



## Turfgrass Improvement Through Breeding and Selection

The program is being worked on with the cooperation of Joint Highway Research in the School of Civil Engineering. The work being done here at Purdue has a **two-fold purpose**. **One**, we are looking for a vigorous, medium-growing selection for roadsides. The **second purpose** is to find a low-growing, semi-dense, disease-resistant selection for turf areas such as golf courses and home lawns.

Certain basic rules for breeding and selection have been followed to make the bluegrass program more efficient. First, a large amount of diverse germ plasm has been obtained in several different ways. Local and golf club; Nugget, cold tolerant from Alaska; and foreign field collections are being used: 16-B, Chicago Northport, from Europe. Selections from other institutions were obtained, and well-known and widely-used varieties such as Merion bluegrass are included. Other sources of diverse germ plasm would be the artificial mutagens such as radiation and chemicals which are known to increase variability.

A second basic principle would be the need to understand and know the plant so that large numbers of perennial plants can be maintained and evaluated efficiently. The cytological differences (chromosome number and embryogenesis) must be studied and also whether the plant is apomitic or cross-fertile. This better allows a breeding program to be established. Another example of increased knowledge would be in the greenhouse where early selection allows the research time to be used on the better plants.

Another rule would be that there must be a selection pressure or a survival of the fittest plants. This will lead to an increase in the frequency of superior genotypes in the plant series, and thus, provide better material for plant selection. The following is a list of selection differentials which we are using here at Purdue: differences in mowing heights, insect and disease infestations, shade, nutrient level, and seed production capabilities.

A fourth and final rule is that we must have time to do the research. Dr. Daniel has stated that it will be at least 1970 before the current selections of Anheuser Dwarf, 16BB56, RI-10, and AQ6 will be released in limited quantities. It will probably be

1975 before my work is ready to be used. This is because of the volume of testing, the small quantity of seed, and also the time required for acceptance by the public.

This work at Purdue has been carried on since 1945. At that time a few apomitic selections were studied, but it soon was realized that variation was the real key to success. Dr. Daniel has kept the program flexible, and thus, the program has the needed diversification to allow selection of different type bluegrasses for different uses.

Including this year's space planting, over 10,000 plants have been selected for testing in the past three years. This last fall work was started with increased plot plantings. This includes two hundred fifty plots from selections obtained from plots sizes three by five feet, and three by ten feet from some of our present best material.

After one month seedlings were selected out of plot material for individual transplant into four inch pots for greenhouse increase over winter. This will be the material for the present 1967 space planting. This coming spring and summer observations will be continued on space plants, sprig plants, and plots. Vegetative and seed increases of outstanding individuals will also be made.

At the present time bluegrasses are being selected using I.B.M. cards and a card sorter (I.B.M. machine number eighty-three). This allows the seventy-two thousand bits of data to be analyzed at six hundred pieces per minute. Besides being faster, it is also more convenient to remember data by use of an I.B.M. card.

Hopefully, this I.B.M. process will better allow selection of that new bluegrass or bluegrasses. At the present time three thousand, seven hundred of the original three thousand, nine hundred plants have been discarded. This leave five per cent of the total population to be used for further work in the selection of that new variety of the future.

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## Will to Win

The late Knute Rockne, famous coach of Notre Dame University teams, in talking on "Athletics and Leadership", said: "Some of you may say that this will to win is a bad thing. In what way is it a bad thing? Education is supposed to prepare a young man for life. Life is competition. Success in life goes only to the man who competes successfully. A successful doctor is a man who goes out and wins — saves lives and restores men to health. A successful lawyer is the man who goes out and wins — wins law cases. A successful sales manager is a man who goes out and wins — sells the goods. The successful executive is a man who can make money and stay out of the bankruptcy court. There is no reward for the loser."