

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

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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.*

A total of 5,660 plots of *Paspalum* have been established in Georgia ranging from mother nursery and increase plots of about 500 ft² each to 2 ft x 2 ft spaced plants. Of this total, 1,134 plots are planted at Blairsville (altitude 1,530 ft - 34° 50.44N, 83° 55.80W) for the ultimate field evaluation for cold hardiness testing.

Collection trips were made to Southern California, Alabama, and Florida to obtain additional *Paspalum*. Up to 15 possible ecotypes have been added to the 300-ecotype collection of *Paspalums*.

Mowing height ranges from 5/32 of an inch for putting green tests to 1/2 an inch for fairway evaluation (most plots). Mowing heights were raised to one inch going into the winter months. Ongoing studies involve greens evaluation, establishment from sod or stolons utilizing mycorrhizal enhancement, herbicide management, traffic-wear-fertility interactions, overseeding, and insect resistance for mole cricket and fall armyworm.

Eighteen *Paspalums* and TIFGREEN were evaluated on 10 ft. by 10 ft. plots throughout the growing season. Mowing height was reduced from 3/4 in. to 5/32 in. gradually over the summer. The close mowing was instrumental in identifying potential candidates for additional putting green evaluations as well as fairway types.

Dollar spot appeared on the putting green test after mowing heights reached a 1/4 of an inch. Natural infection in combination with additional inoculations provided constant pressure on the green throughout the summer. No fungicides were applied during

the year. With the exception of a selection from Argentina, all plots suffered dollar spot infestations ranging from 10 to 90 percent of the plot area. From this test, two ecotypes (Argentina selection and an Aldine Pines selection) will be increased for testing on golf courses in the Caribbean region and southern U.S.

Approximately 775 hybrid seedlings were space-planted during the summer of 1995 for evaluation. Seed from 61 polycross combinations and other field plots were collected in November 1995. Somaclonal variation resulting from tissue culture is being utilized as a selection tool, especially for the finer-textured *Paspalums*. A total of 3,640 regenerated plants have been planted in the field and are maintained at a ½ inch mowing height. Forty finer-textured selections have been selected from tissue culture regenerants. Somaclonal variation also exists for genetic color, growth rate, and winter hardiness.

A cold temperature chamber has been used to induce cold shock (-9C) and recovery tests on several *Paspalum* ecotypes. In conjunction with electrolyte leakage tests, the relative cold threshold of 17° F (-8C) has been verified. Field evaluations at Blairsville, Georgia have indicated that some *Paspalums* survived -3° F (-18C) during the 1993-1994 winter and 2° F (-17C) during the 1994-1995 winter. The cold chamber and field evaluations suggest sufficient variability exists among the ecotypes in the current collection for improvement in winter hardiness.