

Evaluation of PGR Materials Applied to Fairway Height Creeping Bentgrass and Annual Bluegrass

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Introduction

This study was conducted on a mature stand of fairway height ‘Penneagle’ creeping bentgrass (*Agrostis stolonifera*) at the Valentine Turfgrass Research Center, Penn State University, University Park, Pa. The objective of the study was to determine the efficacy of Legacy plant growth regulator and Primo Maxx using discoloration, color, and quality ratings, measurements of plant height, and fresh weight foliar yields.

Methods and Materials

This study was a randomized complete block design with three replications. Treatments were applied on May 29 (MAY), June 25 (4 WAT), and July 25, 2008 (8 WAT) using a three foot CO₂ powered boom sprayer calibrated to deliver 80gpa using one, flat fan, 11008E nozzle at 40 psi.

The test site was maintained similar to that of a golf course fairway with respect to irrigation, fertilization and mowing. Turfgrass height was measured using a Turfcheck 1 prism. Clipping weights were taken once a week with an eleven bladed John Deere reel mower bench set to a height of 0.500” and modified to collect clippings.

Results and Discussion

Turfgrass discoloration and color were each rated eleven times during the study (Tables 1 and 2 respectively). There were some significant differences among treated and non-treated turfgrass over the time of the study. There was no time when any treated or non-treated turfgrass fell below a level of acceptable for discoloration or color during the study.

Turfgrass quality, Table 3, was rated eleven times. No treated or non-treated turfgrass fell below a level of 8.0 for quality, still well above the level of acceptability.

Turfgrass heights were rated eleven times and recorded in Table 4. Following a review of the data one can see significant differences from all treated turf on several rating dates. It is also apparent when there were no height differences between treated and non treated turfgrass, hence, the need for reapplications of materials. The time interval for material reapplication appears correct from these data.

Finally, data was collected eleven times to reveal any possible differences in fresh clipping weights (Table 5). On the June 5th and 12th rating dates all treated turfgrass significantly reduced the fresh clipping weights compare to non treated turfgrass. On the June 19th rating date, only the high rate of Legacy had significantly less clippings than non treated. On the July 9th rating date, all treated turfgrass, except the low rate of Legacy, significantly reduced clippings compared to non-treated. The last significant difference in fresh clipping weights was observed on the July 29th rating date, four days after an application of materials, when treated with Primo MAXX was compared to non-treated.

In general, these PGRs work extremely well and can be a part of almost any turfgrass management regime.

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Table 1. Turfgrass discoloration ratings on a scale of 0-10 where 0 = brown turf, 7= acceptable, and 10 = no discoloration, taken in 2008.

Treatment	Form	Rate oz/A	Timing	-----Discoloration ¹ -----					
				6/5	6/12	6/19	6/25	7/2	7/9
LEGACY	1.52MEC	8	MAY/4/8 WAT	10.0a	10.0a	10.0a	10.0a	10.0a	10.0a
LEGACY	1.52MEC	14	MAY/4/8 WAT	10.0a	10.0a	10.0a	10.0a	10.0a	10.0a
CHECK				8.5b	10.0a	10.0a	10.0a	10.0a	10.0a
LEGACY	1.52MEC	20	MAY/4/8 WAT	8.2b	8.2b	7.3b	10.0a	10.0a	10.0a
PRIMO MAXX	1MEC	11	MAY/4/8 WAT	9.5a	10.0a	10.0a	10.0a	10.0a	10.0a

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

Table 1 (continued). Turfgrass discoloration ratings on a scale of 0-10 where 0 = brown turf, 7= acceptable, and 10 = no discoloration, taken in 2008.

