

EVALUATION OF HERBICIDES FOR CONTROL OF ROUGHSTALK BLUEGRASS IN KENTUCKY BLUEGRASS, 1994-1995

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Abstract

Nine herbicides; terbacil (Sinbar, Dupont), ethofumesate (Nortron, AgrEvo), metribuzin (Lexone, Du Pont), fenoxaprop (Horizon, Hoechst), oxyfluorfen (Goal, Rhom and Haas), diuron, primisulfuron (Beacon, Ciba), dicamba (Banvel, Sandoz), and imazamethabenz (Assert, Cyanamid), were applied at two rates in a grid pattern to plots in three commercial Kentucky bluegrass (*Poa pratensis*) fields to evaluate crop injury, and three roughstalk bluegrass (*Poa trivialis*) fields to determine control of established and seedling plants. There were differences in cultivar response to herbicides for both Kentucky bluegrass and roughstalk bluegrass. Across cultivars, crop injury to Kentucky bluegrass was 20 percent for Assert applied at 1½ pt/a, and 18 percent for Sinbar at 1¼ lb/a. Sinbar at 1¼ lb/a provided 89 percent control of established roughstalk bluegrass plants across cultivars, while Sinbar plus Diuron combinations provided 79 to 83 percent control. Ninety-four percent of seedling roughstalk bluegrass, across cultivars, was controlled with Sinbar at 1¼ lb/a, and with Sinbar plus Diuron, control was 92 percent. Application of Horizon reduced seed set in Kentucky bluegrass up to 90 percent for 'Merit', 60 percent for 'Coventry', and 85 percent for 'Unique'.

Introduction

Historically central Oregon has been an important Kentucky bluegrass seed production area. In recent years, however, roughstalk bluegrass production has increased, and currently accounts for over one-third of grass seed in grown in the area. Contamination of Kentucky bluegrass seed with roughstalk bluegrass has become an increasingly serious problem for the central Oregon grass seed industry. Evaluation of herbicides for control of roughstalk bluegrass in Kentucky bluegrass were initiated during the 1993-1994 season, and expanded during 1994-1995.

Methods and Materials

To evaluate herbicides for crop injury three trials were set up in three commercial Kentucky bluegrass fields with varieties 'Merit', 'Coventry', and 'Unique'. To evaluate percent control of established and seedling plants of roughstalk bluegrass, three commercial fields of roughstalk bluegrass ('Saber', 'Laser', and 'Cypress') were used. Eight herbicides were fall-applied November 3 to the three roughstalk bluegrass fields, November 7 to fields of 'Coventry' and 'Unique', and November 22, 1995 to the 'Merit' field. The ninth herbicide, Horizon, was applied to all locations March 25, 1995. Materials were applied at two rates in a grid pattern of 10 ft x 10 ft plots with 100 plots per location, using a CO₂ pressurized, hand-held, boom sprayer at 40 psi and 20 gal/a of water. Spray Booster-S was applied at 1 qt/100 gal in combination with all herbicides. There was rain the evening of November 3, following application to the roughstalk bluegrass fields.

The 'Saber' field was removed from production after evaluation March 17, 1995 for control of established and seedling roughstalk bluegrass plants. The other two roughstalk bluegrass fields were evaluated March 28, 1995. Evaluation of percent crop injury, based on reduction in plant biomass, was conducted on the Kentucky bluegrass fields March 29, 1995. Evaluation of the spring-applied Horizon plots was conducted May 10, 1995. Pre-harvest evaluations of percent reduction in seed set were conducted on June 9 and 12, 1995.

Results and Discussion

Crop Injury to Kentucky Bluegrass: The greatest injury to Kentucky bluegrass across cultivars resulted from Assert at $\frac{1}{2}$ pt/a (20 percent injury) and Sinbar at $\frac{1}{4}$ lb/a (18 percent injury). Injury was also produced by Assert at $\frac{1}{2}$ pt/a (10 to 12 percent) in combination with other materials, and Beacon at 1 oz/a (10 percent). Cultivars 'Coventry' and 'Unique' appeared to be more sensitive to Beacon, while Merit showed increased injury from Sinbar, Nortron, and Banvel.

Evaluation of phytotoxicity on May 10 following the spring application of Horizon showed up to 30 percent damage to Kentucky bluegrass. Pre-harvest evaluation of seed set indicated reductions from Horizon in all three cultivars, up to 90 percent for 'Merit', 60 percent for 'Coventry', and 85 percent for 'Unique'.

Established Roughstalk Bluegrass Control: The roughstalk bluegrass fields used to evaluate percent control show the greatest control with Sinbar at $\frac{1}{4}$ lb/a (89 percent control), and Sinbar plus Diuron combinations (79 to 83 percent control). 'Saber' was best controlled with combinations of Sinbar at $\frac{3}{4}$ lb/a (70-98 percent control), while 'Laser' appeared to be more resistant with generally a lesser degree of control from either Sinbar at $\frac{3}{4}$ lb/a or Diuron at 2 lb/a. The best combination was Diuron plus Sinbar with 85 percent control. 'Cypress' showed the greatest promise for control with Sinbar, Diuron, Assert, and Lexone in combination with other materials.

Evaluation of phytotoxicity May 10 following the spring application of Horizon showed some damage to roughstalk bluegrass. Injury up to 10 percent was observed at $\frac{1}{2}$ pt/a, with 15 to 20 percent injury at $\frac{2}{4}$ pt/a for both 'Laser' and 'Cypress'.

Seedling Roughstalk Bluegrass Control: Across cultivars, seedling plants between the rows were best controlled with Sinbar at $\frac{1}{4}$ lb/a (94 percent control) or a Sinbar plus Diuron combination (92 percent control). Sinbar in combination with Beacon or Goal provided 85 percent control, while Sinbar in combination with Lexone gave 80 percent control. As with established roughstalk plants, Sinbar at either rate, and Diuron at 2 lb/a provided the most consistent control across combinations. The only effective material on 'Saber' was Sinbar, while Beacon and Diuron provided consistent control above 80 percent on 'Laser' (except in combination with Banvel). Some control was also provided by Lexone and Sinbar. As with established plants, 'Cypress' was the most sensitive cultivar for seedling control, with Sinbar, Diuron, and Lexone being the most effective materials.

Table 1. Percent control for selected fall-applied herbicides providing the best overall performance on established and seedling roughstalk bluegrass, and crop injury to Kentucky bluegrass, evaluated March, 1995 near Madras and Culver, Oregon.

Material and rate	Roughstalk bluegrass control		Injury to Kentucky bluegrass
	seedlings	established plants	
		percent -----	
Sinbar 0.5 lb + Sinbar 0.75 lb	94	89	18
Sinbar 0.5 lb + Diuron 2.0 lb	92	83	2
Diuron 1.0 lb + Sinbar 0.75 lb	92	79	3
Sinbar 0.5 lb + Beacon 0.75 oz	85	32	7
Goal 10 oz + Sinbar 0.75 lb	85	68	5
Sinbar 0.5 lb + Lexone 5 oz	80	50	0
Lexone 2 oz + Sinbar 0.75 lb	80	68	7
Assert 0.75 lb + Sinbar 0.75 lb	75	68	3

Table 2. Average percent crop injury to Kentucky bluegrass across 3 locations and varieties for the following herbicides applied alone, and in combination November, 1994 (except Horizon, March 25, 1995) to plots in commercial fields near Madras and Culver, Oregon.

