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.

Seed production has been initiated on Spartan hard fescue, Citation II perennial ryegrass, Omega II perennial ryegrass, and Repell perennial ryegrass. These varieties used germ plasm obtained from the New Jersey Agricultural Experiment Station in their development.

Nearly 3000 new turf evaluation plots of Kentucky bluegrass, perennial ryegrass, fine fescue, and tall fescue were seeded in September. The establishment of seven additional acres of spaced-plant nurseries are being completed.

Resistance to sod webworms and billbugs was found to be associated with the presence of an endophytic fungus growing within the tissues of perennial ryegrass plants. This discovery should have important implications in plant breeding, seed production, seed labeling, and varietal evaluation. Programs have been initiated to utilize "Endophyte Enhanced Pest Resistance" in turfgrass breeding work. Preliminary observations indicate that endophytic fungi may also be involved in insect resistance in the fine fescues. Histochemical and other laboratory studies are being conducted to gain a better understanding of this method of resistance.

R=70609

U. S. DEPARTMENT OF AGRICULTURE - Dr. Jack Murray, Project Leader

Funds Granted $4600 Varietal development of seeded zoysiagrass.

The zoysiagrass germ plasm collected in Southeast Asia during the summer of 1982 is still in plant quarantine due to an unknown disease. Considerable time this year has been spent studying the etiology of the unknown disease and methods of eradication. No additional collections were made.

Symptoms of three unidentified diseases were found among zoysia accessions in the greenhouse. Two are believed to be virus-caused while the third and most severe disease is suspected to be a bacterium. No virus particle could be found, and experimental results suggest that the virus disease is Biotic in origin. The scientists have not as yet been able to consistently transmit the bacteria-causing disease and artificially infect healthy zoysia. Therefore, the etiology of this disease remains unproven.

The diseases caused by the viruses are not spreading and affect only a small portion of the zoysia accessions. No attempts have been made to cure diseased plants. Experiments with various antibiotics to eradicate bacteria and achieve remission of symptoms in infected plants have been unsuccessful. Preliminary experimental results using hot water treatments of nodes to eradicate the disease are promising. With one of the heat treatment schedules, symptoms did not reappear in zoysia plants for four months after treatment. Test work and a refinement of methods of treatment using hot water continue and there is hope to eradicate the disease in all infected accessions.

Some zoysia accessions have not shown symptoms during more than a year of exposure to infected plants in the greenhouse. If these plants prove to be resistant to the disease they will not be subject to eradication experiments.