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# Musk and Other Thistles

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Musk, also called nodding thistle (*Carduus nutans* L.), is a serious weed pest in Iowa, Nebraska, and Kansas and is spreading rapidly in Missouri.

A native of western Europe, it was brought to the United States about 50 years ago and was first identified in Iowa in 1932. It spread rapidly west to Nebraska but was considered a rare weed in Kansas as recently as 1948. These three states have designated musk thistle a "noxious weed," and it comes under authority of their weed laws.

## Characteristics

Like most of its close relatives, musk thistle is covered with sharp spines. They grow along the leaf margins, and extend down the branches and stems (Figure 1). The leaves are deeply and irregularly indented, have a smooth waxy surface, and are grayish green along the outer edge with a lighter green midrib area. Plant height varies from two to six or more feet.

The delicate flowers are a deep, reddish pink and are large and solitary. Each flower is located at the tip of a long stem or branch which bends or "nods" and twists as the flower matures and increases in size. Blooming starts and the first flowers appear in early summer but buds continue to develop and bloom until mid-July and early August.

The seed of musk thistle is air borne and consequently can be carried by wind for many miles from the site where it originated. Weed species that spread by windblown seed are difficult to control. Musk thistles produce an average of 10,000 seeds per plant but under favorable conditions can produce considerably more.

Musk thistle is generally classed as a biennial based on length of life. This means that two growing seasons are required for a plant to complete its life cycle and to produce mature seeds. The plant dies after seed has matured. Following seed germination, a rosette (Figure 2) develops and increases in size throughout the growing season. A fleshy tap root overwinters as low temperatures kill the rosette leaves. The following spring, new leaves originate from crown buds, and a shoot develops and branches and grows rapidly upward. Flower buds appear and the plant starts to bloom in early June.

If a rosette becomes established in late summer or early fall and successfully survives the winter, it would then be described as a winter annual. This often occurs with favorable fall weather followed by a mild winter. Thus, the distinction between a biennial and a winter annual growth pattern can be vague.

Musk thistle is not a serious weed problem in crops requiring spring seedbed preparation. Tillage will easily

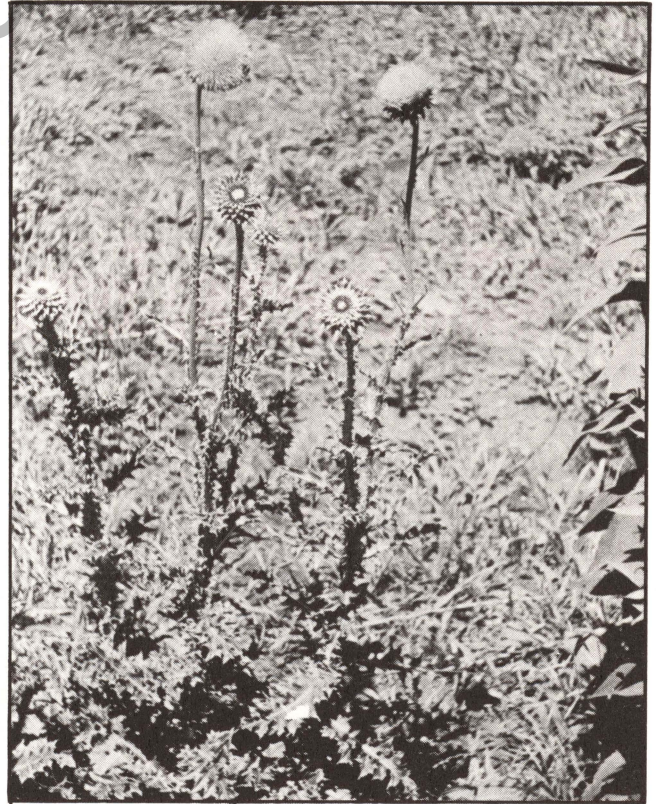


Figure 1. Musk thistle in various stages of bloom.



Figure 2. Musk thistle in rosette stage.





**Figure 3. Pasture infested with musk thistle. Note large solitary flowers and bending stems.**



**Figure 4. Musk thistle treated with 2,4-D. An earlier application would have been more effective.**

eradicate any rosettes established during the preceding summer or fall. Musk thistle can, however, be a problem in fall-sown grains, alfalfa, or clover if conditions are favorable for seedling establishment and winter survival.

