



Musk Thistle Fact Sheet

Common Name: Musk Thistle

Alternate Name: Nodding Thistle

Scientific Name: *Carduus nutans*

Legal Status: Prohibited-Eradicate

Musk Thistle was added to the Maryland Noxious Weed Regulations in 1984. It is one of four thistle species on the noxious weed list. The law prohibits the import and transport of noxious weeds throughout the state and requires that infested lands be managed for their eradication or control.

What is Musk Thistle?

Musk Thistle is an **aggressive, non-native biennial weed** (sometimes a winter annual) introduced to North America in the mid-1800s, likely as a contaminant in crop seed and possibly as an ornamental plant. Without the natural controls present in its native habitat, the species spread rapidly across much of the United States and southern Canada.

Musk thistle **reproduces solely by seed** and germinates in the fall and spring, forming a rosette that survives through the winter. Blooming occurs from May through July. A single plant can produce thousands of seeds, often within 7-10 days of blooming, allowing it to spread rapidly and form dense stands. Seeds are carried by wind, water, vehicles, equipment, hay, and even wildlife and livestock.

Musk thistle invades pastures, hay fields, roadsides, and disturbed soils. Because seedlings establish readily in disturbed soils, **any bare ground creates an ideal entry point**. Once it takes hold, musk thistle forms dense patches that crowd out desirable species. Its sharp spines deter grazing animals, allowing infestations to expand unchecked. Left unmanaged, musk thistle can significantly reduce agricultural yields and degrade the quality of farmland.

Appearance

Musk thistle forms a **dense, low growing basal rosette** in the first year that generally measures up to 3 feet in diameter. Its dark green leaves are deeply lobed with sharp, spine-tipped lobes. Leaves have a distinct, **light green or silver-white midrib** and **"frosted" or white-margined appearance**. Generally **hairless, smooth and waxy**, they sometimes have sparse hair on the underside veins. In its second year, the plant bolts and leaf bases extend down the stem, giving the plant a characteristic **"winged"** or thorny appearance. The **upper part of the stem**, immediately below the flower head, **is usually naked** (typically bare, leafless, and nearly hairless).



Photos by Susi Ponce, MDA

Stages of Musk Thistle
 a) rosette b) young bud
 c) flower head stages d) bolting e) seedhead

Flowering starts at the top (terminal head) and moves down the branches. The mature purple flower heads are solitary and large (1.5 to 3 inches wide) with a **'powder puff'** shape. The heavy flower heads often bend over or droop at a 90-degree angle, giving it the nickname **"nodding thistle."** They are held upright on tall, spiny stems that may reach 6-7 feet. **Flowers are fragrant**, emitting a distinct, slightly sweet, musk-like or honey-almond scent. Located directly beneath the drooping flower heads are **sharp bracts** that are green-to-purple, spine-tipped, and leaf-like. They are **broad, triangular**, and often **curve backward**, distinguishing them from other thistle species. Each small lightweight seed is attached to a **feathery, white, parachute-like bristles** (pappi) that allows for wind dispersal. While most seeds fall within about 160 ft of the parent plant, this is enough for rapid spread into disturbed or open areas. Each plant forms a large, fleshy and thick taproot.

Prevention

1. Early detection is key to prevent invasion. **Scout your land frequently** in the early growing season. Look for thistle plants along field margins and fencerows.
2. **Use certified weed-free seed, hay, straw, and soil** to ensure the seed is not contaminated with thistle seed.
3. **Avoid bare ground and minimize soil disturbances** from vehicles, machinery and over grazing in non-cropland areas. Promptly revegetate disturbed areas with desirable perennial forage species.
4. **Inspect for visible seed tufts and clean equipment** before leaving infested areas.

Key ID Characteristics



All photos by Susi Ponce, MDA



Management

Managing musk thistle requires a multi-year, integrated control strategy focused on preventing seed production and reducing root reserves. Annual treatments are often necessary.

- **Chemical.** Apply a post-emergent broadleaf herbicide when the plant is actively growing. The **most effective timing is to apply herbicide during the rosette stage in late fall** (October - November) as it is actively transporting nutrients to its roots, and kills the plant before winter. Early spring (March - April), before bolting, is the second best time. For bolted plants, applying herbicide to the cut surface can also be effective. **Read labels before use.** Use a surfactant to increase absorption of the herbicide by the leaves. Do not apply when the soil is dry or the plant is stressed.

- **Mechanical.** For small infestations, use a sharp shovel or spade to **cut the plant 1 to 2 inches below the surface of the soil**, ideally when the plant is in the rosette stage or early bolt. If the plant is cut at or above the soil surface, it can often resprout from remaining buds, particularly if cut too early in its lifecycle. **Repeat the cutting process twice or more per season** because seeds in the soil can germinate during the growing season. If the plants have bloomed, they should be collected and bagged, even after cutting, as they can still produce viable seeds. If plant has already set seed, use caution when removing and bagging seedheads. Wear protective clothing including eye protection. For large infestations, **mow before flowering**, ideally in May and early June and repeat.

- **Cultural.** Maintain a vigorous and competitive pasture and prevent over-grazing to suppress seedling development. Avoid applying fertilizer during musk thistle germination to prevent establishment.

- **Biological.** The Maryland Department of Agriculture released the weevil *Rhinocyllus conicus* in the late 1970s and early 1980s to help control musk thistle. To check if the weevil is active, inspect the underside of musk thistle bracts for small brown egg sacs. If so, leave undisturbed to allow for the weevils to eat the seeds.

Resources

MDA has entered into an agreement with many counties in the State to provide technical assistance to landowners.

Many of the programs provide herbicide application to landowners on a fee-for-service basis.

To learn whether your County has a Weed Control Program, visit <https://mda.maryland.gov/plants-pests>

For **weed identification and herbicide recommendations**, contact your local Extension office at: <https://extension.umd.edu/locations>



Scan the QR code for more ID photos.



Note: Land under the Conservation Reserve Program should consult with USDA Farm Service Agency on weed control and management.



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