Reprinted with permission from: 1989 Leafy Spurge Symposium. Bozeman, MT. July 12-13, 1989. pp. 64-68.

Sponsored by: Montana Agricultural Experiment Station, Montana State University, Bozeman, MT.

Control of leafy spurge with picloram and fluroxypyr

MARK A. PETERSON

Dow Chemical, R. R. #1, Box 51B, Brookings, SD 57006.

Abstract:

Leafy spurge (*Euphorbia esula* L.) control with picloram (4-amino-3,5,6-trichloropicolinic acid) and fluroxypyr (4-amino-3,5-dichloro-6-fluro-2-pyridyloxyacetic acid) was evaluated at a site near Carrington, ND. Initial treatments were fluroxypyr at 0.25 and 0.5 lb ae/A, picloram at 0.5 lb ae/A and an untreated check. Retreatments included fluroxypyr at 0.125 and 0.25 lb ae/A; picloram at 0.25 lb ae/A; and combinations of picloram at 0.125 and 0.25 lb ae/A with either fluroxypyr at 0.25 lb ae/A, fluroxypyr at 0.125 lb ae/A or 2,4-D (2,4-dichloro-phenoxyacetic acid) ester at 1.0 lb ae/A. Treatments containing fluroxypyr gave a very rapid control of leafy spurge top growth.. However, considerable regrowth occurred in the fall following spring applications of the initial treatments. By June of 1988 control with any treatment was 25% or less. Control in 1988 and 1989 after application of retreatments followed a pattern similar to that noticed with the original treatments. However, the combination of picloram at 0.25 ae/A with fluroxypyr at 0.25 lb ae/A provided control which was significantly better than that achieved with other retreatments; yet this retreatment still only achieved 26% control 11 months after treatment when averaged across the initial treatments. The poor control of leafy spurge in this study may be in part due to the extremely hot and dry conditions, which occurred during application, especially at the time of retreatment.

Introduction

Fluroxypyr is a non-phenoxy growth regulator herbicide which is currently under development by the Dow Chemical Company in the United States as a methyl-heptyl ester formulation. It is active on a number of broadleaf species while having little effect on

grasses. The objectives of this study were to examine the potential of fluroxypyr to reduce leafy spurge infestations and to see whether fluroxypyr could be an effective "set-up" treatment or tank-mix partner for picloram.

Materials and methods

The study was established on a non-cropland site near Carrington, ND. The experimental design was split block with three replications. Initial treatments consisting of fluroxypyr at 0.25 and 0.5 lb ae/A, picloram at 0.5 lb ae/A and an untreated check were applied July 7, 1987 when leafy spurge plants had set seed. Retreatments consisting of fluroxypyr at 0.125 and 0.25 lb ae/A, picloram at 0.25 lb ae/A, picloram at 0.125 lb ae/A plus fluroxypyr at 0.125 and 0.25 lb ae/A, and picloram at 0.25 lb ae/A in combination with either fluroxypyr at 0.25 lb ae/A or 2,4-D (2,4-dichloro-phenoxyacetic acid) ester at 1.0 lb ae/A were applied perpendicularly to the initial treatments on July 6, 1988, after seed set. All treatments were applied with a CO_2 backpack sprayer set at a pressure of 28 psi with TeeJet 8002 nozzles to deliver a spray volume of 15 gpa at 3.0 mph. Leafy spurge stand reduction was evaluated visually on a 0 to 100 scale with 0 = no stand reduction and 100 = complete stand reduction as compared to the untreated check.

Results and discussion

Treatments containing fluroxypyr gave a very rapid control of leafy spurge top growth (data not shown). However, considerable regrowth occurred in the fall following spring applications of the initial treatments. As is shown in Table 1, regrowth of leafy spurge in fluroxypyr-treated plots had reduced control to 40% or less. Control with picloram at that time was 60%. By June of 1988 control with any treatment was 25% or less. Normally, 0.5 lb ae/A of picloram would provide better control than that achieved in this case. This may be due to the fact that the treatments were applied at seed set, which is past the optimum timing for picloram application. Control after application of retreatments followed a pattern similar to that noticed with the original treatments. Leafy spurge control 2.5 months after application of the retreatments was 30 to 50% for most treatments (Table 2). However, control with the combination of picloram at 0.25 ae/A with fluroxypyr at 0.25 lb ae/A was superior to that achieved with other retreatments. Control with this retreatment averaged across initial treatments was 69%. Yet this retreatment still only achieved 26% control 11 months after treatment when averaged across the initial treatments (Table 3). The poor control of leafy spurge in this study may be in part due to the extremely hot and dry conditions, which occurred during application, especially at the time of retreatment. There was no significant difference between the initial treatments in terms of retreatment performance, although control was generally lower where no initial treatment was applied.

In summary, leafy spurge top growth is rapidly controlled by application of fluroxypyr. However, this rapid action may limit translocation to crowns and roots since substantial regrowth usually occurs shortly after treatment. Fluroxypyr was not better than picloram as a "set-up" in a retreatment program. In this study, tank-mixes of piclo-

ram and fluroxypyr were more effective than mixes of picloram and 2,4-D ester when picloram was applied at 0.25 lb ae/A.

Table 1. Leafy spurge control from initial fluroxypyr and picloram treatments.

Treatment	Percent Control	
	9/30/87	6/16/88
Fluroxypyr 0.25	40	7
Fluroxypyr 0.5	33	20
Picloram 0.5	60	25
Untreated	0	0
LSD (.05)	11	24

Table 2. Leafy spurge control 2.5 months after application of retreatments. Carrington, ND.

		Initial Treatment			
		Fluroxypyr 0.25	Fluroxypyr 0.5	Picloram 0.5	Untreated
Retreatment					
Fluroxypyr	0.125	32	33	30	20
Fluroxypyr	0.25	27	31	30	10
Picloram	0.25	25	30	34	26
Picloram Fluroxypyr	0.125+ 0.125	32	38	54	12
Picloram Fluroxypyr	0.125+ 0.25	38	43	40	10
Picloram Fluroxypyr	0.25+ 0.25	65	68	75	43
Picloram 2,4-D ester	0.25+ 1.0	42	48	53	37
Untreated		12	10	22	0
LSD (.05) = 22					

Table 3. Leafy spurge control 11 months after application of retreatments. Carrington, ND.

		Initial Treatment			
		Fluroxypyr 0.25	Fluroxypyr 0.5	Picloram 0.5	Untreated
Retreatment					
Fluroxypyr	0.125	7	12	5	0
Fluroxypyr	0.25	3	3	0	0
Picloram	0.25	3	3	10	0
Picloram Fluroxypyr	0.125+ 0.125	3	7	15	0
Picloram Fluroxypyr	0.125+ 0.25	3	7	10	0
Picloram Fluroxypyr	0.25+ 0.25	22	17	40	5
Picloram 2,4-D ester	0.25+ 1.0	0	7	10	0
Untreated		0	0	0	0
LSD (.05) = 14					