



Canada Thistle

Cirsium arvense



BMP assembled March 2021
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This Best Management Practice (BMP) document provides guidance for managing Canada thistle in the Oak Openings Region of Northwest Ohio and Southeast Michigan. This BMP was developed by the Green Ribbon Initiative (GRI) and its partners & uses available research & local experience to recommend environmentally safe control practices.

INTRODUCTION AND IMPACTS — Canada thistle (*Cirsium arvense*), also called field thistle or creeping thistle, is native to northern Europe and western Asia. Despite its common name, Canada thistle is

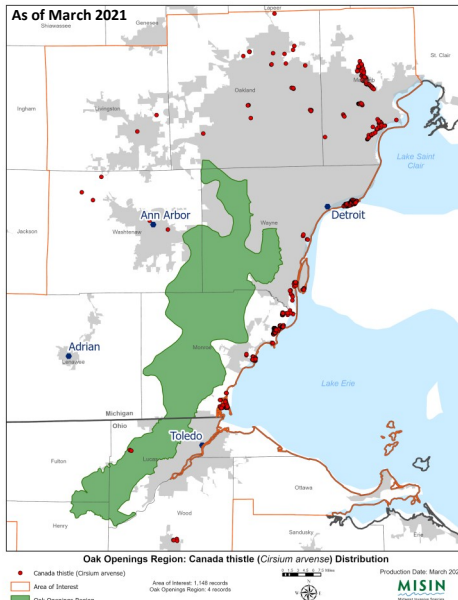
not native to Canada or even to North America! Canada thistle (*C. thistle*) was introduced to North America in the 17th century. It is a noxious weed (declared so in MI, OH, PA and 32 other states) and has plagued farmers in America since European settlement. In fact, Vermont declared *C. thistle* a noxious weed in 1795! According to distributions in BONAP's North American Plant Atlas

(BNAPA), *C. thistle* is a considerable problem in states north and west of Texas, and generally north beyond the Southeastern U.S. (i.e. north of OK, AR, AL, GA and SC). In Ohio, it has been recorded in all but 6 counties (BNAPA). In Michigan, records are found in all but 15 counties, with notable missing records in the "mitten" and "thumb" of the lower peninsula (BNAPA). The Midwest Invasive Species Information Network (MISIN) has 1,144 records of *C. thistle* (see map: red points) documented just outside of the Oak Openings Region (OOR) (approx. 20 mi radius). In the MISIN database, there are only 4 occurrences currently mapped within the OOR boundaries (see map: green polygon); however, according to BONAP's North American Plant Atlas, records have been observed in all 7 OOR counties.

Canada thistle has many characteristics that contribute to its classification as a noxious and invasive weed. It can be very aggressive, out-competing and displacing desirable native plants and, if left uncontrolled, it can form dense patches and monocultures. Small colonies can quickly grow due to a fast-spreading root system (small taproot with creeping lateral roots). A large patch with thousands of stems rising from the roots is often one plant with a mega root mass.

Canada thistle seeds need dispersal pathways to spread into new areas. Although seeds are wind dispersed (seeds have a fluffy pappus attached to the seed tip), most seed spread is through "animals, in hay, contaminated crop seed, machinery, and irrigation water" (USDA-USFS Fire Effects Info. System (FEIS)). Seedling survival can be a delicate matter, with too much or too little moisture, competition, shade, aeration and dryness lowering survival rates. Note: Shoot (i.e. stem) and flower growth are induced by 15+ hour days; in the OOR this starts in late May.

SIMILAR SPECIES - Several similar non-native weeds occur in the Oak Openings Region, including bull thistle (*C. vulgare*) and musk thistle (*Carduus nutans*). Both bull and musk thistle have spiny winged stems, whereas Canada thistle's stem is grooved and without spiny wings. Swamp thistle (*C. muticum*), a wetland native, does not have spiny wings either, however the outer bracts on the flowerhead are cobwebby and sticky; Canada thistle's flowerhead is not sticky and only slightly cobwebby.



Canada Thistle
© Robert Biederman



Bull Thistle
© R,W, Smith



Swamp Thistle
© P. L. Cornett

HABITAT— In the OOR, *C. thistle* is primarily a problem weed in crop and fallow fields and open sites undergoing restoration. *C. thistle* is a sun-loving species; it grows well in open, high-light communities including prairies and open riparian habitats. *C. thistle* can establish and spread readily in other disturbed sites including forest edges, roadsides, ditches, railroads, lakeshores and waste areas.

IDENTIFICATION - Habit: A perennial forb with prickly leaves and a creeping lateral root system, often forming large patches and individual clones. Usually has numerous aboveground stems. Flowers are showy with flowerheads numerous but only 1-2 cm in diameter. Height to 6.5 ft. (2 m), but typically to 4 or 5 ft. *C. thistle* is dioecious, having male and female reproductive parts on separate individuals.



Canada thistle
© John M. Randall



Canada thistle seedling stage
© Leslie J. Mehrhoff



seeds of Canada thistle
© Bruce Ackley

The following character descriptions are mainly derived from [MN Dept. of Ag's Noxious and Invasive Weeds](#) (MNDA) web pages:

Leaves: Leaves are alternate, lance-shaped, irregularly lobed, and have wavy spiny/toothed margins.

Stems: Stems are usually smooth, but sometimes have short hairs; slightly grooved.

Flowers: Purple and pink (to white) flowers are borne at the end of the stems in clusters. Buds are 0.5 in. wide (1.27 cm) by 0.75 -1 in. long (1.9 -2.54 cm), tear-dropped shaped and lack spines. Blooms July thru August. Most often fertilized by honeybees.

