
BWSR FEATURED PLANT

MINNESOTA'S THISTLES

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Mention thistles and many people's thoughts go right to the familiar pesky Canada Thistle or the even more prickly Bull Thistle. But there are actually nine species of thistle in Minnesota, five of which are native, and a tenth species with the potential to show up from neighboring Wisconsin (the non-native European Marsh Thistle). With more than half of our thistles being native, and with a few non-native species being dropped from the noxious weed list in the last few years, it pays to know which is which.

Identification

The quickest way to distinguish native thistles from non-native thistles is to grab hold of the stems! Or, looking will work just as well, and it'll be a lot less painful. None of MN's native thistle species have spiny-wings along the stem, and most non-native species do. The only non-native species that does not have spiny wings along the stem is Canada Thistle. This species is one of only two colony-forming (spreading by rhizomes) perennial thistles in MN. The other perennial thistle is the native species Flodman's Thistle, which can easily be distinguished from Canada Thistle by the white and wooly appearance of the stems and lower leaf surfaces.



Flodman's Thistle, with white stem & large, solitary flower head.

Photo: Ken Graeve

Two other important look-alikes are the native Swamp Thistle and the non-native European Marsh Thistle. Watch out for European Marsh Thistle. Although not known to be in MN, it is currently invading sedge meadows, bogs, and even cedar swamps in the Upper Peninsula of Michigan and northeast Wisconsin. These two are the only biennial thistles that will grow exclusively in wet areas. The key differences are that the native Swamp Thistle has smooth stems and the non-native European Marsh Thistle has spiny stems and unusual-looking tightly clustered flower heads. Report any sightings to the Minnesota Department of Agriculture.



Canada Thistle, with greenish stem & small, clustered flower heads.

Arrow and bracket point to a single phyllary.

Photo: Dave Hanson

Bull Thistle and Plumeless Thistle are two similar-looking non-native thistles. Now that Bull Thistle has been dropped from the noxious weed list, it is worthwhile to be able to tell them apart. Both are biennial thistles with very spiny stems. Bull Thistle has larger flower heads, about 1-1 1/2" wide. Plumeless Thistle flower heads are typically less than 1" wide. However, the size of the flower heads is a general guideline and some plants will break the rules. Another way to tell is to look very closely at the white fuzz on the seeds, called the pappus. Pull off an individual strand and hold it up to the light. On Bull Thistle a single strand has branches and looks somewhat like a tiny wispy feather, or plume. On Plumeless Thistle each strand is just a linear, un-branched thread. This is why it's called "plumeless. Although

there are other thistles that have this type of pappus, this is a reliable way to distinguish Bull Thistle from Plumeless Thistle.

The most common native thistle is called Field Thistle. This often gets mistaken for Bull Thistle, but like all native thistles it does not have spiny wings along its stem. Field Thistle also has several small leaves right below the flower head, which Bull Thistle does not have.



Plumeless Thistle, showing spiny stem. Flower heads are smaller & more numerous than Bull Thistle.
Photo: Dave Hanson



Bull Thistle, showing spiny stem. Flower heads are larger & fewer than Plumeless Thistle.
Photo: Ken Graeve



Field Thistle, showing smooth stem and whitish leaf undersides.
Photo: Ken Graeve

Key

1-Colony-forming perennial

2-**Stem green and smooth**, leaves green underneath and smooth, flower heads in clusters
..... Canada Thistle (*Cirsium arvense*)

2-**Stem wooly-white**, leaves wooly-white underneath, flower heads solitary
..... Flodman's Thistle (*Cirsium flodmanii*)

1-Biennial or Monocarpic perennial:

3-Stem **without spiny wings**:

4-Phyllaries (scale-like leaves or bracts on flower heads) with short or no spines
5-Flower heads in clusters, spines on phyllaries <0.5mm or absent, plants 2-6' tall, growing in wet areas Swamp Thistle (*Cirsium muticum*)

5-Flower heads solitary, phyllaries with short spines, plants 1-3' tall, growing in dry sandy soils (a species of special concern in Minnesota) Hill's Thistle (*Cirsium Hillii*)

