

Seedhead Suppression of Annual Bluegrass on a Putting Green

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Introduction

This study was conducted on a mixed stand of ‘Penncross’ creeping bentgrass (*Agrostis stolonifera*) and annual bluegrass (*Poa annua*) at the Penn State Blue Golf Course in State College, PA. The objective of the study was to evaluate selected growth regulators, with and without adjuvants, for the seedhead suppression of annual bluegrass.

Methods and Materials

This study was a randomized complete block design with three replications, and a plot size of 21 ft². Treatments were applied on April 6 (PRIOR), April 13 (BOOT), and May 6 (3 WAT), 2006, respectively, using a three-foot CO₂ powered boom sprayer calibrated to deliver 40 gpa using one 11004E even tip/flat fan nozzle at 40 psi.

Boot stage of the annual bluegrass was observed April 16, 2006. Non treated test areas within the test site revealed approximately 100% coverage of annual bluegrass seedheads.

The site was maintained using cultural practices for irrigation, mowing, and fertilization that would be typical for a putting green. The test area was mowed twice with a Toro Triplex, bench set to 0.115”, before the April 6, 2006 application of selected materials. During the study the site was fertilized with a Nature Safe 8-3-5 fertilizer at a rate of 1 lb N/M on May 1, 2006.

Results and Discussion

Turfgrass phytotoxicity was rated five times during the study (Table 1). The turfgrass phytotoxicity was variable and in some cases lasted for several weeks. On the first rating date, April 24, 2005, turfgrass treated with Embark at 40 oz/A, Embark at 40 oz/A plus MacroSorb Foliar at any rate, Embark at 20 oz/A plus Primo and Proxy applies twice, Embark at 40 oz/A plus ECO-N, Proxy plus Primo plus Trimmit with or without ECO-N (BOOT), any combination of Trimmit and Embark, and Primo (PRIOR) plus Embark at 40 oz/A (BOOT) plus Ferromec (BOOT) was rated less than acceptable for phytotoxicity 7.0.

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Annual bluegrass seedhead suppression was rated three times during the study (Table 2). On the last rating date, May 26, 2006, turfgrass treated with Embark at 40 oz/A with and without Ferramec, Embark at 40 oz/A plus MacroSorb Foliar at 8 oz/M, Embark at 40 oz/A plus MacroSorb Foliar at 4 oz/M, plus Ferramec, Proxy plus Primo plus ECO-N (BOOT/3 WAT), Embark at 20 oz/A (BOOT) plus Primo plus Proxy (BOOT/3 WAT), Embark at 40 oz/A plus ECO-N, Proxy plus Primo plus Trimmit plus ECO-N, Primo plus Trimmit plus Embark at 40 oz/A with and without ECO-N, Trimmit plus Embark at 40 oz/A with and without ECO-N, Proxy (PRIOR) plus Embark at 40 oz/A plus Ferramec (BOOT), Primo (PRIOR) plus Embark at 40 oz/A plus Ferramec (BOOT), ECO-N (PRIOR) plus Embark at 40 oz/A plus Ferramec (BOOT), and Embark at 40 oz/A plus Signature plus Ferramec had significantly fewer annual bluegrass seedheads than untreated turfgrass and had at least 75% reduction of the seedheads.

Table 1. Ratings of phytotoxicity of an annual bluegrass/creeping bentgrass putting green on a scale of 0 to 10 where 0 = complete phytotoxicity, 7 = acceptable, and 10 = no phytotoxicity in 2006.

