and the plants are manageable. 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 **triclopyr** (examples: Lilly Miller’s liquid concentrate “Blackberry and Brush Killer” and Ortho’s “Brush-B-Gon Poison Ivy Killer Concentrate”) is effective in controlling spotted knapweed. Triclopyr is a selective herbicide that will not kill grass when used according to label instructions, but may damage or kill other broadleaf plants. Triclopyr products are rated as “moderate in hazard” by Thurston County’s pesticide review process because broadcast applications of triclopyr at greater than 2 lbs of active ingredient per acre can result in contaminating the food supply for birds and small animals. Since this prescription recommends only spraying individual plants or small patches, the risk to birds and small animals is greatly reduced.

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 8% triclopyr (be sure the product you choose lists triclopyr as the only active ingredient) 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 triclopyr:

- 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.
- Triclopyr is a selective, broadleaf weed killer and can injure any plants that it comes in contact with, except for grass. Care should be used to avoid contact with ornamentals and other desirable plants.
- 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 farm supply stores as an agricultural herbicide that is only to be used in areas listed on the label and **may not be used in urban lawns or landscapes.** Aminopyralid products are considered “moderate in hazard” by Thurston County’s review process for the potential for chemical mobility and persistence.

Timing: Apply either triclopyr or aminopyralid in the spring when plants are actively growing and in the pre-bud to early bud growth stage—the goal is to insure all plants have emerged, but are treated before they reproduce.

Pollinator Protection: To minimize negative impacts to bees and other pollinators, treatment prior to blooming is recommended. Removal of flowers before treatment can be an option in some situations. If treatment must occur during the blooming period, try to spray early or late in the day or on cloudy, cool days when pollinators are least active.

Product/Method	Rates	Mix
Triclopyr Lilly Miller® “Blackberry & Brush Killer” or Ortho® “Brush-B-Gon Poison Ivy Killer Concentrate”	4 oz. (1/2 cup) per 500 ft ²	To determine the amount of mix needed, first measure the area to be treated, then measure the amount of plain water needed to spray the area using a backpack or tank sprayer. Allow sufficient time for the area to dry completely before treatment. Then add 4 oz. (1/2 cup) of product to enough water for each 500 sq. ft of area that needs to be treated. Spray plants until they are wet but not dripping.
Aminopyralid Milestone® Spot/Foliar	1 tsp per 1000 ft ²	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 teaspoon 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.

READ AND FOLLOW ALL LABEL DIRECTIONS AND RESTRICTIONS. Obey all label precautions including site specific and safety measures. Always use personal protective equipment that includes coveralls, chemical resistant 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. 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

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