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Picloram and 2,4-D combination treatments for leafy spurge control[1]

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Picloram is an effective herbicide for leafy spurge control especially when applied at rates from 1 to 2 lb/A. However, the high cost of the 2 lb/A treatment makes it uneconomical to treat large acreages in pasture and rangeland weed control programs. Research at NDSU has suggested that picloram at 0.25 to 0.5 lb/A applied annually will give satisfactory leafy spurge control after 3 to 5 years. The purpose of this experiment is to establish the number of annual applications of picloram needed to provide 90 to 100% control of leafy spurge at various locations in the state and to investigate possible synergism between picloram and 2,4-D.

The experiment was established on 25 August 1981 at Dickinson, 1 September 1981 at Sheldon and on 11 June 1982 at Valley City. All treatments were applied annually except 2,4-D alone which was applied biannually (both spring and fall). Thus the Dickinson and Sheldon sites have received two picloram and picloram plus 2,4-D treatments and three 2,4-D treatments, while the Valley City site has received one and two treatments, respectively. The plots are 10 by 30 feet and each treatment is replicated four times in a randomized complete block at all sites. Evaluations were based on percent stand reduction as compared to the control and are shown in the table.

Picloram at 0.25, 0.375 and 0.5 lb/A provided 49, 66 and 74% control, respectively, after two treatments at Dickinson and Sheldon. These observations represent an increase of 21, 24, and 23% control, respectively, compared to the June evaluation after one treatment. 2,4-D did not give satisfactory control of leafy spurge.

[1] Cooperative investigation of Agronomy and ARS, U.S. Department of Agriculture. Published with the approval of the Agriculture Experiment Station, North Dakota State University, Fargo, ND.

Table.

Herbicide	Rate	Control 1982						
		Sheldon		Dickinson		Average[a]		Valley City
		June	Aug.	June	Sept.	June	Fall	Aug.
	(lb/A)	(%)						
Picloram	0.25	33	49	24	48	28	49	68
Picloram	0.375	46	79	7	56	42	66	78
Picloram	0.5	72	75	0	74	51	74	81
2,4-D biannually	1.0	23	22	11	0	17	27	5
2,4-D biannually	1.5	9	15	10	20	9	18	14
2,4-D biannually	2.0	14	20	8	9	11	14	37
Picloram+2,4-D	0.25+1.0	26	54	53	69	39	63	41
Picloram+2,4-D	0.25+1.5	35	58	46	61	41	60	50
Picloram+2,4-D	0.25+2.0	52	78	53	49	52	61	49
Picloram+2,4-D	0.375+1.0	70	78	49	64	59	70	67
Picloram+2,4-D	0.375+1.5	68	74	63	67	66	70	61
Picloram+2,4-D	0.375+2.0	43	81	65	69	54	74	64
Picloram+2,4-D	0.5+1.0	76	77	66	79	71	78	61
Picloram+2,4-D	0.5+1.5	79	58	66	65	73	62	82
Picloram+2,4-D	0.5+2.0	66	75	66	80	66	78	87
LSD (0.05)		27	26	23	19	24	18	30

[a] Experiment at Valley City began in June 1981 and is not included in average.

Spring evaluations revealed a trend towards increased leafy spurge control when 2,4-D at 1.0 to 2.0 lb/A was applied with picloram at 0.25 to 0.5 lb/A to 0.5 lb/A compared to the respective picloram treatments applied alone. The additive response was seen following spring retreatments for picloram at 0.25 plus 2,4-D at 1.0, 1.5 and 2.0 lb/A, but not for the higher rates of picloram. At Valley City, the addition of 2,4-D to picloram tended to decrease leafy spurge control, when evaluated less than 3 months after application; perhaps the 2,4-D caused rapid control of leafy spurge before picloram translocation was complete since growing conditions were ideal during the spring of 1982. Annual applications of picloram have shown an increase in leafy spurge control over time while biannual treatments of 2,4-D have not. Tank mixtures of 2,4-D with picloram have given varying results.