Sinbar 1/2 lb 2	Sinbar 1/2 lb Assert 1 1/2 pts 10	Sinbar 1/2 lb Banvel 5 pts 2	Sinbar 'A lb Beacon 'A oz 7	Sinbar 'A lb Diuron 2 lbs 2	Sinbar 'A lb Goal 20 oz 0	Sinbar 'A lb Horizon 1'A pts 3	Sinbar 1/2 lb Lexone 5 oz 0	Sinbar 'A lb Nortron 2 pts 2	Sinbar 'A lb Sinbar 'A lb 18
Nortron 1 pt 2	Nortron 1 pt Assert 1'A pts 10	Nortron 1 pt Banvel 5 pts 3	Nortron 1 pt Beacon 'A oz 7	Nortron 1 pt Diuron 2 lbs 2	Nortron 1 pt Goal 20 oz 2	Nortron 1 pt Horizon 1'A pts 3	Nortron 1 pt Lexone 5 oz 0	Nortron 1 pt Nortron 2 pts 3	Nortron 1 pt Sinbar 'A lb 2
Lexone 2 oz 2	Lexone 2 oz Assert 1'A pts 7	Lexone 2 oz Banvel 5 pts 2	Lexone 2 oz Beacon 'A oz 3	Lexone 2 oz Diuron 2 lbs 2	Lexone 2 oz Goal 20 oz 0	Lexone 2 oz Horizon 1'A pts 0	Lexone 2 oz Lexone 5 oz 0	Lexone 2 oz Nortron 2 pts 3	Lexone 2 oz Sinbar M.lb 7
Horizon 1/4 pt 3	Horizon 'A pt Assert 1 1/2 pts 12	Horizon 'A pt Banvel 5 pts 7	Horizon 1/4 pt Beacon 'A oz 8	Horizon 'A pt Diuron 2 lbs 3	Horizon 'A pt Goal 20 oz 2	Horizon 1/4 pt Horizon 1'A pts 5	Horizon 1/4 pt Lexone 5 oz 0	Horizon 1/4 pt Nortron 2 pts 7	Horizon 'A pt Sinbar 'A lb 5
Goal 10 oz 2	Goal 10 oz Assert 1'A pts 8	Goal 10 oz Banvel 5 pts 7	Goal 10 oz Beacon 'A oz 5	Goal 10 oz Diuron 2 lbs 5	Goal 10 oz Goal 20 oz 2	Goal 10 oz Horizon 1 1/2 pts 3	Goal 10 oz Lexone 5 oz 2	Goal 10 oz Nortron 2 pts 3	Goal 10 oz Sinbar 'A lb 5
Diuron 1 lb 0	Diuron 1 lb Assert 1 1/2 pts 10	Diuron 1 lb Banvel 5 pts 3	Diuron 1 lb Beacon 'A oz 5	Diuron 1 lb Diuron 2 lbs 3	Diuron 1 lb Goal 20 oz 0	Diuron 1 lb Horizon 1'A pts 3	Diuron 1 lb Lexone 5 oz 0	Diuron 1 lb Nortron 2 pts 2	Diuron 1 lb Sinbar 'A lb 3
Beacon 1 oz 5	Beacon 1 oz Assert 1 1/2 pts 12	Beacon 1 oz Banvel 5 pts 7	Beacon 1 oz Beacon 'A oz 10	Beacon 1 oz Diuron 2 lbs 5	Beacon 1 oz Goal 20 oz 2	Beacon 1 oz Horizon 1'A pts 8	Beacon 1 oz Lexone 5 oz 3	Beacon 1 oz Nortron 2 pts 8	Beacon 1 oz Sinbar 'A lb 3
Banvel 2'A pts 2	Banvel 2'A pts Assert 1'A pts 5	Banvel 2'A pts Banvel 5 pts 5	Banvel 2'A pts Beacon 'A oz 7	Banvel 2'A pts Diuron 2 lbs 3	Banvel 2'A pts Goal 20 oz 2	Banvel 2'A pts Horizon 1'A pts 5	Banvel 2'A pts Lexone 5 oz 2	Banvel 2'A pts Nortron 2 pts 5	Banvel 2'A pts Sinbar 'A lb 3
Assert 1/4 pt 0	Assert 1/4 pt Assert 1'A pts 20	Assert 1/4 pt Banvel 5 pts 3	Assert 1/4 pt Beacon 'A oz 7	Assert 1/4 pt Diuron 2 lbs 3	Assert 1/4 pt Goal 20 oz 2	Assert 1/4 pt Horizon 1 1/2 pts 7	Assert 1/4 pt Lexone 5 oz 2	Assert 1/4 pt Nortron 2 pts 7	Assert 1/4 pt Sinbar 'A lb 3
Untreated 0	Assert 1'A pts 3	Banvel 5 pts 2	Beacon 'A oz 7	Diuron 2 lbs 3	Goal 20 oz 2	Horizon 1'A pts 2	Lexone 5 oz 0	Nortron 2 pts 2	Sinbar 1/4 lb 2

Table 3. Percent crop injury to 'Merit' Kentucky bluegrass for the following herbicides applied alone, and in combination November 22, 1994 (except Horizon, March 25, 1995) to plots in a commercial field near Madras, Oregon.

Sinbar 1/4 lb 0	Sinbar 1/4 lb Assert 11/4 pts 10	Sinbar 1/2 lb Banvel 5 pts 5	Sinbar 'A lb Beacon 1/4 oz 5	Sinbar 'A lb Diuron 2 lbs 0	Sinbar 1/4 lb Goal 20 oz 0	Sinbar 1/2 lb Horizon 11/4 pts 0	Sinbar 1/4 lb Lexone 5 oz 0	Sinbar 'A lb Nortron 2 pts 5	Sinbar 1/4 lb Sinbar 1/4 lb 5
Nortron 1 pt 0	Nortron 1 pt Assert 11/4 pts 15	Nortron 1 pt Banvel 5 pts 5	Nortron 1 pt Beacon' oz 5	Nortron 1 pt Diuron 2 lbs 0	Nortron 1 pt Goal 20 oz 0	Nortron 1 pt Horizon 11/4 pts 5	Nortron 1 pt Lexone 5 oz 0	Nortron 1 pt Nortron 2 pts 5	Nortron 1 pt Sinbar 1/4 lb 5
Lexone 2 oz 0	Lexone 2 oz Assert 11/2 pts 10	Lexone 2 oz Banvel 5 pts 5	Lexone 2 oz Beacon 1/4 oz 0	Lexone 2 oz Diuron 2 lbs 0	Lexone 2 oz Goal 20 oz 0	Lexone 2 oz Horizon 11/4 pts 0	Lexone 2 oz Lexone 5 oz 0	Lexone 2 oz Nortron 2 pts 5	Lexone 2 oz Sinbar 1/4 lb 5
Horizon 1/2 pt 0	Horizon 1/4 pt Assert 11/4 pts 15	Horizon 1/2 pt Banvel 5 pts 10	Horizon 1/2 pt Beacon' oz 5	Horizon 1/4 pt Diuron 2 lbs 5	Horizon 1/4 pt Goal 20 oz 0	Horizon 1/2 pt Horizon 11/4 pts 5	Horizon 1/2 pt Lexone 5 oz 0	Horizon 1/2 pt Nortron 2 pts 10	Horizon 1/2 pt Sinbar 1/4 lb 10
Goal 10 oz 0	Goal 10 oz Assert 11/2 pts 15	Goal 10 oz Banvel 5 pts 10	Goal 10 oz Beacon 1/2 oz 5	Goal 10 oz Diuron 2 lbs 5	Goal 10 oz Goal 20 oz 0	Goal 10 oz Horizon 11/4 pts 5	Goal 10 oz Lexone 5 oz 0	Goal 10 oz Nortron 2 pts 5	Goal 10 oz Sinbar 1/4 lb 10
Diuron 1 lb 0	Diuron 1 lb Assert 11/4 pts 10	Diuron 1 lb Banvel 5 pts 10	Diuron 1 lb Beacon 1/2 oz 5	Diuron 1 lb Diuron 2 lbs 5	Diuron 1 lb Goal 20 oz 0	Diuron 1 lb Horizon 11/4 pts 5	Diuron 1 lb Lexone 5 oz 0	Diuron 1 lb Nortron 2 pts 5	Diuron 1 lb Sinbar 1/4 lb 10
Beacon 1 oz 0	Beacon 1 oz Assert 11/2 pts 15	Beacon 1 oz Banvel 5 pts 10	Beacon 1 oz Beacon' oz 5	Beacon 1 oz Diuron 2 lbs 5	Beacon 1 oz Goal 20 oz 0	Beacon 1 oz Horizon 11/4 pts 5	Beacon 1 oz Lexone 5 oz 0	Beacon 1 oz Nortron 2 pts 10	Beacon 1 oz Sinbar 1/4 lb 10
Banvel 2 1/4 pts 0	Banvel 2 1/4 pts Assert 11/4 pts 10	Banvel 2 1/4 pts Banvel 5 pts 5	Banvel 2 1/4 pts Beacon 1/4 oz 5	Banvel 2 1/4 pts Diuron 2 lbs 5	Banvel 2 1/4 pts Goal 20 oz 5	Banvel 2 1/4 pts Horizon 11/4 pts 10	Banvel 2 1/4 pts Lexone 5 oz 0	Banvel 2 1/4 pts Nortron 2 pts 10	Banvel 2 1/4 pts Sinbar 1/4 lb 10
Assert 1/4 pt 0	Assert 1/4 pt Assert 1 1/4 pts 15	Assert 1/2 pt Banvel 5 pts 5	Assert 1/2 pt Beacon 1/4 oz 5	Assert 1/2 pt Diuron 2 lbs 5	Assert 1/2 pt Goal 20 oz 5	Assert 1/2 pt Horizon 11/2 pts 10	Assert 1/4 pt Lexone 5 oz 5	Assert 1/2 pt Nortron 2 pts 10	Assert 1/4 pt Sinbar 1/4 lb 10
Untreated 0	Assert 11/2 pts 5	Banvel 5 pts 0	Beacon 1/2 oz 0	Diuron 2 lbs 0	Goal 20 oz 0	Horizon 11/2 pts 5	Lexone 5 oz 0	Nortron 2 pts 5	Sinbar 1/4 lb 5

Table 4. Percent crop injury to 'Coventry' Kentucky bluegrass for the following herbicides applied alone, and in combination November 7, 1994 (except Horizon, March 25, 1995) to plots in a commercial field near Madras, Oregon.

