Large spiny, clasping leaves become progressively smaller up the stem, which terminates in heads of pink-purple flowers.

Milk thistle, native to the Mediterranean region of Europe, is sometimes cultivated as an ornamental or medicinal plant. It is an introduced weed in the United States, Canada, New Zealand, Australia, South Africa, Chile and Argentina. Although its spines can cause livestock injury and ingestion can cause nitrate poisoning, milk thistle primarily causes damage by reducing forage production and availability. In Washington, it appeared in Clark, Cowlitz and Klickitat counties. Extensive stands of milk thistle infest southwestern Oregon, while smaller, scattered infestations occur in the Willamette Valley. In eastern Oregon, land managers are working to eradicate milk thistle in Umatilla County. It is widespread in California, particularly in the coastal counties but also in the interior valley. Milk thistle is a Class A noxious weed in Washington and a Class B noxious weed in Oregon. Idaho has not reported finding milk thistle.

IDENTIFICATION

Milk thistle is a sparsely branched thistle, growing up to 6 feet tall, with slightly cobwebby stems. Rosette leaves are large, up to 10 inches wide and 20 inches long. The leaves have deep lobes, pointed tips and bases that clasps the stem. Yellow prickles on the wavy leaf margins are 1/8 to 1/2 inch long. Stem leaves are smaller and less deeply lobed. Leaf upper surfaces are shiny and dark green with milky white netting that follows the large veins. This white marbling, peculiar to milk thistle, is conspicuous as early as the first true leaves. Flower heads differ from other thistles by the leathery spine-tipped bracts. The stiff spires are 3/4 to 2 inches long. The plant produces purple flowers from late April to August. Seeds are 1/4 inch long, flattened, nearly smooth and shiny, sometimes brown mottled or black with gray spots. A white plume, about 3/4 inch long, falls off at maturity.

BIOLOGY AND ECOLOGY

Milk thistle is a winter annual, sometimes biennial. It reproduces by seed. Because the seeds are heavy (20 mg), and plumes drop when mature, most seeds fall near the parent plant. This can lead to dense thistle stands, especially on fertile sites: thick patches of milk thistle in California produced up to 4 tons (green weight) per acre. As many as 1.4 million viable milk thistle seeds per acre have accumulated in some California soils. In an Australian study, the primary flower head produced an average of 190 seeds. Other heads averaged 114 seeds, for an average of 6,350 seeds per plant, 94% of which were viable.
Plants release ripe seeds 17 to 23 days after pollination. Seeds germinate from late summer through winter, whenever temperature and moisture conditions are favorable. Fresh milk thistle seeds have some dormancy related to afterripening, which may last 5 months. Longer dormancy, linked to warmer temperatures, delays germination until autumn rainfall. Following afterripening, milk thistle seeds germinate over a temperature range of 32° to 86°F. Optimum germination occurs when night temperatures of 56° to 59°F alternate with daytime temperatures of 60° to 65°F. Seeds do not require light for germination. Although emergence decreases with increased depth of seed burial, about 30% of the seeds planted 3 inches deep produced seedlings. Plants overwinter as rosettes, which may reach 3 feet in diameter.

In California and Australia, milk thistle is more common on soils of high natural fertility. It invades pastures from initial infestations in disturbed areas such as road sides, rodent mounds, ditch banks, edges of cultivated fields, livestock feed yards and corrals.

TOXICITY

Milk thistle is a nitrate accumulator. Ingestion of milk thistle by grazing animals causes nitrate poisoning, which can be lethal to cattle and sheep. Normally unpalatable, milk thistle is particularly dangerous in the early wilting stage after herbicide application, mowing or under drought conditions.

CONTROL

Prevent spread of milk thistle. Vehicles, animals and agricultural products may carry the seeds. Milk thistle seeds also have been found in seed packets of garden flowers and vegetables. You can eradicate milk thistle by preventing seed production until the seed reserve in the soil is exhausted. Milk thistle seeds remain viable in the soil for at least 9 years. Seeds even have germinated from a 27-year-old seed lot. Seeds stored under dry conditions typically survive longer than seeds in the soil.

For small infestations, dig or grub the rosettes or older plants to at least 1.5 inches below the soil surface. Fully formed buds can produce viable seeds even without opening if they are left attached to the plant, so remove and destroy large buds and all open flowers. Studies in Australia showed that mowing and flailing before the start of flowering prevents viable seed production only if none of the buds have developed fully and are near opening. If moisture is adequate, mown plants will regrow and produce seed later in the season.

Cultivation will control growing plants, when you follow up by seeding a crop or pasture. Alfalfa and a perennial pasture grass dramatically reduced reestablishment of milk thistle on fertile soils in eastern Australia. The three steps in Australia's program for converting dense stands of milk thistle to productive pasture included:

- **Preventing** thistle seed production the year before planting the crop,
- **Cultivating** to kill thistles in the year that the crop is planted, and
- **Controlling** thistle seedlings during grass or legume establishment.

Milk thistle seedlings weakened by shade from a dense pasture canopy often fail to survive competition for water by established perennials. At least 80% shade is necessary in winter to reduce milk thistle seedling growth to a vulnerable level.

Biological control will not eradicate milk thistle. However, where reducing the infestation level is the goal, a pathogen and an insect are available that make milk thistle less competitive with forage species in managed pastures. A fungal disease, *Septoria silybi*, causes lesions on leaves that reduce the plant's ability to photosynthesize. *Rhyncyllus conicus*, a seed-eating weevil, is well established in Oregon populations of milk thistle. This weevil also feeds on seeds of musk and plumeless thistles.

For chemical control recommendations, refer to the *Pacific Northwest Weed Control Handbook*, an annually revised extension publication available from the extension offices of Oregon State University, Washington State University and the University of Idaho.

The author acknowledges the support of the Washington State Department of Agriculture and the Washington State Noxious Weed Control Board in preparation of this bulletin.


Issued by Washington State University Cooperative Extension, Larry G. James, Interim Director; Oregon State University Extension Service, O. E. Smith, Director; and the U. S. Department of Agriculture in furtherance of the Acts of May 8 and June 30, 1914. Cooperative Extension programs and policies comply with federal and state laws and regulations on nondiscrimination regarding race, color, national origin, religion, gender, age, disability, and gender preference. Trade names have been used to simplify information; no endorsement is intended. Published November 1991. 50/0/50

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