# Evaluation of Primo Maxx and Sprayer Nozzles on Fairway Height Creeping Bentgrass

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## Introduction

This study was conducted on a mature stand of 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 the efficacy of varying nozzle types (droplet size) with applications of Primo MAXX and using color ratings and measurements of plant height and foliar fresh weight yield.

## Methods and Materials

This study was a randomized complete block design with three replications. The plot size was 40 $ft^2$. All treatments were applied on June 7, June 29 and July 20, 2006 using a four foot battery powered walk behind boom sprayer calibrated to deliver 1 gpm using two nozzles of varying types/droplet size at 40 psi. The test site was maintained similar to that of a golf course fairway with respect to irrigation and mowing. The study received 0.5 lb N/M before the trial was initiated and 0.25 lb N/M every month thereafter from a liquid methylene urea source. Turfgrass height was measured using a Turfcheck 1 prism. Clipping weights were taken once a week with a John Deere walk behind reel mower bench set to 0.485" with an actual height of cut 0.500".

## Results and Discussion

Turfgrass color was evaluated nine times during the study (Table 1). At no time during the study did treated or non turfgrass color ratings fall below acceptable (7.0).

Turfgrass height was evaluated nine times during the study (Table 2). On the June 14, 21, July 5, and 13, 2006 rating dates, turfgrass treated with Primo MAXX at 0.5 oz/M using the Turf Jet ¼ TT J04 (XC) nozzles or XR Tee Jet XR11004 (M) nozzles was significantly shorter than non treated turfgrass. Additionally, on the July 13, 2006 rating date, turfgrass treated with Primo MAXX at 0.125 oz/M using the M nozzles was significantly shorter than non treated turfgrass. Finally, on the last rating date, August 16, 2006, turfgrass with Primo MAXX at 0.125 oz/M using the M nozzles had significantly higher turfgrass than non treated, possibly a rebound effect of the PGR.

Turfgrass fresh clipping yield was rated nine times during the study (Table 3). On the June 14, 21, 28, July 5, 13, 19, and 26, 2006 rating dates, turfgrass treated with Primo MAXX at 0.5 oz/M using the XC or M nozzles had significantly less fresh clipping yield than non treated turfgrass. On the June 14, 2006 rating date, turfgrass treated with Primo MAXX at 0.125 oz/M using the XC nozzles also had significantly less fresh clipping yield than non treated turfgrass. Finally, on the June 21, July 13, and 26, 2006 rating dates, turfgrass treated with Primo Maxx at 0.125 oz/M using the XC or M nozzles had significantly less fresh clipping yield than non treated turfgrass.

Generally, when Primo MAXX was applied at the 0.5 oz/M rate, fresh clipping yields were not significantly different when the XC nozzles were compared to the M nozzles. There were some rating dates when the XC or M nozzles were significantly different when compared to the VC nozzles with respect to the fresh clipping yield. When Primo MAXX was applied at the 0.125 oz/M rate there were no significant differences found when XC nozzles were compared to M nozzles.

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**Table 1.** Color ratings on a scale of 0-10 where 0 = brown, 7= acceptable, and 10 = dark green of PGR's applied to creeping bentgrass taken in 2006.

| Treatment | Form | Rate oz/M | 6-14 | 6-21 | 6-28 | 7-5 | 7-13 | 7-19 | 7-26 | 8-3 | 8-16 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| PRIMO MAXX TURF JET 1/4TT JO4 (2.8) XC[1] | 1MEC | 0.125 | 8.5 | 9.0 | 8.5 | 8.3 | 8.5 | 9.0 | 9.0 | 8.8 | 8.0 |
| PRIMO MAXX XR TEEJET XR11004 (2.8) M | 1MEC | 0.125 | 8.0 | 9.0 | 8.5 | 8.7 | 8.7 | 9.2 | 9.0 | 9.2 | 8.0 |
| CHECK | | | 7.5 | 8.5 | 8.0 | 8.2 | 8.2 | 8.7 | 8.8 | 8.2 | 8.0 |
| PRIMO MAXX AI TEEJET AI11003 (2.0) VC | 1MEC | 0.125 | 8.2 | 9.0 | 8.7 | 8.5 | 8.7 | 9.5 | 9.2 | 9.0 | 8.0 |
| PRIMO MAXX TURF JET 1/4TT JO4 (2.8) XC | 1MEC | 0.5 | 7.7 | 8.5 | 8.5 | 9.2 | 9.0 | 9.3 | 9.3 | 9.3 | 8.0 |
| PRIMO MAXX XR TEEJET XR11004 (2.8) M | 1MEC | 0.5 | 7.8 | 8.8 | 8.8 | 8.8 | 8.8 | 9.3 | 9.3 | 9.3 | 8.0 |

1 – Nozzle type (ground speed mph) droplet size where XC = extra coarse, VC = very coarse and M = medium.

