EVALUATION OF HERBICIDES FOR CONTROL OF ROUGHSTALK BLUEGRASS AND INJURY TO KENTUCKY BLUEGRASS, 1996-1997

Marvin Butler, Les Gilmore, Mark Morlan, and Al Short

Abstract

Herbicides Sinbar (terbacil), Karmex (diuron), Beacon (primisulfuron), Rely (glufosinate), Goal (oxyfluorfen), and Horizon (fenoxaprop) were applied in combination to commercial fields of roughstalk bluegrass (Poa trivialis) *and Kentucky bluegrass* (Poa pratensis). *The most effective treatment for control of roughstalk bluegrass while minimizing injury to Kentucky bluegrass was Sinbar at 0.5 lb/a plus Karmex at 2 lb/a applied in early November, followed by Beacon at 0.76 oz/a plus Karmex at 1 lb/a applied in mid-April.*

Introduction

Research to evaluate herbicides for control of roughstalk bluegrass *(Poa trivialis* L.) in Kentucky bluegrass *(Poa pratensis* L.) was initiated in 1993. A wide variety of herbicide combinations were screened during the 1994-1995 season. In subsequent years, the objective has been to evaluate treatments with the most promise and to fine-tune application rates and timings of the most effective herbicide combinations. In addition, several new herbicides have been evaluated as they have become available.

During the 1996-1997 season, the focus was on combining a fall application of Sinbar(terbacil), plus Karmex (diuron) with a spring application of Beacon (primisulfuron) plus Karmex. Spring applications included both April and May application dates to determine proper timing. A mid-winter application of Horizon (fenoxaprop) and fall application of Rely (glufosinate), alone and in combination with Goal (oxyfluorfen), were also evaluated.

Methods and Materials

Plots were place in three commercial grass seed fields to evaluate crop reduction and yield reduction of 'Cypress' and 'Saber II' roughstalk bluegrass and 'Crest' Kentucky bluegrass. Evaluations included a November 2, 1996 application of Sinbar at 0.5 lb/a plus Karmex at 2 lb/a alone, or in combination with a spring application of Beacon at 0.76 *oz/a* plus Karmex at 1 lb/a applied either April 23 or May 16, 1997. A single November 2 application of Beacon at 0.76 oz/a plus Karmex at 2 lb/a was evaluated, along with a double application of Beacon at 0.38 oz/a plus Karmex at 2 lb/a applied November 2, and May 16. New product evaluations included a November 2 application of Rely at 4 pt/a alone, and in combination with Goal at 0.5 pt/a. Horizon at 1.6 pt/a was evaluated as a single January 20 application, and following a November 2 application of Sinbar at 0.5 lb/a plus Karmex at 2 lb/a.

Treatments were applied with a CO_2 pressurized, hand-held, boom sprayer at 40 psi and 20 gal/a water. Plots 10 ft X 20 ft were replicated three times in a randomized complete block design. A nonionic surfactant was applied at 1 qt/100 gal in combination with all herbicides. Visual

evaluations for percent reduction in biomass to established plants were conducted December 6, 1996, and pre-harvest evaluations of percentage of reduction in seed set were conducted June 19, 1996.

Results and Discussion

To date, the most effective treatment for control of roughstalk bluegrass while minimizing injury to Kentucky bluegrass appears to be Sinbar at 0.5 lb/a plus Karmex at 2 lb/a applied in early November, followed by Beacon at 0.76 oz/a plus Karmex at 1 lb/a applied in mid April.

Results for 'Cypress' roughstalk bluegrass are provided in Table 1. Yield reduction with fall application of Sinbar plus Karmex alone (70%), or followed by spring applications of Beacon plus Karmex (93-99%), were more effective than Beacon plus Karmex alone (43%), or applied both fall and spring (60%). Sinbar plus Karmex followed by Beacon plus Karmex applied in April performed better (99%) than when the Beacon plus Karmex was applied in May (93%). Horizon applied in January reduced yield about 7 percent when either applied alone or following Sinbar plus Karmex. Rely alone, or in combination with Goal, resulted in serious crop reduction (85%, 93%), but relatively light yield reduction (12%, 20%).

Results for 'Saber **II**' are provided in Table 2. Treatments generally had less effect on Saber **II** than 'Cypress', but followed the same trends observed on 'Cypress'. Sinbar plus Karmex followed by Beacon plus Karmex applied in April resulted in the greatest yield reduction (92%), followed by Beacon plus Karmex applied in May (63%). Fall applications of either Sinbar plus Karmex or Beacon plus Karmex did not perform as well alone as when followed by a spring application of Beacon plus Karmex.

Results for 'Crest' Kentucky bluegrass are provided in Table 3. Sinbar plus Karmex had no effect on yield whether applied alone or followed by Beacon plus Karmex in April. There were slight yield reductions (7-10%) with Beacon plus Karmex, whether applied in the fall or in May. Rely alone, or in combination with Goal, seriously reduced both crop (90-95%) and yields (70-77%). Horizon applied in January had little effect on crop or yields.

During 1997-1998 research will focus on single and split spring applications applied either in March or April, or both, following Sinbar plus Karmex treatments in early November. The new material to be evaluated is Milestone, with single fall applications at two rates.