Sinbar 1/2 lb 5	Sinbar 'A lb Assert 11/2 pts 10	Sinbar 1/2 lb Banvel 5 pts 0	Sinbar 1/2 lb Beacon % oz 5	Sinbar 1/2 lb Diuron 2 lbs 5	Sinbar 1/2 lb Goal 20 oz 0	Sinbar 1/2 lb Horizon 11/2 pts 10	Sinbar 1/2 lb Lexone 5 oz 0	Sinbar 1/2 lb Nortron 2 pts 0	Sinbar 1/2 lb Sinbar % lb 20
Nortron 1 pt 5	Nortron 1 pt Assert 11/2 pts 10	Nortron 1 pt Banvel 5 pts 5	Nortron 1 pt Beacon % oz 10	Nortron 1 pt Diuron 2 lbs 5	Nortron 1 pt Goal 20 oz 5	Nortron 1 pt Horizon 11/2 pts 5	Nortron 1 pt Lexone 5 oz 0	Nortron 1 pt Nortron 2 pts 5	Nortron 1 pt Sinbar % lb 0
Lexone 2 oz 5	Lexone 2 oz Assert 1 1/2 pts 10	Lexone 2 oz Banvel 5 pts 0	Lexone 2 oz Beacon 3/4 oz 5	Lexone 2 oz Diuron 2 lbs 5	Lexone 2 oz Goal 20 oz 0	Lexone 2 oz Horizon 11/2 pts 0	Lexone 2 oz Lexone 5 oz 0	Lexone 2 oz Nortron 2 pts 0	Lexone 2 oz Sinbar % lb 10
Horizon' pt 5	Horizon', pt Assert 11/2 pts 10	Horizon 3/4 pt Banvel 5 pts 5	Horizon' pt Beacon % oz 10	Horizon', pt Diuron 2 lbs 5	Horizon' pt Goal 20 oz 5	Horizon' pt Horizon 11/2 pts 5	Horizon % pt Lexone 5 oz 0	Horizon 3/4 pt Nortron 2 pts 5	Horizon'/ pt Sinbar 3/4 lb 5
Goal 10 oz 0	Goal 10 oz Assert 11/2 pts 0	Goal 10 oz Banvel 5 pts 0	Goal 10 oz Beacon % oz 0	Goal 10 oz Diuron 2 lbs 5	Goal 10 oz Goal 20 oz 0	Goal 10 oz Horizon 11/2 pts 0	Goal 10 oz Lexone 5 oz 0	Goal 10 oz Nortron 2 pts 0	Goal 10 oz Sinbar % lb 0
Diuron 1 lb 0	Diuron 1 lb Assert 11/2 pts 15	Diuron 1 lb Banvel 5 pts 0	Diuron 1 lb Beacon % oz 5	Diuron 1 lb Diuron 2 lbs 5	Diuron 1 lb Goal 20 oz 0	Diuron 1 lb Horizon 11/2 pts 5	Diuron 1 lb Lexone 5 oz 0	Diuron 1 lb Nortron 2 pts 0	Diuron 1 lb Sinbar 3/4 lb 0
Beacon oz 5	Beacon oz Assert 11/2 pts 5	Beacon oz Banvel 5 pts 5	Beacon oz Beacon 1/4 oz 10	Beacon oz Diuron 2 lbs 10	Beacon oz Goal 20 oz 0	Beacon oz Horizon 11/2 pts 10	Beacon oz Lexone 5 oz 5	Beacon oz Nortron 2 pts 5	Beacon oz Sinbar 3/4 lb 0
Banvel 2 1/2 pts 5	Banvel 2 1/2 pts Assert 11/2 pts 0	Banvel 2 1/2 pts Banvel 5 pts 5	Banvel 2 1/2 pts Beacon 1/4 oz 10	Banvel 2 1/2 pts Diuron 2 lbs 5	Banvel 2 1/2 pts Goal 20 oz 0	Banvel 2 1/2 pts Horizon 11/2 pts 5	Banvel 2 1/2 pts Lexone 5 oz 5	Banvel 2 1/2 pts Nortron 2 pts 0	Banvel 2 1/2 pts Sinbar % lb 0
Assert 1/4 pt 0	Assert % pt Assert 11/2 pts 30	Assert 1/4 pt Banvel 5 pts 0	Assert % pt Beacon 1/2 oz 5	Assert % pt Diuron 2 lbs 5	Assert % pt Goal 20 oz 0	Assert % pt Horizon 1 1/2 pts 5	Assert' pt Lexone 5 oz 0	Assert % pt Nortron 2 pts 0	Assert % pt Sinbar % lb 0
Untreated 0	Assert 11/2 pts 0	Banvel 5 pts 5	Beacon' oz 10	Diuron 2 lbs 10	Goal 20 oz 5	Horizon 11/2 pts 0	Lexone 5 oz 0	Nortron 2 pts 0	Sinbar % lb 0

Table 5. Percent crop injury to 'Unique' Kentucky bluegrass for the following herbicides applied alone, and in combination November 17, 1994 (except Horizon, March 25, 1995) to plots in a commercial field near Culver, Oregon.

Sinbar 'A lb 0	Sinbar 1/4 lb Assert 11/4 pts 10	Sinbar 1/4 lb Banvel 5 pts 0	Sinbar 1/4 lb Beacon'/. oz 10	Sinbar 1/4 lb Diuron 2 lbs 0	Sinbar 1/4 lb Goal 20 oz 0	Sinbar /2 lb Horizon 11/4 pts 0	Sinbar 1/4 lb Lexone 5 oz 0	Sinbar 1/4 lb Nortron 2 pts 0	Sinbar 1/2 lb Sinbar '/. lb 30
Nortron 1 pt 0	Nortron 1 pt Assert 11/4 pts 5	Nortron 1 pt Banvel 5 pts 0	Nortron 1 pt Beacon'/. oz 5	Nortron 1 pt Diuron 2 lbs 0	Nortron 1 pt Goal 20 oz 0	Nortron 1 pt Horizon 11/2 pts 0	Nortron 1 pt Lexone 5,oz 0	Nortron 1 pt Nortron 2 pts 0	Nortron 1 pt Sinbar '/. lb 0
Lexone 2 oz 0	Lexone 2 oz Assert 1'A pts 0	Lexone 2 oz Banvel 5 pts 0	Lexone 2 oz Beacon 'hoz 5	Lexone 2 oz Diuron 2 lbs 0	Lexone 2 oz Goal 20 oz 0	Lexone 2 oz• Horizon 11/4 pts 0	Lexone 2 oz Lexone 5 oz 0	Lexone 2 oz Nortron 2 pts 5	Lexone 2 oz Sinbar 1/4 lb 5
Horizon % pt 5	Horizon % pt Assert 11/4 pts 10	Horizon /4 pt Banvel 5 pts 5	Horizon' pt Beacon'/. oz 10	Horizon'/. pt Diuron 2 lbs 0	Horizon /4 pt Goal 20 oz 0	Horizon 1/4 pt Horizon 11/4 pts 5	Horizon 3/4, pt Lexone 5 oz 0	Horizon /4 pt Nortron 2 pts 5	Horizon 3/4 pt Sinbar % lb 0
Goal 10 oz 5	Goal 10 oz Assert 11/4 pts 10	Goal 10 oz Banvel 5 pts 10	Goal 10 oz Beacon'/. oz 10	Goal 10 oz Diuron 2 lbs 5	Goal 10 oz Goal 20 oz 5	Goal 10 oz Horizon 11/4 pts 5	Goal 10 oz Lexone 5 oz 5	Goal 10 oz Nortron 2 pts 5	Goal 10 oz Sinbar '/. lb 5
Diuron 1 lb 0	Diuron 1 lb Assert 11/4 pts 5	Diuron 1 lb Banvel 5 pts 0	Diuron 1 lb Beacon'/. oz 5	Diuron 1 lb Diuron 2 lbs 0	Diuron 1 lb Goal 20 oz 0	Diuron 1 lb Horizon 11/2 pts 0	Diuron 1 lb Lexone 5 oz 0	Diuron 1 lb Nortron 2 pts 0	Diuron 1 lb Sinbar % lb 0
Beacon oz 10	Beacon oz Assert 11/4 pts 15	Beacon oz Banvel 5 pts 5	Beacon oz Beacon'/. oz 15	Beacon oz Diuron 2 lbs 0	Beacon oz Goal 20 oz 5	Beacon oz Horizon 11/4 pts 10	Beacon oz Lexone 5 oz 5	Beacon oz Nortron 2 pts 10	Beacon oz Sinbar '< lb 0
Banvel 2 1/4 pts 0	Banvel 2 1/4 pts Assert 11/4 pts 5	Banvel 2% pts Banvel 5 pts 5	Banvel 2 1/4 pts Beacon Y. oz 5	Banvel 2 1/4 pts Diuron 2 lbs 0	Banvel 2 1/2 pts Goal 20 oz 0	Banvel 2 1/4 pts Horizon 1'A pts 0	Banvel 2% pts Lexone 5 oz 0	Banvel 2% pts Nortron 2 pts 5	Banvel 2 1/4 pts Sinbar % lb 0
Assert'/. pt 0	Assert'/. pt Assert 11/4 pts 15	Assert'/. pt Banvel 5 pts 5	Assert'/. pt Beacon % oz 10	Assert'/. pt Diuron 2 lbs 0	Assert'/. pt Goal 20 oz 0	Assert'/. pt Horizon 11/4 pts 5	Assert'/. pt Lexone 5 oz 0	Assert'/. pt Nortron 2 pts 10	Assert % pt Sinbar % lb 0
Untreated 0	Assert 11/2 pts 5	Banvel 5 pts 0	Beacon % oz 10	Diuron 2 lbs 0	Goal 20 oz 0	Horizon 11/4 pts 0	Lexone 5 oz 0	Nortron 2 pts 0	Sinbar % lb 0

