

Plumas-Sierra-Butte Livestock & Natural Resources

Summer 2019

Musk Thistle - *Carduus nutans*

Tom Getts - Weed Ecology and Cropping Systems Advisor - Lassen, Modoc, Sierra, and Plumas Counties and Tracy Schohr - Livestock and Natural Resources Advisor - Plumas, Sierra and Butte Counties



Native to Eurasia, musk thistle was thought to be introduced to North America on the east coast in the mid 1800's possibly from ship ballast deposits. It is currently listed as noxious or problematic in 25 states as it can overtake a variety of environments from roadsides, grassland pastures and open areas. Typically, it is associated with disturbance, and thrives on fertile drained soils. Musk thistle is an A list noxious weed in California with limited populations and is required to be controlled.

Biology: It is a biennial thistle species that, in the first year after germination, grows as a basal rosette. In the second year it bolts, sending up a flowering seed stalk. Bolted plants typically reach heights from 3-5 feet tall, with large pink/purple flowers. A large individual plant can produce up to 20,000 seeds per plant with a soil seed life ranging from 3-10 years. Musk thistle can only reproduce and spread by seed.

Dispersal: Seeds are large, and attached to a pappus (white fluffy "parachute") for wind dispersal. However, it is estimated that only 5 percent of the seed remains attached to the pappus, and the majority of the seed falls to the ground, creating a patchy dynamic. Additionally, seeds can be spread by water, animals and machinery.

Impacts: Musk thistle can spread prolifically and have negative impacts on ecosystems and agriculture. It competes with desirable forage, and because of its spiny nature, livestock and wildlife rarely graze upon it. It has the ability to create a physical barrier, reducing use of the land by both livestock and wildlife. Like many invasive weeds, when left unmanaged it has the ability to take over and transform the landscape.

Control: Understanding the biology of the plant can help narrow down which control methods can be effective. As a biennial musk thistle only reproduces and spreads by seed, eliminating seed production is the key to musk thistle management. Like all weeds, when musk thistle is a seedling it is most susceptible to control techniques. Small plants can be much more easily targeted with physical or chemical control techniques than larger plants. Mechanical techniques (such as cultivation, hand pulling, or digging) can be effective if plants are severed at least two inches below the soil surface. Mowing can be used to suppress the plants when they are in flower before seed set, but will not eliminate seed set, and regrowth may occur. Goats may target musk with intensive grazing, but cattle typically tend to avoid grazing when possible. Competitive planting, and proper irrigation and fertilization of competitive grass species, will help crowd out thistles by eliminating space for them to succeed. There are numerous biological control agents establishing in North America, from the thistle head weevil, to the crown weevil, and musk thistle rust. While these biocontrol agents may suppress seed set, they will not often eliminate seed set, and cannot be relied upon in California where eradication of A list weed species is the goal. Chemical control options are often chosen for musk thistle control. Application to the rosette stage before bolting, are more effective than applications made to flowering plants. Broadcast applications of products with residual activity may give suppression for more than one growing season.

Select Herbicides

| Herbicide Trade Name | Product Rate/A | Comments |
|--|---|---|
| 2,4-D 2,4-D LV4 2,4-D Amine | 2 qt./acre (1.9 a.e./acre) | 2,4-D can be applied to effectively control musk thistle rosettes and will not injure established grasses. It can be tank mixed with dicamba, aminopyralid, or triclopyr for more effective control of larger plants. 2,4-D alone will not provide any residual control of musk thistle seeds. |
| Aminopyralid Milestone | 4-5 oz./acre (1-1.25 lb. a.e./ acre) | Aminopyralid can be applied as a pre-emergence application, up to emerged musk thistle plants in the flower bud stage for effective control. It will not impact established grasses, but there are haying restrictions. Broadcast applications of aminopyralid to patches of musk thistle rosettes can be an excellent way to target germinating seeds. |
| Clopyralid Transline | 0.25-0.66 pt./ acre (1.5 to 4 oz. a.e./acre) | Clopyralid can be applied from the seedling stage up until the flower bud stage to control musk thistle. It is safe on established grasses, and will provide some soil residual activity to target musk thistle seedlings. The maximum labeled rate for application in California is 2/3 pt./acre. |
| Chlorsulfuron Telar | 1-2.6 oz./acre (.75-1.96 oz. a.e./acre) | Chlorsulfuron can provide good control of musk thistle seedlings and rosettes (with some residual activity). Applications to bolting plants may reduce seed set. Generally safe on established perennial grasses, chlorsulfuron will impact the ability to establish grasses after application. |
| Glyphosate Roundup Accord XRT | 1.3-2.67 qt./ acre (1.5-3 lb. a.e./ acre) | Glyphosate will control musk thistle from the seedling stage up until the bud stage of growth. It is non-selective and will kill all green vegetation (including grasses) it comes into contact with. A good choice on roadsides and in farmyards, it is not the first choice in pastures, as bare spots after application maybe colonized by other non-desirable vegetation. |

Any mention of pesticide is not a recommendation or endorsement of use by the University of California or the authors. Pesticides are mentioned by trade names for informational purposes only. Whenever using a pesticide read and follow the label.



References:

- DiTomaso, J.M., G.B. Kyser et al. 2013. Weed Control in Natural Areas in the Western United States. Weed Research and Information Center, University of California. 544pp. (http://wric.ucdavis.edu/information/natural%20areas/wr_B/Bromus_diandrus-madritensis-tectorum.pdf)
- Zouhar, Kris. 2002. Carduus nutans. In: Fire Effects Information System, [Online]. U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station, Fire Sciences Laboratory (Producer). Available: <https://www.fs.fed.us/database/feis/plants/forb/carnut/all.html> [2019, July 5]
- Beck, K.G. 2013. Musk Thistle Fact Sheet 3.102 Natural Resource Series Range. Colorado State University Cooperative Extension.

This resource is courtesy of University of California Cooperative Extension.
For questions contact:

Tom Getts

Weed Ecology and Cropping Systems Advisor - Lassen, Modoc, Sierra, and Plumas Counties

tjgetts@ucanr.edu - 530-251-2650 office - 970-481-9174 cell

Tracy Schohr

Livestock and Natural Resources Advisor - Plumas, Sierra and Butte Counties

tkchohr@ucanr.edu - 916-716-2643 cell