

Breeding and Evaluation of Kentucky Bluegrass, Tall Fescue, Perennial Ryegrass and Bentgrass for Turf

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Objectives:

1. Collect and evaluate potentially useful turfgrass germplasm.
2. Collect and evaluate endophytes associated with cool-season turfgrass species.
3. Continue the breeding and development of new cool-season turfgrasses.
4. Develop and apply several new tools designed to improve the ability to discriminate among endophyte isolates from nature and to synthesize new grass-endophyte combinations for experimental testing and possible commercial use.

Start Date: 1982

Project Duration: 5 years

Total Funding: \$40,000

Since the beginning of the USGA's renewed research effort in 1983, an annual grant has been awarded to Rutgers University for the general support of cool-season turfgrass breeding. This program is under the direction of Drs. Reed Funk and Bill Meyer. Their breeding efforts have a tremendous impact on the entire turfgrass industry. A large percent of the new cool season turfgrass varieties originate from germplasm acquired and screened by the faculty and staff at Rutgers University.

Promising turfgrass germplasm and associated endophytes were collected from Romania, Uzbekistan, Finland, Inner Mongolia, and USA.

Over 10,400 new turfgrass evaluation plots and over 115,000 spaced-plants were established in 2000. The first harvest of certified or foundation seed was produced from the following turfgrass cultivars developed with the participation of the Rutgers turfgrass breeding program: a) 'Cabernet', 'Bordeaux', 'Sonoma', 'Boutique', and 'Brooklawn' Kentucky bluegrasses; b) 'Somerville',



Dr. Reed Funk discusses one of several breeding projects at Rutgers University with USGA research committee members.

'Applaud', 'SR 4820', 'SR 480'1, 'SR 4RHT', 'Pizzazz', 'Promise', 'Gator H', 'SR-4330', and 'Amazing' perennial ryegrasses; c) 'Genesis II', 'SR 8600', 'SR 8250', 'SR 8V9', 'Signia', 'Finesse', 'Focus', 'Exceeda', 'Bingo', and 'Mustang III' tall fescues; and d) 'Longfellow 11' Chewings fescue.

A severe, uniform, but short-lived, attack of gray leaf spot (blast) incited by *Pyricularia grisea* occurred on a newly planted perennial ryegrass test at the Plant Science Research and Extension Farm, Adelphia, NJ in September, 2000. All commercially available cultivars showed moderately severe to severe turf loss. However, a few experimental entries showed little or no damage. Most resistant plants trace to recent selections from Eastern Europe.

Gray leaf spot also occurred on an adjacent new seeding of tall fescue. Many of the newer turf-type cultivars, and experimental selections showed moderate to good resistance compared to susceptible plots of 'Kentucky 31' and highly susceptible plots of 'Torpedo'.

Dollar spot was severe on turf plots of endophyte-free cultivars and selections of strong creeping red and Chewings fescues in field trials established in 1997 and 1998 at Adelphia, NJ. Fine fescues containing endophytes showed good resistance.

Significant opportunities for substantial genetic improvements of colonial and velvet bentgrass are becoming apparent in our germplasm collection and breeding program. Velvet bentgrass seed, as a component of South German Mixed Bentgrass, was planted on many golf courses during the early 1900's.



Dr. Bill Meyer has created a traffic machine with spikeless golf shoe soles for screening cool-season grasses at Rutgers University.

A few seedlings with improved adaptation to our hotter, more humid summers survived to produce attractive turfs. Varieties being developed from collections of these plants appear to have significantly improved summer performance in New Jersey turf trials but often need protection from pre or post emergence damping-off.

A new putting green bermudagrass developed by Geng Yun Zhiang shows promise in field trials in Georgia and New Jersey. It is also being tested in Arizona and North Carolina.

Summary Points

- Five bluegrasses, ten ryegrasses, ten tall fescues, and one Chewings fescue released.
- Some gray leaf spot resistance was found in perennial ryegrass selections that trace to Eastern Europe.
- New endophytes from Eastern Europe were identified.
- Opportunities are present to improve colonial and velvet bentgrass with better adaptation to hotter, more humid summers.
- New putting green bermudagrass developed.