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USGA GREEN SECTION

1983 SUMMARY OF RESEARCH REPORTS

R=70605

GEORGIA COASTAL PLAIN EXPERIMENT STATION - Dr. Glenn W. Burton, Project Leader

Funds Granted $5000 — Bermudagrass varietal improvement for golf through selection and breeding for the South and the transition zone with emphasis on winter hardy cultivars.

The highlight of the 1983 turf research program was the release of Tifgreen II, a radiation-induced mutant that was made in 1971. Years of testing at Tifton and elsewhere warranted its release as a new variety similar to Tifgreen but superior under low maintenance. These tests proved that it is more resistant than Tifgreen to nematodes, mole crickets, and weed invasion.

Tifgreen II contains less of the red basic plant color that makes bermudagrass turn reddish-brown at low temperatures. This gives it a lighter green color and also will improve its color in the fall and winter when not killed by frost. It may reduce the need for overseeding. Its greatest advantage is its improved spring recovery demonstrated very well after the 1981-1982 winter. All of these improvements in Tifgreen II grown under low maintenance proves that it is possible to breed varieties of species that will be superior to presently used varieties under low maintenance. This confirms one of the Green Section's new research objectives.

To test winter hardiness, 30 selections of the best bermudagrasses in North Carolina were established in the spring of 1982. A survey of those plots in late June, 1983 showed that many had survived and that Tifgreen II was doing as well if not better than all of the others. However, in future winter hardiness tests, the strip to be planted on a fairway should first have all other grasses killed with Roundup before planting to the bermudagrasses.

Several of the hybrid bermudas planted at Rutgers University in the spring of 1979 are still alive and making good turf. These have been mowed regularly and have survived the same winter that killed them at Pine Valley. This suggests that the heavier soil at Rutgers may have been a factor in their better survival.

The breeding program objective at Tifton has been to breed a high quality bermudagrass triploid with the hardiness of our best Berlin selections which survived very well at Pine Valley when the others died. A Cynodon transvaalensis with equal hardiness crossed with these bermudas should give us such superior triploids. Attempts to get these cold-hardy Cynodon transvaalensis plants from South Africa have failed to-date. Dr. James Watson reports that Cynodon transvaalensis is probably scarce and may be hard to find. A special trip by some one to South Africa to search for them may be required.

Dr. Burton has collected ten different accessions of the eight chromosome Cynodon transvaalensis. Most of these have been in the bermudagrass germ plasm nursery and survived many winters at Tifton. One of them came from Arizona. These varieties have been increased and placed at Rutgers University and Michigan State University. If one of them proves to be winter hardy, it will be crossed with the hardy Berlin bermuda selections and the bermudagrass breeding program will be on its way to realizing its latest objective.

R=70606

MISSISSIPPI STATE UNIVERSITY - Dr. Jeffrey V. Krans, Project Leader

Funds Granted $2500 In vitro selection of heat tolerant creeping bentgrass.

Since the initiation of this research in 1978, progress has been made toward the recovery of improved heat tolerance in creeping bentgrass. Previous research has led to the elucidation of media and environmental conditions for manipulation of creeping bentgrass in tissue culture, development of a mutant cell selection scheme which isolates and allows recovery of heat tolerant cell lines and collection of 20 variant plants of creeping bentgrass with improved heat tolerance.

Research over the past six months has produced and evaluated 20 heat tolerant variants recovered via tissue culture techniques. Currently, 5 to 10 plants per month are being isolated and transferred to the field for turf quality evaluation and persistence. These plants show little difference in appearance to seed-propogated Penncross. Several heat tolerant selections of creeping bentgrass which were produced in the fall of 1982 survived the summer of 1983 in good condition without fungicide treatments. These, plus future selections, should provide a sufficient number from which to evaluate and choose improved heat tolerant variants. The final number of selected plants for field observation will be 70 to 80. By March, 1984 this number should be reached. These clones are planted in 2' x 2' plots on a sand-peat soil mix. Plots are mowed at a quarter-inch without fungicide treatments and compared to other commercial creeping bentgrasses for persistence.

In 1984, the work will center on field evaluation and the identification of the most persistent heat tolerant and desirable types of bentgrass.

R=70607

PENNSYLVANIA STATE UNIVERSITY - Dr. Joseph M. Duich, Project Leader

Funds Granted $4000 Bentgrass breeding for golf courses.

All planned phases of the Colonial bentgrass project as outlined in the 1982 report were continued this year. A portion of these phases are thesis objectives for Mr. Eric K. Nelson, Master of Science candidate. During the past year, over 29,900 plants were started and screened in the greenhouse.

In the Colonial bentgrass project, the following results were obtained:

Chromosome Counts. Considerable effort was devoted to chromosome counts of 102 experimental parents. Five parents were found to deviate from the major anticipated number of 42.