

Mesotrione: Application for Creeping Bentgrass Removal from Kentucky bluegrass

Marcus A. Jones and Nick E. Christians

Introduction

Research was conducted to determine: 1) what rate of mesotrione is best for removing creeping bentgrass from Kentucky bluegrass, and 2) what mesotrione rates are safe to Kentucky bluegrass.

Materials and Methods

The experiment was conducted at the Iowa State University Horticulture Research Station in 2005. The research area consisted of a mixed sward of Kentucky bluegrass and creeping bentgrass. Soil type was a Nicollet (fine-loamy, mixed, mesic-Aquic Hapludolls) with 5 ppm P, 92 ppm K, 4.2% organic matter, and a pH of 7.0. All turf was regularly irrigated and maintained at a mowing height of 1 ½ inches. The trial was arranged as a randomized complete block design with 4 replications and each plot measured 5 feet by 5 feet.

On 27 July 2005 mesotrione was applied at 0.125 and 0.187 lb ai/A. Repeat applications followed at two-week intervals until plots had received two, three, or four applications of mesotrione. Mesotrione was mixed and applied with a non-ionic surfactant at 0.25% v/v for all applications.

A backpack sprayer pressurized with carbon dioxide to 38 psi and equipped with TeeJet #8002 flat fan nozzles was used to make all applications. Total spray volume was 3 gal/1000 ft². Visual estimates of creeping bentgrass control were recorded 14 days after each application on a 0 to 100% linear scale. Turfgrass phytotoxicity was evaluated 7 and 14 days after each application on a scale of 1 to 9 with 1 = brown turf, 6 = acceptable damage, and 9 = no phytotoxicity.

All data were analyzed using the General Linear Models procedure of SAS. Crabgrass control and phytotoxicity means were compared by using an *F*-protected least significant different (LSD) test. All tests of significance were made at $P \leq 0.05$.

Results

Mesotrione provided effective postemergence control of creeping bentgrass in Kentucky bluegrass. Creeping bentgrass treated with mesotrione displayed phytotoxicity 67% greater compared with untreated control plots 7 days after initial treatment (DAIT)(Table 2). Phytotoxicity symptoms continued to progress up to 21 DAIT when all bentgrass tissue appeared dead. Greater than 93% creeping bentgrass control was observed in all treated plots 28, 42, and 56 DAIT (Table 1). All mesotrione treatments were equally effective at controlling creeping bentgrass 26 and 42 DAIT. Fifty-six days after the initial treatment minimal regrowth of creeping bentgrass was observed in some plots which received only two applications of mesotrione at 0.125 or 0.187 lb ai/A and plots which received three applications at 0.125 lb ai/A.

Application protocols which call for 3 and 4 applications might be more effective than 1 or 2 applications in large swards of creeping bentgrass with dense canopies that offer an opportunity for escape.

Table 1. Creeping bentgrass control is affected by mesotrione rate and application timing.

Mesotrione (lb ai/A)	Application Timing	Creeping bentgrass control			
		14 DAT	28 DAT	42 DAT	56 DAT
0.125	July 27, Aug. 10,	1b ^y	99a	99a	93b
0.187	July 27, Aug. 10,	7ab	100a	99a	97ab
0.125	July 27, Aug. 10, Aug. 24	10ab	98a	99a	95ab
0.187 ^z	July 27, Aug. 10, Aug. 24	13a	100a	100a	99ab
0.125	July 27, Aug. 10, Aug. 24, Sept. 7	8ab	99a	100a	100a
Control		0b	0b	0b	0c

^z Mesotrione rates on July 27, Aug. 10 and Aug 24 were 0.187, 0.187, and 0.125 lb ai/A, respectively.

^y Means within columns followed by the same letter are not different according to Fisher's LSD_{0.05}.

Table 2. Mesotrione rate and number of applications affects creeping bentgrass phytotoxicity.

Mesotrione (lb ai/A)	Apps	Creeping bentgrass phytotoxicity							
		1 st application		2 nd application		3 rd application		4 th application	
		7 DAT	14 DAT	7 DAT	14 DAT	7 DAT	14 DAT	7 DAT	14 DAT
0.125	2	3b ^y	3b	1b	1b	-	-	-	-
0.187	2	3b	3bc	1b	1b	-	-	-	-
0.125	3	3b	3bc	1b	1b	1b	1b	-	-
0.187 ^z	3	3b	2c	1b	1b	1b	1b	-	-
0.125	4	3b	3bc	1b	1b	1b	1b	1b	1b
Control	-	9a	9a	9a	9a	9a	9a	9a	9a

^z Mesotrione rates on July 27, Aug. 10 and Aug 24 were 0.187, 0.187, and 0.125 lb ai/A, respectively.

^y Means within columns followed by the same letter are not different according to Fisher's LSD_{0.05}.



Side view of block showing creeping bentgrass removal from Kentucky bluegrass via applications of mesotrione.



Plot receiving two applications of mesotrione at 0.187 lb ai/A. Picture taken 9/7/2005, 42 days after initial application. Note the unharmed Kentucky bluegrass plants within the senesced creeping bentgrass.