Annual Bluegrass Control in Greens Height Creeping Bentgrass

J. A. Borger, M. B. Naedel, and K. R. Hivner[1]

Introduction

This study was conducted on a mature stand of 'Penncross' creeping bentgrass (*Agrostis stolonifera*) and annual bluegrass (*Poa annua*) at the Valentine Turfgrass Research Center, Penn State University, University Park, PA. The objective of the study was to determine if selected materials could reduce the annual bluegrass population under simulated golf course greens conditions.

Methods and Materials

This study was a randomized complete block design with three replications. Treatments were applied on September 27, 2010 (SEP) October 25, 2010 (OCT) November 24, 2010 (NOV) using a three foot CO_2 powered boom sprayer calibrated to deliver 87.12gpa using one, flat fan, TP9508EVS nozzle at 40 psi. The test area was maintained at 0.125 inch using a Toro triplex reel mower. Additionally, turfgrass was irrigated on an as needed basis to prevent moisture stress. The test area received maintenance fungicide applications to control disease. Additionally, fertilizer was applied to ensure adequate plant nutrition.

The test site consisted of approximately 40 percent creeping bentgrass and 60 percent annual bluegrass at the initiation of the study. The annual bluegrass population was visually evaluated on October 1, 2010, again on March 16, 2011, and finally on April 27, 2012 on a plot by plot basis, to determine the baseline population and percent change of the population in each plot.

Results and Discussion

Annual bluegrass phytotoxicity was rated three times during the study (Table 1). All treated annual bluegrass populations revealed some level of phytotoxicity during the study.

Creeping bentgrass phytotoxicity was rated three times during the study (Table 2). No phytotoxicity was observed on any rating date.

Turfgrass color was rated on November 19, 2010 (Table 3). There were some color differences noted in Table 3.

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[1] Instructor, Research Technician II, and Research Technician I, Respectively, Department of Crop and Soil Sciences, Penn State University, University Park, Pa, 16802

The control of annual bluegrass was first rated on March 16, 2011 (Table 4). Annual bluegrass control was variable. Turfgrass treated with MRC-01 at 2 L/ha once at the SEPT or SEPT/OCT timings or OCT alone, MRC-01 at the 4 L/ha applied at the SEPT/OCT or the SEPT/OCT/NOV timings revealed a significant reduction (greater than 40%) in the annual bluegrass populations when compared to treated or non treated turfgrass. At no time during the study was bare ground present. It appears that MRC-01 needs to be applied earlier (September) in the fall to be most effective. All rates of MRC-01 reduced the populations of annual bluegrass, just not a significant reduction in all cases.

In the Spring of 2012 while reviewing previous test sites, a noticeable difference in annual bluegrass populations was observed. Because of this, a rating of the percent control of annual bluegrass was conducted on April 27, 2012 (Table 4). All turfgrass treated with MRC, except that treated at 2 L/ha in SEPT or NOV and 4 L/ha in NOV, significantly reduced the annual bluegrass population when compared to non-treated turfgrass. It is important to note that no control materials were applied to this site since the last application of materials in November, 2010. To that, MRC applied at 2 L/ha SEPT/OCT/NOV, and 4 L/ha applied SEPT/OCT/NOV or SEPT/OCT decreased the amount of annual bluegrass in the sward more that the last time the area was rated (3/16/11). In some cases control exceeded 93%.

In conclusion, MRC has again proven to reduce the annual bluegrass population and now it is documented that the population tends to remain low or to be further reduced.

Table 1. Annual bluegrass phytotoxicity on a scale of 0-10, where 0 = dead turf, 7 = acceptable, and 10 = no phytotoxicity in a mixed greens height sward of 'Penncross' creeping bentgrass and annual bluegrass in 2010 and 2011.

