

Fertility and Traffic on Eight Bermudagrass Cultivars in Florida

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Objectives:

1. Characterize a general response of these bermudagrass genotypes (both seeded and vegetative) to varying combinations of N fertility, traffic, and dry-down treatments
2. Establish appropriate fertility recommendations for each of the genotypes studied under high- and low-traffic conditions and during periods of drought stress.
3. Identify those cultivars that are best able to maintain quality under conditions of abiotic stress (nutrients, traffic and drought).

Start Date: 2009

Project Duration: one year

Total Funding: \$5,000

This project compares fertility, traffic, drought survival, and divot recovery of eight bermudagrass genotypes. Included genotypes are commercial cultivars 'Tifway', 'TifSport', 'Celebration', 'Floratex', 'Riviera', and three University of Georgia experimental lines (Hybrid #1, St-5, and T-11).

In Florida there is interest in using new cultivars of bermudagrass on golf course tees and fairways. As an example, 'Celebration' is increasingly being utilized for new courses and renovations. There is limited information comparing the performance of 'Celebration' to standards such as 'Tifway'. Therefore, information involving fertility, traffic, drought response, divot recovery, and their interaction would benefit golf course superintendents trying to make appropriate decisions regarding cultivar selection.

Plots are being evaluated for genetic color, density, turf quality, winter color, thatch accumulation, divot recovery, and drought survival (dry-down and recovery). Artificial traffic is applied to a portion of the plot using a modified Cady traffic simulator that was constructed using a Ryan GA-30 aerifier. Divots are removed from the plots using a divot machine constructed from a modified clay pigeon thrower.

This study is being conducted at the University of Florida Plant Science Research and Education Unit located in Citra, Florida. The plots are approximately three-years-old, having been established in 2006. Main plots (cultivar) are laid out in a randomized complete block (RCB) design with three replications with each main plot being approximately 14' x 14' in size. Each cultivar is split into traffic and

non-traffic plots 14' x 7' in size. Each traffic treatment is split into three nitrogen rates (0.5, 0.75, and 1.0 lbs/1000 ft²) applied as a Harrell's 15-5-15 turf fertilizer blend with 50% slow-release nitrogen once every two weeks. Treatments were initiated on August 1, 2009 and continued through November 23, 2009 with visual quality and photographs for digital image analysis being collected

once every two weeks. Initial drought response observations are expected to be conducted during the 2010 growing season.

Initial results indicated no difference in turf visual turf quality, color, or density as a result of nitrogen rate. This is supported by digital image analysis which also indicated no relationship between nitrogen rate and percent green cover or digital green color index values. This indicates that the current nitrogen rates are too low and/or too narrow in range to establish differences in growth response.

Traffic treatments reduced green cover by 10-20% in each cultivar at the end of the first season of data collection. Comparing overall turfgrass visual quality along with density and digital green color index as calculated through image analysis, we observed that Hybrid 1, ST5, and 'Celebration' consistently yielded the best visual quality ratings when subjected to traffic stress. 'Celebration' consistently



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produced the darkest green color, while 'Celebration', ST5, Hybrid 1, and T11 maintained the highest plant density under weekly traffic treatments.

When considering traffic tolerance and divot recovery, the cultivars consistently yielding the quickest divot recovery and best traffic tolerance were Hybrid 1, ST5, 'Celebration', and T11.

Summary Points

- Nitrogen rates of 0.5, 0.75, and 1.0 lb N/1000 ft² are too narrow in range to result in N-rate treatment differences
- 'Celebration' has the darkest genetic color as supported by visual ratings and DGCI analysis
- 'Celebration', ST5, Hybrid 1, and T11 maintained the highest plant density of the eight cultivars after 14 weeks of weekly traffic treatments.
- Cultivars that performed well under traffic stress also recovered most quickly from divot damage.