

BIENNIAL THISTLE MANAGEMENT



Left to right: bull thistle, musk thistle, Scotch thistle, plumeless thistle. (Photos by Steve Dewey)

Several biennial thistles are problematic in North America including bull thistle (*Cirsium vulgare*), musk thistle (*Carduus nutans*), plumeless thistle (*Carduus acanthoides*), and Scotch thistle (*Onopordum acanthium*).

Biennial thistles germinate and grow into rosettes in their first year and spend the winter as rosettes. In their second year, rosettes resume growth in early spring and bolt in mid-to late spring. Bolted plants then flower, set seed, and die by summer's end. Biennial thistles only reproduce from seeds, so the key to management is to prevent seed production.

Thistle species introduced from Europe often become weedy in part because the natural enemies that keep their populations in check in their native habitat are not found in North America. Disturbance, adequate moisture, and sunlight favors establishment of biennial thistles; thus degraded pastures and rangeland with bare soil or disturbed areas are most susceptible to invasion. Once established, biennial thistles compete with desirable vegetation, and sharp spines can deter livestock and possibly wildlife from grazing. Reductions in livestock carrying capacity have been reported when biennial thistles invade rangeland and pasture.

Management of biennial thistles includes herbicides, biological control agents, mechanical, and cultural control methods. The following information summarizes results of herbicide field trials conducted on non-native biennial thistles. The duration of biennial thistle control on any site is dependent on herbicide properties and environmental conditions such as soil type, rainfall, and presence of competitive desirable vegetation. In general, control with herbicides tends to

be shorter in duration on coarse textured soils and on sites with annual rather than perennial grasses.

Results of Herbicide Field Trials

MUSK, BULL, AND PLUMELESS THISTLES

Milestone® (aminopyralid) at 3 to 5 fluid ounces product per acre (fl oz/A) provides good to excellent control of musk, bull, and plumeless thistle (Table 1). Milestone can be applied from rosette (fall or spring) to early flower growth stages. Fall application timing on biennial thistle rosettes will provide control of rosettes and germinating seeds through the following growing season (Figure 1). Field studies have also been conducted when musk thistle is at

late bolt to early flower growth stage. In field trials conducted at two locations in the mid-west, Opensight® (aminopyralid plus metsulfuron) at 1.5 to 2 ounces of product per acre provided similar control as Milestone® (aminopyralid alone) when applied to musk thistle at late bud to early bloom growth stage (Figure 2).

SCOTCH THISTLE

Milestone® at 5 to 7 fluid ounces of product per acre should be applied to control Scotch thistle. Although lower rates may provide effective control on some sites, the 5 to 7 fl oz/A rate provides more consistent control across multiple locations. A field study conducted by Dr. Robert Wilson, University of Nebraska Weed Scientist at the Panhandle Research and Extension

Figure 1: Musk thistle control 200 to 236 days after herbicide treatments applied to rosettes in the fall (Iowa and Nebraska locations combined). Means with the same lower case letters do not differ ($P < 0.05$, LSD).

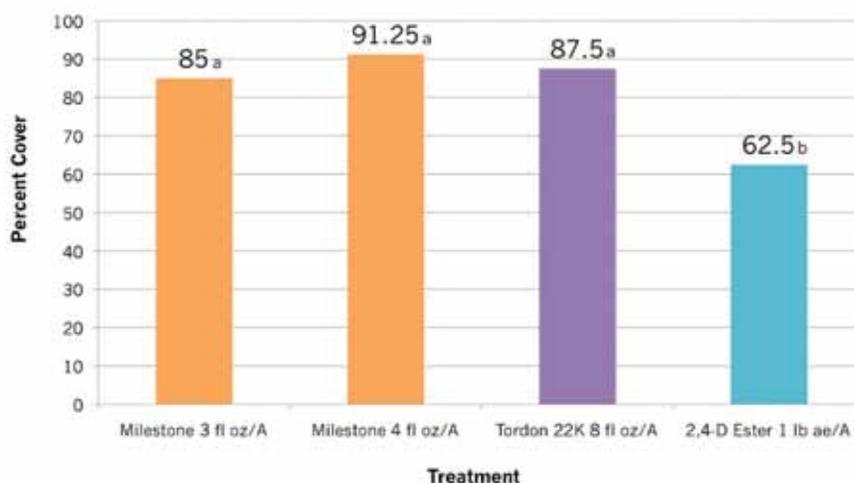


Table 1: Biennial thistle control with several herbicides evaluated 28 to 56 days after application (DAA) to bolting thistle in the spring.