Table 6. Average percent control of established roughstalk bluegrass across 3 locations and varieties for the following herbicides applied alone, and in combination, November, 1994 (except Horizon, March 25, 1995) to plots in commercial fields near Madras.

Sinbar 1/2 lb 17	Sinbar 1/2 lb Assert 1 1/2 pts 40	Sinbar 1/2 lb Banvel 5 pts 10	Sinbar 1/2 lb Beacon 1/4 oz 32	Sinbar 1/2 lb Diuron 2 lbs 83	Sinbar 1/2 lb Goal 20 oz 33	Sinbar 1/2 lb Horizon 11/2 pts 30	Sinbar 1/2 lb Lexone 5 oz 50	Sinbar 1/2 lb Nortron 2 pts 38	Sinbar 1/2 lb Sinbar 1/4 lb 89
Nortron 1 pt 0	Nortron 1 pt Assert 1 1/2 pts 13	Nortron 1 pt Banvel 5 pts 0	Nortron 1 pt Beacon 1/4 oz 12	Nortron 1 pt Diuron 2 lbs 40	Nortron 1 pt Goal 20 oz 3	Nortron 1 pt Horizon 1 1/2 pts 7	Nortron 1 pt Lexone 5 oz 13	Nortron 1 pt Nortron 2 pts 12	Nortron 1 pt Sinbar 1/4 lb 60
Lexone 2 oz 0	Lexone 2 oz Assert 1% pts 18	Lexone 2 oz Banvel 5 pts 0	Lexone 2 oz Beacon 1/4 oz 27	Lexone 2 oz Diuron 2 lbs 50	Lexone 2 oz Goal 20 oz 7	Lexone 2 oz Horizon 1% pts 7	Lexone 2 oz Lexone 5 oz 13	Lexone 2 oz Nortron 2 pts 12	Lexone 2 oz Sinbar 1/4 lb 68
Horizon 1/4 pt 5	Horizon 1/4 pt Assert 1% pts 17	Horizon 1/4 pt Banvel 5 pts 0	Horizon 1/4 pt Beacon 1/4 oz 3	Horizon 1/4 pt Diuron 2 lbs 33	Horizon 1/4 pt Goal 20 oz 0	Horizon 1/4 pt Horizon 1% pts 0	Horizon 1/4 pt Lexone 5 oz 7	Horizon 1/4 pt Nortron 2 pts 5	Horizon 1/4 pt Sinbar 1/4 lb 60
Goal 10 oz 0	Goal 10 oz Assert 1% pts 25	Goal 10 oz Banvel 5 pts 5	Goal 10 oz Beacon 1/4 oz 10	Goal 10 oz Diuron 2 lbs 33	Goal 10 oz Goal 20 oz 3	Goal 10 oz Horizon 1 1/2 pts 0	Goal 10 oz Lexone 5 oz 8	Goal 10 oz Nortron 2 pts 7	Goal 10 oz Sinbar 1/4 lb 68
Diuron 1 lb 0	Diuron 1 lb Assert 1 1/2 pts 35	Diuron 1 lb Banvel 5 pts 7	Diuron 1 lb Beacon 1/4 oz 28	Diuron 1 lb Dimon 2 lbs 42	Diuron 1 lb Goal 20 oz 10	Diuron 1 lb Horizon 11/2 pts 12	Diuron 1 lb Lexone 5 oz 23	Diuron 1 lb Nortron 2 pts 13	Diuron 1 lb Sinbar 1/4 lb 79
Beacon 1/4 oz 0	Beacon 1/4 oz Assert 1% pts 20	Beacon 1/4 oz Banvel 5 pts 0	Beacon 1/4 oz Beacon 1/4 oz 30	Beacon 1/4 oz Diuron 2 lbs 43	Beacon 1/4 oz Goal 20 oz 0	Beacon 1/4 oz Horizon 1% pts 7	Beacon 1/4 oz Lexone 5 oz 13	Beacon 1/4 oz Nortron 2 pts 0	Beacon 1/4 oz Sinbar 1/4 lb 62
Banvel 2% pts 0	Banvel 2% pts Assert 1% pts 0	Banvel 2 1/2 pts Banvel 5 pts 3	Banvel 2 1/2 pts Beacon 1/4 oz 2	Banvel 2% pts Diuron 2 lbs 28	Banvel 2% pts Goal 20 oz 0	Banvel 2 1/2 pts Horizon 1% pts 3	Banvel 2% pts Lexone 5 oz 7	Banvel 2 1/2 pts Nortron 2 pts 0	Banvel 2% pts Sinbar 1/4 lb 57
Assert 1/4 pt 0	Assert 1/4 pt Assert 1% pts 8	Assert 1/4 pt Banvel 5 pts 3	Assert 1/4 pt Beacon 1/4 oz 18	Assert 1/4 pt Diuron 2 lbs 60	Assert 1/4 pt Goal 20 oz 3	Assert 1/4 pt Horizon 1% pts 3	Assert 1/4 pt Lexone 5 oz 17	Assert 1/4 pt Nortron 2 pts 0	Assert 1/4 pt Sinbar 1/4 lb 68
Untreated 0	Assert 1% pts 7	Banvel 5 pts 0	Beacon 1/4 oz 8	Diuron 2 lbs 60	Goal 20 oz 0	Horizon 1% pts 3	Lexone 5 oz 13	Nortron 2 pts 0	Sinbar 1/4 lb 62

Table 7. Percent control of established 'Saber' roughstalk bluegrass for the following herbicides applied alone, and in combination, November 3, 1994 (except Horizon, March 25, 1995) to plots in a commercial field near Madras, Oregon.

