

# Established Kentucky Bluegrass Variety Response to Primisulfuron

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## Introduction

Trials have been conducted over the last 2 years to evaluate the response of traditional and newer releases of Kentucky bluegrass varieties to Beacon<sup>®</sup> (primisulfuron) application during the year of establishment (Affeldt et al. 2009, 2010). We concluded that some varieties had a marginal amount of sensitivity to injury from primisulfuron, but most varieties were not sensitive.

Primisulfuron is currently the only registered herbicide that effectively controls rough bluegrass (*Poa trivialis*) and downy brome (*Bromus tectorum*) in new seedings of Kentucky bluegrass. Observations in commercial seed production suggest that Kentucky bluegrass varieties can have varying levels of sensitivity to primisulfuron, and it is not recommended for use on sensitive varieties. Mueller-Warrant et al. (1997) reported differences in varietal sensitivity to primisulfuron, but significant seed yield losses were not observed. However, primisulfuron can be used in each year in the life of Kentucky bluegrass, which is a perennial crop that is typically maintained in a field for 5 years. The objective of this research was to evaluate the response of 15 Kentucky bluegrass varieties to primisulfuron applied during the second year of the stand following applications during the establishment year.

## Methods and Materials

A field trial was established in 2008 at the Central Oregon Agricultural Research Center north of Madras, Oregon. The trial consisted of 15 varieties of Kentucky bluegrass that were chosen for evaluation in a variety trial that was being conducted in a commercial field at Agency Farms (see “Third Year of Kentucky Bluegrass Variety Evaluation under Nonthermal Residue Management” in this report).

The trial was arranged as a split-plot design, with 10- by 40-ft main plots and two 10- by 20-ft subplots. Subplots included an untreated check and primisulfuron. Main plots and subplots were randomized within four replicated blocks. The primisulfuron treatment was made as a split-application with 0.018 lb ai/acre (0.38 oz Beacon/acre) applied on October 12, 2009. Primisulfuron was applied with a CO<sub>2</sub>-pressurized backpack sprayer delivering 20 gal/acre at 40 psi.

Crop injury was determined by making visual evaluations on a percentage scale when Kentucky bluegrass was in a reproductive growth stage on June 29, 2010. Seed yield was measured by swathing each variety when seed moisture for that variety was at 24 to 28 percent. Swathing dates were as follows:

- July 7, 2010: Shamrock, Volt
- July 8, 2010: Atlantis, Crest, Merit, Bandera
- July 11, 2010: Rhapsody, A00-891
- July 12, 2010: Monte Carlo

- July 13, 2010: A01-299
- July 15, 2010: A00-1400, Zinfandel, Valor, Bariris, Bordeaux

After drying, the plots were threshed in a Wintersteiger plot combine and then seed samples were de-bearded and cleaned. Clean seed yield data were analyzed with the mixed model in SAS.

## **Results and Discussion**

The effect of primisulfuron on established Kentucky bluegrass was minimal compared to the effects seen on new seedings (Table 1). There was no significant difference in seed yield between the check and primisulfuron, and there was little effect on lodging. Primisulfuron does not seem to have a cumulative effect when used over consecutive years in Kentucky bluegrass.

Based on anecdotal information regarding primisulfuron injury to commercial fields of Kentucky bluegrass, yield losses from 80 to 90 percent may have occurred. The seed yield reductions observed in this study support those from last year and suggest that other factors are more likely the cause of severe crop injury. The other factors include but are not limited to planting date, application timing, and weather conditions at the time of application. Based on our experience, we have created the following guidelines to avoid injury to seedling Kentucky bluegrass from primisulfuron.

1. Choose a vigorous and tolerant variety, if possible.
2. Consider making a preemergence application of mesotrione (Callisto<sup>®</sup>) to suppress weedy grasses like cheatgrass and volunteer wheat, if cost effective. In some situations this may prevent the need for any fall application of primisulfuron. Spring applications of primisulfuron pose less risk for injury than fall applications.
3. Do not apply the full rate (Beacon at 0.76 oz/acre) in one application. Instead split the application and apply 0.38 oz in the fall followed by an additional 0.38 oz in the spring.
4. In central Oregon, plant Kentucky bluegrass by August 15 to avoid having to apply primisulfuron during erratic weather conditions that tend to occur in the fall.
5. If possible, avoid applying primisulfuron before or after major changes in daily high temperatures.
6. Wait until Kentucky bluegrass has reached the 1- to 2-tiller stage to apply primisulfuron.

**Table 1.** Response of established Kentucky bluegrass to primisulfuron (Beacon<sup>®</sup>) herbicide at the Central Oregon Agricultural Research Center, Madras, OR, 2009-2010.<sup>1</sup>

Variety	Injury <sup>2</sup>	Lodging <sup>3</sup>		Clean seed yield	
		Check	Beacon	Check	Beacon
		----- (% visual) -----		----- (lb/acre) -----	
Atlantis	3	18	25	938	100
Merit	8	25	13	840	923
Rhapsody	0	3	8	921	772
Valor	0	0	0	695	616
Bariris	11	95	90	390	317
Crest	0	30	13	705	792
Monte Carlo	0	0	0	790	1068
Shamrock	0	63	70	1127	1244
A00-891	0	43	43	1349	1108
A00-1400	0	30	41	465	445
Bandera	1	4	4	789	933
Bordeaux	0	56	68	932	921
Volt	0	58	64	743	849
Zinfandel	0	0	0	651	764
A01-299	0	0	0	818	858

<sup>1</sup>Primisulfuron (Beacon 75 DG) was applied at 0.38 oz product/acre on October 12, 2009 with R-11<sup>®</sup> non-ionic surfactant at 0.25 percent v/v.

<sup>2</sup>Visual injury from primisulfuron compared to an untreated check, evaluated June 29, 2010.

<sup>3</sup>Evaluated June 29, 2010.

## References

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