MANAGEMENT OF

INVASIVE PLANTS IN WISCONSIN

A3924-04

Canada thistle

(Cirsium arvense)

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Invasive plants can thrive and aggressively spread beyond their natural range, disrupting ecosystems. The *Management of Invasive Plants in Wisconsin* series explains how to identify invasive plants and provides common management options. Management methods recommend specific timings for treatment, as well as expected effectiveness. For more information, go to: fyi.uwex.edu/weedsci/category/invasive-plants-of-wisconsin.

Canada thistle is a 2–6′ herbaceous, creeping perennial with slender, upright, grooved stems that branch only at the top. Stems are slightly hairy when young and progressively hairier as the plant matures.

Legal classification in Wisconsin: Restricted

Leaves: Alternate, attached directly to stem (sessile), simple, and oblong. Leaves are irregularly lobed and tapered with spiny, toothed margins. Amount of spininess and lobing varies between plants.

Flowers: Midsummer to early fall. Numerous, small (0.5–0.75″ wide), purple to pink (rarely white) flower heads. Plants are either male or female (dioecious).

Fruits and seeds: Seeds are small, light brown, tapered, and loosely attached to a feathery tuft of hair. Seeds seldom remain attached to these hairs.

Roots: Reproduces clonally by creeping roots that grow laterally in soil, up to 10–12′ per year. Also produces taproots that may grow more than 6′ deep. Readily regenerates from root fragments.

Similar species: Canada thistle is distinguished from all other thistles by creeping lateral roots, dense clonal growth, and small dioecious flower heads.

Ecological threat:

- Invades open natural areas such as prairies, savannas, glades, dunes, streambanks, sedge meadows, and forest openings. It also invades croplands, pastures, forest openings, lawns and gardens, roadsides, ditches, and waste sites.
- Canada thistle is prevalent in grasslands, such as pastures and Conservation Reserve Program (CRP) land.

UW Extension Cooperative Extension

NPM

Non-chemical control

Removal

Effectiveness in season: 70–90%
Season after treatment: < 50%

Pull or cut 3–4 times a year. The first removal should take place when flower buds are fully developed. Repeat at four-week intervals as resprouts occur until the plant goes dormant in fall. Pulling or cutting when plant is drought-stressed can increase effectiveness. Removal is required for 3–5 years to eradicate perennial plants, but seeds can persist and reinvade areas for up to 20 years. If flowers are present, bag material and dispose of it in a landfill or burn it to avoid potential for seed spread.

Mowing

Effectiveness in season: 50–70%
Season after treatment: < 50%

Mow when plant has produced flower buds. Then mow a second time when plant again produces flower buds or when the plant has 7–10 leaves. Late summer or fall mowing is less effective than early mowing since plants remain as rosettes. Mowing when plants are drought-stressed can increase effectiveness. Mowing will suppress thistle growth, but not control it.

Prescribed burning

Effectiveness in season: 50–70%
Season after treatment: < 50%

Spring burns kill germinating seedlings and can suppress above-ground growth of established plants, depending on fire intensity. After the fire, established plants will resprout and reinvade areas; this management method is not recommended unless integrated with other techniques. Fire may benefit other species well-adapted to this management (e.g., prairie grasses), resulting in improved competition with Canada thistle. A handheld propane torch can be effective for treating seedlings.

Grazing

Effectiveness in season: 70–90%
Season after treatment: < 50%

The optimal time for grazing is similar to hand pulling. Sheep, goats, and cattle may graze Canada thistle before bud stage to reduce flower production, but grazing is more effective when plants are treated with salt or animals are trained to eat these spiny plants. High-intensity, short-duration grazing of plants for 2–3 years in grass-based pastures can reduce stem densities to low levels. Avoid over-grazing a site since it can suppress other vegetation competing with Canada thistle and enhance thistle populations.

Biological control

Effectiveness in season: < 50%
Season after treatment: < 50%

Pseudomonas syringae pv. *tagetis* (PST), an unregulated bacterium, infects thistles in non-disturbed habitats. Plant mortality rarely occurs as a result of infection; infections do not persist and plants must be reinfected annually. Infections are increased by mowing or other physical disturbances when moisture is present on foliage. There are a number of other introduced agents that have been used to suppress Canada thistle, but these species are generalist feeders and would not be approved for release in Wisconsin. To release biological control agents in Wisconsin, contact the Wisconsin Department of Agriculture, Transportation, and Consumer Protection for required permit.

