

SUPPRESSION OF CANADA THISTLE
AT THE GRANT-KOHR'S RANCH NHS

Year 3 Progress Report

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Systematic suppression of Canada thistle in the flood irrigated Lower Meadows using Redeem herbicide was begun in 2001. The first year progress report (Rice and Hardin 12/31/2001) provides the rationale for the project, details of the treatment prescription, and the monitoring method. The prescription calls for up to three years of herbicide treatment with the goal of depleting the regenerating root system of Canada thistle and maximizing density and competition from in-situ desirable pasture grasses.

The baseline abundance of Canada thistle was determined in July 2001 prior to the first herbicide treatment. The irrigation water was shut off in 2001 on July 24. Lower Meadow fields 2, 3, and 4 were sprayed by helicopter on August 11, 2001. Redeem was applied at 2 qt/ac, with the surfactant Syltac at 0.25% v/v, in a total volume of 3 gal/ac. A nominal 150 acres were treated.

In July 2002 the abundance of Canada thistle was re-measured. Results of the 2001 spray treatment are reported in the second year progress report (Rice and Hardin 12/31/2002) which also includes photos showing the Canada thistle abundance in 2001 and the visible reduction in Canada thistle topgrowth in 2002. The average number of stems and rosettes in the three fields sprayed in 2001 was reduced from 7,756 to 2,359 per acre (Table 1). Overall efficacy was 70%. Field #1 was not sprayed in 2001 nor in 2002. Canada thistle stem density was essentially unchanged in that untreated field. There were 7,096 stems per acre measured in 2001 and 7,148 in 2002.

The 2002 treatment for fields 2, 3 & 4 was initially scheduled for the first week in August, about two weeks after irrigation had been discontinued. However, helicopter availability and weather delayed the spraying until August 26. Available soil moisture declined during that delay interval, but the Canada thistle was still actively growing at the time of the second treatment. About 75% of the Canada thistle was flowering in 2002, more advanced than at the time of the 2001 spraying. This second treatment was also Redeem at 2 qt/ac, with Syltac surfactant at 0.25% v/v, for a total volume of 3 gal/ac.

Table 1. Canada thistle abundance before and after the herbicide treatments.

	<u>2001</u>	<u>2002</u>	<u>2003</u>	<u>Efficacy (%)</u>		
<u>LOWER MEADOW #1</u>	baseline	not sprayed	not sprayed			
total # microplots sampled	146	154	144			
# of microplots with Canada thistle	26	29	10			
Frequency of Occurrence	17.8%	18.8%	6.9%			
total number of stems	64	68	16			
avg # stems / microplot	0.438	0.442	0.111			
acres/0.25 m ² microplot	0.0000618	0.0000618	0.0000618			
Stems Per Acre	7,096	7,148	1,799*			
<u>LOWER MEADOW #2</u>	baseline	sprayed	re-sprayed			
total # microplots sampled	120	118	131			
# of microplots with Canada thistle	15	4	1			
Frequency of Occurrence	12.5%	3.4%	0.8%			
total number of stems	35	12	1			
avg # stems / microplot	0.292	0.102	0.008			
acres/0.25 m ² microplot	0.0000618	0.0000618	0.0000618	<u>Spray 2001</u>	<u>Spray 2002</u>	<u>Two Year</u>
Stems Per Acre	4,721	1,646	124	65%	92%	97%
<u>LOWER MEADOW #3</u>	baseline	sprayed	re-sprayed			
total # microplots sampled	104	97	99			
# of microplots with Canada thistle	12	5	3			
Frequency of Occurrence	11.5%	5.2%	3.0%			
total number of stems	30	8	9			
avg # stems / microplot	0.288	0.082	0.091			
acres/0.25 m ² microplot	0.0000618	0.0000618	0.0000618	<u>Spray 2001</u>	<u>Spray 2002</u>	<u>Two Year</u>
Stems Per Acre	4,669	1,335	1,472	71%	-10% [†]	68% [†]
<u>LOWER MEADOW #4</u>	baseline	sprayed	re-sprayed			
total # microplots sampled	231	231	253			
# of microplots with Canada thistle	46	19	4			
Frequency of Occurrence	19.9%	8.2%	1.6%			
total number of stems	153	45	8			
avg # stems / microplot	0.662	0.195	0.032			
acres/0.25 m ² microplot	0.0000618	0.0000618	0.0000618	<u>Spray 2001</u>	<u>Spray 2002</u>	<u>Two Year</u>
Stems Per Acre	10,722	3,153	512	71%	84%	95%
<u>LOWER MEADOWS #2+#3+#4</u>	baseline	sprayed	re-sprayed			
total # microplots sampled	455	446	483			
# of microplots with Canada thistle	73	28	8			
Frequency of Occurrence	16.0%	6.3%	1.7%			
total number of stems	218	65	18			
avg # stems / microplot	0.479	0.146	0.037			
acres/0.25 m ² microplot	0.0000618	0.0000618	0.0000618	<u>Spray 2001</u>	<u>Spray 2002</u>	<u>Two Year</u>
Stems Per Acre	7,756	2,359	603	70%	74%	92%

* Lower Meadow #1 was mowed before sampling in 2003.

[†] Remaining stems in Lower Meadow #3 are on the east perimeter or on the banks of the Kohrs Ditch where Redeem was not applied.

The 2002 treatments, the response measured in July 2003, also had high efficacy (Table 1). The average number of stems in the three sprayed fields was reduced to 603 per acre. The 2002 treatment efficacy was 74%, similar to the 2001 spraying efficacy of 70%. The overall two-year efficacy was 92%. Most of the Canada thistle remaining in 2003 was along the east perimeter or on the banks of the Kohrs Ditch where Redeem was not applied because of proximity to water. The three field interiors, where two years of spraying was actually done, were essentially free of Canada thistle in 2003. Accordingly, these three fields were not re-sprayed in 2003.

Cost for the herbicide applications (chemical and helicopter) to the nominal 150 acres was \$7,174 in 2001 and \$7,400 in 2002, or about \$49/acre for each of two treatment years.

Redeem treatments of Lower Meadow #1, the field mowed rather than grazed, were begun in mid September 2003. The later treatment date was to allow Canada thistle regrowth subsequent to the mowing, and to take advantage of emergence of fall rosettes, thus increasing the leaf surface area available for herbicide uptake. Herbicide and surfactant rates were the same as the 2001 and 2002 treatments to fields 2, 3, and 4, but total volume was increased to 4 gal/ac because of the dry conditions that prevailed at the time of spraying field 1.

The University of Montana weed specialists also assisted the Ranch and Montana State University in producing an updated GIS map of noxious weed distributions at Grant-Kohrs.

References (On File at Grant-Kohrs)

Rice, P. and Hardin, J. 2001. Suppression of Canada Thistle at Grant-Kohrs NHS: Year 1 Progress Report. 9p.

Rice, P. and Hardin, J. 2002. Suppression of Canada Thistle at Grant-Kohrs NHS: Year 2 Progress Report. 5p.