

# Improvement of *Poa annua* var *reptans* 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.*

Three selections (MN#42, MN#184, and MN#208) were approved for release by the Minnesota Agricultural Experiment Station - Horticultural Plant Release Committee in 1994. An exclusive agreement was subsequently executed by the University of Minnesota Office of Research and Technology Transfer (Patents and Licensing) and Peterson Seed Company, Savage, Minnesota.

One-acre seed production fields for MN#42 and MN#184; and 2 acres of MN#208 have been monitored for seed production since their establishment on November 12, 1993 at a site in Oregon. Most of the seed has been successfully harvested with standard windrow and combine equipment during the early summer.

MN#42 had the most uniform heading and exhibited the least amount of shattering. MN#184 and MN#208 exhibited some uneven ripening and shattering. There are some indications that two harvests per season may be possible. In 1994, MN#42, MN#184, and MN#208 produced 291, 170, and 208 total pounds of seed per acre, respectively. However, each selection produced sufficient seed to warrant continued production and evaluation.

On the basis of second year seed production and performance under mowing trials, it was decided that the first introduction will be MN#184 instead of MN#42 as originally indicated. Fifteen acres was seeded to MN#184 in Oregon during October 1995 for production of *breeder's* seed in 1996. An additional planting of 6 acres is planned for the spring of 1996. All three selections under consideration for

introduction maintained trueness to type in the seed field.

Selection MN#184 performed exceptionally well during the 1994-95 growing season. All three selections responded equally to a series of herbicide treatments. No phytotoxicity was observed for Poast (herbicide) treated *Poa reptans* selections in the seed field. This will be very beneficial for keeping the seed fields free of bentgrass and weeds. Poast will be the herbicide of choice for seed production.

Vernalization and photoperiod requirements are major determinants to perenniality. Vernalization requirements are met between 4C and 8C after 10 to 12 weeks exposure. Some perennials are induced to flower under short days while others are induced under long days and some are day neutral but require vernalization. Plants require no fewer than 4 to 6 leaves in order to be receptive to these flower induction stimuli.

Observations of crosses between annual (continuous flowering) and perennial (seasonal flowering) type of *Poa reptans* indicate a 3:1 ratio of continuous flowering to seasonal flowering types. These inheritance investigations indicate that flowering pattern fits a genetic model involving one locus with continual flowering being dominant to seasonal.

The cytology and flow cytometry research was completed and submitted for publication.

Earlier studies documented the occurrence of diploid ( $2N = 2X = 14$ ) and tetraploid ( $2N = 4X = 28$ ) *Poa annua* in our breeding populations. Subsequent field sampling on one golf green revealed the presence of

diploids to a level of approximately 24% of the population on greens. Interestingly, no  $2N = 14$  types have been found in either the fairway or the rough *Poa* populations. The diminutive stature, fine texture, slow growth, and persistence appear to be clear indicators of the  $2N = 14$  types. All of the  $2N = 14$  types observed to date have been sterile.

Plants resulting from seed of interspecific crosses and reciprocals, between *Poa supina*, *Poa infirma* and *Poa reptans* exhibit some unique plant types. These materials will be observed for several generations, and they will be evaluated as parents.

Research plans for 1996 include expanding the number of evaluation sites in the cool season turfgrass area; continuing efforts into improving seed production; and establishing replicated plantings to evaluate potential use for winter overseeding in the Southern U.S. Seed blends of MN#42, MN#184, and MN#208 continue to be evaluated for compatibility and performance under putting green conditions.