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Abstract

The objectives of this study were to determine if new mesotrione formulations provide equivalent bentgrass control as the current formulation, and to determine if there was any phytotoxicity to the Kentucky bluegrass from the new mesotrione formulations.

Keywords

Horticulture

Disciplines

Agricultural Science | Agriculture | Horticulture

The Selective Removal of Creeping Bentgrass from Kentucky Bluegrass

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Introduction

The objectives of this study were to determine if new mesotrione formulations provide equivalent bentgrass control as the current formulation, and to determine if there was any phytotoxicity to the Kentucky bluegrass from the new mesotrione formulations.

Materials and Methods

This study was conducted at the Iowa State University Horticulture Research Station, Ames, IA, adjacent to a Penncross putting green. The soil is a disturbed Nicollet clay-loam soil, with a pH of 7.7, 5.0% organic matter, 93 ppm K, and 7 ppm P. Plots were arranged in a randomized complete block design with four replications.

Treatment applications (Table 1) began on May 15, 2008. The second, third, and fourth applications were made on June 4, June 28, and July 19, respectively. Treatments were applied using a CO₂ backpack sprayer at 40 psi, and at a spray equivalent of 3 gallons/1000 ft².

Data were collected on creeping bentgrass control, beginning on June 12, 2008 and ending on September 25 (Table 2). Phytotoxicity to Kentucky bluegrass was also assessed (data not shown).

Results and Discussion

There were no differences in bentgrass control between Treatments 2, 5, and 8 at the end of the season, all of which were applied in different formulations but at the same active ingredient rate (140 gai/ha) (Table 2). Each of the treatments was applied every three weeks, up to six weeks after the initial treatment. Treatment 2 was the original mesotrione formulation, while Treatment 5 was the same type of liquid formulation, but contained half of the active ingredient as the original. Treatment 8 was a WG formulation, with 50% active ingredient.

There were no differences between Treatments 3 and 6 throughout the growing season. Both treatments were applied every three weeks, up to six weeks after the initial treatment, and with the same active ingredient (175 gai/ha). Treatment 3 was the original mesotrione formulation, while Treatment 6 was the same liquid formulation, but with half of the active ingredient. There were also no differences between Treatments 4 and 7 throughout the growing season. Both treatments were applied every three weeks, up to nine weeks after the initial treatment, and with the same active ingredient (140 gai/ha). Treatment 4 was the original mesotrione formulation, and Treatment 7 was the same liquid formulation, but with half of the active ingredient.

There was no damage to the Kentucky bluegrass at any time during the trial (data not shown). Bentgrass populations in the untreated control plots averaged 87.5% bentgrass cover throughout the season (Table 3).

Table 1. Treatment list and application timings for HMS803B.

Trt	Product	Form. conc.	Form. conc. unit	Product/AI rate	Product/AI rate unit	Converted rate	Converted rate unit	App. int.
1	Control							
2	A12738	480	GA/L	140	gai/ha	4	flozpr/A	5/15
	Activator			0.25	%V/V	0.25	%V/V	
	A12738	480	GA/L	140	gai/ha	4	flozpr/A	6/4
	Activator			0.25	%V/V	0.25	%V/V	
	A12738	480	GA/L	140	gai/ha	4	flozpr/A	6/28
	Activator			0.25	%V/V	0.25	%V/V	
3	A12738	480	GA/L	175	gai/ha	5	flozpr/A	5/15
	Activator			0.25	%V/V	0.25	%V/V	
	A12738	480	GA/L	175	gai/ha	5	flozpr/A	6/4
	Activator			0.25	%V/V	0.25	%V/V	
	A12738	480	GA/L	175	gai/ha	5	flozpr/A	6/28
	Activator			0.25	%V/V	0.25	%V/V	
4	A12738	480	GA/L	140	gai/ha	4	flozpr/A	5/15
	Activator			0.25	%V/V	0.25	%V/V	
	A12738	480	GA/L	140	gai/ha	4	flozpr/A	6/4
	Activator			0.25	%V/V	0.25	%V/V	
	A12738	480	GA/L	140	gai/ha	4	flozpr/A	6/28
	Activator			0.25	%V/V	0.25	%V/V	
	A12738	480	GA/L	140	gai/ha	4	flozpr/A	7/19
	Activator			0.25	%V/V	0.25	%V/V	
5	EXC3937	240	GA/L	140	gai/ha	8	flozpr/A	5/15
	Activator			0.25	%V/V	0.25	%V/V	
	EXC3937	240	GA/L	140	gai/ha	8	flozpr/A	6/4
	Activator			0.25	%V/V	0.25	%V/V	
	EXC3937	240	GA/L	140	gai/ha	8	flozpr/A	6/28
	Activator			0.25	%V/V	0.25	%V/V	
6	EXC3937	240	GA/L	175	gai/ha	10	flozpr/A	5/15
	Activator			0.25	%V/V	0.25	%V/V	
	EXC3937	240	GA/L	175	gai/ha	10	flozpr/A	6/4
	Activator			0.25	%V/V	0.25	%V/V	
	EXC3937	240	GA/L	175	gai/ha	10	flozpr/A	6/28
	Activator			0.25	%V/V	0.25	%V/V	
7	EXC3937	240	GA/L	140	gai/ha	8	flozpr/A	5/15
	Activator			0.25	%V/V	0.25	%V/V	
	EXC3937	240	GA/L	140	gai/ha	8	flozpr/A	6/4
	Activator			0.25	%V/V	0.25	%V/V	
	EXC3937	240	GA/L	140	gai/ha	8	flozpr/A	6/28
	Activator			0.25	%V/V	0.25	%V/V	
	EXC3937	240	GA/L	140	gai/ha	8	flozpr/A	7/19
	Activator			0.25	%V/V	0.25	%V/V	
8	A14203	50	%AW/W	140	gai/ha	0.125	lbai/A	5/15
	Activator			0.25	%V/V	0.25	%V/V	
	A14203	50	%AW/W	140	gai/ha	0.125	lbai/A	6/4
	Activator			0.25	%V/V	0.25	%V/V	
	A14203	50	%AW/W	140	gai/ha	0.125	lbai/A	6/28
	Activator			0.25	%V/V	0.25	%V/V	

Table 2. Percentage control of bentgrass for HMS803B.

Treatment	June 12	June 25	July 15	August 8	Sept 25
1	0.0	0.0	0.0	0.0	0.0
2	37.0	47.5	75.5	62.8	34.0
3	37.3	40.0	86.0	78.0	63.5
4	40.0	46.5	75.3	77.3	66.8
5	21.8	28.8	67.5	58.5	34.0
6	47.5	45.8	84.8	76.0	79.5
7	30.3	30.5	68.0	74.8	68.8
8	32.8	43.5	63.3	69.0	65.8
LSD (0.05)	24.8	17.8	19.1	21.2	32.5

Table 3. Bentgrass percentages within plots for HMS803B.

Treatment	May 14	June 12	June 25	July 15	August 8	Sept 25
1	82.5	85.3	90.0	88.0	92.3	87.0
2	86.3	53.8	45.0	21.3	32.5	57.5
3	78.8	48.8	47.5	11.5	17.5	29.3
4	71.3	46.3	42.5	20.3	19.0	26.8
5	78.8	62.5	57.5	25.0	32.5	53.8
6	88.8	46.3	48.8	13.8	21.3	18.3
7	82.5	58.8	58.8	27.5	21.3	26.3
8	67.5	46.3	40.0	27.5	22.5	26.5
LSD (0.05)	16.1	22.9	18.0	15.3	18.0	28.5