

Nodding Plumeless Thistle

(*Carduus nutans* L.)

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Pasture



Fig. 1. Musk thistle invading a pasture.

Fig. 2. Musk thistle leaves have numerous spines.

Fig. 3. The large colorful flower of musk thistle showing the spiny bracts.

Introduction

Problems Created

Musk thistle is native to Europe and Asia, as with all species of *Carduus* (in contrast with *Cirsium*, of which there are about 100 native thistle species in the US). Musk thistle was introduced into the eastern United States in the early 1900s and is a well-known rangeland pest in the US. It was discovered in our region in Davidson County, Tennessee in 1942 and since has spread throughout that state. Musk thistle frequents railroad, highway, and power line rights-of-way, where it provides a seed source for invasion of crop and pasture lands, as well as natural areas.

Agronomically, the aggressive growth of musk thistle causes significant competition with crops. Musk thistle also can reduce productivity of pasture and rangeland by suppressing growth of desirable forage and through grazing deterrence caused by the sharp spines on stems, leaf margins and blooms. Musk thistle generally is thought to pose little threat to undisturbed natural areas, but it is known to invade native and restored grasslands, even in the presence of dense vegetation. Because of its unpalatability, selective grazing in invaded areas results in eventual degradation of native meadows and grasslands where grazers feed on other plants, giving musk thistle a competitive advantage.

Regulations

Musk thistle is considered a noxious weed in twenty-four US states. In the southeast, it is listed as a Class B Noxious Weed in AR and NC. It is considered a significant invasion threat in SC, TN, and a severe threat in KY.

Description

Vegetative Growth

Musk thistle is similar to Canada thistle (*Cirsium arvense* [L.] Scop.) and bull thistle (*Cirsium vulgare* [Savi.]), also non-native in the US. However, musk thistle can be distinguished from other thistles by its large, disk-shaped, apical flower heads. Stems of musk thistle grow to 1.5' to 6' tall, and are highly branched and spiny throughout. Its dark green leaves are coarsely toothed, elliptical to lance-shaped in outline, with a smooth waxy surface and a yellowish to whitish apical spine on each leaf lobe. Leaf dimensions range from 0.5" to 1.5" wide, and 2" to 5" long.

Flowering

Musk thistle produces disk-shaped, 1.5" to 3.5" diameter flower heads that are formed solitary at the ends of highly branched, spiny stems. The bracts and petals in the flower heads may be deep rose, violet, or purple (occasionally white), and the outer bracts are spiny. Flower heads droop on the stem when fully developed, giving musk thistle its other common name, "nodding thistle."

Dispersal

The number of flower/fruit heads varies from 200 to 600 per plant in the most suitable habitats to 20 or fewer heads per plant on poor sites. Flowers appear from May to August, and as many as 1,200 seeds may be produced per head. Seeds mature in about one month and may be carried on the wind for several km/mi, with the aid of a pappus of fine bristles. The seeds may remain viable in the soil for as long as a decade.

Spread by

Musk thistle is spread on equipment, in contaminated hay and fodder, and is often associated with localized disturbance and overgrazing.

Habitat

Musk thistle can be found from sea level to about 8,000 ft. elevation, and it may occupy soils with neutral to acidic pH. It readily invades openings, and as such, spreads rapidly in areas subjected to frequent disturbance. However, musk thistle grows poorly in excessively wet, dry, or shaded conditions. Because of its affinity for disturbance, cropland, pasture, and rangeland are especially vulnerable to invasion; this is exacerbated by the typically well-drained range soils and selective grazing by livestock.

Distribution

Musk thistle is present from the Atlantic to the Pacific coast, in forest, prairie, and agricultural habitats. It has been recorded in forty-five states, and is considered a noxious weed in twenty-four states.

In the Mid-South, this species is known from fewer than a dozen counties in AR, LA, and MS. Alabama distribution of musk thistle was not available at the time this fact sheet was developed. Tennessee has the highest occurrence of this species in our region, with herbarium records from more than thirty counties encompassing the length of the state.

Control Methods

Biological Control

Two weevils have been introduced from Europe as a biological control for musk thistle, the thistle-head-feeding weevil (*Rhinocyllus conicus*) and the rosette weevil (*Trichosiromus horridus*). In western states, their use brought some success. Successful biological control of musk thistle often comes with more coverage of pasture grasses such as fescue

(*Festuca arundinaria* Schreb.) and orchard grass (*Dactylis glomerata* L.), or less desirable plants such as spotted knapweed. However, recent observations of unintentional and unanticipated impacts of the thistlehead-feeding weevil to native thistles, including some rare species, has raised concerns regarding its continued use, at least in the western U.S.

Chemical Control

Foliar spraying is effective on established populations of musk thistle. Apply a 2% solution of glyphosate or triclopyr and water plus a 0.5% non-ionic surfactant to ensure wetting of all leaves and stems. Triclopyr is selective to broadleaf species and is a better choice if native grasses are present. Glyphosate, a non-selective systemic herbicide, will injure or kill non-target plants that are contacted by spray. Chlorpyralid is effective at a concentration of 0.5% and is selective to Aster, Buckwheat, and Pea families. Imazapyr can also be used as a non-selective herbicide option at an application rate of 4 to 6 pints per acre. A low pressure and coarse spray pattern will limit drift and damage to non-target species. Treatments should be applied during the rosette stage or prior to flowering.

Mechanical Control

Hand Pulling is most effective on small populations, can be done throughout the year, but is most effective prior to the development of seeds. Flowers or seed heads should be bagged and disposed of to prevent seed dispersal. Minimizing soil disturbance will help prevent germination of seeds already present in the soil.

Physical Control

None.

Table 1. Suggested chemical control methods for musk thistle.

Herbicide	Broadcast Rate per acre	Spot Treatment Solution
glyphosate	1.5 to 2 quarts	2%
triclopyr	2 to 6 quarts	2%
chlorpyralid		0.5%
imazapyr	4 to 6 pints	

References

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