

HERBICIDES FOR WEED CONTROL IN CLOVER SEED PRODUCTION

Corey V. Ransom and Joey Ishida
Malheur Experiment Station
Oregon State University
Ontario, OR, 1998

Introduction

Weed control in clover seed production is necessary to insure weed-free clover seed and to prevent yield losses from weed competition. Herbicide options are limited in clover-seed production and research is needed to identify additional herbicide options for weed control.

Methods

Trials were conducted on cooperators' fields in Adrian, OR to evaluate herbicides for weed control and crop tolerance in clover-seed production. With the exception of herbicide applications, cooperators managed the plot areas with the rest of their field. Treatments were applied with a CO₂-pressurized backpack sprayer, calibrated to deliver 20 gpa at 30 psi. Plots were 9- or 10-ft wide by 30-ft long and were arranged in a randomized complete block design with four replications. Herbicide treatments were evaluated for weed control, clover injury, height, and seed yield. Clover seed-yield was determined by harvesting a 3.75-ft strip from the center of each plot with a small plot combine. Raw seed was cleaned using a hand threshing machine. Data were analyzed using analysis of variance and means were separated using a protected least significant difference at the 5 percent level, LSD (0.05).

Prowl, Pursuit, and Raptor

Prowl was applied preemergence (PRE), early postemergence (EPOST), and late postemergence (LPOST). Pursuit and Raptor (imazamox) herbicides were also applied at the late-postemergence timing. Clover injury, height, and flowering were evaluated throughout the season, and clover seed was harvested September 11. Because weeds were nearly absent from this trial, the data documented clover tolerance to the herbicide treatments. Efficacy of Prowl for weed control in clover seed has been documented in other trials.

Select for Perennial Grass Control

In another trial, Select and Poast were evaluated for quackgrass and perennial ryegrass control in clover seed. Postemergence applications of Select were made when clover was 3-in tall, and quackgrass and perennial ryegrass were 6- and 13-in tall, respectively. Clover injury and grass control were evaluated throughout the season. Clover seed yields were not taken.

Results

Prowl, Pursuit, and Raptor

Treatments of Prowl did not cause visual injury, reduce plant height, or delay bloom compared to the untreated plots at any of the rates and application timings tested (Table 1). The Prowl application that was to be banded in the furrow was broadcast directly over some of the rows because of an improper nozzle spacing, and even with Prowl directed on the crop row, no injury was apparent. Pursuit and Raptor treatments did cause significant clover injury and reduced clover height on May 27. Injury was greatest with Pursuit (44 percent) than with Raptor at either rate (23-31 percent). By June 16 the injury with Pursuit was still apparent (48 percent), but not with the Raptor treatments. Similar to injury, clover height was reduced more with Pursuit than Raptor and height reduction was only significant June 16 with the Pursuit treatment. The percentage of clover in bloom was also reduced by Pursuit and Raptor treatments on May 27, but only by Pursuit on June 16. While injury, height reduction, and clover bloom were affected by Pursuit and Raptor, clover seed yields were not different among any of the treatments. Yields were somewhat variable and ranged from 233 to 291 lb/acre. This was lower than the commercial yields from the same field and may have been due to our harvester.

Select for Perennial Grass Control

For the grass control trials, Select applied at the two higher rates (0.125 and 0.25 lb ai/acre) injured clover 1 wk after application (April 6) (Table 2). Only clover treated with the highest rate of Select exhibited injury April 17 and 30, and by May 27 no significant injury symptoms were visible. Quackgrass control was not different among treatments on April 13 or May 27. However, 4 wk after treatment (May 24) the high rate of Select exhibited slightly better quackgrass control than Poast. Perennial ryegrass control on May 24 was less with Select at the low rate (0.094 lb ai/acre) than with the higher rates or with Poast. Increasing rates of Select gave increased perennial ryegrass control with the highest rate providing significantly better control than the other treatments. By April 30 perennial ryegrass control was not different among herbicides and ranged from 72 to 77 percent. Select treatments appear to be safe on clover and provided control similar to the currently registered grass herbicide, Poast.

Table 1. Clover injury, height, flowering, and seed yield in response to herbicide applications, Adrian, OR, 1998.

Treatment [†]	Rate lb ai/acre	Timing [‡]	Clover							
			Injury		Height		Bloom		Seed yield [§]	
			May 27	June 16	May 27	June 16	May 27	June 16	Raw	Clean
			-----%-----		-----inches-----		-----%-----		-----lb/acre-----	
Prowl	1.24	PRE	5	0	21.0	23.9	16	70	458	263
Prowl	2.48	PRE	4	0	21.1	23.9	16	70	478	268
Prowl	1.24	EPOST	5	0	20.9	24.9	20	70	396	253
Prowl	2.48	EPOST	3	0	22.0	25.4	18	70	440	262
Prowl (Banded in furrow)	2.48	EPOST	8	0	20.1	24.0	19	70	413	250
Pursuit + NIS + 32% N	0.094	LPOST	44	48	15.5	15.6	0	16	440	232
Raptor+ NIS + 32% N	0.032	LPOST	23	4	18.4	23.5	6	68	375	247
Raptor+ NIS + 32% N	0.04	LPOST	31	3	18.0	22.8	6	65	448	291
Untreated	-	-	8	0	19.7	24.2	19	70	394	256
Untreated	-	-	3	1	21.3	24.0	20	70	468	255
LSD (0.05)			8	5	2.4	2.0	4	6	NS	NS

[†]NIS= nonionic surfactant at 0.25% v/v; 32% N was applied at 1.5 qt/acre.

[‡]PRE, preemergence, applied February 23; EPOST, early postemergence, applied April 24; LPOST, late postemergence, applied May 6.

[§]Seed was harvested September 11.

Table 2. Quackgrass and perennial ryegrass control with postemergence grass herbicides in clover seed production, Adrian, OR, 1998.

Treatment [†]	Rate lb ai/acre	Grass control								
		Clover injury				Quackgrass			Perennial ryegrass	
		April 6	April 17	April 30	May 27	April 13	April 24	May 27	April 24	April 30
		-----%-----								
Select + COC	0.094	0	0	0	0	46	66	95	55	72
Select + COC	0.125	8	5	0	0	45	65	95	58	73
Select + COC	0.25	12	12	3	2	43	68	95	65	73
Poast + COC	0.38	0	0	0	0	38	60	95	58	77
Untreated	-	0	0	0	0	0	0	0	0	0
LSD (0.05)		3	5	2	NS	11	7	0	1	8

[†]COC = crop oil concentrate at 1 qt/acre. Treatments were applied March 30.