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Sulfometuron applied alone and with auxin herbicides for leafy spurge control[1]

RODNEY G. LYM and CALVIN G. MESSERSMITH

Sulfometuron is an analog of chlorsulfuron but with slightly less soil residual and a different weed control spectrum. Sulfometuron currently is used for grass suppression along roadsides and also has controlled some broadleaf weeds including leafy spurge. The purpose of this experiment was to evaluate sulfometuron alone and in combination with auxin herbicides for leafy spurge control.

The experiment was established in cropland severely infested with leafy spurge near Hunter, ND. Spring and fall treatments were applied on June 27 and September 4, 1985, respectively. Leafy spurge was 26 to 36 inches tall and beginning seed set in June while fall regrowth following a summer dormancy had begun when treatments were applied in September. The herbicides were applied with a tractor-mounted sprayer delivering 8.5 gpa at 35 psi. All plots were 10 by 30 feet in a randomized complete block design with four replications. As leafy spurge control declined, a retreatment of picloram at 0.25 lb/A was applied on August 26, 1986, as a split-block treatment to the back one-third of each plot to evaluate sulfometuron as a pretreatment to picloram. Evaluations were based on percent stand reduction as compared to the control.

Leafy spurge growth stopped following application of sulfometuron alone, regardless of application date. Plants treated with sulfometuron alone in June were not controlled visibly but had chlorotic leaves when evaluated in August and root bud elongation was inhibited. Leafy spurge top growth was killed when treated with sulfometuron plus an auxin herbicide and root bud growth was inhibited. Leafy spurge root buds were white and short on plants treated with sulfometuron, compared to the pink elongated buds on untreated plants. Sulfometuron plus an auxin herbicide provided better leafy spurge control than sulfometuron alone, and long-term control was better when sulfometuron was mixed with picloram than with 2,4-D or dicamba (Table). Leafy spurge control declined rapidly between the June and August 1986 evaulations.

Leafy spurge control increased to a maximum of 100% following retreatment with picloram at 0.25 lb/A (Table). Control averaged 81 and 67% in August 1987, when picloram was applied to plants originally treated with sulfometuron in the spring and fall, respectively. Control increased following the picloram retreatment as the sulfometuron rate increased following spring but not fall treatments. The best long-term control was

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sulfometuron spring-applied with either picloram or metsulfuron followed by the picloram retreatment which averaged 94 and 93%, respectively. The optimum herbicide application rates and date and the effectiveness of various retreatments must be evaluated further to determine if sulfometuron plus an auxin herbicide can provide cost-effective leafy spurge control.

Table. Leafy spurge control with sulfometuron applied either alone or with various auxin herbicides (Lym and Messersmith).

		Evaluation Date						
					May 1987		August 1987	
Application date/treatment	Rate	Aug 1985	May 1986	Aug 1986	Single	Retreat[a]	Single	Retreat[a]
	(oz/A)	(% control)						
June 27, 1985								
Sulfometuron	1	0	6	0	0	87	5	63
Sulfometuron	1.5	0	63	25	12	88	17	85
Sulfometuron	2	0	36	6	3	87	10	82
Sulfometuron+2,4-D	1 + 16	95	76	26	8	84	24	64
Sulfometuron+dicamba	1 + 32	96	85	40	35	98	55	86
Sulfometuron+picloram	1 + 8	70	96	59	51	100	67	94
Sulfometuron+metsulfuron	2 + 0.5	0	60	24	0	98	5	93
Control	…	0	0	0	0	63	0	55
LSD (0.05)		25	22	26	25	31	20	31
September 4, 1985								
Sulfometuron	0.5	…	16	0	0	54	0	40
Sulfometuron	1	…	95	7	23	77	21	56
Sulfometuron+2,4-D	1 + 16	…	99	17	3	92	8	72
Sulfometuron+dicamba	1 + 32	…	97	23	15	91	13	73
Sulfometuron+picloram	1 + 8	…	99	74	33	83	38	83
Sulfometuron+2,4-D	0.5 + 16	…	95	24	21	87	26	62
Sulfometuron+dicamba	0.5 + 32	…	97	51	19	83	19	84
Sulfometuron+picloram	0.5 + 8	…	99	40	17	86	27	71
Sulfometuron+metsulfuron	2 + 0.5	…	88	13	0	83	0	62
DPX-L5300	1		44	6	4	76	4	49
Control			0	0	0	73	0	38
LSD (0.05)			26	30	36	29	32	NS

[a] Picloram at 0.25 lb/A applied as a split-block to the back one-third of each plot on August 26, 1986.