Treatment	Form	Rate oz/M	Timing	(-----Phytotoxicity-----)				
				4/24	5/4	5/9	5/17	5/26
EMBARK	0.2SL	40 OZ/A	BOOT	6.0	6.7	7.7	10.0	10.0
EMBARK	0.2SL	40 OZ/A	BOOT	7.0	6.7	6.8	10.0	10.0
FERROMECC	L	5	BOOT					
EMBARK	0.2SL	40 OZ/A	BOOT	6.3	7.7	7.3	10.0	10.0
MACROSORB FOLIAR	L	4	BOOT					
EMBARK	0.2SL	40 OZ/A	BOOT	6.0	6.7	7.3	9.0	10.0
MACROSORB FOLIAR	L	8	BOOT					
EMBARK	0.2SL	40 OZ/A	BOOT	7.0	7.3	8.7	10.0	10.0
MACROSORB FOLIAR	L	4	BOOT					
FERROMECC	L	5	BOOT					
PROXY	2SL	5	BOOT/3 WAT	9.7	9.7	10.0	10.0	10.0
PRIMO	1MEC	0.125	BOOT/3 WAT					
MACROSORB FOLIAR	L	4	BOOT/3 WAT					
PROXY	2SL	3	BOOT/3 WAT	9.7	10.0	10.0	10.0	10.0
PRIMO	1MEC	0.125	BOOT/3 WAT					
ECO-N (24-0-0)	2.2L	0.2 LB N/M	BOOT/3 WAT					
EMBARK	0.2SL	20 OZ/A	BOOT	6.7	8.0	9.2	10.0	10.0
PRIMO	1MEC	0.125	BOOT/3 WAT					
PROXY	2SL	5	BOOT/3 WAT					
EMBARK	0.2SL	40 OZ/A	BOOT	6.7	6.7	7.0	10.0	10.0
ECO-N (24-0-0)	2.2L	0.2 LB N/M	BOOT					
PROXY	2SL	5	BOOT	6.3	6.0	5.7	6.3	10.0
PRIMO	1MEC	0.125	BOOT					
TRIMMIT	2SC	6 OZ/A	BOOT					
PROXY	2SL	5	BOOT	6.7	8.0	7.5	8.0	10.0
PRIMO	1MEC	0.125	BOOT					
TRIMMIT	2SC	6 OZ/A	BOOT					
ECO-N (24-0-0)	2.2L	0.2 LB N/M	BOOT					
PRIMO	1MEC	0.125	BOOT	5.7	4.7	5.0	5.3	10.0
TRIMMIT	2SC	6 OZ/A	BOOT					
EMBARK	0.2SL	40 OZ/A	BOOT					
CHECK				10.0	10.0	10.0	10.0	10.0
PRIMO	1MEC	0.125	BOOT	5.7	4.3	5.0	5.0	10.0
TRIMMIT	2SC	6 OZ/A	BOOT					
EMBARK	0.2SL	40 OZ/A	BOOT					
ECO-N (24-0-0)	2.2L	0.2 LB N/M	BOOT					
TRIMMIT	2SC	6 OZ/A	BOOT	5.7	4.7	5.0	5.0	10.0
EMBARK	0.2SL	40 OZ/A	BOOT					
TRIMMIT	2SC	6 OZ/A	BOOT	5.7	4.0	5.2	5.3	10.0
EMBARK	0.2SL	40 OZ/A	BOOT					
ECO-N (24-0-0)	2.2L	0.2 LB N/M	BOOT					
BANNER MAXX	1.3EC	4	BOOT	9.7	10.0	9.7	8.7	10.0
BANNER MAXX	1.3EC	4	BOOT	9.7	9.7	9.7	9.0	10.0
ECO-N (24-0-0)	2.2L	0.2 LB N/M	BOOT					
PROXY	2SL	5	PRIOR	7.7	7.3	8.5	10.0	10.0
EMBARK	0.2SL	40 OZ/A	BOOT					
FERROMECC	L	5	BOOT					
PROXY	2SL	5	PRIOR	8.7	7.0	8.0	7.7	10.0
TRIMMIT	2SC	6 OZ/A	BOOT					
ECO-N (24-0-0)	2.2L	0.2 LB N/M	BOOT					
PROXY	2SL	5	PRIOR/BOOT	7.7	10.0	9.3	10.0	10.0
PRIMO	1MEC	0.125	BOOT					
PRIMO	1MEC	0.125	PRIOR	6.3	7.7	7.8	10.0	10.0
EMBARK	0.2SL	40 OZ/A	BOOT					
FERROMECC	L	5	BOOT					
TRIMMIT	2SC	6 OZ/A	PRIOR	6.0	5.3	5.5	6.0	10.0
EMBARK	0.2SL	40 OZ/A	BOOT					
FERROMECC	L	5	BOOT					
ECO-N (24-0-0)	2.2L	0.2 LB N/M	PRIOR	8.0	7.0	6.3	10.0	10.0
EMBARK	0.2SL	40 OZ/A	BOOT					
FERROMECC	L	5	BOOT					
EMBARK	0.2SL	40 OZ/A	BOOT	7.0	6.6	6.6	10.0	10.0
SIGNATURE	80WG	4	BOOT					
EMBARK	0.2SL	40 OZ/A	BOOT	8.7	8.7	8.2	10.0	10.0
SIGNATURE	80WG	4	BOOT					
FERROMECC	L	5	BOOT					

Table 2. Ratings of the percent seedhead suppression of an annual bluegrass/creeping bentgrass putting green in 2006.

