

Stop #7: Evaluation of Products for Water Stress Management Using a Linear Gradient Irrigation System (LGIS)

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In the Southwest and other areas of the United States, irrigation is necessary to maximize turf quality throughout the growing season. With the concern of water shortages rising, water conservation has become a major topic within the turf industry. Using a Linear Gradient Irrigation System (LGIS), researchers have put forth a significant effort to evaluate turfgrass species and germplasm for drought resistance (Qian 1999). However, there has been little investigation using LGIS to evaluate the effectiveness of chemical treatments to manage water stress on turf.

This study is assessing 11 different chemical treatments for water stress management of bermudagrass under variable rates of irrigation using a LGIS. The LGIS allows us to achieve multiple levels of irrigation while running a single irrigation program. The system is comprised of a single line of 13 valve-in-head sprinklers spaced at 16 ft, one-third of the normal sprinkler spacing. Each head is operated individually to prevent stream collision from adjacent sprinklers. The experiment has been established as a modified strip-plot design with chemical treatments (T) as main plots, irrigation levels (IL) as strips, and the combination of T and IL as subplots. Main plots are positioned perpendicular to the irrigation line to achieve the irrigation gradient. Based upon previous research conducted by Banuelos et. al. (2011) our target irrigation levels to evaluate are 85 to 55% of daily reference evapotranspiration (ET_o).

No.	Treatment	Dosage (oz./M)	Interval (Days)
1	UCR006P	5.88	14
2	UCR006P	7.35	14
3	UCR006P	8.82	14
4	UCR006P	11.75	14
5	Recovery Rx	5.00	14
6	PK Plus	6.00	14
7	Kelplex	2.00	7
7	Ultraplex	4.00	7
8	Revolution	6.00	28
9	Neptune	6.00	28
10	Aquaplus	3.00	28
11	Primo Maxx	0.30	14
12	Control		

Cultivar: Tifway II sodded 8/07/2012

Fertility: 1.3 lbs N/M 8/17/2012

LGIS Initiated: 9/04/2012

Key Objectives:

- 1.) Establish which product(s) reduce stress under drought conditions.
- 2.) Determine effective irrigation and chemical management practices to reduce water use.
- 3.) Evaluate the ability of products to maintain acceptable turf quality under reduced water use.
- 4.) Contribute to the water conservation efforts of the turfgrass industry.

*all treatments applied in a carrier volume of 2 gal/M.

References:

- Banuelos, J.B., et.al. "Deficit Irrigation of Seashore Paspalum and Bermudagrass" Agronomy Journal 103.6 (2011): 1567-1577.
- Qian, Y.L. and M.C. Engelke. "Performance of Five Turfgrasses under Linear Gradient Irrigation" HortScience 34.5(1999): 893-896.