Sinbar 1/2 lb 10	Sinbar 'A lb Assert 11/2 pts 30	Sinbar 1/2 lb Banvel 5 pts 10	Sinbar 1/2 lb Beacon' oz 0	Sinbar 1/2 lb Diuron 2 lbs 70	Sinbar 'A lb Goal 20 oz 20	Sinbar 'A lb Horizon 11/2 pts 20	Sinbar 'A lb Lexone 5 oz 40	Sinbar 1/2 lb Nortron 2 pts 10	Sinbar 1/2 lb Sinbar % lb 100
Nortron 1 pt 0	Nortron 1 pt Assert 1 1/2 pts 0	Nortron 1 pt Banvel 5 pts 0	Nortron 1 pt Beacon' oz 0	Nortron 1 pt Diuron 2 lbs 10	Nortron 1 pt Goal 20 oz 0	Nortron 1 pt Horizon 11/2 pts 0	Nortron 1 pt Lexone 5 oz 0	Nortron 1 pt Nortron 2 pts 0	Nortron 1 pt Sinbar % lb 90
Lexone 2 oz 0	Lexone 2 oz Assert 11/2 pts 0	Lexone 2 oz Banvel 5 pts 0	Lexone 2 oz Beacon' /4 oz 0	Lexone 2 oz Diuron 2 lbs 10	Lexone 2 oz Goal 20 oz 0	Lexone 2 oz Horizon 11/2 pts 0	Lexone 2 oz Lexone 5 oz 0	Lexone 2 oz Nortron 2 pts 0	Lexone 2 oz Sinbar % lb 98
Horizon % pt 0	Horizon 'A pt Assert 11/2 pts 0	Horizon' / pt Banvel 5 pts 0	Horizon' pt Beacon' oz 0	Horizon' pt Diuron 2 lbs 10	Horizon' pt Goal 20 oz 0	Horizon' /4 pt Horizon 1'A pts 0	Horizon' pt Lexone 5 oz 0	Horizon' pt Nortron 2 pts 0	Horizon' pt Sinbar % lb 80
Goal 10 oz 0	Goal 10 oz Assert 11/2 pts 0	Goal 10 oz Banvel 5 pts 0	Goal 10 oz Beacon' % oz 0	Goal 10 oz Diuron 2 lbs 10	Goal 10 oz Goal 20 oz 0	Goal 10 oz Horizon 1 'A pts 0	Goal 10 oz Lexone 5 oz 0	Goal 10 oz Nortron 2 pts 0	Goal 10 oz Sinbar % lb 90
Diuron 1 lb 0	Diuron 1 lb Assert 1 'A pts 0	Diuron 1 lb Banvel 5 pts 0	Diuron 1 lb Beacon' oz 0	Diuron 1 lb Diuron 2 lbs 10	Diuron 1 lb Goal 20 oz 0	Diuron 1 lb Horizon 1'A pts 0	Diuron 1 lb Lexone 5 oz 0	Diuron 1 lb Nortron 2 pts 0	Diuron 1 lb Sinbar % lb 98
Beacon oz 0	Beacon oz Assert 1'A pts 0	Beacon oz Banvel 5 pts 0	Beacon oz Beacon' oz 0	Beacon oz Diuron 2 lbs 20	Beacon oz Goal 20 oz 0	Beacon oz Horizon 1 'A pts 0	Beacon oz Lexone 5 oz 0	Beacon oz Nortron 2 pts 0	Beacon oz Sinbar % lb 80
Banvel 21/2 pts 0	Banvel 21/2 pts Assert 11/2 pts 0	Banvel 21/2 pts Banvel 5 pts 0	Banvel 21/2 pts Beacon % oz 0	Banvel 21/2 pts Diuron 2 lbs 10	Banvel 21/2 pts Goal 20 oz 0	Banvel 21/2 pts Horizon 1'A pts 0	Banvel 21/2 pts Lexone 5 oz 0	Banvel 21/2 pts Nortron 2 pts 0	Banvel 21/2 pts Sinbar % lb 70
Assert' pt 0	Assert' pt Assert 1'A pts 0	Assert' pt Banvel 5 pts 0	Assert' pt Beacon % oz 0	Assert % pt Diuron 2 lbs 30	Assert' 1/2 pt Goal 20 oz 0	Assert' pt Horizon 1 'A pts 0	Assert' pt Lexone 5 oz 0	Assert' pt Nortron 2 pts 0	Assert 'A pt Sinbar % lb 80
Untreated 0	Assert 1'A pts 0	Banvel 5 pts 0	Beacon' oz 0	Diuron 2 lbs 30	Goal 20 oz 0	Horizon 1'A pts 0	Lexone 5 oz 0	Nortron 2 pts 0	Sinbar % lb 70

Table 8. Percent control of established 'Laser' roughstalk bluegrass for the following herbicides applied alone, and in combination, November 3, 1994 (except Horizon, March 25, 1995) to plots in a commercial field near Madras, Oregon.

Sinbar 1/42 lb 20	Sinbar 1/2 lb Assert 1 1/2 pts 5	Sinbar 1/2 lb Banvel 5 pts 0	Sinbar 1/2 lb Beacon 'A oz 20	Sinbar 1/2 lb Diuron 2 lbs 85	Sinbar 1/2 lb Goal 20 oz 5	Sinbar 1/2 lb Horizon 1 1/2 pts 0	Sinbar 1/2 lb Lexone 5 oz 15	Sinbar 1/2 lb Nortron 2 pts 20	Sinbar 1/2 lb Sinbar 'A lb 70
Nortron 1 pt 0	Nortron 1 pt Assert I 'A pts 0	Nortron 1 pt Banvel 5 pts 0	Nortron 1 pt Beacon 'A oz 25	Nortron 1 pt Diuron 2 lbs 30	Nortron 1 pt Goal 20 oz 0	Nortron I pt Horizon 1 1/2 pts 0	Nortron 1 pt Lexone 5 oz 0	Nortron 1 pt Nortron 2 pts 0	Nortron I pt Sinbar 'A lb 5
Lexone 2 oz 0	Lexone 2 oz Assert 1 1/2 pts 5	Lexone 2 oz Banvel 5 pts 0	Lexone 2 oz Beacon 3/4 oz 30	Lexone 2 oz Diuron 2 lbs 60	Lexone 2 oz Goal 20 oz 0	Lexone 2 oz Horizon I 'A pts 0	Lexone 2 oz Lexone 5 oz 0	Lexone 2 oz Nortron 2 pts 0	Lexone 2 oz Sinbar 'A lb 15
Horizon' pt 0	Horizon % pt Assert 1 1/2 pts 0	Horizon 'A pt Banvel 5 pts 0	Horizon 'A pt Beacon 'A oz 10	Horizon 'A pt Diuron 2 lbs 15	Horizon', pt Goal 20 oz 0	Horizon 1/4 pt Horizon 1 1/2 pts 0	Horizon' pt Lexone 5 oz 0	Horizon 'A pt Nortron 2 pts 0	Horizon 'A pt Sinbar % lb 5
Goal 10 oz 0	Goal 10 oz Assert I 1/2 pts 5	Goal 10 oz Banvel 5 pts 0	Goal 10 oz Beacon' oz 10	Goal 10 oz Diuron 2 lbs 15	Goal 10 oz Goal 20 oz 0	Goal 10 oz Horizon 1 1/2 pts 0	Goal 10 oz Lexone 5 oz 0	Goal 10 oz Nortron 2 pts 0	Goal 10 oz Sinbar 1/4 lb 20
Diuron 1 lb 0	Diuron 1 lb Assert 1 1/2 pts 10	Diuron 1 lb Banvel 5 pts 0	Diuron 1 lb Beacon 1/4 oz 10	Diuron 1 lb Dimon 2 lbs 30	Diuron 1 lb Goal 20 oz 0	Diuron 1 lb Horizon 1 1/2 pts 0	Diuron 1 lb Lexone 5 oz 5	Diuron 1 lb Nortron 2 pts 0	Diuron 1 lb Sinbar 'A lb 40
Beacon oz 0	Beacon oz Assert 1 1/2 pts 20	Beacon oz Banvel 5 pts 0	Beacon oz Beacon 1/4 oz 40	Beacon oz Diuron 2 lbs 20	Beacon oz Goal 20 oz 0	Beacon oz Horizon 1 1/2 pts 0	Beacon oz Lexone 5 oz 0	Beacon oz Nortron 2 pts 0	Beacon oz Sinbar 1/4 lb 10
Banvel 2 1/2 pts 0	Banvel 2 1/2 pts Assert 1 1/2 pts 0	Banvel 2 1/2 pts Banvel 5 pts 0	Banvel 2 1/2 pts Beacon' oz 0	Banvel 2 1/2 pts Diuron 2 lbs 5	Banvel 2 1/2 pts Goal 20 oz 0	Banvel 2 1/2 pts Horizon 1 1/2 pts 0	Banvel 2 1/2 pts Lexone 5 oz 0	Banvel 2 1/2 pts Nortron 2 pts 0	Banvel 2 1/2 pts Sinbar % lb 10
Assert 3/4 pt 0	Assert % pt Assert I 'A pts 15	Assert' pt Banvel 5 pts 0	Assert % pt Beacon' oz 25	Assert 1/4 pt Diuron 2 lbs 60	Assert' < pt Goal 20 oz 0	Assert 'A pt Horizon 1 1/2 pts 0	Assert 'A pt Lexone 5 oz 0	Assert 'A pt Nortron 2 pts 0	Assert% pt Sinbar % lb 30
Untreated 0	Assert 1 1/2 pts 0	Banvel 5 pts 0	Beacon 1/4 oz 15	Diuron 2 lbs 70	Goal 20 oz 0	Horizon 1 1/2 pts 0	Lexone 5 oz 0	Nortron 2 pts 0	Sinbar 'A lb 20

Table 9. Percent control of established 'Cypress' roughstalk bluegrass for the following herbicides applied alone, and in combination, November 3, 1994 (except Horizon, March 25, 1995) to plots in a commercial field near Madras, Oregon.

