

## Woolly Distaff Thistle Control

### Introduction

Woolly distaff thistle, commonly called distaff thistle (*Carthamus lanatus* L.), is a noxious, invasive weed that severely degrades rangelands. Distaff thistle is an annual, completing its life cycle in one year. Distaff thistle degrades forage quality by displacing palatable plants and, with severe infestations, by hindering access to grazing land. It is also a threat because its sharp spines can injure the mouths and feet of grazing animals. Although distaff thistle is not as wide-spread throughout California as other noxious thistles such as yellow star-thistle (*Centaurea solstitialis* L.) and purple star-thistle (*Centaurea calcitrapa* L.) it is becoming well established, in parts of Marin County where its range is increasing at an alarming rate.



Mature woolly distaff thistle

### Plant Characteristics

Distaff thistle is native to the Mediterranean region of Europe. It is a member of the sunflower family and is closely related to the commercial safflower (*Carthamus*

*tinctorius* L.). Young plants survive winter and early spring as low-growing rosettes. Mature plants are tall, rigid and spiny, growing up to 4 feet. The dense, intricately branched flower stalks are supported by stout stems which are unbranched on the lower third, giving plants a top-heavy appearance. Stems are white to pale green and can have woolly hairs. Rosette leaves are deeply divided and spine tipped. Stem leaves are also deeply divided and spiny. Flower heads are single, 1 to 2 inches in diameter, and are surrounded by rigid, spiny bracts. Flowers, which bloom from late spring through summer, are yellow. The only other yellow-flowered thistle in Marin County is yellow star-thistle, which has much smaller flowers and shorter spines.



Spiny flower heads of woolly distaff thistle

### Life Cycle

Although distaff thistle matures in summer, it is considered a winter annual because it germinates from fall through mid-winter. Normally, young plants, which exist as low-growing rosettes through winter, are not readily apparent until stems sprout up in late spring. However, in years with early rainfall and warm temperatures, seeds germinate and rosettes may be visible earlier. In years where later rains and/or cold temperatures occur, germination and maturity is later. Typically plants flower from late spring through summer and seed is produced in late summer. Because most of the large, heavy seed falls near the parent plant, stands can be extremely dense, smothering all other vegetation. Seed can also be disbursed by water, animals, vehicles,

heavy winds, and contaminated feed. Although most seeds germinate within the first 2 years, under the right conditions seed can survive up to 8 years or longer. When soil is disturbed by road grading, cultivation or livestock concentration, buried seed can surface and germinate. Distaff thistle grows in deep fertile soils and on poor, rocky hillsides.

### **Control**

Since distaff thistle reproduces from seed, control should focus on minimizing seed production. The two control methods for distaff thistle are chemical and mechanical. Because it is so closely related to safflower, biological control agents have not been introduced for fear of damage to commercial safflower crops. Successful control or eradication of distaff thistle requires following a strategy that integrates appropriate control methods with the life cycle and ecology of this plant. In developing a weed management strategy, consider the level of control that is reasonable to expect. Attempting complete eradication will require a more extensive effort than confinement of a stand. Control results should be carefully observed to increase success in future years. General weed control principles that should be followed include:

- Control all isolated individuals and small outlying populations to prevent establishment of new stands. Although these may not seem like high priority areas, the small amount of time required to control them will pay off in the future by preventing large populations from establishing in relatively weed free areas.
- Implement yearly control measures before flower maturity and seed set or remove and dispose of seed heads or mature flowering heads. Control methods may have to be repeated several times during a season for plants with staggered maturities.
- Maximize vegetative cover in affected areas. Reseeding bare areas and maintaining recommended residual dry matter (RDM) levels will help prevent establishment of new distaff thistle seedlings.



Consult the Marin County Department of Agriculture for thistle identification and information on pesticide permits (415) 899-8601.

### **Mechanical Controls**

#### *Hoeing*

Hoeing can be effective in controlling small infestations of distaff thistle. This technique should be used when plants are in the rosette stage or after they have bolted but before flowers have started to show color. If hoeing is done after flowers start showing color, plants should be removed from the site and disposed of. Flower heads that show color but have not set seed can mature and seed can ripen after plants are cut. Hoeing may need to be repeated two or three times each year to remove plants with staggered maturities.

#### *Mowing*

Good results using mowing to control distaff thistle have been reported from Australia where it is also a serious rangeland weed. Plants must be cut close to the ground and proper timing is essential. Ideally plants should be mowed in late spring when they have bolted but flowers have not fully developed. Plants that are mowed too early may regrow and produce seed while cutting too late may disperse seed from mature flower heads. Timing may vary from year to year depending on weather and plant development. In West Marin plants should be checked during spring and early summer to determine the optimal time to mow. If regrowth occurs a second mowing may be needed.

#### **Chemical Control**

If herbicides are used, spraying should be done in late winter or early spring, ideally in January or February. Most plants will be small rosettes at this time and can be difficult to find. However, dead standing plants from the previous year can be used to locate existing infestations. Early spraying of rosettes requires less herbicide and is more effective than later spraying of mature plants. It causes less damage to desirable pasture plants and reduces chemical application costs. Broadleaf selective herbicides are the best choice for this time of year because they will not kill actively growing grasses. In late spring or early summer, once annual grasses have dried up, non-selective herbicides can be used for control of late season distaff thistle rosettes or immature plants that have not yet bloomed. A January or February spraying can be followed by manual removal, mowing, or spot spraying of non-selective herbicides to kill later maturing plants. Infested areas should be monitored to assess the need for follow-up control. Control practices may need to be repeated throughout the spring and summer.