Seeds: 0.09 to 0.2 in. (2.4 - 5 mm) long and 0.04 in. (1 mm) in diameter. Seeds attached to a fluffy pappus (wind dispersed).

Roots: Small taproot with creeping lateral roots, often extensive.

Canada Thistle Timeline	Jan	Feb	March	April	May	June	July	Aug	Sept	Oct	Nov	Dec
Life History (perennial)	new roots and underground shoots begin growth		new shoots emerge from established plants (stems remain short); root reserves decline		shoots begin to elongate; root reserves decline		flowering (seed disperse 8-11 days after flowering)		early: seed dispersal; root storage increases; later: seed germination, rosettes form		plants die back w/ hard freeze	plants overwinter as root mass
Hand Cutting, Brush cutting or Mowing					cut/mow just prior to flowering; target: mid - late June		continue to cut/mow just prior to flowering (2nd & 3rd cut)					
Herbicide (early spring or follow-up cut/mow)				herbicide (Spring) target bolt stage: mid to late June						herbicide (Fall); rosettes & colonies		
Tilling with Herbicide							till fields/disturbed areas to increase shoots & leaf area, creating more surface area					
Prescribed Fire	C. thistle populations are adapted to survive fire and to colonize recently burned areas; litter ignites readily. Site assessments should be conducted pre and post to determine if herbicide treatments are needed after an Rx (or natural) fire. Studies show seedlings have established long after a fire event (2 to 9 yrs). Planting/seeding natives after burning may help control efforts.											

REPRODUCTION AND DISPERSAL—“Canada thistle is probably the most widespread of all thistle species. In addition to N. A., Canada thistle is invasive in northern and southern Africa, the Middle East, Japan, India, New Zealand, Australia, and South America” (FEIS). C. thistle is a prolific seed producer and also spreads by roots (MNDA). Although seeds are wind dispersed, most seed spread is through “animals, in hay, contaminated crop seed, machinery, and irrigation water”(FEIS). **Thoroughly cleaning equipment is a critical prevention measure for Canada thistle in the OOR. Land managers should consider incorporating pre- and post-project equipment cleaning into contracts.**

New plants can also form from root fragments as short as 0.2 inch (6 mm) (FEIS). “Once a population gets established, C. thistle begins to quickly displace native vegetation, including desirable pollinator habitat, creating large stands with little biological diversity and low habitat value” (MNDA).

REPORTING — Canada thistle is identified as a **control** species in the OOR. Reporting locations of C. thistle is essential for its management and control. In fact, with only 4 documented records in the MISIN database, reporting in the OOR is extremely low (occurrences are known to be more numerous and widespread). To report or to find out specific ways you can help map occurrences, contact [MISIN](#), [GRI \(OO-CWMA\)](#) or your county CWMA or CISMA. Early detection of C. thistle invasions limits the future effort needed to reduce established populations.

CONTROL*— Management efforts must focus on both the prevention of seeds and eliminating root growth. Management plans that combine fall and early spring applications of specific foliar herbicides and pre-flower mowing throughout the growing season have shown to produce excellent results, especially when follow-up management occurs for several years until the population is significantly reduced. Restoration of treated sites by planting native species can also sustain management into the future. *The control measures listed above are mainly derived from MN Dept. of Ag’s Noxious and Invasive Weeds (MNDA) web pages:

Herbicide	Trade Names	Concentration
Dicamba + 2,4-D amine	Weedmaster®	4 pints/acre (growing populations)
Glyphosate	Roundup®, Glypro® AquaNeat®	foliar: 1.5% solution by volume (all) Rndup/Glypro= 1.5 to 3 pints/acre AquaNeat = 3 to 4.5 pints/acre

Chemical: It is the responsibility of the applicator to comply with herbicide labels and regulations when planning chemical treatment. Where appropriate, use herbicides approved for aquatic areas. Also, use herbicides with the appropriate non-ionic surfactant.

Foliar or Backpack Spraying—Fall and spring applications of foliar herbicides that mobilize their active ingredients into the root system of the plant have been shown to provide the most effective management. Infestations need to be monitored for several years after initial treatments and follow-up applications should be administered for surviving plants and new seedlings.

Mechanical: Pulling: Can be done in combination with other cutting techniques or with small populations; reduces root nutrient stores.

Digging—Not recommended due to extensive root system; also root fragments can grow into new plants.

Mowing—Mowing or cutting of stands prior to flowering in late June can significantly reduce the overall seed production of a population.

However, C. thistle will continue to flower after mowing, so attempts must be repeated throughout mid and late summer to inhibit overall seed production. Mowing in a single year will not be sufficient to control large stands; multiple years are required. Equipment needs to be inspected and cleaned.

Covering—Potential treatment for small, dense populations where cutting stalks is a 1st treatment and herbicide is not an option.

Disking— Will likely increase the number of foliar shoots and leaf area, creating more surface area for herbicide application. (FEIS)

Biological: Several biological control agents are commercially available. However, results have been variable and non-target impacts not thoroughly tested. More information is needed before these agents can be considered a viable means of control.

Prescribed Fire: Not recommended. According to FEIS, fire kills the aboveground portion of plants, while roots often survive severe fires. After fire, plants sprout vegetatively from the extensive perennial root system, or colonize bare ground via seedling establishment.

DISPOSAL— Root fragments can grow into new plants; place roots and seed heads into black plastic bags and leave in sun to liquify.

