including variable mowing heights and fertility rates, were conducted to evaluate alkaligrass, blue grama, and fairway crested wheatgrass selections.

University of Arizona - Dr. Charles F. Mancino

Breeding and Development of Curly Mesquitegrass as a Desert Turf

Curly mesquitegrass (*Hilaria belangeri*) is a potential turfgrass for low maintenance areas in the Southwestern Desert regions of the United States. Under the direction of Dr. Mancino, germplasm was collected throughout Arizona. Several basic studies were conducted, including cytological examination of chromosome behavior prior to seed formation, effects of chemicals on germination, the effects of seed storage times and conditions on germination, and the effects of seeding dates and rates on establishment. Management studies examined interacting effects of mowing heights and nitrogen rates. In cooperation with Texas A&M University, genetic rooting potential of curly mesquitegrass was determined.

Much of the variation observed among the curly mesquitegrasses collected from Arizona was due to genetic differences, and therefore, the species appears to have the potential to be improved for use as a "low maintenance" turfgrass. The results from cultural practice studies demonstrated that mesquitegrass can perform well (i.e., display acceptable color, density, uniformity, etc.) under turfgrass management practices. Good color and adequate density (> 70%) was achieved for some of the accessions at low nitrogen rates (48 kg N ha^{-1} yr^{-1} or 1 lbs. per 1000 ft^2) and a mowing height of 10 cm (1.5 inches). The research project also demonstrated that seed could be produced and that establishment of mesquitegrass by seed was a viable method.

Annual Bluegrass

Poa annua, annual bluegrass, is widely adapted throughout the world. In cool climates it represents a major, often undesirable, component of golf course turfgrass. In warm climates, as well as in zones of marginal adaptation, it is considered a weed because of its intolerance to extremes of temperature and moisture stress.

The evolutionary parents of *Poa annua* are *P. supina* (a diploid perennial type) and *P. inferma* (a diploid annual type). It was hoped that a breeding program involving standard breeding techniques, as well as tissue culture, could yield superior plants with desirable genetic characteristics.

University of Minnesota - Dr. Donald B. White

Through the efforts of Dr. White, a breeding program to develop annual bluegrasses for golf course putting greens was implemented. With over fifty years of failed attempts to achieve 100 percent annual bluegrass control, it was decided to evaluate the improvement potential of the species. Dr. White states his philosophy simply, "... when served lemons, why not make lemonade!"

Research efforts have developed methods to control flowering, long term viability of seed, determination of chromosome number, and most important, identification of individual parents with superior agronomic characteristics which will be used to develop turf-type cultivars. Research indicates that both the perennial form, *Poa annua* var *reptans*, and an annual species, *P. supina*, exhibit the most potential for new varieties.

Seed production plots of the most promising parents were established in the Pacific Northwest to produce seed for cultivar trials. A limited amount of seed from these production blocks was planted on golf course putting green nurseries in Southern California, Massachusetts, and at the University of Minnesota turfgrass research plots.

In addition, the development of the excised stem/mist technique allows for controlled crosses between elite materials to produce intra- and interspecific hybrids for characters of interest. This technique has allowed for the development and evaluation of several F_1, F_2, F_3 and back-crossed materials segregating for plant type, color, texture, seedling vigor, culm length, stolons, and perennial growth habit.

Research concerning the temperature and photoperiod requirements for seedhead initiation indicates that plants segregate into day-neutral and seasonal flowering categories. One exciting discovery was that segregation ratios for progeny from day-neutral parents suggest that the characteristic may be controlled by a single gene. This type of information could help lead to the development of *P. annua* var *reptans* varieties with reduced flowering periods under mowing.

Zoysiagrass

Zoysiagrass was introduced into the United States from the Orient around 1900. Some selections have been used throughout the transition zone since about 1950. Use has been limited because zoysiagrass selections are propagated