

Musk thistle (*Carduus nutans*)



History and status: Musk thistle is native to Europe, northern Africa, and western Asia. It was first reported in North America in 1853 in Pennsylvania and is thought to have arrived in ship ballast. The first record of musk thistle in Montana was in 1921 in Missoula County. Twenty-five states list musk thistle as a noxious weed, including all states bordering Montana. Alberta and Saskatchewan have also placed this plant on their noxious weed lists. Although it is not a state-listed noxious weed in Montana, it is listed in the following counties: Beaverhead, Broadwater, Deer Lodge, Gallatin, Lewis & Clark, Liberty, Lincoln, Teton, Madison, Pondera, Teton, and Toole.

Biology and identification: Musk thistle typically behaves as a biennial, but it can act as an annual. Seedlings emerge in spring or fall and quickly form a large rosette (up to 2 feet in diameter). Plants commonly overwinter as rosettes and form large flowering stalks in the second year. Plants are often large-statured with adult plants reaching 3 to 6 feet in height. It has a large taproot. Musk thistle has broad triangular bracts, notably wide at the base and bent backwards, unlike any other native or exotic thistle in Montana. Flowers are solitary and often nod at maturity (photo below).

Habitat: Musk thistle establishes in a variety of habitats. Disturbed areas with some bare soil are most susceptible to invasion since seedling establishment is favored by sunlight. In the western U.S., it is not generally considered an invader of intact, undisturbed plant communities.

Spread: Reproduction is only by seed, and each individual can produce 10,000-11,000 seeds. Seeds may remain viable for at least 10 to 15 years. Seeds can be dispersed by human activities such as movement of hay and crop seeds, or by animals, water or wind. Despite these various vectors, most seeds fall relatively close to the parent plant.

Impacts: In favorable conditions, musk thistle can form dense stands of up to 60,000 plants/acre. Such stands have been described as “self-perpetuating” as they may exclude other vegetation. There is even some evidence that musk thistle produces allelopathic compounds that hinders other vegetation and promotes its own recruitment. Dense stands can restrict livestock movement. Livestock tend to avoid grazing near this species due to its numerous spines, causing a reduction in usable forage.

Management Priorities: Musk thistle establishment is dependent on bare ground and disturbance, therefore establishing or maintaining competitive vegetation should be the first management priority. Since musk thistle only reproduces from seed and the seedbank is long-lived, one key management objective is to prevent flowers from setting seed. Musk thistle can be killed by severing the taproot below the soil surface using a hoe or shovel or with tillage in croplands. Mowing is not considered an effective control method. Two weevils serve as biocontrol agents; *Rhinocyllus conicus* is a flower head weevil that was released in Montana in 1969. It has significant impact on seed production, however its effectiveness is reduced in habitats where the plant flowers late or has an extended flowering period (e.g. high elevation or moist sites). A second weevil *Trichosirocalus horridus* attacks rosettes. This weevil is not considered an effective control measure by itself, but augments the flower weevil, especially in combination with good plant competition. Both weevils are widespread in Montana. Interstate movement of these weevils is prohibited due to non-target effects on native and endangered thistles. Musk thistle can be managed with strategic goat grazing as goats have been shown to eat the flowers, though they tend to avoid vegetative growth. Chemical control is most effective with fall applications to rosettes. Some active ingredients that are effective on musk thistle include chlorsulfuron, metsulfuron, clopyralid, aminopyralid, picloram, dicamba, and 2,4-D.



For information about thistle identification, go to http://store.msuextension.org/Products/Guide-to-Exotic-Thistles-in-Montana-and-How-to-Differentiate-from-Native-Thistles_EB0221.aspx

Word Scramble: Test your knowledge of musk thistle

CHEALLTPLAO

Type of compound that musk thistle produces that hinders other vegetation and promotes its own recruitment

ASGOT

What livestock species grazes the flowers of musk thistle?

RTTSEAIETN

What type of shipment is prohibited for the two musk thistle biocontrol agents?

IWEESVL

What type of biocontrol agents attack musk thistle?

RSABCT

Feature of musk thistle that distinguishes it from other native or exotic thistles in Montana

NLLIHOOCSCCRIUSYNU

Flower head weevil that affects seed production

ESTRTEO

Overwintering stage of musk thistle

Solutions are posted to the MSU Extension Invasive Rangeland Weed website:
www.msuinvasiveplants.org/monthly_weed_post.html