Treatment	Form	Rate	Timing	(----------Poa Phytotoxicity----------		)
		L/ha		10/25/10	11/19/10	3/16/11
MRC-01	EC	2	SEPT	6.0	7.0	7.7
MRC-01	EC	2	OCT	7.3	7.5	7.0
MRC-01	EC	2	NOV	7.3	8.0	9.3
MRC-01	EC	4	SEPT	5.5	5.5	8.0
MRC-01	EC	4	OCT	7.8	7.7	6.2
MRC-01	EC	4	NOV	7.2	7.8	9.3
CHECK				10.0	10.0	10.0
MRC-01	EC	2	SEPT/OCT	5.8	5.8	7.0
MRC-01	EC	2	SEPT/OCT/NOV	5.8	6.7	7.5
MRC-01	EC	4	SEPT/OCT	5.8	6.3	7.7
MRC-01	EC	4	SEPT/OCT/NOV	5.7	6.0	8.7
MRC-01	EC	2	OCT/NOV	7.3	7.7	7.3
MRC-01	EC	4	OCT/NOV	7.8	8.2	6.2
TRIMMIT	2SC	16 fl oz/A	SEPT/OCT/NOV	5.7	7.0	9.0

Table 2. Creeping bentgrass phytotoxicity on a scale of 0-10, where 0 = dead turf, 7 = acceptable, and 10 = no phytotoxicity in a mixed greens height sward of 'Penncross' creeping bentgrass and annual bluegrass in 2010 and 2011.

Treatment	Form	Rate	Timing	(----------Bent Phytotoxicity----------		)
		L/ha		10/25/10	11/19/10	3/16/11
MRC-01	EC	2	SEPT	10.0	10.0	10.0
MRC-01	EC	2	OCT	10.0	10.0	10.0
MRC-01	EC	2	NOV	10.0	10.0	10.0
MRC-01	EC	4	SEPT	10.0	10.0	10.0
MRC-01	EC	4	OCT	10.0	10.0	10.0
MRC-01	EC	4	NOV	10.0	10.0	10.0
CHECK				10.0	10.0	10.0
MRC-01	EC	2	SEPT/OCT	10.0	10.0	10.0
MRC-01	EC	2	SEPT/OCT/NOV	10.0	10.0	10.0
MRC-01	EC	4	SEPT/OCT	10.0	10.0	10.0
MRC-01	EC	4	SEPT/OCT/NOV	10.0	10.0	10.0
MRC-01	EC	2	OCT/NOV	10.0	10.0	10.0
MRC-01	EC	4	OCT/NOV	10.0	10.0	10.0
TRIMMIT	2SC	16 fl oz/A	SEPT/OCT/NOV	10.0	10.0	10.0

Table 3. Turfgrass color ratings on a scale of 0-10 where 0 = brown turf, 7 = acceptable, and 10 = dark green color, taken in 2010.

Treatment	Form	Rate L/ha	Timing	(-------Color------) 11/19/10
MRC	EC	2	SEPT	7.0
MRC	EC	2	OCT	7.2
MRC	EC	2	NOV	7.3
MRC	EC	4	SEPT	5.8
MRC	EC	4	OCT	7.2
MRC	EC	4	NOV	7.2
CHECK				7.7
MRC	EC	2	SEPT/OCT	6.3
MRC	EC	2	SEPT/OCT/NOV	6.5
MRC	EC	4	SEPT/OCT	6.5
MRC	EC	4	SEPT/OCT/NOV	6.3
MRC	EC	2	OCT/NOV	7.2
MRC	EC	4	OCT/NOV	7.2
TRIMMIT	2SC	16 fl oz/A	SEPT/OCT/NOV	6.5

Table 4. Percent control of annual bluegrass in a mixed greens height sward with 'Penncross' creeping bentgrass in 2011 and 2012.

Treatment	Form	Rate L/ha	Timing	(------% Control [1]-------) 3/16/11	4/27/12
MRC	EC	2	SEPT	44.3b	15.1e
MRC	EC	2	OCT	44.4b	43.5d
MRC	EC	2	NOV	7.1c	11.9e
MRC	EC	4	SEPT	82.6a	68.6bc
MRC	EC	4	OCT	52.7b	71.9b
MRC	EC	4	NOV	6.7c	0.0e
CHECK				0.0c	0.0e
MRC	EC	2	SEPT/OCT	53.6b	67.6bc
MRC	EC	2	SEPT/OCT/NOV	41.7b	80.7ab
MRC	EC	4	SEPT/OCT	87.8a	93.1a
MRC	EC	4	SEPT/OCT/NOV	84.4a	93.2a
MRC	EC	2	OCT/NOV	52.9b	46.5d
MRC	EC	4	OCT/NOV	43.5b	52.1cd
TRIMMIT	2SC	16 fl oz/A	SEPT/OCT/NOV	85.0a	0.0e

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