**Table 2.** Height ratings (in inches) of PGR's applied to creeping bentgrass taken in 2006.

| Treatment | Form | Rate oz/M | 6-14 | 6-21 | 6-28 | 7-5 | 7-13 | 7-19 | 7-26 | 8-3 | 8-16 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| PRIMO MAXX TURF JET 1/4TT JO4 (2.8) XC[1] | 1MEC | 0.125 | 0.46ab[2] | 0.46ab | 0.69a | 0.59ab | 0.49a | 0.57a | 0.53ab | 0.47a | 0.44ab |
| PRIMO MAXX XR TEEJET XR11004 (2.8) M | 1MEC | 0.125 | 0.46ab | 0.45ab | 0.68a | 0.57ab | 0.43bc | 0.56a | 0.58a | 0.48a | 0.49a |
| CHECK | | | 0.53a | 0.53a | 0.73a | 0.63a | 0.49a | 0.61a | 0.52ab | 0.47a | 0.42b |
| PRIMO MAXX AI TEEJET AI11003 (2.0) VC | 1MEC | 0.125 | 0.48ab | 0.46ab | 0.68a | 0.57ab | 0.46ab | 0.56a | 0.53ab | 0.47a | 0.46ab |
| PRIMO MAXX TURF JET 1/4TT JO4 (2.8) XC | 1MEC | 0.5 | 0.42b | 0.39b | 0.60a | 0.51b | 0.43bc | 0.52a | 0.46b | 0.42a | 0.47ab |
| PRIMO MAXX XR TEEJET XR11004 (2.8) M | 1MEC | 0.5 | 0.45b | 0.42b | 0.66a | 0.52b | 0.41c | 0.54a | 0.47b | 0.40a | 0.44ab |

1 – Nozzle type (ground speed mph) droplet size where XC = extra coarse, VC = very coarse and M = medium.

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

**Table 3.** Fresh clipping weight (grams) of creeping bentgrass taken in 2006.

| Treatment | Form | Rate oz/M | 6-14 | 6-21 | 6-28 | 7-5 | 7-13 | 7-19 | 7-26 | 8-3 | 8-16 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| PRIMO MAXX TURF JET 1/4TT JO4 (2.8) XC[1] | 1MEC | 0.125 | 4.0b[2] | 5.2bc | 48.8ab | 11.3ab | 3.6bc | 10.9ab | 5.6b | 8.5a | 18.1a |
| PRIMO MAXX XR TEEJET XR11004 (2.8) M | 1MEC | 0.125 | 3.7bc | 4.1bcd | 49.1ab | 10.7ab | 2.9bc | 11.8a | 4.2bc | 7.1a | 14.3a |
| CHECK | | | 5.9a | 11.9a | 70.0a | 16.1a | 7.4a | 13.9a | 7.8a | 7.3a | 13.1a |
| PRIMO MAXX AI TEEJET AI11003 (2.0) VC | 1MEC | 0.125 | 4.8ab | 6.3b | 51.5ab | 11.8ab | 5.4ab | 12.4a | 4.8b | 7.7a | 13.3a |
| PRIMO MAXX TURF JET 1/4TT JO4 (2.8) XC | 1MEC | 0.5 | 2.3c | 2.3d | 32.5b | 6.0b | 1.5c | 6.8c | 2.9c | 3.6a | 16.5a |
| PRIMO MAXX XR TEEJET XR11004 (2.8) M | 1MEC | 0.5 | 2.4c | 3.0cd | 44.9b | 6.7b | 2.7bc | 8.2bc | 2.9c | 4.0a | 14.1a |

1 – Nozzle type (ground speed mph) droplet size where XC = extra coarse, VC = very coarse and M = medium.

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