Table 1. Effect of fall-applied herbicide applications November 2, 1996 alone or in combination with additional applications as indicated below on 'Cypress' roughstalk bluegrass at S & L Farms near Madras, OR.

	Treatments	Rate	Crop Reduction[1] December 6, 1997	Yield Reduction[2] June 19, 1997
		(product/a)	(percent)	
1.	Sinbar	0.5 lb	22 c[3]	70 ab
	+Karmex	2.0 lb		
2.	Beacon	0.76 oz	5 D	43 c
	+Karmex	2.0 lb		
3.	Sinbar	0.5 lb	17 C	99 a
	+Karmex	2.0 lb		
	Beacon (Apr 23)	0.76 oz		
	+Karmex	1.0 lb		
4.	Sinbar	0.5 lb	17 c	93 a
	+Karmex	2.0 lb		
	Beacon (May16)	0.76 oz		
	+Karmex	1.0 lb		
5.	Beacon	0.38 oz	3 d	60 be
	+Karmex	2.0 lb		
	Beacon (May 16)	0.38 oz		
	+Karmex	1.0 lb		
6.	Sinbar	0.5 lb	13 c	77 ab
	+Karmex	2.0 lb		
	Horizon	1.6 pt		
7.	Rely	4.0 pt	93 a	12 d
	+Goal	0.5 pt		
8.	Rely	4.0 pt	85 b	20 d
9.	Horizon (Jan 18)	1.6 pt	5 d	7 d
10.	Untreated		0 d	0 d

[1]Data based on visual evaluation of reduction in biomass
[2]Data based on visual evaluation of reduction in seed set.
[3]Mean separation with Student-Newman-Keuls ($P<0.05$).

Table 2. Effect of fall-applied herbicide applications November 2, 1996, alone or in combination with additional applications as indicated below on 'Saber II' roughstalk bluegrass at Bob Houts Farms near Madras, OR.

	Treatments	Rate	Crop Reduction[1] December 6, 1997	Yield Reduction[2] June 19, 1997
		(product/a)	----------(%)----------	
1.	Sinbar	0.5 lb	7 c[3]	10 cd
	+Karmex	2.0 lb		
2.	Beacon	0.76oz	5 C	17 cd
	+Karmex	2.0 lb		
3.	Sinbar	0.5 lb	7 C	92 a
	+Karmex	2.0 lb		
	Beacon (Apr 23)	0.76 oz		
	+Karmex	1.0 lb		
4.	Sinbar	0.5 lb	7 c	63 b
	+Karmex	2.0 lb		
	Beacon (May16)	0.76 oz		
	+Karmex	1.0 lb		
5.	Beacon	0.38 oz	3 c	40 be
	+Karmex	2.0 lb		
	Beacon (May 16)	0.38 oz		
	+Karmex	1.0 lb		
6.	Sinbar	0.5 lb	5 c	17 cd
	+Karmex	2.0 lb		
	Horizon	1.6 pt		
7.	Rely	4.0 pt	95 a	27 cd
	+Goal	0.5 pt		
8.	Rely	4.0 pt	88 b	17 cd
9.	Horizon (Jan 18)	1.6 pt	2 c	5 cd
10.	Untreated		0 c	0 d

[1]Data based on visual evaluation of reduction in biomass.
[2]Data based on visual evaluation of reduction in seed set.
[3]Mean separation with Student-Newman-Keuls ($P<0.05$).

Table 3. Effect of fall-applied herbicide applications November 2, 1996, alone or in combination with additional applications as indicated below on 'Crest' Kentucky bluegrass at Boyle Farms near Madras, OR.

	Treatments	Rate	Crop Reduction[1] December 6, 1997	Yield Reduction[2] June 19, 1997
		(product/a)	(%)	
1.	Sinbar	0.5 lb	7 c[3]	0 b
	+Karmex	2.0 lb		
2.	Beacon	0.76 oz	3 c	7 b
	+Karmex	2.0 lb		
3.	Sinbar	0.5 lb	7 c	0 b
	+Karmex	2.0 lb		
	Beacon (Apr 23)	0.76 oz		
	+Karmex	1.0 lb		
4.	Sinbar	0.5 lb	7 c	10 b
	+Karmex	2.0 lb		
	Beacon (May16)	0.76 oz		
	+Karmex	1.0 lb		
5.	Beacon	0.38 oz	3 c	10 b
	+Karmex	2.0 lb		
	Beacon (May 16)	0.38 oz		
	+Karmex	1.0 lb		
6.	Sinbar	0.5 lb	7 c	0 b
	+Karmex	2.0 lb		
	Horizon	1.6 pt		
7.	Rely	4.0 pt	95 a	77 a
	+Goal	0.5 pt		
8.	Rely	4.0 pt	90 b	70 a
9.	Horizon (Jan 18)	1.6 pt	0 c	5 b
10.	Untreated		0 c	0 b

[1]Data based on visual evaluation of reduction in biomass.
[2]Data based on visual evaluation of reduction in seed set.
[3]Mean separation with Student-Newman-Keuls ($P<0.05$).