Treatment	Form	Rate oz/A	Timing	-----Discoloration ¹ -----				
				7/16	7/23	7/29	8/13	8/20
LEGACY	1.52MEC	8	MAY/4/8 WAT	10.0a	10.0a	10.0a	10.0a	10.0a
LEGACY	1.52MEC	14	MAY/4/8 WAT	10.0a	10.0a	10.0a	10.0a	10.0a
CHECK				10.0a	10.0a	10.0a	10.0a	10.0a
LEGACY	1.52MEC	20	MAY/4/8 WAT	10.0a	10.0a	10.0a	10.0a	10.0a
PRIMO MAXX	1MEC	11	MAY/4/8 WAT	10.0a	10.0a	10.0a	10.0a	10.0a

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

Table 2. Turfgrass color ratings on a scale of 0-9 where 0 = poor color, 6= acceptable, and 9 = dark green color, taken in 2008.

Treatment	Form	Rate oz/A	Timing	-----Color ¹ -----					
				6/5	6/12	6/19	6/25	7/2	7/9
LEGACY	1.52MEC	8	MAY/4/8 WAT	8.5a	8.8ab	9.0a	8.7a	9.0a	8.5b
LEGACY	1.52MEC	14	MAY/4/8 WAT	8.5a	8.8ab	9.0a	9.0a	9.0a	9.0a
CHECK				8.3a	8.5b	8.8a	8.7a	8.3b	8.2c
LEGACY	1.52MEC	20	MAY/4/8 WAT	8.0b	9.0a	9.0a	9.0a	9.0a	9.0a
PRIMO MAXX	1MEC	11	MAY/4/8 WAT	8.3a	8.7ab	8.7a	8.8a	9.0a	9.0a

Table 2 (continued). Turfgrass color ratings on a scale of 0-9 where 0 = poor color, 6= acceptable, and 9 = dark green color, taken in 2008.

Treatment	Form	Rate oz/A	Timing	-----Color ¹ -----				
				7/16	7/23	7/29	8/13	8/20
LEGACY	1.52MEC	8	MAY/4/8 WAT	8.7b	8.5bc	8.8a	9.0a	8.8a
LEGACY	1.52MEC	14	MAY/4/8 WAT	9.0a	8.5bc	9.0a	9.0a	9.0a
CHECK				8.2c	8.3c	8.5b	8.5b	8.5b
LEGACY	1.52MEC	20	MAY/4/8 WAT	9.0a	9.0a	9.0a	9.0a	9.0a
PRIMO MAXX	1MEC	11	MAY/4/8 WAT	9.0a	8.8ab	9.0a	9.0a	9.0a

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

Table 3. Turfgrass quality ratings on a scale of 0-9 where 0 = poor quality, 6= acceptable, and 9 = excellent quality, taken in 2008.

Treatment	Form	Rate oz/A	Timing	Quality ¹					
				6/5	6/12	6/19	6/25	7/2	7/9
LEGACY	1.52MEC	8	MAY/4/8 WAT	8.5a	8.5a	8.8a	8.5ab	9.0a	8.5a
LEGACY	1.52MEC	14	MAY/4/8 WAT	8.3a	8.7a	8.8a	8.5ab	8.8a	8.8a
CHECK				8.3a	8.3a	8.3ab	8.3b	8.2b	8.0b
LEGACY	1.52MEC	20	MAY/4/8 WAT	8.2a	8.0b	8.0b	8.8a	8.7a	8.7a
PRIMO MAXX	1MEC	11	MAY/4/8 WAT	8.3a	8.5a	8.2b	8.7ab	9.0a	8.8a

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

Table 3 (continued). Turfgrass quality ratings on a scale of 0-9 where 0 = poor quality, 6= acceptable, and 9 = excellent quality, taken in 2008.

