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 and traffic.
2. Establish appropriate fertility recommendations for each of the genotypes studied under high- and low-traffic conditions.
3. Identify those cultivars that are best able to maintain quality under conditions of abiotic stress (nutrients and traffic).

Start Date: 2009
Project Duration: 2 years
Total Funding: $10,000

This project compares fertility, traffic tolerance, and divot recovery of eight bermudagrass genotypes. Included genotypes are commercial cultivars 'Tifway', 'TifSport', 'Tifgrand', 'Celebration', 'Floratex'. 'Riviera', and two University of Georgia experimental lines (Hybrid #1 [seeded], and 'T-11'). Plots were evaluated for genetic color, density, turf quality, winter color, and divot recovery. Artificial traffic was applied to a portion of the plot weekly using a modified Cady traffic simulator that was constructed using a John Deere Aercore 800. Divots were removed from the plots using a divot machine constructed from a modified clay pigeon thrower.

Main plots (cultivar) were laid out in a randomized complete block (RCB) design with three replications with each main plot being approximately 14 ft x 14 ft in size. Each cultivar was split into traffic and non-traffic plots 14 ft x 7 ft in size. Traffic treatments were applied weekly during the study period. Each traffic treatment was split into three nitrogen rates (0.5, 0.75, and 1.0 lb/1000 ft^2) applied as a Harrell's 15-5-15 turf fertilizer blend with 50% slow-release nitrogen once every two weeks. Divots were removed from each plot and tracked through recovery on three different dates in 2010.

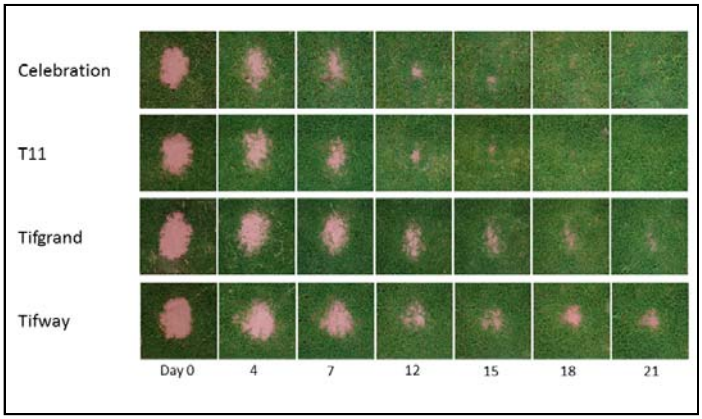
Not a single cultivar performed the best in every aspect of evaluation. Instead, several cultivars performed well in multiple areas of assessment. 'Celebration', 'Hybrid 1', 'T11', and 'TifGrand' all performed well under both traffic and no-traffic treatments. 'Celebration' produced high visual ratings, consistently above the minimum level of acceptability, and yielded the darkest green color of any of the cultivars evaluated.

When evaluating cultivars for percent cover, all cultivars began the season in the same statistical category. 'Hybrid 1' and 'TifGrand' performed the best in both years of the study while 'Celebration', 'Riviera', and 'T11' performed well in one of the two years. 'Tifway', 'TifSport', and 'Floratex' consistently rated in the lowest statistical category for percent coverage. Once traffic damage began to accumulate, these cultivars could not recover fast enough and percent cover greatly declined. In 2009, plots receiving simulated traffic treatments declined by up to 20%.

Changes in caused by traffic were evaluated by calculating delta values between traffic treatments and comparing cultivar and fertility effects. It was found that in 2009, cultivars 'Hybrid 1', 'Riviera', and 'T11' were affected the least by traffic over all evaluations. The change in percent cover, color, and visual ratings were not greatly affected by traffic treatments in these cultivars. 'Celebration' and 'Tifsport' were affected the most by traffic as shown by their reduction in color, quality, and density of these cultivars as a result of traffic stress.

When evaluated for divot recovery, 'T11' performed the best of all bermudagrass cultivars, and was in the top statistical category on all but one collection date. 'T11' is a promising experimental cultivar, exhibiting a high growth rate even when subjected to traffic stress. 'Celebration' was the fastest recovering commercially available cultivar in this study, typically reaching 50% recovery by day 7, and by day 15 was 95% recovered in these growing conditions. 'Floratex' did well in early and midsummer, but divot recovery slowed in late summer, suggesting a decrease in growth rate. Seeded cultivars 'Riviera' and 'Hybrid 1' performed similarly reaching 50% recovery in an average of 8 to 10 days and 95% recovery in 16 days.

'Tifgrand', 'Tifway', and 'Tifsport' recovered slowly from divot damage, taking an average of 10 days to reach 50% recovery and about 18 days to reach 95% recovery.



'Celebration' was the fastest recovering commercially available cultivar from divot damage in this study, typically reaching 50% recovery by day 7, and by day 15 was 95% recovered in these growing conditions.

Summary Points

- Nitrogen rates of 0.5, 0.75, and 1.0 are too narrow in range to result in N-rate treatment differences
- 'Celebration' has the darkest genetic color as supported by visual ratings.
- 'Celebration', 'ST5', 'Hybrid 1', and 'T11' maintained the highest plant density of the eight cultivars after two seasons of weekly traffic treatments.
- 'Celebration', 'Floratex', and 'T11' consistently recovered from divot injury 3 to 4 days faster than 'Hybrid 1', 'Riviera', 'Tifgrand', 'Tifway', or 'Tifsport'.