

USGA Annual Turfgrass Research Report 1990

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BREEDING AND DEVELOPMENT OF CURLY MESQUITEGRASS

The utilization of curly mesquitegrass, *Hilaria belangeri*, as a seed established desert turfgrass appears promising. Research during 1990 identified substantial genetic variation in turf qualities and reproductive traits, and continued to assess field performance of selected plant material to cultural practices. Other efforts concentrated on identifying additional superior turf type plants, establishing crossing blocks of these plants, and harvesting this seed to begin developing an improved 'turf-type' synthetic population.

In 1989, 15 clones were established in replicated field plots at Tucson and Safford, AZ in an effort to quantify genetic variation in turf traits. Broad sense heritabilities for color were 0.63 and 0.78 in Tucson and Safford, respectively. Leaf length ranged from 26.5 to 102.5 mm, and heritabilities for leaf length were 0.43 and 0.40. Leaf width ranged from 8 to 13 mm, and heritability estimates were 0.18 and 0.11 in Tucson and Safford, respectively. Significant correlations of leaf length and width were 0.32 and 0.37 in Tucson and Safford. The heritability of density was determined to be 0.48 in Tucson, and 0.71 in Safford.

Heritabilities for reproductive traits also were determined. For seed shattering, heritability was calculated to be 0.24. The number of flowers per spike had a heritability of 0.42 at both locations. No correlation existed between seed shattering and flowers per spike. Uncut plant height ranged from 20 to 41 cm, and had heritabilities of 0.71 and 0.82 in Tucson and Safford, respectively.

The genetic component of most of these traits are considered to be moderately to highly heritable. This indicates that rapid progress through recurrent selection can be made in improving turfgrass qualities and seed production in this species.

The Cultural Practices Area (CPA) had average ground covers of 42, 44, and 39% in March for the 5 cm, 10 cm, and no cut treatments. These averages increased to 81, 82, and 82% ground cover by October for the same treatments. Poor color and overall quality of the uncut plots was evident throughout 1990. Differences existed among nitrogen rates with respect to color and quality only in July. The 5 and 10 cm heights of cut can produce very dense turfs with complete ground cover. Plans for 1991 do not include the no cut treatment. Additionally, plot sizes of the cutting treatments will be increased with the plant material that responded well in this experiment.

In addition to the 8 superior 'turf-type' selections made in 1989, 12 more selections were made in 1990. Selected plants from both years were increased and planted into 8 crossing blocks for polycross seed production to combine multidesirable traits. Eight harvests of seed occurred this season from August to October, and we anticipate one more final harvest. Single cross crossing blocks will be planted in 1991 for the specific hybridization of superior plants.

USGA EXECUTIVE SUMMARY 1990

BREEDING AND DEVELOPMENT OF CURLY MESQUITEGRASS AS A DESERT TURF

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The genetic components of the turfgrass characters and seed production traits were determined in 1990. Most of the traits investigated can be considered as moderately to highly heritable. This indicates that rapid progress through recurrent selection can be made in improving turfgrass qualities and seed production in this species.

The ongoing Cultural Practices Experiment reconfirmed the cutting requirement to maintain this species as a healthy turf. Poor color and overall quality of the uncut plots was evident throughout 1990. The 5 and 10 cm heights of cut produced very dense turfs with complete ground cover.

In addition to the 8 superior 'turf-type' selections made in 1989, 12 more selections were made in 1990. Selected plants from both years were increased and planted into 8 crossing blocks for seed production. Eight harvests of seed occurred this season from August to October, and one more final harvest is anticipated. Multiple harvests of seed is a key feature in maximizing seed production of this species.