Treatment	Form	Rate oz/A	Timing	Quality ¹				
				7/16	7/23	7/29	8/13	8/20
LEGACY	1.52MEC	8	MAY/4/8 WAT	8.5a	8.3ab	8.5a	8.5a	8.5ab
LEGACY	1.52MEC	14	MAY/4/8 WAT	8.7a	8.5a	8.8a	8.5a	8.8a
CHECK				8.0b	8.0b	8.5a	8.5a	8.2b
LEGACY	1.52MEC	20	MAY/4/8 WAT	8.8a	8.7a	8.8a	8.5a	8.8a
PRIMO MAXX	1MEC	11	MAY/4/8 WAT	8.8a	8.3ab	8.5a	8.5a	8.7a

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

Table 4. Height ratings (in inches) of fairway height creeping bentgrass and annual bluegrass, taken in 2008.

Treatment	Form	Rate oz/A	Timing	Height ¹					
				6/5	6/12	6/19	6/25	7/2	7/9
LEGACY	1.52MEC	8	MAY/4/8 WAT	0.37b	0.37bc	0.39a	0.44a	0.44b	0.41a
LEGACY	1.52MEC	14	MAY/4/8 WAT	0.36b	0.38bc	0.37a	0.43a	0.44b	0.38ab
CHECK				0.44a	0.46a	0.38a	0.46a	0.52a	0.38ab
LEGACY	1.52MEC	20	MAY/4/8 WAT	0.37b	0.32c	0.36a	0.44a	0.44b	0.37b
PRIMO MAXX	1MEC	11	MAY/4/8 WAT	0.38b	0.39b	0.39a	0.44a	0.43b	0.41ab

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

Table 4. Height ratings (in inches) of fairway height creeping bentgrass and annual bluegrass, taken in 2008.

Treatment	Form	Rate oz/A	Timing	Height ¹				
				7/16	7/23	7/29	8/13	8/20
LEGACY	1.52MEC	8	MAY/4/8 WAT	0.48a	0.46ab	0.42b	0.42ab	0.46a
LEGACY	1.52MEC	14	MAY/4/8 WAT	0.48a	0.47ab	0.44ab	0.44a	0.50a
CHECK				0.51a	0.49a	0.46a	0.46a	0.47a
LEGACY	1.52MEC	20	MAY/4/8 WAT	0.46a	0.49a	0.44ab	0.39b	0.50a
PRIMO MAXX	1MEC	11	MAY/4/8 WAT	0.44a	0.44b	0.42ab	0.42ab	0.48a

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

Table 5. Fresh clipping weight (grams) of creeping bentgrass and annual bluegrass, taken in 2008.

Treatment	Form	Rate oz/A	Timing	Weights ¹					
				6/5	6/12	6/19	6/25	7/2	7/9
LEGACY	1.52MEC	8	MAY/4/8 WAT	2.2b	3.8b	5.1ab	18.6a	64.6a	22.4ab
LEGACY	1.52MEC	14	MAY/4/8 WAT	2.5b	3.4bc	5.8ab	15.2a	50.8a	15.6b
CHECK				5.2a	8.5a	8.0a	14.2a	45.8a	29.3a
LEGACY	1.52MEC	20	MAY/4/8 WAT	1.7b	1.3d	2.7b	10.2a	62.1a	16.7b
PRIMO MAXX	1MEC	11	MAY/4/8 WAT	2.3b	1.9cd	5.6ab	15.4a	51.3a	15.7b

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

Table 5. Fresh clipping weight (grams) of creeping bentgrass and annual bluegrass, taken in 2008.

Treatment	Form	Rate oz/A	Timing	Weights ¹				
				7/16	7/23	7/29	8/13	8/20
LEGACY	1.52MEC	8	MAY/4/8 WAT	94.7a	14.2a	5.9ab	6.2a	13.6a
LEGACY	1.52MEC	14	MAY/4/8 WAT	74.2a	15.1a	6.5ab	9.7a	16.2a
CHECK				102.6a	13.3a	7.9a	10.2a	15.6a
LEGACY	1.52MEC	20	MAY/4/8 WAT	119.1a	17.2a	6.1ab	6.8a	18.1a
PRIMO MAXX	1MEC	11	MAY/4/8 WAT	89.3a	11.7a	4.9b	8.1a	15.4a

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