Development of Stress Tolerant Seashore *Paspalum* for Golf Course Usage

Dr. Ron Duncan

University of Georgia

Goals:

- *Establish an extensive collection of genetic material.*
- *Improve the adaptability of the species with special emphasis on: acid soil stress tolerance with deep rooting and root plasticity in high bulk density (compacted) soil, winter hardiness to expand its adaptation zone, and wear resistance that will meet or surpass golf course requirements.*

Cooperators:

B.J. Johnson
Kris Braman
Wayne Hanna
Bob Carrow

A new green, a new tee, and two new fairways were built during 1996 to streamline initial evaluation of *Paspalum* ecotypes and provide larger sites for additional evaluation of putting green, tee and fairway types. Initial evaluation is on a green with mowing height 1/8 to 3/16 of an inch, which identifies fast-growing tee/fairway types and slow-growing putting green types. Variations in slow release and fast-release nitrogen fertilizers, irrigation, and verticutting were used to establish the new tee and new green from stolons.

Two putting green types (AP 10, AP 14) and one fairway type (PI 509018-1 from Argentina) are currently being evaluated on golf courses. Three courses in Atlanta—The Standard Club, Berkeley Hills CC, and Atlanta National CC—are evaluating the Paspalums; two in Texas—Kings Crossing G&CC in Corpus Christi and The Cliffs near Graford; and one in California—Tony Lema GC in San Leandro.

Studies are continuing using simple sequence repeats or microsatellites to genetically profile *Paspalum* ecotypes. Preemergent, postemergent and establishment herbicide strategies are being investigated in cooperation with B. J. Johnson. Field mole cricket evaluations are being conducted at Tifton, GA, in collaboration with Kris Braman and Wayne Hanna. Bob Carrow has refocused his research program to assess stress tolerance mechanisms in *Paspalum*. The three ecotypes being evaluated on golf courses have been planted in Lincoln, NE, Manhattan, KS, Stillwater, OK, and Dallas,

TX to determine their cold thermal threshold winter hardiness. They have survived - 8° F at Blairsville in North Georgia.

Somaclonal variation resulting from tissue culture regeneration has resulted in over 100 new selections from among 5,500 regenerated plants, with improvements in genetic color (darker green), spread (growth rate), density (short internode length, finer leaf texture) and winter hardiness (6° C lower cold thermal threshold).

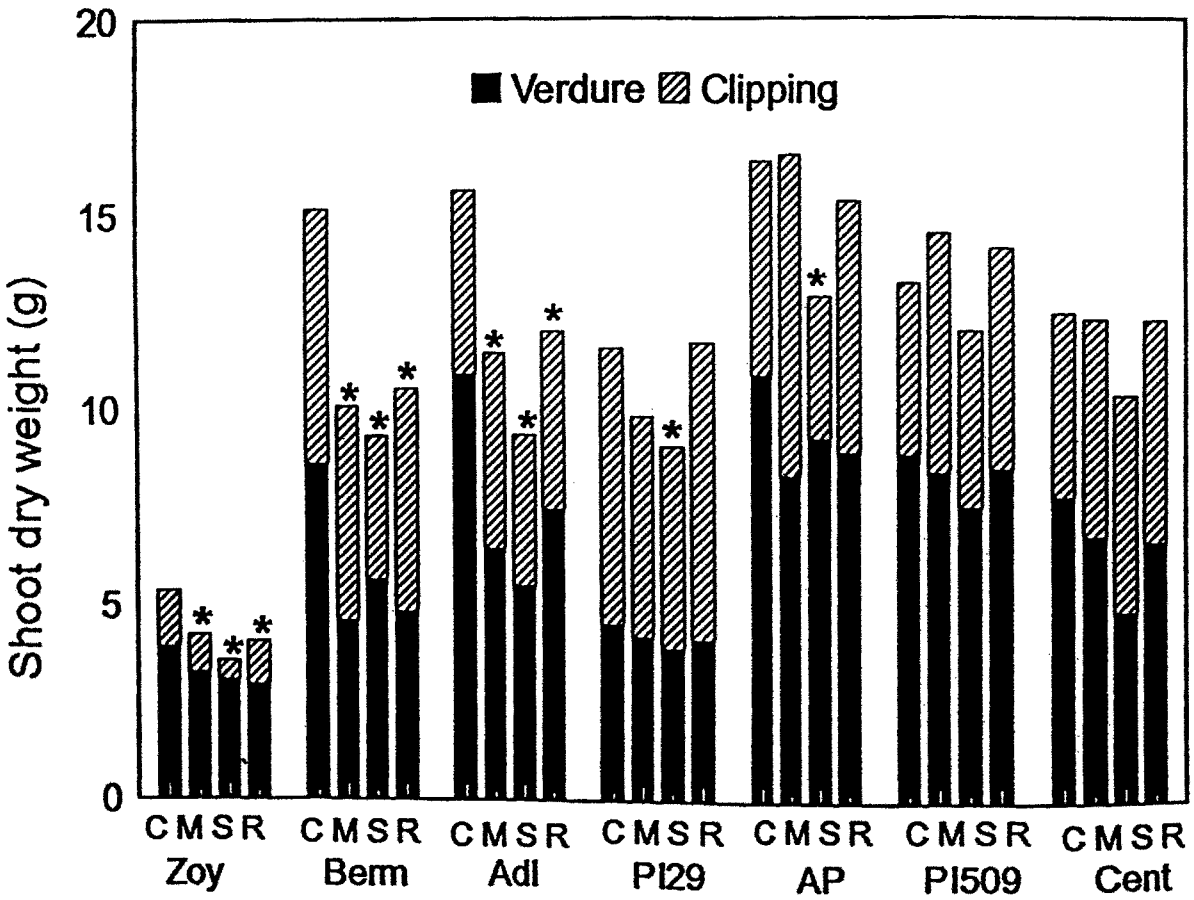

Figure 2. Shoot dry matter production, including clippings and verdure, of seven turfgrasses under various soil moisture conditions: control (C); moderate stress (M); severe stress (S); and rewatering (R). Bars marked with a '*' indicate significant differences from the respective controls base on a $LSD_{0.05}$ test. The seashore *Paspalums* in the study included Adl (ADALAYD), PI 29 (PI 299042), AP (AP14) and PI509 (PI509018). Other grass species included were Zoy (Emerald zoysiagrass), Berm (Common bermudagrass) and Cent (TIFBLAIR Centipedegrass).