BREEDING AND EVALUATION OF SEEDED COLD TOLERANT BERMUDAGRASS

OKLAHOMA STATE UNIVERSITY
Stillwater, Oklahoma

Drs. Charles Taliaferro,
J.A. Anderson, M.P. Kenna
Principal Investigators

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Mean fertility (seed set) has been tripled in a cold-tolerant broad gene-base bermudagrass population using phenotypic recurrent selection. Progress has also been made in selecting for finer texture within this population. The premise of the recurrent selection breeding procedure is ongoing population improvement via increase in the frequency of favorable quantitative genes controlling the characters under selection. Experimental strains derived from this population are now being tested for turf performance, and new strains will be available on a regular basis for evaluation.

Plants of the very fine textured C. transvaalensis having excellent seed head production and seed set were found in our germ plasm nurseries. The four best of these plants had seed set percentages of 83, 77, 73, and 72. These plants will be further assessed for seed yield and genetic improvement potential. Because this material already possesses extremely fine texture, sod density, and cold tolerance, the development of strains with economic seed yield potential would be of major importance.

Research to date has demonstrated the reliability and feasibility of two laboratory techniques for measuring cold tolerance of bermudagrass plants. Further assessment of the electrolyte leakage and freeze/regrowth techniques during the winter of 1987-88 confirmed earlier results indicating good agreement between the techniques, with both accurately ranking varieties of known relative cold tolerance.

Tissue culture techniques have been developed permitting regeneration of large numbers of bermudagrass plants from embryogenic callus derived from somatic (diploid meristematic) tissue explants. Although regeneration of plants from cultured bermudagrass anthers has not been achieved to date, some anther callus from some bermudagrass plants has been produced. This and the fact that haploid plants have been regenerated in several grass species via anther culture gives hope that continued refinement in several grass species via anther culture gives hope that continued refinement of technique will result in eventual success with bermudagrass.