MUSK THISTLE: Options for control

Musk Thistle, a class-B noxious weed in Lincoln County, Washington (*Carduus nutans)* of the Asteraceae family. Also known as nodding thistle, derives from Eurasia.

Musk, is an aggressive, biennial herb with showy pink to violet-purple flowers and painful spiny stems and leaves. Mature plants range in height from 1½ to 6 feet tall, and have multi-branched stems. Leaves are dark green, coarsely lobed, with a smooth waxy surface and a yellowish to white spine at the tip. The large disk-shaped flower heads, containing hundreds of tiny individual flowers, are 1½ to 3½ inches in length and occur at the tips of stems. Flower heads will droop to a 90-degree angle from the stem when mature, hence its alternate name, nodding thistle. Each plant may produce thousands of straw-colored seeds adorned with plume-like bristles.

Musk thistle normally requires two years to complete its life cycle (i.e. biennial or winter annual). Occasionally, the plant completes its life cycle in one growing season (i.e. summer annual). The typical biennial musk thistle exhibits itself the first year in the form of a rosette, a cluster of tightly packed leaves laying flat on the ground. Rosettes vary in diameter from a few inches to three feet. Musk thistle over-winters as rosette. During the rosette stage (either fall or spring), Musk thistle is most susceptible to chemical control. In its second year of growth, the Musk thistle plant will leave the rosette stage as its stem elongates (bolts) toward the mature, flowering plant with a large fleshy taproot that is corky and hollow near the ground surface. Chemical control is less effective during the bolted stage and chemical susceptibility continues to decline as the plant reaches maturity.

Musk thistle invades pastures, meadows, and fields. In so doing it crowds out other more desirable forage plants. Livestock will not graze in areas heavily infested with Musk thistle thus decreasing available pasture. It spreads rapidly by seed. It also invades stream banks, hindering access, and has been reported as problematic in grain fields.

There is a biological available for Musk thistle by the name of Rhinocyllus conicus, a seed head feeding insect. When well established, dramatically reduces Musk thistle stand density and vigor.

Musk thistle has a history of being used for medicinal purposes. The flowers are fever reducers, and are used to purify the blood. The seeds contain a fixed oil that is rich in linoleic acid, which benefits in the prevention of atherosclerosis. The stem of Musk thistle is edible, and is said to taste like

Rosettes have distinctive white veins on their upper surface. Young leaves are hairless and immediately take on a rosette growth.

Leaves are lanceolate, deeply lobed, with light green to white midribs and veins.

Musk thistle has sharply spiny stems and leaves.

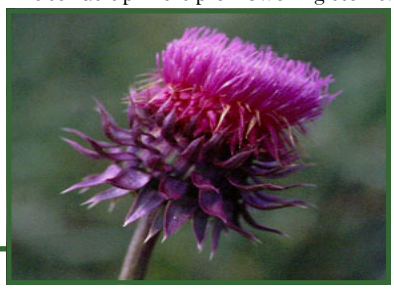
Key identifying traits

- **Leaves** are dark green, hairless, bipinnatley, deeply lobed with a waxy surface, and small sharp spines, with light green midrib.
- **Upper** flower **stems** are typically **bare**.
- The lower **stems** are **spiny** and **winged**, except for right below the flower head.
- **Flowers** are pink to violet purple, 1 1/2 - 3inches in diameter, **drooping** at maturity.
- Just beneath the flowers are very **spiny bracts**.
- Older plants **grow** to over **6 ft. tall**.

Biology and ecology

- **Biennial** or sometimes a winter annual.
- Some **rosettes** may reach a span of 3 feet or more in diameter by late fall.
- **Reproduces entirely by seed** that is dispersed short distances by wind.
- **Each plant** may have 50 to 100 flower heads with up to 1,200 seeds per head and **120,000 seeds per** single **plant**.
- Once seeds mature, the plant dies.
- **Not palatable** to **livestock** due to sharp spines.

In the plants second growing season, it sends up multiple flowering stems.



The large globose flower heads, contain hundreds of tiny individual flowers, producing seed at maturity.

Flowers are attractive purple-pink, about the size of a silver dollar.

