EVALUATION OF HERBICIDES ON ROUNDUP READY BENTGRASS AND CONVENTIONAL BENTGRASS IN CENTRAL OREGON, 2000-2002

Marvin Butler, Les Gilmore, and Claudia Campbell

Abstract

Herbicides were evaluated for efficacy on 'Roundup Ready' and conventional bentgrass. Fall-applied treatments included Roundup Pro®, Fusilade®, Envoy®, Rely®, Vantage®, Kerb®, and Beacon®. Evaluation of efficacy on April 2 indicated 95 percent control of 'Roundup Ready' bentgrass with Fusilade at 0.375 lb ai/acre, followed by 90 percent control at 0.25 lb ai/acre. Roundup Pro at 1.5 lb ai/acre provided 98-99 percent control of conventional bentgrass. By June 5 control of Roundup Ready bentgrass with Fusilade at either 0.375 lb ai/acre or 0.25 lb ai/acre increased to 99 percent. Envoy at 0.25 lb ai/acre provided 96 percent control. Generally, other treatments provided inadequate control. Fusilade activity on 'Roundup Ready' bentgrass was slower than the quick action provided by Roundup on conventional bentgrass.

Introduction

In response to discussions between The Scotts Company and New Era Seeds to grow 'Roundup Ready' bentgrass in central Oregon, plots were established by the parties involved to determine the effectiveness of seven herbicides on both 'Roundup Ready' bentgrass and conventional bentgrass.

Methods and Materials

'Roundup Ready' and conventional bentgrass plugs started in greenhouses were transplanted into an isolated area at the north end of the Agency Plains near Madras on October 10, 2000. 'Roundup Ready' plants were placed on 5-ft centers, while the conventional bentgrass was planted on 2.5-ft centers.

Plots were two rows (one row each of 'Roundup Ready' and conventional bentgrass) by 30 ft long. Borders between the plots were one to two rows wide. Plots were replicated three times in a randomized complete block design. Herbicides that were evaluated included Roundup Pro, Fusilade, Envoy, Rely, Vantage, Kerb and Beacon. They were generally applied in combination with Crop Oil Concentrate (COC) at 1 percent v/v, with and without R11 surfactant at 0.05 percent. Exceptions were Roundup Pro and Kerb that did not include COC or R11, Beacon that included R11 with and without COC, and one treatment of Rely in combination with Ammonium Sulfate (AMS). Matt Fillotti from The Scotts Company and Ron Crocket with Monsanto applied the herbicide treatments September 28, 2001.

In addition to "in house" evaluations conducted by Matt on November 20, 2001 and April 30, 2002, Marvin Butler and Les Gilmore evaluated the plots on April 2 and June 5,

2002. Plots were rated for percent biomass reduction, with the remaining portion of the percentage indicating an estimate of the amount of regrowth present.

Results and Discussion

With a year of growth following transplanting, plants were quite large when herbicides were applied (Fig. 1-4). Despite the large plants, a variety of herbicides provided significant control of both 'Roundup Ready' and conventional bentgrass (Table 1). The standard of comparison for both evaluations was Roundup Pro at 1.5 lb ai/acre.

For the April 2 evaluation, Roundup Pro at 1.5 lb ai/acre provided 98-99 percent control of conventional bentgrass. Fusilade at 0.375 lb ai/acre provided an average of 95 percent control of the 'Roundup Ready' bentgrass, while Fusilade at 0.25 lb ai/acre provided an average of 90 percent control. Envoy at 0.25 lb ai/acre provided 87-88 percent control, Rely at 1.5 lb ai/acre gave 85 percent control, and Vantage at 0.375 lb ai/acre controlled about 81 percent of the 'Roundup Ready' bentgrass. Kerb and Beacon did not provide adequate control of either the 'Roundup Ready' or conventional bentgrass. Although Rely provided slightly better bentgrass control compared to Vantage, the strength of the regrowth was greater with Rely.

On the June 5 evaluation, efficacy had increased for the top-performing herbicides. Fusilade at 0.375 lb ai/acre and 0.25 lb ai/acre had killed all but one or two shoots per plot, and was rated as reducing biomass by 99 percent. It is possible that given additional time these shoots would have died as well. Envoy at 0.25 lb ai/acre provided 96 percent control. Inadequate control was provided by Rely at 1.5 lb ai/acre (56 percent), Vantage at 0.375 lb ai/acre (69 percent), Kerb at 4.0 lb ai/acre (50 percent) and Beacon at 0.0356 lb/acre (19 percent). Percent control increased from the April 2 to the June 5 evaluation for both rates of Fusilade and the single rate of Envoy. Regrowth in the Rely, Vantage, Kerb, and Beacon plots is indicated by decreased control for these treatments on the June 5 evaluation. New growth in the Rely plots looked healthy with good recovery, while plants in the Beacon plots remained stunted with no heading taking place.

Although control of bentgrass was 99 percent with Fusilade at 0.375 lb ai/acre compared to 100 percent with Roundup Pro at 1.5 lb ai/acre, the control was as near to 100 percent as possible at the June 5 evaluation. The difference being Fusilade activity was slower compared to the quick action of Roundup Pro, and one or two small shoots per plot continued to have some life remaining in the Fusilade treated plots by the June 5 evaluation.

Table 1. Evaluation of herbicides by percent reduction of biomass on 'Roundup Ready' bentgrass and conventional bentgrass, near Madras, OR, 2002.

	% Biomass reduction			
	--------April 2, 2002--------		--------June 5, 2002--------	
Treatments (lb ai/acre)	Roundup Ready	Conventional	Roundup Ready	Conventional
Roundup Pro 1.5	0.00 f[1]	98.7 a	0.00 f	100 a
Fusilade .375 + COC 1%	94.0 ab	94.3 ab	98.7 a	94.2 a
Fusilade .375 + COC 1% + R11 .05%	96.0 a	93.3 ab	99.0 a	86.7 ab
Fusilade .250 + COC 1% + R11 .05%	93.3 ab	93.3 ab	99.2 a	93.3 a
Fusilade .250 + COC 1%	86.7 abc	85.0 b	97.7 a	90.0 a
Envoy .250 + COC 1%	86.7 abc	90.0 ab	95.2 ab	89.7 a
Envoy .250 + COC 1% + R11 .05%	88.3 abc	88.3 ab	96.8 a	85.0 ab
Rely 1.5 + AMS 4.5	88.3 abc	88.3 ab	65.8 bcd	58.3 bc
Rely 1.5 + COC 1% + R11 .05%	83.3 bc	83.3 b	46.7 de	46.7 cd
Vantage .375 + COC 1% + R11 .05%	85.0 abc	85.0 b	59.2 cd	41.7 cde
Vantage .375 + COC 1%	76.7 c	70.0 c	78.3 abc	51.2 cd
Kerb 4.0	31.7 d	38.3 d	49.6 de	46.1 cd
Beacon .0356 + COC 1% + R11 .05%	20.0 e	30.0 de	15.0 f	15.0 ef
Beacon .0356 + R11 .05%	23.3 de	26.7 e	23.3 ef	23.3 def
Untreated	0.00 f	0.00 f	0.00 f	0.00 f

[1]Mean separation with LSD at $P \leq 0.05$.