The weed is found most commonly along roadsides, railroad rights-of-way, fence borders, wastelands, and in pastures. Inaccessible locations along fence rows, ditch banks, and waste areas should be checked periodically. Newly established thistles in the rosette state are inconspicuous and may not be observed until they bloom the following year.

Musk thistle presents its greatest threat in pasture land as livestock shy away from the spiny invader and will not graze



**Figure 5. Bull thistle (*Cirsium vulgare*).**

in heavily infested areas. Thus, the thistle becomes established and grows uninhibited, and the infested area becomes even denser as annual reseeding occurs.

The key to a control program is to prevent plants in an infested area from going to seed. Such a program will require continuous vigilance because seeds in the soil will germinate and rosettes will appear for a period of several years.

## Control

Spring tillage of any kind is highly effective in controlling musk thistle. Cultivation of row crops will prevent thistles from being established as rosettes. Summer plowing after small grain harvest with occasional disking will destroy established plants and will prevent new rosettes from getting a foothold. In general, musk thistle is not a serious problem in cultivated fields.

Close mowing of second year plants will give only temporary control because buds in the lower leaf axils will rapidly produce new stems and branches. Buds and flowers soon develop if no further control measures are taken. If an infestation is mowed after some of the flowers have matured seed, consider burning the area when the plants have thoroughly dried. Burning would destroy many of the seeds before they become airborne.

Musk thistle is susceptible to 2,4-D and can be controlled by this herbicide if used properly. Spring applications should be made when active growth is in progress but before the emergence of flower buds and before stem elongation. 2,4-D is quite ineffective if applied after flowers develop. An early application of 2,4-D is essential. Use one pound acid equivalent per acre. Applications made in September or October to first-year rosettes are effective, too. Apply at a rate of one





Figure 6. Field thistle (*Cirsium discolor*).



Figure 7. Tall thistle (*Cirsium altissimum*).

pound acid equivalent per acre.

Where a patch of thistles has been mowed and where early regrowth is in progress, an application of 2,4-D at one pound per acre may be used to advantage.

Wherever weeds have become established there is generally a heavy infestation of seed in the soil. Consequently, plants that are eradicated will be replaced by new ones that originate from germinating seed. This means an infested area will need to be re-treated until the supply of seed in the soil is exhausted.

Dairy cattle in production should not graze pastures sprayed with 2,4-D for a period of one week following application of the chemical. Traces of 2,4-D residue have been detected in milk when lactating animals have grazed treated areas within the one week period.

**Summary.** Musk thistle develops a rosette during its first year of growth and dies after maturing seed the following year.

Musk thistle is readily controlled by tillage.

Musk thistle is susceptible to 2,4-D, but stage of growth is critical for a successful pesticide application.

Use 2,4-D according to recommendations and label instructions.

*Never let a plant go to seed!*

## Other Thistles

*Bull thistle* (Figure 5), *Field thistle* (Figure 6) and *Tall thistle* (Figure 7) are all, like musk thistle, biennials. Consequently, control is similar to the methods described for musk thistle. Field thistle and tall thistle are characterized by the distinctive light grey-green, short, smooth hair on the underside of the leaf. Leaf margins of tall thistle are not as deeply



Figure 8. Canada thistle (*Cirsium arvense*).



Figure 9. Spiny-leaved sow thistle (*Sonchus asper*).



Figure 10. Common sow thistle (*Sonchus oleraceus*).

notched as those of field thistle.

Of the three species, bull thistle and field thistle are more widely distributed than tall thistle. All three species are found in pastures, along roadsides, and in waste areas. For each species, seed is airborne.

*Canada thistle* (Figure 8), a perennial, spreads vegetatively by creeping underground root stocks. Like other thistle species, seed is airborne. Of all the different species, Canada

thistle is the most difficult to control. Repeated mowing or intensive tillage will prevent its spread but will not result in complete eradication. 2,4-D, spot treatment with Tordon or several soil sterilants will result in good control. Fortunately, Canada thistle has limited distribution in Missouri.

Both *sow thistles* (Figures 9 and 10) are annuals and are readily controlled by mowing, tillage, or an application of 2,4-D.