Sinbar 1/2 lb 20	Sinbar 1/2 lb Assert 11/2 pts 85	Sinbar 1/2 lb Banvel 5 pts 20	Sinbar 'A lb Beacon 1/4 oz 75	Sinbar 1/2 lb Diuron 2 lbs 95	Sinbar 1/2 lb Goal 20 oz 75	Sinbar 1/2 lb Horizon 11/2 pts 70	Sinbar 1/2 lb Lexone 5 oz 95	Sinbar 1/2 lb Nortron 2 pts 85	Sinbar 1/2 lb Sinbar 1/4 lb 98
Nortron 1 pt 0	Nortron 1 pt Assert 11/2 pts 40	Nortron 1 pt Banvel 5 pts 0	Nortron 1 pt Beacon % oz 10	Nortron 1 pt Diuron 2 lbs 80	Nortron 1 pt Goal 20 oz 10	Nortron 1 pt Horizon 11/2 pts 20	Nortron 1 pt Lexone 5 oz 40	Nortron 1 pt Nortron 2 pts 35	Nortron 1 pt Sinbar 1/4 lb 85
Lexone 2 oz 0	Lexone 2 oz Assert 11/2 pts 50	Lexone 2 oz Banvel 5 pts 0	Lexone 2 oz Beacon 1/4 oz 50	Lexone 2 oz Diuron 2 lbs 80	Lexone 2 oz Goal 20 oz 20	Lexone 2 oz Horizon 1/4 pts 20	Lexone 2 oz Lexone 5 oz 40	Lexone 2 oz Nortron 2 pts 35	Lexone 2 oz Sinbar 1/4 lb 90
Horizon 1/4 pt 0	Horizon 3/4 pt Assert 11/2 pts 50	Horizon 1/4 pt Banvel 5 pts 0	Horizon 1/4 pt Beacon % oz 10	Horizon 1/4 pt Diuron 2 lbs 75	Horizon 1/4 pt Goal 20 oz 0	Horizon 1/4 pt Horizon 11/2 pts 0	Horizon 1/4 pt Lexone 5 oz 20	Horizon 1/4 pt Nortron 2 pts 15	Horizon 1/4 pt Sinbar 1/4 lb 95
Goal 10 oz 0	Goal 10 oz Assert 11/2 pts 70	Goal 10 oz Banvel 5 pts 15	Goal 10 oz Beacon % oz 20	Goal 10 oz Diuron 2 lbs 75	Goal 10 oz Goal 20 oz 10	Goal 10 oz Horizon 11/2 pts 0	Goal 10 oz Lexone 5 oz 25	Goal 10 oz Nortron 2 pts 20	Goal 10 oz Sinbar 1/4 lb 95
Diuron 1 lb 0	Diuron 1 lb Assert 11/2 pts 95	Diuron 1 lb Banvel 5 pts 20	Diuron 1 lb Beacon 1/4 oz 75	Diuron 1 lb Diuron 2 lbs 85	Diuron 1 lb Goal 20 oz 30	Diuron 1 lb Horizon 11/2 pts 35	Diuron 1 lb Lexone 5 oz 65	Diuron 1 lb Nortron 2 pts 40	Diuron 1 lb Sinbar 1/4 lb 100
Beacon 1 oz 0	Beacon 1 oz Assert 11/2 pts 40	Beacon 1 oz Banvel 5 pts 0	Beacon 1 oz Beacon % oz 50	Beacon 1 oz Diuron 2 lbs 90	Beacon 1 oz Goal 20 oz 0	Beacon 1 oz Horizon 11/2 pts 20	Beacon 1 oz Lexone 5 oz 40	Beacon 1 oz Nortron 2 pts 0	Beacon 1 oz Sinbar 3/4 lb 95
Banvel 2 1/2 pts 0	Banvel 2 1/2 pts Assert 11/2 pts 0	Banvel 2 1/2 pts Banvel 5 pts 10	Banvel 2 1/2 pts Beacon % oz 5	Banvel 2 1/2 pts Diuron 2 lbs 70	Banvel 2 1/2 pts Goal 20 oz 0	Banvel 2 1/2 pts Horizon 11/2 pts 10	Banvel 2 1/2 pts Lexone 5 oz 20	Banvel 2 1/2 pts Nortron 2 pts 0	Banvel 2 1/2 pts Sinbar 1/4 lb 90
Assert 1/4 pt 0	Assert 1/4 pt Assert 11/2 pts 10	Assert 1/4 pt Banvel 5 pts 10	Assert 1/4 pt Beacon % oz 30	Assert 1/4 pt Diuron 2 lbs 90	Assert 1/4 pt Goal 20 oz 10	Assert 1/4 pt Horizon 11/2 pts 10	Assert 1/4 pt Lexone 5 oz 40	Assert 1/4 pt Nortron 2 pts 0	Assert 1/4 pt Sinbar 1/4 lb 95
Untreated 0	Assert 11/2 pts 20	Banvel 5 pts 10	Beacon Y., oz 10	Diuron 2 lbs 80	Goal 20 oz 0	Horizon 11/2 pts 10	Lexone 5 oz 40	Nortron 2 pts 0	Sinbar 1/4 lb 95

Table 10. Average percent control of seedling roughstalk bluegrass across 3 locations and varieties for the following herbicides applied alone, and in combination, November 1994 (except Horizon, March 1995) to plots in commercial fields near Madras, Oregon.

Sinbar 1/2 lb 73	Sinbar 1/2 lb Assert 11/2 pts 65	Sinbar 1/2 lb Banvel 5 pts 38	Sinbar 1/2 lb Beacon % oz 85	Sinbar 1/2 lb Diuron 2 lbs 92	Sinbar 1/2 lb Goal 20 oz 72	Sinbar 1/2 lb Horizon 11/2 pts 58	Sinbar 1/2 lb Lexone 5 oz 80	Sinbar 1/2 lb Nortron 2 pts 55	Sinbar 1/2 lb Sinbar % lb 94
Nortron 1 pt 0	Nortron 1 pt Assert 11/2 pts 15	Nortron 1 pt Banvel 5 pts 5	Nortron 1 pt Beacon 3/4 oz 40	Nortron 1 pt Diuron 2 lbs 53	Nortron 1 pt Goal 20 oz 13	Nortron 1 pt Horizon 11/2 pts 5	Nortron 1 pt Lexone 5 oz 43	Nortron 1 pt Nortron 2 pts 13	Nortron 1 pt Sinbar 1/4 lb 77
Lexone 2 oz 3	Lexone 2 oz Assert 11/2 pts 18	Lexone 2 oz Banvel 5 pts 3	Lexone 2 oz Beacon % oz 52	Lexone 2 oz Diuron 2 lbs 63	Lexone 2 oz Goal 20 oz 38	Lexone 2 oz Horizon 11/2 pts 8	Lexone 2 oz Lexone 5 oz 58	Lexone 2 oz Nortron 2 pts 28	Lexone 2 oz Sinbar M lb 80
Horizon % pt 2	Horizon 1/4 pt Assert 11/2 pts 5	Horizon 1/4 pt Banvel 5 pts 3	Horizon 1/4 pt Beacon 3/4 oz 48	Horizon % pt Diuron 2 lbs 45	Horizon % pt Goal 20 oz 12	Horizon % pt Horizon 11/2 pts 0	Horizon 3/4 pt Lexone 5 oz 25	Horizon 1/4 pt Nortron 2 pts 5	Horizon % pt Sinbar 1/4 lb 57
Goal 10 oz 0	Goal 10 oz Assert 11/2 pts 35	Goal 10 oz Banvel 5 pts 3	Goal 10 oz Beacon 3/4 oz 55	Goal 10 oz Diuron 2 lbs 50	Goal 10 oz Goal 20 oz 18	Goal 10 oz Horizon 11/2 pts 10	Goal 10 oz Lexone 5 oz 47	Goal 10 oz Nortron 2 pts 12	Goal 10 oz Sinbar % lb 85
Diuron 1 lb 13	Diuron 1 lb Assert 11/2 pts 60	Diuron 1 lb Banvel 5 pts 5	Diuron 1 lb Beacon % oz 48	Diuron 1 lb Diuron 2 lbs 60	Diuron 1 lb Goal 20 oz 35	Diuron 1 lb Horizon 11/2 pts 22	Diuron 1 lb Lexone 5 oz 50	Diuron 1 lb Nortron 2 pts 22	Diuron 1 lb Sinbar % lb 92
Beacon % oz 2	Beacon % oz Assert 11/2 pts 33	Beacon % oz Banvel 5 pts 3	Beacon % oz Beacon 1/4 oz 60	Beacon % oz Diuron 2 lbs 58	Beacon % oz Goal 20 oz 23	Beacon % oz Horizon 11/2 pts 23	Beacon % oz Lexone 5 oz 33	Beacon % oz Nortron 2 pts 8	Beacon % oz Sinbar 1/4 lb 70
Banvel 2 1/2 pts 0	Banvel 2 1/2 pts Assert 11/2 pts 7	Banvel 2 1/2 pts Banvel 5 pts 3	Banvel 2 1/2 pts Beacon % oz 30	Banvel 2 1/2 pts Diuron 2 lbs 43	Banvel 2 1/2 pts Goal 20 oz 23	Banvel 2 1/2 pts Horizon 11/2 pts 5	Banvel 2 1/2 pts Lexone 5 oz 33	Banvel 2 1/2 pts Nortron 2 pts 3	Banvel 2 1/2 pts Sinbar % lb 60
Assert 1/4 pt 3	Assert 1/4 pt Assert 11/2 pts 25	Assert 1/4 pt Banvel 5 pts 5	Assert % pt Beacon 1/4 oz 53	Assert % pt Diuron 2 lbs 63	Assert 1/4 pt Goal 20 oz 40	Assert % pt Horizon 11/2 pts 5	Assert % pt Lexone 5 oz 45	Assert % pt Nortron 2 pts 5	Assert % pt Sinbar % lb 75
Untreated 0	Assert 11/2 pts 17	Banvel 5 pts 2	Beacon % oz 43	Diuron 2 lbs 53	Goal 20 oz 13	Horizon 11/2 pts 2	Lexone 5 oz 38	Nortron 2 pts 8	Sinbar 1/4 lb 68

