

## 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 testing 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 of *Poa annua* var *reptans* MN#42, MN#184 and MN#208, were released in an exclusive agreement to Peterson Seed Co. of Savage, Minnesota in 1994.

The November 1993 experimental seed production planting of these three selections continued under observation and seed was harvested for the last time before the planting was destroyed, as planned, this fall. Standard harvesting machinery and procedures were employed in this process.

One of the haunting questions of the growers relates to the ability to clean up a field once seeded to creeping bluegrass and to reclaim it for seed production of other grasses. For that and other reasons, this planting was purposefully destroyed during the late summer and fall of 1996. The 1992 trial plantings at Pickseed West were also eliminated this fall.

1994 seed from the above planting was utilized in seeding two semi-experimental fields, totaling 17 acres, to MN#184 during the fall of 1995. Unfortunately, the largest of those fields, approximately 11 acres, was flooded and had to be abandoned. The other field also was flooded and under water for several days; however the grower was able to maintain the planting and seed was harvested from approximately 3 acres in 1996.

A new 7-acre planting, to replace the flooded and abandoned seeding, was seeded to MN#184 (1994 seed) in April of 1996 with expectations for seed production in the spring of 1997.

Our research has clearly shown that MN#184 possesses an obligate vernalization

requirement. Plants in this seeding were not exposed to sufficient cold to fulfill that requirement (between 4 and 8 C for 10 to 12 weeks). This allowed additional rouging of all plants that produced flowers during the 1996 growing season. This should ensure true-to-type seed from this field in 1997. Additionally, plantings were seeded in October of 1996 with the expectation that they will produce seed in June or July 1997. No new seed trials of MN#42 or MN#208 were initiated in 1996.

Much of the effort in 1996 focused on learning about seed production and seed production problems. Additional tests to evaluate seed harvested in Oregon for trueness to type were initiated and occupied substantial time and effort during 1996.

Cultural trials were initiated with a June 1995 seeding on a high sand content (90:10, sand:peat) green. A replicated trial was established with 10 selections in the program, including MN#42, MN#184, and MN#208. The green was covered during the winter. Although some winter damage was observed to some selections, all recovered sufficiently.

The trial was attacked by dollar spot and *Rhizoctonia* which were identified from lab samples during the summer of 1996. However, symptoms also indicated the possibility of a severe *Anthraco*se or *Pythium* problem on several of the selections. MN#184 and some of the other numbered selections displayed remarkable resistance to the organism(s) involved.

In addition, MN#184 exhibited substantial resistance to *Fusarium* patch in both Washington and Oregon putting green trials over the 1995-96 winter. The 1995-96 winter was a particularly difficult year for

*Fusarium* problems in the Pacific Northwest. MN#42 and MN#208 also exhibited some resistance in the Oregon trial.

Several new trials were established during 1996 or late in the Fall of 1995. Plantings at The Columbia Country Club in Columbia, Maryland; Bloomfield Hills, Michigan; University of Rhode Island; and the Greenbrier Country Club, White Sulphur Springs, West Virginia. Arrangements were made and seed delivered for future trials at the Broadmoor Country Club in Seattle, Washington; the Vancouver Country Club in Vancouver, Canada; and Pebble Beach.

A 5,000 square foot planting of bulked seed from many of the selections in the program was established to expand evaluations of mixtures and to serve as a source of materials in maintaining our gene bank for the future. In addition, this will offer us the opportunity to increase cultural practices research including: fertility, plant growth regulation, pest management, seed head control, stress management, selective herbicide tolerance, interseeding bentgrass and other important needs.

In response to a need to shorten turn-around time, we have initiated a limited program of starting promising materials. Materials are seeded into compartments in flats. After sufficient growth as been attained for the plants to be receptive to vernalization treatments, the plants are exposed to a cold treatment in a controlled temperature cooler. This procedure has proven to be quite successful in inducing flowering and subsequent seed development.

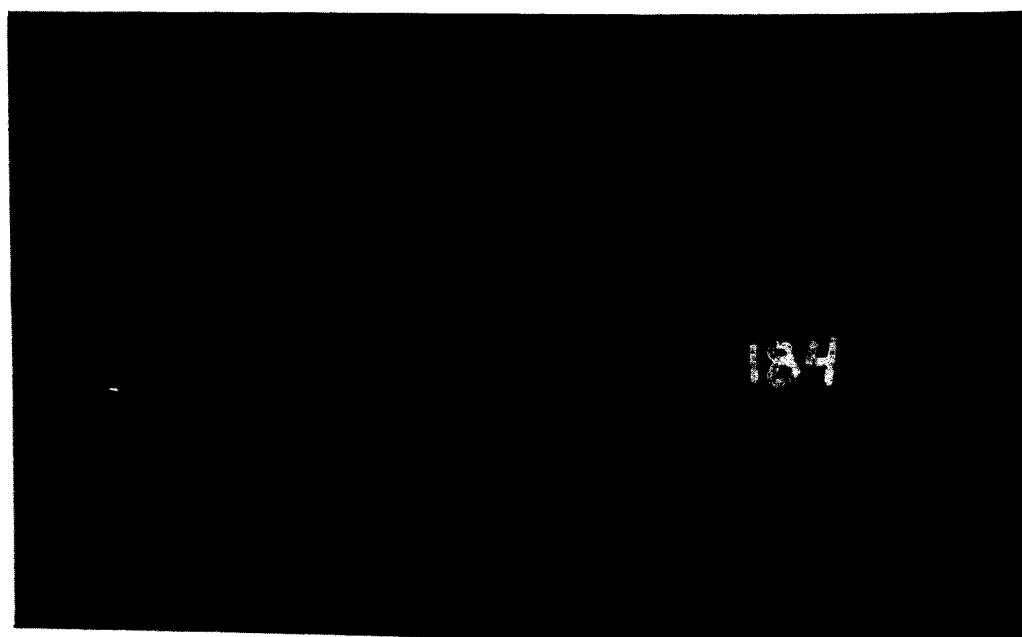
Two hundred accessions were advanced at least one generation during 1996. Field plantings included space planting of approximately 250 different accessions in units of ten plants for evaluation for plant growth habit, vigor, spreading ability, texture, color, and other characteristics important for adaptability to golf course use. This planting also was utilized for seed collection to increase desirable materials for further study and evaluation.

During the fall, more than 1,500 tillers from the most promising materials were collected for propagation and to ensure that these materials will be carried over to 1997. Some tillers were used to develop plants for seed increase over winter, while others were devoted to advancing to the next generation or simply for preservation of the plant material.

Forty different crosses were completed between superior selections in the program. Two of these crosses resulted in non-flowering progeny. Several progeny exhibited combinations of characteristics superior to either parent.

A project has been initiated to build a library for use in RFLP investigations with creeping bluegrass materials in this project.

We hope to construct a plastic greenhouse that will enable faster seed production by completing a full cycle of establishment in flats, vernalization, and flowering under complete isolation of clones and/or lines. This should speed up the process of evaluation, selection, seed increase and shorten the time to introduction.



**Figure 1. View of MN#184 bordered on two sides by disease susceptible selections. Dollar spot and brown patch were isolated from blighted areas. Small plots of some of the new selections (lower right of photograph) also exhibited some resistance.**