

Control of Perennial Ryegrass in Fairway Height Annual Bluegrass

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Introduction

This study was conducted on a mature stand of fairway height annual bluegrass (*Poa annua*) contaminated with perennial ryegrass (*Lolium perenne* L.) at the Valentine Turfgrass Research Center, Penn State University, University Park, PA. The objective of the study was to determine phytotoxicity on annual bluegrass and if selected materials could reduce the perennial ryegrass population under simulated golf course fairway conditions.

Methods and Materials

This study was a randomized complete block design with three replications. Treatments were applied on September 9 (SEPT), and 30, 2014 (3 WAT) using a three foot CO₂ powered boom sprayer (Figure 1) calibrated to deliver 40 gpa using one, flat fan, TP9508EVS nozzle at 50 psi. The test site was mowed at 0.50 inches three times a week with a reel mower and the clippings were collected. Turfgrass was irrigated on an as needed basis to prevent moisture stress.

At the initiation of the trial, the test site (Figure 2) consisted of approximately 80-85 percent annual bluegrass and 15-20 percent perennial ryegrass. The perennial ryegrass population was visually evaluated at the beginning of the study, on a plot by plot basis to determine the baseline population and percent change of the population after application of selected materials.

Results and Discussion

Annual bluegrass and perennial ryegrass phytotoxicity were rated three times during the study (Table 1). No unacceptable phytotoxicity was observed on the annual bluegrass during the study. Only treated perennial ryegrass had unacceptable levels of phytotoxicity which would be expected.

Perennial ryegrass control was rated four times during the study (Table 2.). The amount of control was variable during this study. Overall there was a reduction of the perennial ryegrass population. On the final rating date 16 October, all treated turfgrass significantly reduce the populations when compared to non-treated turfgrass.

The perennial ryegrass population was rate on May 1, 2015 (Table 2). All treated turfgrass significantly reduce the populations when compared to non-treated turfgrass. The reduction of perennial ryegrass was found to be similar to that observed in the fall. Hence, it appears that little regrowth of the perennial ryegrass happened during the late fall of 2014 and early spring of 2015. By the end of the study there was complete coverage of turf in all the plots (Figure 3).

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Table 1. Evaluations of annual bluegrass (POA) and perennial ryegrass (RYE) phytotoxicity following applications on September 9 and 30, 2014 where 0 = no phytotoxicity, 3 = acceptable, and 10 = dead turf in 2014.

Treatment	AI GM/L	Rate FL OZA	TIMING	(--POA PHYTO--)			(--RYE PHYTO--)		
				9/23	10/7	10/16	9/23	10/7	10/16
A15118B INDUCE	100 EC	4.80 0.25 % v/v	SEPT/3 WAT	2.7	3.0	0.0	8.7	8.7	8.7
A15118B INDUCE	100 EC	9.60 0.25 % v/v	SEPT/3 WAT	2.7	3.0	0.0	8.7	8.7	8.7
A15118B A18575F INDUCE	100 EC 200 EC	4.80 5.13 0.25 % v/v	SEPT/3 WAT	2.3	2.0	0.0	6.0	7.3	7.3
UNTREATED CHECK				0.0	0.0	0.0	0.0	0.0	0.0
A15118B A18575F INDUCE	100 EC 200 EC	9.60 5.13 0.25 % v/v	SEPT/3 WAT	2.0	2.7	0.0	8.0	7.3	7.3
A13617V INDUCE	50 EC	9.60 0.25 % v/v		2.3	2.7	0.0	7.7	8.0	8.7
A13617V INDUCE	50 EC	19.20 0.25 % v/v	SEPT/3 WAT	2.7	3.0	0.0	8.7	8.7	8.7

Table 2. Percent control of perennial ryegrass (RYE) in a mixed sward with fairway height annual bluegrass treated in 2014 and rated in 2014 and spring 2015.

Treatment	AI GM/L	Rate FL OZA	TIMING	(-----RYE CONTROL ¹ -----)				
				9/23	9/30	10/7	10/16	5/1/15
A15118B INDUCE	100 EC	4.80 0.25 % v/v	SEPT/3 WAT	100.0 a	88.9 a	93.3 a	97.8 a	83.3 a
A15118B INDUCE	100 EC	9.60 0.25 % v/v	SEPT/3 WAT	100.0 a	96.3 a	90.7 ab	100.0 a	67.6 a
A15118B A18575F INDUCE	100 EC 200 EC	4.80 5.13 0.25 % v/v	SEPT/3 WAT	62.2 b	96.3 a	74.1 ab	97.8 a	90.7 a
UNTREATED CHECK				0.0 c	0.0 b	0.0 c	0.0 b	0.0 b
A15118B A18575F INDUCE	100 EC 200 EC	9.60 5.13 0.25 % v/v	SEPT/3 WAT	73.1 ab	84.5 a	63.9 b	98.1 a	78.5 a
A13617V INDUCE	50 EC	9.60 0.25 % v/v		91.7 ab	100.0 a	91.7 ab	100.0 a	80.6 a
A13617V INDUCE	50 EC	19.20 0.25 % v/v	SEPT/3 WAT	97.8 a	100.0 a	96.3 a	96.3 a	77.8 a

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