Table 11. Percent control of 'Saber' seedling roughstalk bluegrass for the following herbicides applied alone, and in combination, November 3, 1994 (except Horizon, March 25, 1995) to plots in a commercial field near Madras, Oregon.

Sinbar 1/2 lb 80	Sinbar 1/2 lb Assert 11/2 pts 80	Sinbar 1/2 lb Banvel 5 pts 80	Sinbar 1/2 lb Beacon', oz 80	Sinbar 1/2 lb Diuron 2 lbs 80	Sinbar %2 lb Goal 20 oz 70	Sinbar 1/2 lb Horizon 11/2 pts 70	Sinbar 1/2 lb Lexone 5 oz 80	Sinbar Y2 lb Nortron 2 pts 50	Sinbar 1/2 lb Sinbar '4 lb 100
Nortron 1 pt 0	Nortron 1 pt Assert 11/2 pts 20	Nortron 1 pt Banvel 5 pts 0	Nortron 1 pt Beacon' oz 0	Nortron 1 pt Diuron 2 lbs 0	Nortron 1 pt Goal 20 oz 0	Nortron 1 pt Horizon 1%2 pts 0	Nortron 1 pt Lexone 5 oz 0	Nortron 1 pt Nortron 2 pts 20	Nortron 1 pt Sinbar 1/4 lb 100
Lexone 2 oz 0	Lexone 2 oz Assert 11/2 pts 20	Lexone 2 oz Banvel 5 pts 0	Lexone 2 oz Beacon' oz 0	Lexone 2 oz Diuron 2 lbs 20	Lexone 2 oz Goal 20 oz 60	Lexone 2 oz Horizon 11/2 pts 0	Lexone 2 oz Lexone 5 oz 30	Lexone 2 oz Nortron 2 pts 0	Lexone 2 oz Sinbar ', lb 100
Horizon', pt 0	Horizon', pt Assert 11/2 pts 0	Horizon 1/4 pt Banvel 5 pts 0	Horizon' pt Beacon', oz 20	Horizon', pt Diuron 2 lbs 0	Horizon 'A pt Goal 20 oz 0	Horizon', pt Horizon 11/2 pts 0	Horizon', pt Lexone 5 oz 0	Horizon', pt Nortron 2 pts 10	Horizon', pt Sinbar ', lb 80
Goal 10 oz 0	Goal 10 oz Assert 11/2 pts 20	Goal 10 oz Banvel 5 pts 0	Goal 10 oz Beacon', oz 20	Goal 10 oz Diuron 2 lbs 0	Goal 10 oz Goal 20 oz 0	Goal 10 oz Horizon 11/2 pts 0	Goal 10 oz Lexone 5 oz 0	Goal 10 oz Nortron 2 pts 0	Goal 10 oz Sinbar 'A lb 90
Diuron 1 lb 0	Diuron 1 lb Assert 11/2 pts 30	Diuron 1 lb Banvel 5 pts 0	Diuron 1 lb Beacon', oz 0	Diuron 1 lb Diuron 2 lbs 0	Diuron 1 lb Goal 20 oz 0	Diuron 1 lb Horizon 1 'A pts 0	Diuron 1 lb Lexone 5 oz 0	Diuron 1 lb Nortron 2 pts 0	Diuron 1 lb Sinbar '1. lb 95
Beacon oz 0	Beacon oz Assert 11/2 pts 30	Beacon oz Banvel 5 pts 0	Beacon oz Beacon', oz 40	Beacon oz Diuron 2 lbs 0	Beacon oz Goal 20 oz 0	Beacon oz Horizon 1 1/2 pts 0	Beacon oz Lexone 5 oz 0	Beacon oz Nortron 2 pts 0	Beacon oz Sinbar 1/4 lb 90
Banvel 21/2 pts 0	Banvel 21/2 pts Assert 11/2 pts 0	Banvel 21/2 pts Banvel 5 pts 0	Banvel 21/2 pts Beacon '4 oz 0	Banvel 21/2 pts Dimon 2 lbs 30	Banvel 21/2 pts Goal 20 oz 0	Banvel 21/2 pts Horizon 11/2 pts 0	Banvel 21/2 pts Lexone 5 oz 0	Banvel 21/2 pts Nortron 2 pts 0	Banvel 21/2 pts Sinbar ', lb 80
Assert', pt 0	Assert', pt Assert 11/2 pts 30	Assert', pt Banvel 5 pts 0	Assert', pt Beacon', oz 40	Assert', pt Diuron 2 lbs 20	Assert' pt Goal 20 oz 0	Assert', pt Horizon 11/2 pts 0	Assert', pt Lexone 5 oz 0	Assert', pt Nortron 2 pts 0	Assert % pt Sinbar %, lb 70
Untreated 0	Assert 11/2 pts 0	Banvel 5 pts 0	Beacon', oz 20	Diuron 2 lbs 0	Goal 20 oz 0	Horizon 11/2 pts 0	Lexone 5 oz 0	Nortron 2 pts 10	Sinbar ', lb 80

Table 12. Percent control of 'Laser' seedling roughstalk bluegrass for the following herbicides applied alone, and in combination, November 3, 1994 (except Horizon, March 25, 1995) to plots in a commercial field near Madras, Oregon.

