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.

Pollen Quality. Seedheads from 66 parents were collected and fixed in 1982; stained and counted this year. Based on this work, pollen quality is not thought to be a limitation in self-fertility.

Progeny Rhizome Analyses. These tests have been conducted for two consecutive years of plant harvest from the same plants, and a selfing program. The results are similar to previous years results. However, sibling analyses (second generation) showed more of an expected segregation range for rhizome production. Third generation seed and further selecting will be done during the coming year.

Selfing. Over 400 plants were second generation field-selfed in 1983. From a greenhouse screening population of nearly 4000 plants, 170 first generation selfed seedlings, and 700 second generation selfed were field planted in September 1983 for further selfing and selection.

Turf Tests. Turf trials of 136 open pollinated parental selections have been evaluated for one year. About 40% show a false crown growth habit which leads to scalping and is therefore undesirable. Natural disease infections involved a moderate infection of pink snowmold, considerable brownpatch, and moderate leafspot.

Cobalt 60. Two rhizomatous parents were subjected to Cobalt 60 radiation. The emerged plants were individually pot planted in the spring and field planted im August. It is hoped that more vigorous rhizomatous forms, or dwarf types similar to those produced in bermudagrass through radiation may be forthcoming from this procedure.

In the salt tolerant selection work, 14 thriving creeping bents were selected from a degraded alkali soil under a fairway adjacent to a salt water bay in New Jersey. They were field planted for initial seed yield in 1984. They were selected from an area having over 3000 ppm sodium. Pending turf quality evaluation, the germ plasm should serve as an excellent source for salt tolerance.

In regard to creeping bentgrass testing, PSU-126 experimental creeping bent seed has been sent to 85 golf courses in 26 states, Canada and South Africa for testing purposes. Second year seed production in Oregon will provide additional seed for testing. An unseasonably wet year in the seed fields of Oregon affected seed yield information.

R=70608

RUTGERS UNIVERSITY - Dr. C. Reed Funk, Project Leader

Funds Granted $5000 — Breeding and evaluation of Kentucky bluegrass, tall fescue, and perennial ryegrass for golf turf use.

Turfgrass germ plasm was collected from old turfs in Georgia, Alabama, New Jersey, California, Utah, and Virginia in this program to obtain varieties with improved stress tolerance, lower maintenance requirements and increased pest resistance. A large clone of centipedegrass was selected from an old turf in Cherry Hill, New Jersey. Previous turfgrass selections are being evaluated in turf trials and nurseries in New Jersey. Kentucky bluegrasses with improved recovery from severe summer stress have been identified and are being increased for additional testing.