INTEGRATED PEST MANAGEMENT PRESCRIPTION

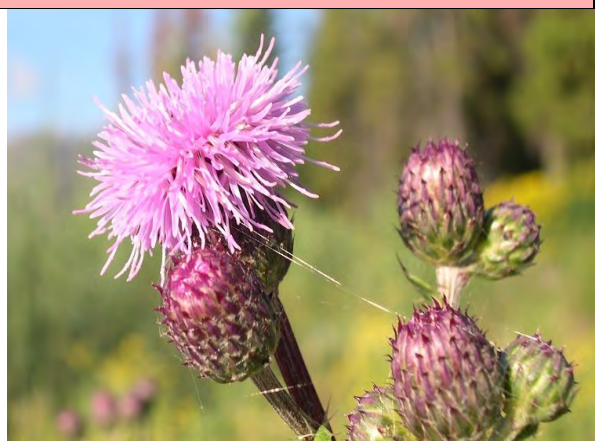
Canada thistle *(Cirsium arvense)*

Description:

Canada thistle (*Cirsium arvense)* is a perennial, it grows from 3 to 6 feet in height and has an extensive underground root system.

Flowers are small, numerous and are lavender to white in color. The flower heads grow on the tips of branches, male and female flowers are found on different plants, and ***both must be present to produce viable seeds***. Viable seeds can remain dormant in the soil for up to 20 years. Leaves are long and narrow, deeply lobed with sharp, yellow spines on the edges.

Canada thistle spreads by seed and aggressive, creeping, horizontal roots (rhizomes) that can extend 15 feet and vertical roots 6-15 feet deep. Nearly all parts of the root can produce buds that develop into shoots that grow and form new plants. Root segments as small as 1/8 to 3/8 inch in length and 1/16 inch in diameter can produce new plants.



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Impacts: Canada thistle is highly invasive. It can spread quickly to form dense patches, crowding out forage grasses by up to 60 percent. Canada thistle competes with crops, reducing yield by as much as 90 percent. Most grazing animals avoid Canada thistle infested areas due to spiny leaves that can lead to mouth irritations and infections. It also harbors insects and is an alternative host for some disease causing organisms.

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

Seedling survival is very poor. Seedlings do not establish in areas with existing groundcover and survive only on disturbed or bare areas in unshaded situations. Replanting with beneficial species is recommended in any area where thistle has been removed or chemically controlled. Close monitoring of the site is necessary to check for emerging seedlings, and for plants missed in previous control efforts.

► Manual / Mechanical

Single plants or seedlings can be pulled and roots carefully removed. However, due to the extensive root system, hand pulling is not a viable option for established infestations. Mowing every 10 to 21 days throughout the growing season and continuing this cutting routine for a minimum of 4 consecutive years can dramatically reduce the infestation. Combining mowing with herbicide treatments will further improve control of Canada thistle.

During a wet season, Canada thistle will generate new plants from small plant fragments if left on the ground after mowing. Be sure to remove all plants and cut plant parts from the site. Clean all thistle control equipment thoroughly. Equipment with plant fragments can spread thistle to non-infested areas. Shallow tillage (disk, sweep) has been shown to be counter-productive, creating a denser, more uniform stand of thistle.

► Biological

Overall, biocontrol currently provides little or no control of Canada thistle populations, though several agents have been introduced. Even in it's native range of southeastern Europe and the eastern Mediterranean, it has few or no effective natural enemies, and is considered a severe agricultural weed problem.

► Chemical

There are two types of herbicides that can be used to control Canada thistle; selective and non-selective. Selective herbicides kill or inhibit growth of certain types of plants (like broad leaf plants) and do not kill other types (like grasses). Non-selective chemicals kill nearly all types of plants. *Glyphosate* is a non-selective active ingredient found in a number of products (like Glyfos ® with 41% glyphosate) that are effective in controlling thistle. Glyphosate works well because it is a systemic herbicide that is taken in through the stems and leaves and distributed to kill all parts of the plant.

Glyphosate products can be used to treat individual plants or small patches, either by spot foliar application, or by stem injection (instructions from supplemental labeling in table below). Glyphosate will not prevent future thistle seed germination or prevent the growth of more desirable species. Products with an initial glyphosate concentration of 40% or greater should be used to mix to a 2% product spray solution (this excludes pre-mixed/ready-to-use products). Thurston County rates glyphosate products high in hazard for carcinogenic potential. The risk from spot spraying Canada thistle is considered low provided that the applicator wears chemically resistant gloves, pants, and a long sleeved shirt.

Another effective active ingredient for Canada thistle is *aminopyralid*. It is a selective herbicide for control of broadleaf weeds and is especially effective at targeting plants in the thistle (*asteraceae*) family. It can, however, cause significant damage to other broadleaf plants, including desirable forbs such as clover. Aminopyralid products are currently only sold in agricultural herbicides (like Milestone™). Agricultural herbicides are available in farm supply stores, and are only to be used on areas listed on the label. Aminopyralid products are considered moderate in hazard by Thurston County's review process for the potential for chemical mobility and persistence.

Timing:

Glyphosate applications made prior to the bud stage are not effective in controlling Canada thistle. Apply when most plants are at or beyond the bud stage of growth. Fall treatments must be applied before a killing frost.

Aminopyralid products: Apply in the spring to plants in the prebud to early bud growth stage—the goal is to insure all plants have emerged. Applications are also effective in the fall before a killing frost. Please read the Milestone™ label for precautions. As a spot treatment only at a rate of 4 to 6 fluid ounces (pastures section) per acre. Do not apply more than 7 fluid ounces per acre per year. Do not enter into treated areas during the restricted entry interval of 12 hours. Keep people and pets off treated areas until spray solution has dried. Milestone should not be applied on residential or commercial lawns or ornamental plantings. 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.

Herbicide & Method	Product Rates	Mix
RoundUp Pro™ Spot/Foliar	2%	Add 2.66 oz. of a 41% glyphosate product to one gallon of water - apply to foliage at or beyond bud stage.
RoundUp Pro™ Stem Injection	100%	Cut 8 to 9 of the tallest plants at bud stage in a clump with clippers. Use a cavity needle and push it into the stem center and then slowly remove it as 0.6 ml per stem of this product is injected into the stem.
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 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 thistle plants in 1,000 sq. ft. area, then continue lightly spraying the thistle 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.

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

READ AND FOLLOW ALL LABEL DIRECTIONS AND RESTRICTIONS. Obey all precautions, safety measures, and wear all recommended personal protective equipment. Use of brand names does not connote endorsement and is for reference only; other products with the same active ingredients may be available under other names. Pesticide product registration is renewed annually and product names and formulations may vary from year to year.

REFERENCES:

Leininger, Wayne C. 1988. Non-chemical alternatives for managing selected plant species in the western United States. XCM-118. Colorado State University, Cooperative Extension. In cooperation with: U.S. Department of the Interior, Fish and Wildlife Service.

Wilson, R.G., Haderlie, L.C. *NebGuide* G80-509, 1980. "Canada Thistle". University of Nebraska Cooperative Extension Service, Institute of Agriculture and Natural Resources.

University of California Davis, Dept. of Agriculture and Natural Resources Database: http://ucce.ucdavis.edu/datastore/detailreport.cfm?usernumber=29&surveynumber=182

The Nature Conservancy ESA for Cirsium arvense: http://tncweeds.ucdavis.edu/esadocs/documnts/cirsarv.pdf

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