

# Kentucky Bluegrass Tolerance to Mesotrione Applied in the Fall

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## Abstract

Four field studies were conducted in commercial fields of Kentucky bluegrass to determine the impact of the use of mesotrione herbicide in the fall on seed production. Mesotrione was applied at two rates, 0.25 and 0.5 lb/acre at two timings, early October and early November alone, and in a sequence of October followed by November. Mesotrione was applied to the following Kentucky bluegrass varieties and growth stages 1) seedling 'Merit', 2) seedling 'Shamrock', 3) established 'Merit', and 4) established 'Shamrock'. Kentucky bluegrass was highly tolerant to fall applications of mesotrione. 'Merit' and 'Shamrock' did not differ in their response to mesotrione regardless of growth stage. None of the mesotrione treatments reduced seed yield.

## Introduction

Butler et al. (2005) reported that fall applications of mesotrione (Callisto<sup>®</sup>) did not cause visible injury to Kentucky bluegrass (*Poa pratensis*). However, the impact of mesotrione use on Kentucky bluegrass seed yield has not been measured. Kentucky bluegrass grown for seed in central Oregon is managed as a perennial, with an anticipated 3 to 5 years of seed production. New stands are planted in late August in order to achieve enough vegetative growth prior to winter to produce seed the following spring. Application of herbicides to Kentucky bluegrass in the fall can have adverse effects on seed production, particularly in newly established stands. Furthermore, some varieties can be more sensitive to herbicides than others. The objective of this study was to determine the impact of the use of mesotrione herbicide in the fall on Kentucky bluegrass crop injury and seed yield.

## Materials and Methods

Four field studies were conducted in commercial fields of Kentucky bluegrass, the fields selected were 1) seedling 'Merit', 2) seedling 'Shamrock', 3) established 'Merit', and 4) established 'Shamrock'. Mesotrione was applied at two rates of 0.25 and 0.5 lb/acre at two timings, early October and early November alone, and in a sequence of October followed by November (Table 1). Plots were 10 ft by 25 ft with four replications arranged as randomized complete blocks. Treatments were applied with a CO<sub>2</sub> backpack sprayer delivering 20 gal/acre, operating at 20 psi and 3 mph.

Crop injury was quantified by making visual evaluations on a percentage scale. Seed yield was measured by harvesting a sample of grass from each plot into burlap sacks prior to the rest of the field being swathed. These samples were air dried and threshed in a Hege<sup>®</sup> plot combine; seed samples were de-bearded and cleaned. Crop injury and clean seed yield data were subjected to Bartlett's test for homogeneity and analyzed using the generalized linear model and analysis of variance (ANOVA) in SAS<sup>®</sup>.

## Results and Discussion

Data for ‘Merit’ and ‘Shamrock’ varieties were pooled across locations for seedling and established fields because the variance was homogenous and location-by-treatment interactions were not significant. This indicated that the two varieties did not differ in their response to mesotrione in this production year.

Kentucky bluegrass was highly tolerant to fall applications of mesotrione. October applications resulted in minor injury to seedling and to a lesser extent established Kentucky bluegrass (Tables 1 and 2). This injury did not persist through the fall as the grass became dormant; by December 16 there was no visible injury in either seedling or established Kentucky bluegrass. Furthermore, there was no visible injury in any of the trials from evaluations on March 12, April 16, and June 8, 2007 (data not shown). None of the mesotrione treatments reduced grass seed yield.

## References

Butler, M.B., J.L. Carroll, and C.K. Campbell. 2005. Control of Roundup Ready creeping bentgrass and roughstalk bluegrass in Kentucky bluegrass seed production in central Oregon. Pages 68-69 in W.C. Young III, ed. Seed Production Research, Oregon State University.

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Table 1. Response of newly seeded Kentucky bluegrass to mesotrione (Callisto<sup>®</sup>) applied in the fall near Madras and Culver, Oregon, 2006-2007.<sup>1</sup>

Mesotrione timing <sup>2</sup>	Mesotrione rate lb/acre	Oct 16 (10 DAA) <sup>3</sup>	Nov 14 (39 DAA) <sup>3</sup>	Dec 16 (71/32 DAA) <sup>4</sup>	Clean seed yield lb/acre
		----- % injury -----			
Check	---	0	0	0	1,603
Oct	0.25	3.1	1.3	0	1,567
Nov	0.25	---	---	0	1,630
Oct + Nov	0.25 + 0.25	6.9 <sup>5</sup>	1.3 <sup>5</sup>	0	1,449
Oct	0.5	8.8	6.9	0	1,461
Nov	0.5	---	---	0	1,594
Oct + Nov	0.5 + 0.5	9.4 <sup>5</sup>	8.8 <sup>5</sup>	0	1,355
LSD ( <i>P</i> = 0.05)		2.8	4.6	NS	NS

<sup>1</sup>Location-by-treatment interactions were not significant, so data for seedling ‘Merit’ and ‘Shamrock’ varieties were pooled across locations and analyzed together.

<sup>2</sup>Mesotrione applied at both locations on October 6, 2006 to 4-leaf Kentucky bluegrass and on November 14, 2006 to 5-tiller Kentucky bluegrass. All applications included crop oil concentrate at 1.0% v/v.

<sup>3</sup> DAA = days after application.

<sup>4</sup> Evaluation was made 71 days after October 6, 2006 application and 32 days after November 14, 2006 application.

<sup>5</sup> Injury was the result of only the October 6, 2006 application.

Table 2. Response of established Kentucky bluegrass to mesotrione (Callisto<sup>®</sup>) applied in the fall near Madras and Culver, Oregon, 2006-2007.<sup>1</sup>

Mesotrione timing <sup>2</sup>	Mesotrione rate lb/acre	Oct 16 (10 DAA) <sup>3</sup>	Nov 14 (39 DAA) <sup>3</sup>	Dec 16 (71/32 DAA) <sup>4</sup>	Clean seed yield lb/acre
		----- % injury -----			
Check	---	0	0	0	1,239
Oct	0.25	1.9	1.3	0	1,207
Nov	0.25	---	---	0	1,109
Oct + Nov	0.25 + 0.25	1.3 <sup>5</sup>	1.9 <sup>5</sup>	0	1,280
Oct	0.5	5.0	6.3	0	1,080
Nov	0.5	---	---	0	1,133
Oct + Nov	0.5 + 0.5	5.0 <sup>5</sup>	6.9 <sup>5</sup>	0	1,132
LSD ( <i>P</i> = 0.05)		1.2	1.7	NS	NS

<sup>1</sup> Location-by-treatment interactions were not significant, so data for established ‘Merit’ and ‘Shamrock’ varieties were pooled across locations and analyzed together.

<sup>2</sup> Mesotrione applied at both locations on October 6, 2006 to 2-inch tall Kentucky bluegrass and on November 14, 2006 to 3-inch tall Kentucky bluegrass. All applications included crop oil concentrate at 1.0% v/v.

<sup>3</sup> DAA = days after application.

<sup>4</sup> Evaluation was made 71 days after October 6, 2006 application and 32 days after November 14, 2006 application.

<sup>5</sup> Injury was the result of only the October 6, 2006 application.