

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 and associated endophytes.
2. Continue population improvement programs to develop improved cool-season turfgrass cultivars and breeding synthetics.
3. Develop and utilize advanced technologies to make current breeding programs more effective.

Start Date: 1982

Project Duration: Continuous

Total Funding: \$10,000 per year

As of October 30, 2009, over 1,800 promising turfgrasses and associated endophytes were collected in Italy, Atlas Mountains in Morocco, France, and Spain. These have had seed produced in The Netherlands and will be evaluated in New Jersey. Over 9,435 new turf evaluation plots, 120,000 spaced-plant nurseries, and 4,000 mowed single-clone selections were established in 2009.

Over 340,000 seedlings from intra- and inter-specific crosses of Kentucky bluegrass were screened for promising hybrids under winter greenhouse conditions and the superior plants were put into spaced-plant nurseries in the spring. Over 14,000 tall fescues, 6,000 Chewings fescues, 7,600 hard fescues, 60,000 perennial ryegrasses, and 12,000 bentgrasses were also screened during the winter in greenhouses, and superior plants were put in spaced-plant nurseries. Over 472 new inter- and intra-specific Kentucky bluegrasses were harvested in 2009.

The following crossing blocks were moved in the spring of 2009: 4 hard fescues (188 plants), 2 Chewings fescues

(69 plants), 21 perennial ryegrasses (899 plants), 2 strong creeping red fescues (102 plants), 16 tall fescues (626 plants), 4 velvet bentgrasses (66 plants), 5 creeping bentgrasses (93 plants), and 6 colonial bentgrasses (125 plants).

To enhance our breeding for resistance to gray leaf spot, over 900 large pots of perennial ryegrass (selected the previous summer) were moved to a greenhouse in November. Increased daylengths were used in the spring to provide an early harvest of these pots. Harvest was one month early, and a new perennial ryegrass trial was seeded on July 9, 2009. Within 30 days, a severe gray leaf spot epidemic occurred and recombinations of the most resistant clonal sources will be made in 2010. Three new gray leaf spot-resistant ryegrasses released in 2009 were 'Revenge GLX', 'Palmer V' and 'Linedrive GLS'.

The breeding program in bentgrasses made good progress in finding new sources of resistance to brown patch in colonial bentgrass. The soon to be released 'Capri' colonial is an improved variety for this disease. Emphasis was also put into breeding for anthracnose and copper spot resistance in creeping, colonial, and velvet bentgrasses. 'Pinup' is a new improved creeping bentgrass increased in 2009.

New promising Kentucky bluegrasses hybrids that were released in 2009 are 'Blue Note', 'Starburst', 'Touche', 'Pinot' and 'Shiraz'. Continued development of turf-type tall fescues with improved brown patch resistance were released in 2009. 'Braveheart', 'Umbrella', 'Canovara', 'Greenbrooks', 'Gazelle II',



Over 900 large pots of perennial ryegrass (selected the previous summer) were moved to a greenhouse in November in an effort to improve resistance to gray leaf spot.

'Catalyst', 'Agressor', 'Garrison', 'Faith', 'Shenandoah Sport', 'Falcon V', 'Speedway', 'Wolfpack II' and 'Finelawn Express'.

Some new fine fescues were released in 2009. They include 'Rushmore' Chewings fescue, and 'Matterhorn' and 'Beacon' hard fescues.

Summary Points

- Continued progress was made in obtaining new sources of turfgrass germplasm. These sources are being used to enhance the Rutgers breeding program.
- Modified population backcrossing and continued cycles of phenotypic and genotypic selection combined with increasing sources of genetic diversity in turfgrass germplasm has resulted in the continued development and release of top performing varieties in the NTEP.
- Fifteen new tall fescues, 3 fine fescues, 5 Kentucky bluegrasses, 2 bentgrasses, and 3 perennial ryegrasses were released in 2009.
- 'Capri' colonial bentgrass is an improved variety with better brown patch resistance, and 'Pinup' creeping bentgrass has improved dollar spot resistance.
- Published or have in press over 10 referred journal articles in 2009.



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