Variation in Spreading Rate and Growth Characteristics of Creeping Bentgrass Seedlings

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Creeping bentgrass, *Agrostis palustris* Huds., has been propagated vegetatively since 1917, the year in which it was first used in putting greens in the United States. If the grass is to be used for fairways, seeding would be a more economical and practical method for establishing stands than the use of sod or stolons. A more complete knowledge of the extent of variation among seedling progenies and the relationships of plant characteristics is needed if a satisfactory turf is to be established by seeding. Such information, which is also highly important in a breeding program, is extremely limited for creeping bentgrass.

The study reported here was conducted to determine the growth rate, texture, density, type of growth, and drouth tolerance of seedling progenies from 49 strains of creeping bent and the extent of variability within and among strains for these characteristics. It is the purpose of this article to present these data and to show some of the relationships existing between the above characteristics.

North and Odland (3) noted a marked similarity between turf produced from seed and from stolons by three strains of creeping bent. Their observations were made at the end of 4, 5, and 6 years. De France (1), on the other hand, found a wide range in types from selfed seed of a single plant indicating considerable heterozygosity of parent plants. Turf from open-pollinated seed of velvet bent was equal to turf from stolons in quality when the two were compared for density, texture, and vigor. Seeded plots, however, showed considerable variability in color, becoming mottled in appearance, especially after 7 or 8 years. Lantz (2) noted also that seeded greens often become spotted in appearance. Stuckey and Banfield (4), in studying open-pollinated progenies of colonial bent plants, found widely divergent morphological types with varying chromosome numbers.

**MATERIALS AND METHODS**

Open-pollinated seed of 49 strains of creeping bentgrass was used to establish a progeny test in April 1948. A simple lattice design with four replications was used. Each strain was represented by 12 plants per replication in a plot 4 by 4 feet. In addition to the differences among strains in type of growth, density, and texture, within strains these characteristics was also determined. A variable for each strain in the four replications from the plants per replication. Correlation coefficients were used to provide an evaluation of the relationships between the data.

**RESULTS AND DISCUSSION**

Average diameters at the end of the growing season are presented in Table 1(a) for the 49 strains of a spreading bentgrass plant usually defined; nevertheless, significantly different obtained between strains in average plant diameters actually ranged from 10.89 to 12.97 inches for C39 to 23.27 inches for C23.

Total growth may not appear to be in production and maintenance of turf where seedlings per square foot may result from production. Nevertheless, vigor is an important factor in injury or diseases and in the plant's ability with weeds. Total growth is a good measurement.

Texture, density, and type of growth were determined for each plant using observational ratings in growth was based mainly on leaf width, a rating indicating fine leaves and a high rating indicating broad leaves. The data in Table 1(b) show the strains did not differ as much in texture as in the two characteristics; however, the differences to strains were highly significant. It should be noted that, barring the very coarse type, the degree is not as important as uniformity in this case.

The lower ratings for density in Table 1(a), for example, indicate a compact type of growth while the highest rating represents open growth. Average ratings varied from 1.0 to 10.8.

Arlington, C24, C28, and C39 were noted for their production of plants with very fine leaf. A rating of 10 indicated an extremely upright growth while the most prostrate types received a rating of 1. Plants of the extremely upright type were of little value for turf. A grass of the intermediate type, however, might have some possibilities on fairways.

To meet successfully the requirements of courses, any fairway grass must have, in addition to the above mentioned qualities and others, the ability to withstand periods of relatively dry weather without suffering and losing color.

Observational ratings for drouth tolerance on each plant with a score of 1 indicating no injury, 2, a highly significant for tolerance to drought on August 25.