UNIVERSITY OF MINNESOTA

Improvement of Poa Annua for Golf Turf

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Poa annua is one of the most widely adapted cultivated grass species in North America, and throughout the world, makes up a major component of golf course turf. It is much maligned, however, because of susceptibility to damage by summer heat and water stress, and an inability to overwinter or tolerate crown dehydration and freezing. Despite vigorous control programs, *Poa annua* has the ability to quickly invade when ever the preferred perennial turfgrass is damaged.

Problems with *Poa annua* are accentuated by the absence of improved types and its habit of seeding continuously in the spring and fall. *Poa annua* is reported to be the evolutionary offspring of *Poa supina* and *Poa infirma*. There are two types of *Poa annua*: 1) *Poa annua* 'annua' which has an upright growth habit and produces a limited number of shoots and roots, and normally survives from one to two years; and 2) *Poa annua* 'reptans' which exhibits a perennial, stoloniferous habit of growth, and has more prolific stem and root production. The objective of this project is to stabilize and consolidate desirable perennial characteristics into improved cultivars for golf course use.

Approximately 1500 individual accessions or selections continue to be maintained and propagated for field evaluation. The eight 'prime' selections under evaluation and consideration for introduction all performed well over the difficult winter of 1990. *Poa annua* selections #117 (10-C) and #184 (16-B) received the highest ratings over winter. *Poa annua* #117 (10-C), #493 (NY-12), #42 (3-A) and *Poa supina* #391 (29-F) exhibited excellent flowering habits this spring. A total of 101 new accessions from 25 locations were integrated into the germplasm pool of the project.

Several new selections have been identified for the next cycle of evaluation for introduction. New evaluation plots, under close mowing, were established at the University of Minnesota, nine golf courses around the country, and at three universities. Work was completed on improving and adapting a mist technique to regulate pollen release and assist in emasculation to facilitate our ability to accomplish specific crosses. Work on improving an excised stem technique was completed and applied to practice. The sugar, fructose, improved seed production and uniformity compared to sucrose. Contrary to other work, no biocide was required and seed matured 15 days after pollination with the stems maintained in the fructose solution.

Approximately 75 crosses were completed with the eight 'prime' selections; and forty additional crosses were made to incorporate and combine desirable

characteristics. Fifty self pollinations were completed in a continuing effort to ascertain heritability of specific characteristics. Several successful interspecific crosses between *Poa annua* and *Poa supina* were accomplished using mist and excised stem techniques. Plants resulting from seed of these crosses are currently under evaluation. These are the first interspecific crosses we have been able to accomplish.

In the spring, a field seed production trial was established at the University of Minnesota to evaluate seed production potential of the eight advanced selections. A seed production trial of 4,000 plants, 500 each of the eight advanced selections, was space planted in November on Pickseed West land in Tangent Oregon. The primary objectives of this planting are: 1) to assess the seed production capabilities of each selection under supervision of a commercial seed grower; 2) to compare differences in seed production between materials; and 3) to produce a supply of breeder's seed that can be used for increase. It is planned that all current studies will continue. Collection of new materials and selective crossing will continue. Strong emphasis will focus on the seed production aspects with the eight advanced materials.