4-Phyllaries with spines 2.5-5 mm
6-Leaves deeply lobed/pinnatifid..... Field Thistle (*Cirsium discolor*)
6-Leaves coarsely toothed or if lobed then lobes less than halfway to the mid-vein
..... Tall Thistle (*Cirsium altissimum*)

3-Stem **with spiny wings** (all non-native):

7-Phyllaries not spine-tipped European Marsh Thistle (*Cirsium palustre*)

7-Phyllaries spine-tipped
8-Flower heads 1 ½ - 3" wide and nodding Musk Thistle (*Carduus nutans*)
8-Flower heads 1 – 1 ½" wide, pappus plumose Bull Thistle (*Cirsium vulgare*)
8-Flower heads < 1" wide, pappus capillary Plumeless Thistle (*Carduus acanthoides*)

Control Recommendations

Don't waste scarce time and resources controlling thistles unnecessarily. There is rarely any need to control native thistles, even the somewhat weedy Field Thistle, since it does not form dense stands or crowd out other native species. Of the non-native species, the highest priority should be to watch out for European Marsh Thistle. Preventing it from getting established in MN will be far easier than trying to remove it after the fact.

The noxious weed law still requires control of Canada Thistle, Musk Thistle, and Plumeless Thistle. Bull Thistle has been removed from the state list, although it may be on some county lists. From an ecological restoration perspective, the amount of effort to put into controlling thistles depends on the extent to which they seem to be threatening the native plant community. Biennial thistles might fade away on their own once bare soil is covered up by perennial vegetation, and whether or not Canada Thistle actually poses a threat seems to be somewhat site-dependent.

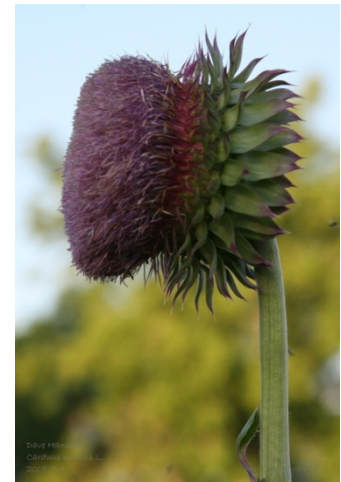
To control the biennial thistles, it's important to understand that they're biennial and become established by exploiting a bit of bare soil. Killing the thistles alone will only leave bare soil again, which is sure to be filled by replacement thistles or some other weed. Correcting the cause of the bare soil



White on the lower leaf surface is more common on native species, such as this Field Thistle.
Photo: Ken Graeve

is the way to eliminate a biennial thistle problem in the long term, and usually involves finding a way to improve the health of desirable vegetation in that location, often through re-seeding bare soil or using a technique such as prescribed fire to invigorate native grasses. While working to correct the underlying cause of the thistle infestation, the biennial thistles themselves can be controlled by cutting off flowering plants just below ground level or by using a broad-leaf herbicides. Just be sure to continue control measures for a few years until the thistle seed bank is depleted and the desirable vegetation has filled back in.

Canada Thistle can be controlled with broad-leaf herbicides or a combination of mowing and herbicide use. Fall might be the most effective time to apply herbicide, allowing the chemical to hitch a ride deeper into the root system as the plants store up energy reserves for the winter. The deep and extensive root system of Canada Thistle is hard to kill in a single treatment, so plan for follow-up monitoring and repeated applications.



Musk Thistle, with large, nodding flower head & wide, spreading phyllaries. Stem is smooth only above top leaves.

Photo: Dave Hanson

References

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Non-native Biennial Thistles in Minnesota

Bull thistle—

leaves dark green, leaf surface bumpy and hairy; leaf lobes long, narrow, stiff, with no (or very few) teeth along edges; stem hairy with spiny wings; flower head 1"-1 ½" wide and in clusters



Musk thistle—

leaves green to yellow green, leaf surface smooth; leaf lobes broadly triangular with a few irregular spine-tipped teeth along edges; stem spiny but not hairy, often not spiny just below flower head; flower heads 1 ½" -3" wide, solitary, & nodding



Plumeless thistle—

leaves green to pale green, leaf surface hairy; leaf lobe broadly triangular with a few irregular spine-tipped teeth along edges; stem spiny but and somewhat hairy, stem spiny all the way to flower head; flower heads <1" wide in clusters



Photos by Ken Graeve and Dave Hanson