OKLAHOMA STATE UNIVERSITY

Breeding and Evaluation of Cold-tolerant Bermudagrass Varieties and Bermudagrass Varieties for Golf Course Putting Greens

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Present objectives of the bermudagrass breeding program are to: 1) develop seed-propagated, cold-tolerant, finer-textured varieties for the transition zone; and 2) develop improved varieties for golf course putting greens, with emphasis on adaptation to southern coastal states.

Significant progress was made last year in development of cold-tolerant, seed-propagated bermudagrass varieties for the U.S. transition zone. Four experimental synthetic varieties were produced in 1989 and established in turf evaluation trials in Colorado, Iowa, Missouri, and Oklahoma this spring (1990). These experimental varieties will be tested for cold tolerance and suitability for use in fairways and roughs.

To further improve turf quality, bermudagrass populations bred for increased basic fertility (seed-set) were subjected to intense greenhouse screening for finer texture and increased density. In 1989, 162 of 10,000 plants were selected (1.6%) and established in spring 1990 in Oklahoma and Arizona nurseries. Inter-crossed seed from these plants were used to establish an additional 10,000 greenhouse plants for selection in late summer, 1990. From this population, 328 selections were established in field polycross nurseries in September 1990. Continued selection in these breeding populations for turf quality, cold-tolerance, and seed yield should refine them to a level permitting development of high-quality, seed-propagated, cold-tolerant varieties.

Development of new bermudagrass varieties for putting greens is proceeding on schedule. Thirty-three hundred *C. transvaalensis* progeny plant selections were established at Stillwater, Oklahoma, in early June for evaluation under putting green maintenance. In late October 1990, the 500 best appearing plants from this nursery were planted in groups of 100 on five Florida golf courses. Evaluations over the next year at Stillwater and the five Florida locations will be used to select 25 to 30 plants which will be subjected to more intensive evaluation.

An experiment was completed to assess the effects of temperature and duration of exposure on cold acclimation of bermudagrass plants in the growth chamber. The information allows refinement of a mass screening procedure for cold hardiness whereby we grow plants in cone-tainers in the greenhouse, acclimate them in a growth chamber, and then subject them to freezing temperatures as a screen for cold tolerance. Results to date suggest the procedure to be a feasible means of mass screening bermudagrass plants for cold tolerance.