CONTROL MEASURES:

For this and other publications, see our website at: www.co.lincoln.wa.us/weedboard

Prevention:

- Beware of fill dirt, hay and seed from outside your area. **Early detection** is vital to prevent invasion.

Biological:

- Rhinocyllus conicus, a seed eating weevil is quite effective in reducing seed output, but should be used in conjunction with other control measures.

Cultural:

Healthy competitive vegetation helps lessen chance of invasion, but doesn't preclude it.

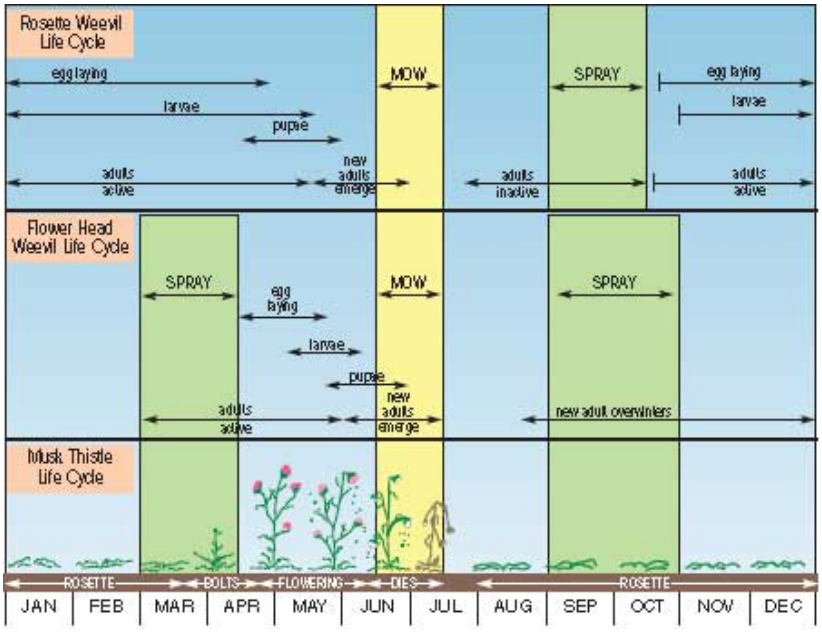
Mechanical:

- Mowing, cutting, digging, pulling or cultivation are all effective if done prior to flowering and repeated when necessary. Seed bank will be present for years.

Chemical:

- Any of the following herbicides can be used during the rosette stage: Metsulfuron (Escort), 2,4-D, Aminopyralid (Milestone) can be used up to the water's edge, Redeem, Cimarron Max, and Curtail.
- For fall rosetted spraying, Dicamba + 2,4-D (Weedmaster) or Milestone are effective.
- **Always** use a **surfactant** due to the waxy leaf surface.
- **Read** the **label** instructions before applying.

The Musk thistle weevil, offer the benefit of reducing Musk thistle populations in areas where no control measures are being made and can contribute significantly to long-term control efforts in areas where musk thistle populations are high. Control of thistles by the weevils is a slow but effective process. Musk thistle flower head weevils over-winter as adults. The adults are slender and brown with scattered golden spots on the wing covers. They are about 1/4 inch long and have a short broad snout. In early spring, the adults emerge from over wintering sites and seek out Musk thistle rosettes. Adults feed on leaves of the plants, but do little damage. Females then mate and begin laying eggs when the plants start to bolt and bloom. Eggs are deposited on the bracts of the flowers. Each egg is covered with a secretion of chewed plant material, giving the eggs an easily noticeable brown, scale-like appearance. Each female lays an average of 100 eggs during its lifetime. The eggs hatch in six to eight days. The larvae tunnel into the thistle flower where they feed on the developing seeds. Some flower heads turn brown prematurely due to the damage caused by the larvae feeding in the flower or in the stem just below the flower.



Flowers infested with weevil larvae turn prematurely brown.

Photos and references courtesy of: Photos: Virginia Tech ID guide; Wikipedia; NWCB written findings; ag.ndsu.nodak.edu/invasiveweeds; nps.gov; invasive.org

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