

Creeping Bentgrass Phytotoxicity and Control Evaluation of Lawn Height 'Park' Kentucky Bluegrass

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Introduction

Phytotoxicity and control evaluations were conducted on a stand of mature 'Park' Kentucky bluegrass (*Poa pratensis*) with mature 'Pencross' creeping bentgrass (*Agrostis stolonifera*) inserted into the sward at the Valentine Turfgrass Research Center, Penn State University, University Park, Pa. The objective of the study was to determine the phytotoxicity to creeping bentgrass and Kentucky bluegrass as well as efficacy of these compounds to reduce the creeping bentgrass population.

Methods and Materials

The study was a randomized complete block design with three replications. Plot size for the study was 30 ft². Two eighteen inch strips of 'Pencross' creeping bentgrass sod were planted on April 6, 2005 in each replication making each plot approximately 70% Kentucky bluegrass and 30% creeping bentgrass. Treatments were applied on September 2 (FALL), September 20 (2 WAT), and October 10 (4 WAT), and October 28 (6 WAT), 2005 using a three foot CO₂ powered boom sprayer calibrated to deliver 40 gpa using two, flat fan, 11004 nozzles at 40 psi.

The test site was mowed at one and one half inches twice weekly with a rotary mower with clippings returned to the site. The site was fertilized with a 19-3-7 complete methylene urea fertilizer calibrated to deliver 1 lb N/1000 ft² in late April and again in late May. Additionally, a 31-0-0 IBDU application of 1 lb N/1000 ft² was made in early August. The test area received maintenance fungicide applications to control disease during the study.

Results and Discussion

Kentucky bluegrass phytotoxicity was rated six times during the study (Table 1). No phytotoxicity was found on any rating date.

Creeping bentgrass phytotoxicity was rated six times during the study (Table 2). All treated creeping bentgrass was rated below acceptable (7.0) at some time in the study. No creeping bentgrass phytotoxicity was observed on the final rating date, December 12, 2005. On this rating date, phytotoxicity was evaluated on creeping bentgrass that did not appear dead.

The percent control of creeping bentgrass was rated six times during the 2005 year (Table 3) and once in the 2006 season (Table 4). The control of creeping bentgrass varied during the study, with a general trend of reducing the population. On the final rating date, all of the treated creeping bentgrass population was significantly reduced compared to the untreated. Only creeping bentgrass treated with mesotrione at 0.125 lb ai/A plus NIS at 0.25 % v/v applied Fall, and 2WAT had less than 90% reduction of the population.

The percent Kentucky bluegrass cover and percent bare ground cover was rated on April 21, 2006 (Table 4). The percent Kentucky bluegrass cover in all treated plots was rated significantly higher than untreated but, there was bare soil still remaining at the conclusion of the study.

It appears that a creeping bentgrass population in a Kentucky bluegrass sward can be reduced or eliminated following application of mesotrione in the fall of the year. Additionally, an overseeding of Kentucky bluegrass might be warranted to reduce any remaining voids in the stand.

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Table 1. Evaluations of Kentucky bluegrass phytotoxicity where 0 = worst, 7 = acceptable, and 10 = no phytotoxicity in 2005.

Treatment	Form	Rate lb ai/A	Timing	-----Phytotoxicity-----					
				9/9	9/17	10/6	10/19	11/1	12/1
MESOTRIONE	4SC	0.125	FALL/2 WAT	10.0	10.0	10.0	10.0	10.0	10.0
NIS	L	0.25 %V/V	FALL/2 WAT						
MESOTRIONE	4SC	0.187	FALL/2 WAT	10.0	10.0	10.0	10.0	10.0	10.0
NIS	L	0.25 %V/V	FALL/2 WAT						
MESOTRIONE	4SC	0.125	FALL/2/4 WAT	10.0	10.0	10.0	10.0	10.0	10.0
NIS	L	0.25 %V/V	FALL/2/4 WAT						
MESOTRIONE	4SC	0.187	FALL/2 WAT	10.0	10.0	10.0	10.0	10.0	10.0
NIS	L	0.25 %V/V	FALL/2/4 WAT						
MESOTRIONE	4SC	0.125	4 WAT						
CHECK				10.0	10.0	10.0	10.0	10.0	10.0
MESOTRIONE	4SC	0.125	FALL/2/4/6 WAT	10.0	10.0	10.0	10.0	10.0	10.0
NIS	L	0.25 %V/V	FALL/2/4/6 WAT						

Table 2. Evaluations of creeping bentgrass phytotoxicity where 0 = worst, 7 = acceptable, and 10 = no phytotoxicity in 2005.