Treatment	Form	Rate oz/M	Timing	(%Suppression ¹)		
				5/4	5/17	5/26
EMBARK	0.2SL	40 OZ/A	BOOT	81.7bcd	78.3a-e	75.0a-d
EMBARK	0.2SL	40 OZ/A	BOOT	76.7de	85.0a-d	80.0abc
FERROMECC	L	5	BOOT			
EMBARK	0.2SL	40 OZ/A	BOOT	92.7abc	81.7a-e	70.0a-d
MACROSORB FOLIAR	L	4	BOOT			
EMBARK	0.2SL	40 OZ/A	BOOT	91.7abc	75.0b-e	75.0a-d
MACROSORB FOLIAR	L	8	BOOT			
EMBARK	0.2SL	40 OZ/A	BOOT	91.7abc	90.0abc	80.0abc
MACROSORB FOLIAR	L	4	BOOT			
FERROMECC	L	5	BOOT			
PROXY	2SL	5	BOOT/3 WAT	73.3def	60.0e	61.7cd
PRIMO	1MEC	0.125	BOOT/3 WAT			
MACROSORB FOLIAR	L	4	BOOT/3 WAT			
PROXY	2SL	3	BOOT/3 WAT	78.3cde	68.3cde	86.7abc
PRIMO	1MEC	0.125	BOOT/3 WAT			
ECO-N (24-0-0)	2.2L	0.2 LB N/M	BOOT/3 WAT			
EMBARK	0.2SL	20 OZ/A	BOOT	91.7abc	88.3a-d	88.3ab
PRIMO	1MEC	0.125	BOOT/3 WAT			
PROXY	2SL	5	BOOT/3 WAT			
EMBARK	0.2SL	40 OZ/A	BOOT	93.3ab	90.0abc	85.0abc
ECO-N (24-0-0)	2.2L	0.2 LB N/M	BOOT			
PROXY	2SL	5	BOOT	92.7abc	68.3cde	73.3a-d
PRIMO	1MEC	0.125	BOOT			
TRIMMIT	2SC	6 OZ/A	BOOT			
PROXY	2SL	5	BOOT	91.7abc	90.0abc	85.0abc
PRIMO	1MEC	0.125	BOOT			
TRIMMIT	2SC	6 OZ/A	BOOT			
ECO-N (24-0-0)	2.2L	0.2 LB N/M	BOOT			
PRIMO	1MEC	0.125	BOOT	97.0a	97.7ab	76.7abc
TRIMMIT	2SC	6 OZ/A	BOOT			
EMBARK	0.2SL	40 OZ/A	BOOT			
CHECK				0.0h	0.0g	0.0g
PRIMO	1MEC	0.125	BOOT	98.0a	99.0a	93.3a
TRIMMIT	2SC	6 OZ/A	BOOT			
EMBARK	0.2SL	40 OZ/A	BOOT			
ECO-N (24-0-0)	2.2L	0.2 LB N/M	BOOT			
TRIMMIT	2SC	6 OZ/A	BOOT	98.0a	97.7ab	80.0abc
EMBARK	0.2SL	40 OZ/A	BOOT			
TRIMMIT	2SC	6 OZ/A	BOOT	98.0a	97.7ab	88.3ab
EMBARK	0.2SL	40 OZ/A	BOOT			
ECO-N (24-0-0)	2.2L	0.2 LB N/M	BOOT			
BANNER MAXX	1.3EC	4	BOOT	53.3g	10.0g	0.0g
BANNER MAXX	1.3EC	4	BOOT	61.7fg	40.0f	26.7f
ECO-N (24-0-0)	2.2L	0.2 LB N/M	BOOT			
PROXY	2SL	5	PRIOR	91.7abc	88.3a-d	90.0ab
EMBARK	0.2SL	40 OZ/A	BOOT			
FERROMECC	L	5	BOOT			
PROXY	2SL	5	PRIOR	65.0efg	30.0f	33.3ef
TRIMMIT	2SC	6 OZ/A	BOOT			
ECO-N (24-0-0)	2.2L	0.2 LB N/M	BOOT			
PROXY	2SL	5	PRIOR/BOOT	86.7a-d	66.7de	68.3a-d
PRIMO	1MEC	0.125	BOOT			
PRIMO	1MEC	0.125	PRIOR	95.0ab	86.7a-d	78.3abc
EMBARK	0.2SL	40 OZ/A	BOOT			
FERROMECC	L	5	BOOT			
TRIMMIT	2SC	6 OZ/A	PRIOR	93.7ab	94.7ab	65.0bcd
EMBARK	0.2SL	40 OZ/A	BOOT			
FERROMECC	L	5	BOOT			
ECO-N (24-0-0)	2.2L	0.2 LB N/M	PRIOR	94.3ab	86.7a-d	83.3abc
EMBARK	0.2SL	40 OZ/A	BOOT			
FERROMECC	L	5	BOOT			
EMBARK	0.2SL	40 OZ/A	BOOT	97.0a	90.8abc	72.4a-d
SIGNATURE	80WG	4	BOOT			
EMBARK	0.2SL	40 OZ/A	BOOT	94.3ab	90.0abc	83.3abc
SIGNATURE	80WG	4	BOOT			
FERROMECC	L	5	BOOT			

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