

Physiological Basis for Selection of Bentgrasses With Superior Drought Resistance

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Goals:

- Determine the water balance in creeping bentgrasses with performance in adverse environments.
- Assess management systems for the incorporation of diverse bentgrass germplasm into existing bentgrass putting greens to improve their stress resistance and functional quality.

Creeping bentgrass provides a premier surface for golf course putting greens. A preference for this species and increasing demands by the public for quality sports turf surfaces have fueled the expansion of bentgrass use throughout the deep South, well beyond the area of adaptation for this species. The expansion of bentgrasses throughout this environmentally stressful area has out-paced development of stress tolerant bentgrass cultivars.

Irrigation and syringing are used on bentgrasses throughout the South to prevent moisture and heat stress. Golf course superintendents pay close attention to soil conditions to ensure adequate soil moisture levels. However, shallow root systems and high evaporative demand frequently expose bentgrass putting greens to physiological drought when atmospheric demand exceeds the turgor maintenance capability of bentgrass. This in turn predisposes bentgrass to heat stress by limiting or even terminating the normal dissipation of thermal energy by evapotranspirational cooling.

Two key individuals were added to this project since July. Mr. David Gilbert, a Master's Degree candidate in the Soil & Crop Sciences Department, will evaluate the water balance in 20 cultivars and experimental lines of creeping bentgrass. The second key individual is Mr. Gene Taylor, a Ph.D. candidate in the Soil & Crop Sciences Department. His research responsibilities will emphasize the genetic links to water stress resistance mechanisms in an elite population of creeping bentgrass. Mr. Taylor will conduct allied studies to assess the response of creeping bentgrass root development to temperature.