Improvement of *Poa annua* for Golf Turf

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Goals:

- Expand the evaluation and development of the advanced selections for turf quality, seed production, and seeding recommendations.
- Continue and expand seed production evaluations in Oregon.
- Continue and expand the development of a "breeder's" seed supply.
- Expand seeded evaluation plantings at selected golf course and university locations.

Field evaluations of the five prime selections continued at the San Diego CC, Chula Vista, CA; The Country Club, Brookline, MA; Oswego CC, Oswego, OR; and were expanded at the University of Minnesota. Mowing heights varied form 1/8 to 1/2 inches. Evaluations at all locations indicate that all selections continue to produce excellent turf. All selections overwintered well at all locations and experimentals 42, 184, and 208 received the highest ratings at all locations.

Approximately 250 new accessions were added to the program. Twenty-two of these are diploid (2n=14 chromosomes) while the rest were normal tetraploid (2n=28) types. Some of the diploids produced flowers; however, to date all are sterile. Purported *Poa infirma* seed was acquired for crossing with *P. supina* and *P. annua*. Subsequent growth and DNA analysis indicate that the material is probably an annual type of *P. annua*. Crosses were completed to several selections and selfed seed was also collected for further evaluation.

A total of 2,250 accessions were evaluated in a field space planting. Twenty-five new crosses were executed for combining desirable characteristics. New materials with promise include one *P. supina* (PS56-S3) which produces uniform, fine textured and dark green progeny. Interspecific crosses of *P. supina* X *P. annua* produced dark green, vigorous, rugged progeny. Flow cytometry has enabled us to conduct a large number of chromosome evaluations and identify the 14 chromosome types.

The 14 chromosome *P. annua* plants are all fine textured, dense, and dark green. Investigations at several golf courses reveal that up to 24 percent of the *P. annua* samples collected from greens were diploid (2n=14) chromosome types. These 14 chromosome plants were not found in fairways or

roughs. Low height of cut and other putting green management practices apparently selected for the diploid types.

Observations continue to support findings that seeded plantings are superior to sodded plantings. Variation in seed dormancy was observed. Experiments showed that seed selections of 184, 493, and 117 require a pre-plant, moist, cold treatment of 7 to 14 days to overcome dormancy. Otherwise, 7 to 8 months in seed storage is required.

Preliminary research indicated that inheritance of flowering habit was controlled by one gene; however, recent research results indicates that a more complicated model exists. Some *P. annua* types exhibit no requirements for flowering to occur, and contrary to the literature, some respond to photoperiod alone, cold induction alone, or to both photoperiod and cold.

Experiments with gibberelic acid (GA) show that it increases internode length. Preliminary work revealed that a timely GA treatment can enable removal of all flower heads with one mowing. This could change the way we manage *P. annua* on existing greens.

We now have enough seed to expand the field evaluation operations with larger plots and more sites. There is enough seed to produce breeder's seed which would be sufficient for planting foundation seed in 1994. Negotiations are still underway to make final arrangements for this planting. Negotiations also continue toward releasing the best materials to a commercial seed company for marketing the first seeded variety by 1996.