

doubling. To meet this objective several secondary objectives are necessary; 1] study pollen development as it correlates with macroscopic inflorescence morphology, 2] development of sterilization technique for panicle treatment prior to culture, 3] induced greenhouse flowering, 4] testing pollen culture techniques already established for small grains and grasses, and 5] chromosome doubling of haploid plants.

UNIVERSITY OF RHODE ISLAND - Dr. Richard Skogley  
Principal Investigator

Selection and Breeding of  
Superior Bentgrasses

1986 Grant \$1500 [ongoing support  
since 1960]

During 1986, considerable effort was expended in trial evaluation of turfgrasses originating from collected materials. Among these grasses are:

1. Creeping and Velvet bentgrasses for putting green use. 81 selections. 49 plots seeded in 1982, and 32 in 1985.
2. Colonial bentgrasses. 95 selections. 50 plots seeded in 1984, and 45 seeded in 1986.
3. Lawn and general purpose grasses. These include Kentucky bluegrass, Canada bluegrass, fine fescues, tall fescues, Perennial ryegrass, sweet vernal and Timothy. 245 selections. 67 seeded in 1983, 100 in 1984 and 78 seeded in 1985

All grass trials are maintained with less nutrients, water and pesticides than is normal.

The grasses collected are mostly from old, dry, low fertility stands throughout New England and the Canadian Maritime Provinces during the past four years. Several of the bentgrasses are older collections and are in second or third stage evaluation.

A collection of sweet vernal grass has also been assembled and is being evaluated for use in extremely infertile and dry conditions. This is a naturalized grass that is widely dispersed in North America. We have determined that the phenotypic diversity within the species is great. We note great differences in texture, color, growth habit, leafiness, and disease reaction. We are currently evaluating its performance under different cutting heights and fertility levels.

During the year we have constructed an automatic rain shelter which will enable us to better evaluate grasses for drought tolerances. We will be able to grow grasses in a natural, outdoor environment with only the water we supply.

We have an additional trial in progress to evaluate mixtures of grasses including creeping bent, Kentucky bluegrass, fine fescue, Colonial bent and Perennial ryegrass, for fairway usage. Performance of these mixtures is being evaluated both with and without fungicides.

Seed of several dozen of the R. I. bentgrass selections were sent to Dr. Milton Engelke and Dr. Ron Ensign for additional stress evaluations.

RUTGERS UNIVERSITY - Dr. C. Reed Funk  
Principal Investigator

Breeding and Evaluation of Kentucky  
Bluegrass, Tall Fescue, and Perennial  
Ryegrass for Golf

1986 Grant - \$5000 [ongoing support  
since 1961]

The New Jersey Agricultural Experiment Station of Rutgers University continues to devote considerable resources to the Turfgrass Breeding Project adding to the support that we are receiving from the United States Golf Association and other sources. This support enables us to make significant improvements in stress tolerance, turf performance, and pest resistance in Kentucky bluegrass, perennial ryegrass, tall fescue, and fine fescues. In addition, we are training a number of students in the fields of turfgrass science and plant breeding. We are also making contributions to basic research.

The effects of endophytic fungi on turf performance and pest resistance in perennial ryegrass, tall fescue, hard fescue, chewings fescue, strong creeping red fescue and blue fescue are continuing. Germplasm collections are being screened for new sources of potentially useful endophytes in other turfgrass species.

TEXAS A&M UNIVERSITY - Dr. James B. Beard  
Principal Investigator

Plant Stress Mechanisms

1986 Grant \$73,000 [fourth year  
of support]

1. Visual assessment via the high canopy resistance - low leaf area concept offers a rapid, economical approach for screening large numbers of mowed bermudagrass or mowed zoysiagrass plantings under field conditions for low water use rates.
2. A procedure for incorporating radioactive  $^{14}\text{C}$  into turfs and then assaying shoot and root sections for radioactivity has been successfully developed and tested for use in rooting studies.