PENNSYLVANIA STATE UNIVERSITY - Dr. Joseph M. Duich, Principal Investigator

Bentgrass Breeding

1985 Grant - $4,000 (Ongoing support since 1958)

Considerable progress was achieved in all aspects of our bentgrass program in 1985, and compared to the previous year excessive rains were not detrimental to field work at planting or harvest time.

Penneagle Creeping Bent

Breeder Seed was produced in 1985 and a new one acre Breeders Nursery was established in July 1985. Commercial seed production is projected to increase 35-40% in each of the next three years.

PSU-126 Creeping Bent

Test seed has been distributed to 140 golf courses in 32 states and several countries to date. Formal requests for performance information will be issued this winter with anticipation of Experiment Station release in the spring of 1986. PSU test plots show no deficiencies following eight years of testing. Cool weather brown patch, Rhizoctonia cerealis, was encountered in the test in 1984-1985 and the PSU-126 showed a high level of resistance.

Oregon seed yield trails in 1985 showed an accepted level of seed yield, between Penncross and Penneagle. Breeder Seed nursery was doubled in size following another stage of reselection in 1984-1985.

A space-planted Referee Test was established in 1985 along with five creeping bent varieties for Plant Variety Protection data. Data was obtained from a similar Oregon test established in 1984 for the necessary two location test data. Preliminary electrophoresis laboratory results show a good differential identifying pattern utilizing three enzyme systems to date.

Experimental Creeping Bents

Eleven salt tolerant bents were nursery established for 2nd generation seed production in 1986 along with clonal plantings of 21 new salt tolerant selections from greens and fairways.

Clonal nursery plantings were made of 22 selections from Penncross and Penneagle segregates following five years mowing at 3/32-inch height of cut. Following the advent of the Stimpmeter and unprecedented demands on superintendents for ultra close-cut greens it appears paramount that bents be developed for closer mowing tolerance.

Colonial Bent Rhizome Development Project

1. SB 1-56 Series - Open pollinated progeny

Seven 2nd generation progeny plants each of 378 second generation half-sib families were selected for individual plant seed harvest in 1984. These plants were selected in the field based on plant spread and yield. The top 156 of 378 families were chosen for continuing into third generation progeny testing based on second generation half-sib family progeny performance in 1984. Particular emphasis was placed on deep rhizomes (those emerging thru holes in bottom of flat sections) and date marking their emergence.

Based on date of emergence, 20 progeny plants with deep rhizomes of 134 3rd generation half-sib families were field planted in 1985 to produce 4th generation seed in 1986.

2. SB 60-135 - Open pollinated progeny

Seven 1st generation progeny sibs each of 67 parents were also selected and individually harvested in 1984 for continued progeny tests. Approximately 18,000 plants [67 families x (7 1st gen progeny x 39 plants each)] were greenhouse planted for screening. Following date marking for deep rhizome development 20 progeny each of 63 second generation sib families were field planted in 1985 for third generation seed production in 1986.

3. Inbreeding

Selfing as a breeding technique to select for rhizomatous reproduction was continued on all colonial bent populations. Amount of selfing was dictated by the number of plants four individuals could bag during the pre-anthesis period; approximately 500 plants in 1985.

In 1984 107 2nd generation inbreds representing 16 parents and 31 1st generation inbreds in the SB 1-56 series set seed for progeny testing. Third generation half-sib families produced 1 to 54 progeny plants each. Approximately 1100 of 3000 plants screened for rhizomes were field planted in 1985 for further selfing.

In the SB 60-135 Series 137 1st generation inbred progeny from 33 parents that were poorly represented in previous work were progeny tested. Over 1100 plants of 3400 screened progeny were field planted in 1985. In both of these series uniformity within lines in contrast to interline variability is becoming apparent in the field. Inbreeding depression, as expressed by plant vigor is obvious as well. It is not known how well the weaker inbred types will survive winters in the field. The degree of restored vigor and rhizome growth as well shall be eagerly anticipated pending survival.

Self-pollination of 25 SB-1 and 28 SB-90 plants derived from cobalt 60 irradiated rhizome sections yielded 600 and 1200 progeny, respectively. Family size ranged from 1 to 72 plants. These first generation inbred families were screened for rhizomes and gross mutations. Following date marking for rhizome emergence, 470 plants were field planted for further selfing.

4. Other Colonial Bents

Eight rhizomatous bents were selected from bermuda fairways in Australia following treatment with atrizine to control Poa annua in 1984. Plants were greenhouse crossed in all possible combination and 1200 progeny field planted in September 1985. Future work will include selection, inbreeding and selection for triazine herbicide tolerance.

Auburn University supplied us with 14 selections which were field planted for seed production and further evaluation.

UNIVERSITY OF RHODE ISLAND - Dr. C. Richard Skogley, Principal Investigator

Selection and Breeding of Superior Bentgrasses

1985 Grant - $1,500 (Ongoing support since 1960)

Continued financial support from USGA/GCSAA has assisted Rhode Island Turfgrass Researchers in their efforts to select or develop improved grasses for the golf course industry. We are currently evaluating nearly 400 of our own experimentals, including about 130 bentgrasses. Vegetative materials and seed of several promising selections are being evaluated for seed production potential in Oregon.