Development of Stress Tolerant Seashore Paspalum for Golf Course Usage

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Goals:

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

Seashore paspalum, *Paspalum vaginatum* Swartz, is a low-input, environmentally compatible turfgrass with salt, drought, and waterlogging tolerance. It can withstand a pH range from 4.0 to 9.8. Additional common names include sand knotgrass, sheathed paspalum, siltgrass, salt jointgrass, seaside millet, saltwater couch, and biscuitgrass. Seashore paspalum is a perennial, warm-season, semi-aquatic diploid (2n=20) grass with an asexual mode of reproduction. It is native to tropical and subtropical areas, including North and South America, Africa, Australia, New Zealand, the Caribbean, and Central America. It is normally found along coastal regions.

A total of 66 cultivars have been collected thus far: 4 from Africa, 7 from Argentina, 1 from Australia, 4 from the Caribbean, and 50 from the United States. Turf texture ranges from very fine to intermediate, to coarse, to very coarse ornamental types.

Various cultivars have been evaluated for adaptation to soil pH ranging from 3.9 to 6.5. Most genotypes have no trouble rooting in the high bulk density, low organic matter, acid red clay soils of Georgia.

Cold tolerance is the limiting characteristic for movement of the turf species inland. The documented low temperature tolerance is 17 to 18^{0}F. Field evaluation of 25 cultivars during the 1992-1993 winter at Griffin, GA produced two cold-shock recovery cycles of 16^{0}F at one site, and one 12^{0}F shock at another site. One cultivar was killed; two were damaged, but recovered; all others were not affected. Another field test has been planted at Blairsville in Northern Georgia

(Appalachian Mountains) at an elevation of 1,100 feet. Temperatures commonly reach 0^0F during the winter at this location.

Management studies have been initiated for paspalum turf quality on putting greens and fairways. Herbicide evaluations on judiciously managed paspalum turf were established in 1993. Armyworm moth studies found significant differences among cultivars for either ovipositional (i.e., egg laying) preference or larval survivability. Tawny and southern mole crickets caused a significantly greater reduction in turf quality, compared to unifested controls, with some variation among the cultivars.

Tissue culture regeneration, RFLP and RAPD evaluations are underway to determine relatedness among the 66 paspalum ecotypes. Flow cytomerty analyses of the DNA content among *Paspalum* species and among seashore paspalum genotypes is providing information for future inter- and intraspecific breeding studies.

Some seashore paspalum cultivars require a temperature-induced trigger (cold shock $\leq$ 60°F) or a photoperiod-sensitivity trigger ($\leq$11 hours light or $\geq$16 hours light), or both, to initiate flowering. Other genotypes are photoperiod and temperature insensitive. Both traditional and biotechnological techniques are being used to improve winterhardiness and seed production capabilities of this species.