Manipulation of the environment

Effectiveness in season: < 50%
Season after treatment: < 50%

Interseeding with competitive grasses can suppress Canada thistle, if grasses successfully establish. This method has been shown to be most effective when paired with other control measures.

Chemical control

Foliar

Apply directly to individual plants or broadcast across an infested area. Broadcasted foliar applications are typically the most cost-effective treatment in dense infestations. Use lower rates on smaller plants and less dense populations and higher rates on larger plants and denser populations. Spring fertilization can increase the effectiveness of herbicides.

2,4-D*

Effectiveness in season: 70–90%
Season after treatment: 50–70%

Common name: Many

Rate:
broadcast: 1–2 lb a.e./A
spot: For a 3.8 lb a.e./gal product: 0.5–0.8% (0.02–0.03 lb a.e./gal)

Timing: Apply during flower bud to early flowering stage or to rosettes in the fall as long as leaves are green.

Remarks: This technique will eradicate new, small infestations, but will only suppress well-established populations unless multiple applications are made.

Caution: Use aquatically labeled product if potential exists for solution to contact surface water. Use of this chemical in areas where soils are permeable, particularly where the water table is shallow, may result in groundwater contamination. Overspray or drift to desirable plants should be avoided since even minute quantities of the spray may cause severe injury to plants.

***Active ingredient (a.i.)**

aminocyclopyrachlor + metsulfuron*

Effectiveness in season: 90–100%
Season after treatment: 90–100%

Common name: Streamline

Rate:
broadcast: 4.75–9.5 oz/A (aminocyclopyrachlor: 1.9–3.75 oz a.i./A + metsulfuron: 0.6–1.2 oz a.i./A)
spot: 0.2–0.4 oz/gal (aminocyclopyrachlor: 0.08–0.16 oz a.i./gal + metsulfuron: 0.03–0.05 oz a.i./gal)

Timing: Apply during flower bud to early flowering stage or to rosettes in the fall as long as leaves are green.

Caution: Do not apply directly to water or to areas where surface water is present. Avoid using Streamline in areas where soils are permeable, particularly where the water table is shallow since groundwater contamination may result. Streamline remains in the soil for months, depending on application rate, and has the potential to contaminate surface runoff water, especially on poorly draining soils or areas with shallow groundwater. Maintenance of a vegetative buffer strip is recommended between the areas Streamline is applied and surface water features. Overspray or drift to desirable plants should be avoided since even minute quantities of the spray may cause severe injury to plants. Do not compost treated plants since herbicide can persist through composting process.

aminopyralid*

Effectiveness in season: 90–100%
Season after treatment: 90–100%

Common name: Milestone

Rate:
broadcast: 5–7 fl oz/A (0.08–0.1 lb a.e./A)
spot: Equivalent to broadcast rates.

Timing: Apply during flower bud to early flowering stage or to rosettes in the fall as long as leaves are green.

Remarks: 14 fl oz/A can be used as long as less than half of the area is treated. Depending on the volume of solution applied per acre, typical mixtures for spot treatments are 2–8 mL Milestone per gallon of water.

Caution: Do not apply directly to water or to areas where surface water is present. Remains in soil for up to one year, depending on application rate. Overspray or drift to desirable plants should be avoided since even minute quantities of the spray may cause severe injury to plants. Do not compost treated plants since herbicide can persist through composting process.

clopyralid *

Effectiveness in season: 90–100%
Season after treatment: 70–90%

Common name: Transline

Rate:
broadcast: 10–16 fl oz/A (0.25–0.4 lb a.e./A)
spot: 0.2–0.4% (0.005–0.01 lb a.e./gal)

Timing: Apply during flower bud to early flowering stage or to rosettes in the fall as long as leaves are green.

Remarks: A wick application of a 2% solution of the product in water is effective when target plants are taller than desirable plants.