Treatment	Form	Rate lb ai/A	Timing	-----Phytotoxicity-----					
				9/9	9/17	10/6	10/19	11/1	12/1
MESOTRIONE	4SC	0.125	FALL/2 WAT	7.3	5.0	6.7	2.0	3.0	10.0
NIS	L	0.25 %V/V	FALL/2 WAT						
MESOTRIONE	4SC	0.187	FALL/2 WAT	6.0	4.3	6.0	1.0	1.0	10.0
NIS	L	0.25 %V/V	FALL/2 WAT						
MESOTRIONE	4SC	0.125	FALL/2/4 WAT	6.0	5.3	6.0	1.3	1.0	10.0
NIS	L	0.25 %V/V	FALL/2/4 WAT						
MESOTRIONE	4SC	0.187	FALL/2 WAT	6.0	5.0	5.3	1.3	1.0	10.0
NIS	L	0.25 %V/V	FALL/2/4 WAT						
MESOTRIONE	4SC	0.125	4 WAT						
CHECK				10.0	10.0	10.0	10.0	10.0	10.0
MESOTRIONE	4SC	0.125	FALL/2/4/6 WAT	6.0	5.0	5.7	2.0	1.0	10.0
NIS	L	0.25 %V/V	FALL/2/4/6 WAT						

Table 3. Percent control of the 'Pencross' creeping bentgrass population in 'Park' Kentucky bluegrass in 2005.

Treatment	Form	Rate lb ai/A	Timing	(% Bent Control ¹)					
				9/9	9/17	10/6	10/19	11/1	12/1
MESOTRIONE	4SC	0.125	FALL/2 WAT	0.0a	0.0a	24.4d	38.89bc	61.1cd	55.5b
NIS	L	0.25 %V/V	FALL/2 WAT						
MESOTRIONE	4SC	0.187	FALL/2 WAT	0.0a	0.0a	55.5c	77.78a	92.2ab	92.2a
NIS	L	0.25 %V/V	FALL/2 WAT						
MESOTRIONE	4SC	0.125	FALL/2/4 WAT	0.0a	0.0a	44.4cd	50.0abc	96.6a	96.6a
NIS	L	0.25 %V/V	FALL/2/4 WAT						
MESOTRIONE	4SC	0.187	FALL/2 WAT	0.0a	0.0a	61.1bc	55.5abc	92.2ab	96.6a
NIS	L	0.25 %V/V	FALL/2/4 WAT						
MESOTRIONE	4SC	0.125	4 WAT						
CHECK				0.0a	0.0a	0.0e	0.00d	0.0e	0.0d
MESOTRIONE	4SC	0.125	FALL/2/4/6 WAT	0.0a	0.0a	38.8cd	55.5abc	82.2abc	96.6a
NIS	L	0.25 %V/V	FALL/2/4/6 WAT						

1 - Means followed by same letter do not significantly differ (P=0.05, Duncan's New MRT)

Table 4. Percent 'Pencross' creeping bentgrass control, percent 'Park' Kentucky bluegrass cover, and percent bare ground on April 21, 2006.

Treatment	Form	Rate lb ai/A	Timing	(-% Bent Control ¹ -)	(-% KBG Cover ¹ -)	(% Bare Ground ¹)
MESOTRIONE	4SC	0.125	FALL/2 WAT	61.1b	81.7bc	6.7de
NIS	L	0.25 %V/V	FALL/2 WAT			
MESOTRIONE	4SC	0.187	FALL/2 WAT	94.4a	85.0ab	13.3c
NIS	L	0.25 %V/V	FALL/2 WAT			
MESOTRIONE	4SC	0.125	FALL/2/4 WAT	100.0a	88.3ab	11.7cd
NIS	L	0.25 %V/V	FALL/2/4 WAT			
MESOTRIONE	4SC	0.187	FALL/2 WAT	100.0a	90.0a	10.0cd
NIS	L	0.25 %V/V	FALL/2/4 WAT			
MESOTRIONE	4SC	0.125	4 WAT			
CHECK				0.0d	70.0d	0.0f
MESOTRIONE	4SC	0.125	FALL/2/4/6 WAT	100.0a	86.7ab	13.3c
NIS	L	0.25 %V/V	FALL/2/4/6 WAT			

1 - Means followed by same letter do not significantly differ (P=0.05, Duncan's New MRT)