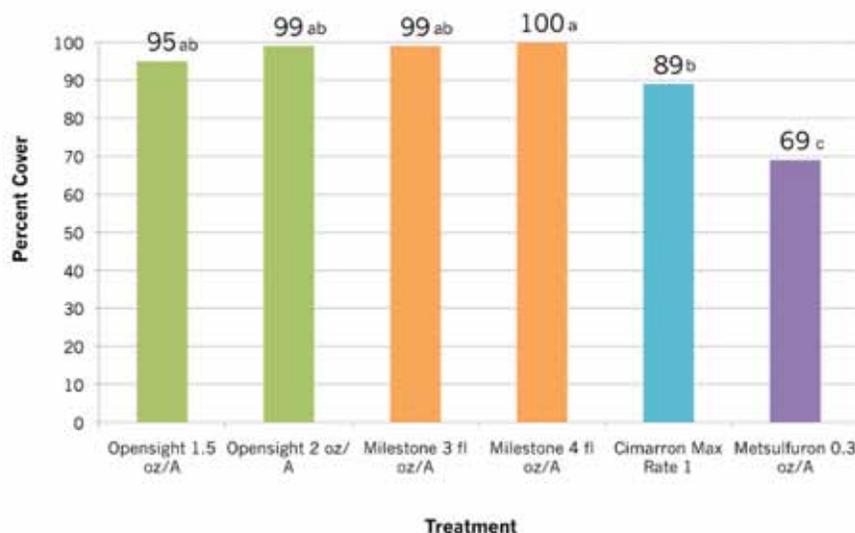
Herbicide Treatment	Application Rate/Acre	Visual Percent Control		
		Musk	Plumeless	Bull
Milestone®	3 fl oz	99 a	-	97 a
Milestone	4 fl oz	100 a	99 a	96 a
Milestone	5 fl oz	100 a	100 a	98 a
Tordon® 22K+2,4-D	1/2 pint+1.0 pint	100 a	97 a	100 a
2,4-D	1.0 quart	78 b	83 b	78 b
Non-treated	-	0 c	0 c	0 c

*Means with the same lower case letters do not differ (P=0.05, LSD)

Table 2: Scotch thistle control with various herbicides at Melbeta, NE evaluated May 30, July 1, and August 25 (25, 55, and 111 days after application).

Herbicide Treatment	Application Rate/Acre	Visual Percent Control		
		5/30	7/1	8/25
Milestone	4 fl oz	97	98	99
Milestone	6 fl oz	97	96	88
Milestone	7 fl oz	97	99	99
ForeFront R&P®	24 fl oz	93	99	98
Transline®	0.5 pint	96	97	94
Tordon 22K+2,4-D	1.0 pint+1.0 pint	97	99	84
Dicamba+2,4-D	1.0 pint+1.0 pint	94	89	66
Non-treated	-	0	0	0
LSD 5%	-	3	9	53

Figure 2: Musk thistle control with various herbicides applied at late bolt to early flower growth stage 90 days after application (2 locations). Means with the same lower case letters do not differ (P<0.05, LSD).



Center in Scottsbluff compared the effectiveness of various herbicides applied post-emergence in the spring for Scotch thistle control. Herbicide treatments were applied on May 5 to Scotch thistle plants at the rosette growth stage. Visual evaluations of Scotch thistle were made following application. In late May and early July, Scotch thistle control with all herbicides was excellent. By late August, Scotch thistle seedlings were emerging in some of the herbicide-treated plots. Results of the data are summarized below and a full report is available in TechLine, Spring 2007 (<http://www.techlinenews.net/ScotchThistle.pdf>).

Integrated Management

Improving the desirable plant community by seeding with competitive grasses or implementing grazing management practices that favor desirable vegetation may be necessary to provide long-term control of biennial thistles. On disturbed sites, integrating the use of herbicides with reseeding and/or with insect biological control agents is likely to decrease biennial thistle populations more effectively than any control method used alone.

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State restriction on the sale and use of Opensight and Transline apply. Consult the label before purchase of use for full details. Tordon 22K is a federally Restricted Use Pesticide.

Label precautions apply to forage treated with ForeFront R&P and Milestone and to manure from animals that have consumed treated forage within the last three days. Consult the label for full details. When using Opensight to treat areas in and around roadside or utility rights-of-way that are or will be grazed or planted to forage, important label precautions apply regarding harvesting hay from treated sites, using manure from animals grazing on treated areas or rotating the treated area to sensitive crops. See the product label for details.