Caution: Do not apply directly to water or to areas where surface water is present. Use of this chemical in areas where soils are permeable, particularly where the water table is shallow, may result in groundwater contamination. Remains in soil for up to one year, depending on application rate. Overspray or drift to desirable plants should be avoided since even minute quantities of the spray may cause severe injury to plants. Do not compost treated plants since herbicide can persist through composting process.

dicamba*

Effectiveness in season: 70–90%
Season after treatment: 50–70%

Common name: Banvel

Rate:
broadcast: 16–64 fl oz/A (0.5–2.0 lb a.e./A)
spot: Equivalent to broadcast rates.

Timing: Apply during flower bud to early flowering stage or to rosettes in the fall as long as leaves are green.

Caution: Do not apply directly to water or to areas where surface water is present. Use of this chemical in areas where soils are permeable, particularly where the water table is shallow, may result in groundwater contamination. Overspray or drift to desirable plants should be avoided since even minute quantities of the spray may cause severe injury to plants. Rates > 16oz/A (0.5 lb a.e./A) may cause stunting and discoloration of sensitive grasses, such as smooth brome.

glyphosate*

Effectiveness in season: 70–90%
Season after treatment: 70–90%

Common name: Roundup

Rate:
broadcast: 0.75–1.5 lb a.e./A
spot: For a 3 lb a.e./gal product: 1.0–2.0% (0.03–0.06 lb a.e./gal)

Timing: Apply during flower bud to early flowering stage or to rosettes in the fall as long as leaves are green.

Remarks: A wick application of a 50% solution of the product is effective when target plants are taller than desirable plants.

Caution: Use product labeled for aquatic use if potential exists for solution to contact surface waters. Applications can result in bare ground since glyphosate is not selective. Overspray or drift to desirable plants should be avoided since even minute quantities of the spray may cause severe injury to plants.

*Active ingredient (a.i.)

picloram*

Effectiveness in season: 70–90%
Season after treatment: 70–90%

Some products containing picloram are restricted-use in Wisconsin.

Common name: Tordon K

Rate:

broadcast: 64–96 fl oz/A (1–1.5 lb a.e./A)
spot: Equivalent to broadcast rates.

Timing: Apply during flower bud to early flowering stage or to rosettes in the fall as long as leaves are green.

Caution: Do not apply directly to water or to areas where surface water is present. Use of this chemical in areas where soils are permeable, particularly where the water table is shallow, may result in groundwater contamination. Remains in the soil for more than one year, depending on application rate, and has the potential to contaminate surface runoff water during this timeframe. Maintenance of a vegetative buffer strip is recommended between the areas picloram is applied and surface water features. Overspray or drift to desirable plants should be avoided since even minute quantities of the spray may cause severe injury to plants. Do not compost treated plants since herbicide can persist through composting process.

picloram + 2,4-D*

Effectiveness in season: 90–100%
Season after treatment: 70–90%

Common name: Grazon

Some products containing picloram are restricted-use in Wisconsin.

Rate:

broadcast: 64–96 fl oz/A (picloram: 0.25–0.4 lb a.e./A + 2,4-D: 1.0–1.5 lb a.e./A)
spot: 1–1.5% (picloram: 0.005–0.008 lb a.e./gal + 2,4-D: 0.02–0.03 lb a.e./gal)

Timing: Apply during flower bud to early flowering stage or to rosettes in the fall as long as leaves are green.

Caution: Do not apply directly to water or to areas where surface water is present. Use of this chemical in areas where soils are permeable, particularly where the water table is shallow, may result in groundwater contamination. Remains in the soil for more than one year, depending on application rate, and has the potential to contaminate surface runoff water during this timeframe. Maintenance of a vegetative buffer strip is recommended between the areas this product is applied and surface water features. Overspray or drift to desirable plants should be avoided since even minute quantities of the spray may cause severe injury to plants. Do not compost treated plants since herbicide can persist through composting process.

Herbicide information is based on label rates and reports by researchers and land managers. Products known to provide effective control or in common use are included. Those that do not provide sufficient control or lack information for effectiveness on target species have been omitted.

References to pesticide products in this publication are for your convenience and not an endorsement of one product instead of a similar product. You are responsible for using pesticides in accordance with the label directions. *Read the label before any application.*

This series of fact sheets was created in cooperation with University of Wisconsin-Extension Team Horticulture.

This material is based upon work supported by the Cooperative State Research, Education, and Extension Service, U.S. Department of Agriculture, under Award No. 2009-45060-06000.

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Management of invasive plants in Wisconsin: Canada thistle (A3924-04) I-9-12