

Leafy Spurge Control with Chemical and Mechanical Treatments

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A study to test the effects of chemical (picloram) and mechanical (mowing) treatments on leafy spurge in rangeland was started in 1984 at the Dickinson Experiment Station. The test plots were located on private property in Golden Valley County, North Dakota. The plots were 22 x 30 foot arranged in a randomized block design with two replications. The soil was Havrelon silt loam. The vegetation on the site was predominantly leafy spurge with a thin understory of Kentucky bluegrass (Poa pratensis), prairie sandreed (Calamovilfa longifolia) and needleandthread (Stipa comata).

The treatments were: in early June, mowing, mowing plus picloram, and picloram; in early July, mowing, mowing plus picloram, and picloram; in mid August, picloram; and annually mowing in June, and in June and July. A control of no treatment was included in each replication. No retreatment has been made to these plots except the annual mow in June and in June and July plots. The early June, early July and mid August periods of treatment coincided with pre-flower, post flower (seed development) and early regrowth phenological stages of development for the leafy spurge plants, respectively. The mowing treatments were conducted with a sickle bar mower and the herbage was raked off the plots. The chemical treatment was applied at a rate of 2 lbs. ai/acre of picloram in the form of 2K granules with a hand held whirlybird spreader. The data that were collected from these plots were: above ground herbage production, leafy spurge stem densities, and mean weight per leafy spurge stem collected monthly through the growing season. The only data included in this report will be the pretreatment stem densities collected in early June and the percent change in stem densities per foot squared compared to the control plots taken in early June of years following treatment (Table 1).

Single mowing treatments in June or July appear to increase stem densities one and two years after treatment. Annually repeated mowing in June and in June and July appear to have some reduction in stem densities. Mowing plus chemical treatment has some effect on the stem density and has some added effect compared to chemical alone one year after treatment, June applied and two years after treatment, July applied. The effects of the treatments on these plots will be monitored one additional year.

**Table 1. Percent Change in Stem Density Compared to Control
One and Two Years after Treatment**

Treatment	1984	1985	1986
	# / ft ²	% of Control	
Control	33.6	----	----
Jun Mow	38.7	+20.0	+59.4
Jul Mow	31.1	+27.9	+17.6
Jun Mow Annually	37.3	+17.2	-59.5
Jun + Jul Mow Annually	39.4	-39.1	-53.8
Jun Mow + picloram	25.6	-74.7	-58.7
July Mow + picloram	25.5	-98.2	-76.0
Jun picloram	28.7	-62.2	-94.7
Jul picloram	38.8	-98.1	-67.2
Aug picloram	40.8	-98.2	-96.3

Leafy Spurge Control with Tebuthiuron

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A study that tests the effects of tebuthiuron (Graslan) on leafy spurge in rangeland was started in 1983 at the Dickinson Experiment Station. Two similar sets of test plots were located on private property in Golden Valley County, North Dakota. One set of plots was established in 1983 and another set in 1984. The plots were arranged in a randomized block design with two replications. The vegetation on the sites were predominantly leafy spurge with an understory of Kentucky bluegrass (Poa pratensis).

Tebuthiuron is a herbicide that is primarily intended for use on shrubs in rangeland. The chemical is absorbed by the roots and translocated to the leaves. Photosynthesis is restricted. The leaves senesce prematurely and fall off and a new set of leaves develop. This process continues until the plant depletes its stored carbohydrates. The process may take one to four years before the plant dies completely depending on the species and the environmental conditions. In theory, this appears to be a desirable method to control leafy spurge.

The herbicide was broadcast applied with a hand held whirlybird spreader at three rates, 1, 2 and 3 lbs. ai/acre, of 20% pellets on 12 July 1983 and 4 June 1984 for sites 1 and 2, respectively. A control of no chemical treatment was included in each replication. No retreatment has been made to these plots. The data that were collected from these plots were; above ground herbage production, leafy spurge stem densities, and mean weight per stem collected monthly through the growing season. The only data included in this report will be the pretreatment stem densities and the percent change in stem densities per foot squared compared to the control plots taken in early June of years following treatments (Tables 1 and 2).

Tebuthiuron does have a detrimental effect on leafy spurge one, two and three years after treatment for the three rates included in this trial. The desired level of control has not been reached after three years. A retreatment may be necessary to control leafy spurge with tebuthiuron. These plots will continue to be monitored.

**Table 1. Percent Change in Stem Density Compared to Control
One to Three Years after Treatment, Site 1**

	1983		1984	1985	1986
Treatment	# / Ft²		% of Control		
Control	13.1		----	----	----
1 lb./acre	11.0		+ 1.6	-27.8	- 6.8
2 lbs./acre	18.7		-18.6	-55.7	-70.0
3 lbs./acre	22.4		-37.1	-66.3	-71.1

**Table 2. Percent Change in Stem Density Compared to Control
One and Two Years after Treatment, Site 2**

	1984		1985	1986
Treatment	# / Ft²		% of Control	
Control	54.5		----	----
1 lb./acre	56.5		+ 0.9	-60.2
2 lbs./acre	49.2		- 9.0	-61.2
3 lbs./acre	62.3		-70.8	-82.7