

Stop #8b: Evaluation of Plant Growth Regulators (PGRs) on Bermudagrass Turf

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Objectives:

These studies were conducted to quantify effects of two plant growth regulators (PGRs) on growth regulation, injury and visual turfgrass quality on bermudagrass (*Cynodon* spp.) maintained as a golf course fairway or athletic field.

Materials and methods:

The study was conducted on mature 'Princess 77' (Plot 12 E 19 E and Plot 12 E 11 S) bermudagrass turf on a Hanford fine sandy loam. Turf was mowed 3 days/wk at 0.5 inches and received 0.5 lbs N/1000 ft² every 6 weeks for a target of 5 lbs N/1000 ft²/yr.

Plant growth regulator (PGR) treatments were applied every 14 days beginning on July 22, 2018 (12 E 19 E) and August 15, 2018 (12 E 11 S) for a total of 4 applications. Treatments were applied using a CO₂-powered backpack sprayer equipped with TeeJet 8002VS nozzles calibrated to deliver 1 gallon/1000 ft². Experimental design was a randomized block with 4 replications. Plot size was 4x10 ft with 2-ft alleys.

Plots were evaluated for visual turf quality (1-9; 9=highest), visual green color intensity (1-9; 9=highest), injury caused by treatments (0-10; 10=highest), NDVI and DIA on biweekly basis starting from July 17, 2018 (12 E 19 E) and August 13, 2018 (12 E 11 S). In addition, clipping yield collection was performed every two weeks, before treatments were applied.

Results:

No significant differences were found among the treatments in terms of visual turf quality, visual green color intensity, NDVI and DGCI or turf cover (DIA) in both trials by September 5, 2018 (Tables 1 and 2). In general, visual turf quality, color and NDVI increased in both studies since the time of initial applications. This was mostly due to improved maintenance practices on those plots.

On the other hand, in the trial conducted on 12 E 19 E plot (Table 3), a significant decrease in clipping yield production was shown with Primo Maxx on August 13, 2018 (4 WAIT).

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Table 1. Treatments evaluated in Plant Growth Regulators (PGRs) trials. Riverside, CA, 2018.

No.	Treatment	Active ingredient	Company	Rate (oz/A)	Timing*
1	Untreated Control	-	-	-	-
2	Anuew	prohexadione-calcium	NuFarm	12	ABCD
3	Anuew	prohexadione-calcium	NuFarm	24	ABCD
4	Primo Maxx	trinexapac-ethyl	Syngenta	11	ABCD

***Timing (12 E 11 S)**

A	8/15/2018
B	8/29/2018
C	9/12/2018
D	9/26/2018

***Timing (12 E 19 E)**

A	7/22/2018
B	8/1/2018
C	8/15/2018
D	8/29/2018

Plant Growth Regulators (PGRs) Trials Plot Plans

(12 E 11 S) ↑N

101	102	103	104	201	202	203	204
Trt 1	Trt 2	Trt 3	Trt 4	Trt 2	Trt 1	Trt 4	Trt 3

301	302	303	304	401	402	403	404
Trt 3	Trt 4	Trt 1	Trt 2	Trt 4	Trt 3	Trt 2	Trt 1

(12 E 19 E) →N

204	203	202	201	104	103	102	101
Trt 3	Trt 1	Trt 2	Trt 4	Trt 4	Trt 3	Trt 2	Trt 1

S

404	403	402	401	304	302	303	301
Trt 1	Trt 2	Trt 4	Trt 3	Trt 2	Trt 4	Trt 1	Trt 3

Table 2. Effect of plant growth regulators (PGRs) on visual turf quality (1-9; 9=highest), injury caused with treatments (0-10; 10=highest), visual green color intensity (1-9; 9=highest), NDVI and clipping yield (CY; g) of bermudagrass on 12 E 11 S plot. Riverside, CA, 2018.

No.	Treatment	Quality 08/13	Quality 08/27	Color 08/13	Color 08/27	NDVI 08/13	NDVI 08/27
1	Untreated Control	4.3*	6.0*	5.5*	6.5*	0.63*	0.79*
2	Anuew (12 oz/A)	4.8	6.5	6.0	6.3	0.65	0.78
3	Anuew (24 oz/A)	4.5	6.8	5.8	6.5	0.65	0.79
4	Primo Maxx (11 oz/A)	3.8	6.5	5.8	6.3	0.61	0.78

No.	Treatment	CY 08/13	CY 08/27	Injury 08/27
1	Untreated Control	8.6*	7.40*	0.3*
2	Anuew (12 oz/A)	7.1	6.82	0.3
3	Anuew (24 oz/A)	11.4	7.35	0.3
4	Primo Maxx (11 oz/A)	10.6	7.28	0.3

*Means not followed by any letter in a column are not significantly different (P=0.05)

Table 3. Effect of plant growth regulators (PGRs) on visual turf quality (1-9; 9=highest), injury caused with treatments (0-10; 10=highest), visual green color intensity (1-9; 9=highest), NDVI and clipping yield (CY; g) of bermudagrass on 12 E 19 E plot. Riverside, CA, 2018.

No.	Treatment	Quality 07/17	Quality 08/27	Color 07/17	Color 08/27	NDVI 07/17	NDVI 08/27
1	Untreated Control	5.0*	6.25*	5.3*	6.5*	0.57*	0.78*
2	Anuew (12 oz/A)	4.8	6.25	5.0	6.5	0.55	0.77
3	Anuew (24 oz/A)	4.5	7.00	4.8	7.5	0.58	0.79
4	Primo Maxx (11 oz/A)	4.8	6.75	4.8	7.0	0.56	0.77

No.	Treatment	CY 07/17	CY 08/13	Injury 07/30	Injury 08/27
1	Untreated Control	2.60	3.09 A**	0.3*	0.0*
2	Anuew (12 oz/A)	1.65	2.18 A	0.5	0.3
3	Anuew (24 oz/A)	2.15	1.84 AB	1.0	0.3
4	Primo Maxx (11 oz/A)	2.11	0.50 B	0.8	0.8

*Means not followed by any letter in a column are not significantly different (P=0.05)

**Means followed by the same letter in a column are not significantly different (P=0.05)