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## **Leafy spurge control with combinations of auxin herbicides applied for 3 years<sup>1</sup>**

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Picloram remains the most effective herbicide for leafy spurge control. However, due to cost or environmental concerns it is often advantageous to tank-mix picloram with other herbicides, as single or annual treatments for leafy spurge control. The purpose of these experiments was to evaluate annual applications of picloram applied with dicamba and various 2,4-D formulations for leafy spurge control.

The experiments were established in 1986 on June 11 or Sept 15 near Dickinson, on June 18 or Sept 3 near Valley City, and on August 28 on the Sheyenne National Grasslands. The herbicides were applied using a tractor-mounted sprayer delivering 8.5 gpa at 35 psi. Retreatments were applied annually in the spring or fall through 1988. All were 10 by 30 feet in a randomized complete block design with four replicates. Evaluations were based on visible percent stand reduction as compared to the control.

Leafy spurge control was similar regardless of the 2,4-D formulation applied with picloram plus dicamba in the spring (Table). Control averaged across all treatments and both locations was 70% in the fall of 1988 (data not shown) but declined to 53% 1 year after the third application [36 months after the first treatment (MAT)] This is similar to the commonly used treatment picloram plus 2,4-D at 0.25 plus 1 lb/A which averaged 60% or more based on long-term observations, 12 months after the last retreatment was applied in a 3 year annual application program.

Fall application of picloram applied with dicamba and 2,4-D provided much better long-term control than the same treatments applied in the spring (Table). Control averaged across all treatments and location was 66 and 43% 12 and 24 months after the third treatment. Leafy spurge control with picloram at 0.5 lb/A averaged 59% 1 year following the third fall application, but improved to 81% when picloram at 0.5 lb/A was applied with dicamba at 2 lb/A. The 80% or better leafy spurge control is similar to a 3 year annual application of dicamba at 2 lb/A alone or picloram plus 2,4-D at 0.5 plus 1 lb/A based on previous research conducted at North Dakota State University. Leafy spurge control with picloram plus dicamba was not improved by adding 2,4-D regardless of the 2,4-D formulation.

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In general, leafy spurge control was similar with all 2,4-D formulations in combination with picloram and dicamba. Picloram applied with dicamba provided better leafy spurge control than picloram applied alone as a fall treatment but is more expensive than the commonly used treatment, picloram plus 2,4-D.

**Table. Leafy spurge control with picloram plus dicamba and various formulations of 2,4-D applied annually from 1986 to 1988 averaged over three locations (Lym and Messersmith).**

Application date and treatment	Rate	Control/months after first treatment <sup>a</sup>				
		12	24	36	45	48
	—lb/A—	%				
<b>Spring</b>						
2,4-D mixed amine <sup>b</sup> + dicamba + picloram	2 + 1 + 0.25	5	17	53		
2,4-D mixed amine <sup>b</sup> + dicamba + picloram	2 + 0.5 + 0.25	18	22	56		
2,4-D mixed amine <sup>b</sup> + dicamba + picloram	1 + 0.12 + 0.5	6	13	46		
2,4-D alkanolamine + dicamba + picloram	2 + 1 + 0.25	7	22	62		
Dicamba + picloram	1 + 0.25	8	26	49		
LSD (0.05)		NS	NS	NS		
<b>Fall</b>						
2,4-D mixed amine <sup>b</sup> + dicamba + picloram	2 + 1 + 0.25	24	26	45	43	29
2,4-D alkanolamine + dicamba + picloram	2 + 1 + 0.25	37	42	53	54	31
2,4-D mixed amine <sup>b</sup> + dicamba + picloram	4 + 2 + 0.5	51	56	86	79	57
2,4-D ester <sup>c</sup> + 2,4-DP + dicamba + picloram	2 + 2 + 0.5 + 0.25	18	22	46	43	35
2,4-D ester + 2,4-DP + dicamba + picloram	2 + 2 + 0.5 + 0.5	44	50	79	75	60
2,4 alkanolamine + dicamba + picloram	4 + 2 + 0.5	33	50	79	72	54
Dicamba + picloram	2 + 0.5	40	49	81	77	52
Picloram	0.5	27	32	59	53	29
LSD (0.05)		NS	11	14	15	17

<sup>a</sup>Final treatment applied 24 months after the first treatment.

<sup>b</sup>Mixed amine salts of 2,4-D (2:1 v/v dimethylamine:diethanolamine) – EH 736.

<sup>c</sup>2,4-D isooctyl ester:2,4-DP butoxyethanol ester:dicamba (4:4:1 v/v/v)–EH 680.