Sinbar 1/2 lb 80	Sinbar 1/2 lb Assert 1 1/2 pts 30	Sinbar 'A lb Banvel 5 pts 10	Sinbar 1/2 lb Beacon 3/4 oz 90	Sinbar 1/2 lb Diuron 2 lbs 98	Sinbar 1/2 lb Goal 20 oz 60	Sinbar 'A lb Horizon 1 1/2 pts 25	Sinbar 1/2 lb Lexone 5 oz 70	Sinbar 'A lb Nortron 2 pts 35	Sinbar 1/2 lb Sinbar 1/4 lb 85
Nortron 1 pt 0	Nortron 1 pt Assert 1 1/2 pts 15	Nortron 1 pt Banvel 5 pts 5	Nortron 1 pt Beacon 3/4 oz 90	Nortron 1 pt Diuron 2 lbs 85	Nortron 1 pt Goal 20 oz 30	Nortron 1 pt Horizon 1 1/2 pts 10	Nortron 1 pt Lexone 5 oz 60	Nortron 1 pt Nortron 2 pts 10	Nortron 1 pt Sinbar 1/4 lb 40
Lexone 2 oz 0	Lexone 2 oz Assert 1 1/2 pts 10	Lexone 2 oz Banvel 5 pts 0	Lexone 2 oz Beacon % oz 85	Lexone 2 oz Diuron 2 lbs 90	Lexone 2 oz Goal 20 oz 30	Lexone 2 oz Horizon 1'A pts 10	Lexone 2 oz Lexone 5 oz 70	Lexone 2 oz Nortron 2 pts 15	Lexone 2 oz Sinbar % lb 50
Horizon % pt 0	Horizon 3/4 pt Assert 1'A pts 5	Horizon 3/4 pt Banvel 5 pts 0	Horizon 1/4 pt Beacon % oz 85	Horizon % pt Diuron 2 lbs 85	Horizon 3/4 pt Goal 20 oz 30	Horizon 3/4 pt Horizon 1'A pts 0	Horizon % pt Lexone 5 oz 35	Horizon 1/4 pt Nortron 2 pts 0	Horizon / pt Sinbar % lb 5
Goal 10 oz 0	Goal 10 oz Assert 1 1/2 pts 60	Goal 10 oz Banvel 5 pts 0	Goal 10 oz Beacon % oz 95	Goal 10 oz Diuron 2 lbs 90	Goal 10 oz Goal 20 oz 40	Goal 10 oz Horizon 1 1/2 pts 30	Goal 10 oz Lexone 5 oz 80	Goal 10 oz Nortron 2 pts 30	Goal 10 oz Sinbar 1/4 lb 70
Diuron 1 lb 0	Diuron 1 lb Assert 1 1/2 pts 70	Diuron 1 lb Banvel 5 pts 5	Diuron 1 lb Beacon % oz 85	Diuron 1 lb Diuron 2 lbs 95	Diuron 1 lb Goal 20 oz 40	Diuron 1 lb Horizon 1 1/2 pts 40	Diuron 1 lb Lexone 5 oz 75	Diuron 1 lb Nortron 2 pts 30	Diuron 1 lb Sinbar % lb 80
Beacon oz 0	Beacon oz Assert 1'A pts 30	Beacon oz Banvel 5 pts 0	Beacon oz Beacon 3/4 oz 90	Beacon oz Diuron 2 lbs 90	Beacon oz Goal 20 oz 40	Beacon oz Horizon 1 1/2 pts 60	Beacon oz Lexone 5 oz 30	Beacon oz Nortron 2 pts 10	Beacon oz Sinbar % lb 30
Banvel 2 1/2 pts 0	Banvel 2% pts Assert 1 1/2 pts 5	Banvel 2 1/2 pts Banvel 5 pts 0	Banvel 2% pts Beacon 3/4 oz 65	Banvel 2% pts Diuron 2 lbs 60	Banvel 2 1/2 pts Goal 20 oz 40	Banvel 2 1/2 pts Horizon 1 1/2 pts 5	Banvel 2% pts Lexone 5 oz 50	Banvel 2/2 pts Nortron 2 pts 5	Banvel 2 1/2 pts Sinbar % lb 20
Assert 3/4 pt 0	Assert 3/4 pt Assert 1' pts 15	Assert % pt Banvel 5 pts 10	Assert 1/4 pt Beacon % oz 80	Assert % pt Diuron 2 lbs 85	Assert % pt Goal 20 oz 70	Assert % pt Horizon 1 1/2 pts 5	Assert % pt Lexone 5 oz 60	Assert % pt Nortron 2 pts 10	Assert % pt Sinbar 3/4 lb 60
Untreated 0	Assert 1 1/2 pts 0	Banvel 5 pts 0	Beacon % oz 85	Diuron 2 lbs 85	Goal 20 oz 40	Horizon 1 1/2 pts 0	Lexone 5 oz 40	Nortron 2 pts 10	Sinbar 3/4 lb 30

Table 13. Percent control of seedling 'Cypress' roughstalk bluegrass for the following herbicides applied alone, and in combination, November 3, 1994 (except Horizon, March 25, 1995) to plots in a commercial field near Madras, Oregon.

Sinbar 1/2 lb 60	Sinbar 1/2 lb Assert 1 1/2 pts 85	Sinbar 1/2 lb Banvel 5 pts 25	Sinbar 1/2 lb Beacon % oz 85	Sinbar 1/2 lb Diuron 2 lbs 98	Sinbar 1/2 lb Goal 20 oz 85	Sinbar 1/2 lb Horizon 1 1/2 pts 80	Sinbar 'A lb Lexone 5 oz 90	Sinbar 1/2 lb Nortron 2 pts 80	Sinbar 1/2 lb Sinbar % lb 98
Nortron 1 pt 0	Nortron 1 pt Assert 1 1/2 pts 10	Nortron 1 pt Banvel 5 pts 10	Nortron 1 pt Beacon' oz 30	Nortron 1 pt Diuron 2 lbs 75	Nortron 1 pt Goal 20 oz 10	Nortron 1 pt Horizon 1 1/2 pts 5	Nortron 1 pt Lexone 5 oz 70	Nortron 1 pt Nortron 2 pts 10	Nortron 1 pt Sinbar % lb 90
Lexone 2 oz 10	Lexone 2 oz Assert 1 1/2 pts 25	Lexone 2 oz Banvel 5 pts 10	Lexone 2 oz Beacon 1/4 oz 70	Lexone 2 oz Diuron 2 lbs 80	Lexone 2 oz Goal 20 oz 25	Lexone 2 oz Horizon 1 1/2 pts 15	Lexone 2 oz Lexone 5 oz 75	Lexone 2 oz Nortron 2 pts 70	Lexone 2 oz Sinbar 1/2 lb 90
Horizon' pt 5	Horizon' pt Assert 1% pts 10	Horizon % pt Banvel 5 pts 10	Horizon' pt Beacon' oz 40	Horizon' pt Diuron 2 lbs 50	Horizon % pt Goal 20 oz 5	Horizon' pt Horizon 1 1/2 pts 0	Horizon' pt Lexone 5 oz 40	Horizon' pt Nortron 2 pts 5	Horizon' pt Sinbar % lb 85
Goal 10 oz 0	Goal 10 oz Assert 1 1/2 pts 25	Goal 10 oz Banvel 5 pts 10	Goal 10 oz Beacon' oz 50	Goal 10 oz Diuron 2 lbs 60	Goal 10 oz Goal 20 oz 15	Goal 10 oz Horizon 1 1/2 pts 0	Goal 10 oz Lexone 5 oz 60	Goal 10 oz Nortron 2 pts 5	Goal 10 oz Sinbar % lb 95
Diuron 1 lb 40	Diuron 1 lb Assert 1 1/2 pts 80	Diuron 1 lb Banvel 5 pts 10	Diuron 1 lb Beacon' oz 60	Diuron 1 lb Diuron 2 lbs 85	Diuron 1 lb Goal 20 oz 65	Diuron 1 lb Horizon 1 1/2 pts 25	Diuron 1 lb Lexone 5 oz 75	Diuron 1 lb Nortron 2 pts 35	Diuron 1 lb Sinbar % lb 100
Beacon oz 5	Beacon oz Assert 1 1/2 pts 40	Beacon oz Banvel 5 pts 10	Beacon oz Beacon 1/4 oz 50	Beacon oz Diuron 2 lbs 85	Beacon oz Goal 20 oz 30	Beacon oz Horizon 1 1/2 pts 10	Beacon oz Lexone 5 oz 70	Beacon oz Nortron 2 pts 15	Beacon oz Sinbar % lb 90
Banvel 2% pts 0	Banvel 2 1/2 pts Assert 1 1/2 pts 15	Banvel 2 1/2 pts Banvel 5 pts 10	Banvel 2 1/2 pts Beacon' oz 25	Banvel 2 1/4 pts Diuron 2 lbs 40	Banvel 2 1/2 pts Goal 20 oz 30	Banvel 2 1/2 pts Horizon 1 1/2 pts 10	Banvel 2 1/2 pts Lexone 5 oz 50	Banvel 2 1/2 pts Nortron 2 pts 5	Banvel 2 1/2 pts Sinbar % lb 80
Assert' pt 10	Assert % pt Assert 1 1/2 pts 30	Assert % pt Banvel 5 pts 5	Assert', pt Beacon', oz 40	Assert 1/4 pt Diuron 2 lbs 85	Assert % pt Goal 20 oz 50	Assert' pt Horizon 1 1/2 pts 10	Assert % pt Lexone 5 oz 75	Assert' pt Nortron 2 pts 5	Assert' pt Sinbar % lb 95
Untreated 0	Assert 1 1/2 pts 50	Banvel 5 pts 5	Beacon 3/4 oz 25	Diuron 2 lbs 75	Goal 20 oz 0	Horizon 1 1/2 pts 5	Lexone 5 oz 75	Nortron 2 pts 5	Sinbar 'A lb 95