

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

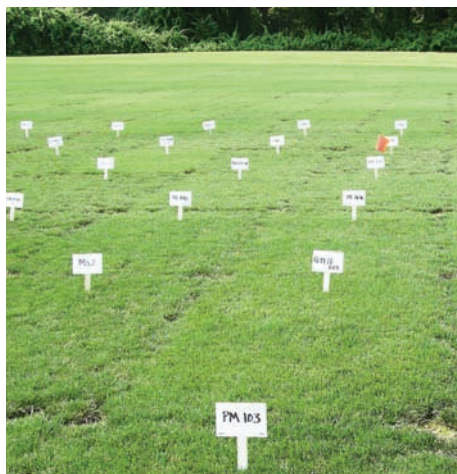
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As of October 30, 2008, over 1,150 promising turfgrasses and associated endophytes were collected in France, Italy, and Islands of Finland. Many of these associated endophytes should be new and unique and should have properties to enhance turfgrass performance. Over 9,434 new turf evaluation plots, 92,000 plants in spaced-plant nurseries, and 30,000 mowed single-clone selections were established in 2008.

Over 200,000 seedlings from intra- and inter-specific crosses of Kentucky bluegrass were screened for promising hybrids under winter greenhouse conditions of short daylengths and cool temperatures. Over 19,500 tall fescues, 34,000 perennial ryegrasses, 9,000 bentgrasses and 8,200 fine fescues were also screened during the winter in greenhouses, and the superior plants put into spaced-plant nurseries. The progenies of 150 new hybrid Kentucky bluegrasses were screened in spaced-plant nurseries to determine apomixis levels and other important turf and seed production characteristics.



Thirteen new perennial ryegrasses were released during 2008 with improved gray leaf spot resistance.



Continued developments of turf-type tall fescue are being released with improved brown patch resistance.

The following crossing blocks were moved in the spring of 2008: 5 hard fescues, 2 strong creeping red fescues, 2 Chewings fescues, 16 perennial ryegrasses, 20 tall fescues, 4 velvet bentgrasses, 4 colonial bentgrass, and 3 creeping bentgrass crossing blocks.

The 30 perennial ryegrasses identified in two different locations of the 2004 National Turfgrass Evaluation Trial in New Jersey have continued to display resistance to gray leaf spot (*Pyricularia grisea*) through 2008. These were developed in collaboration with other organizations since the fall of 2000 when the first severe epidemic occurred at Adelphia, New Jersey.

We are making continuous progress with annual cycles of recurrent selection in perennial ryegrass for gray leaf spot, dollar spot (*Sclerotinia homocarpa*), red thread (*Latisaria fusiformis*), and crown rust (*Puccinia coronata*). Some of the newly released perennial ryegrasses released this year are 'Defender', '1G Squared', 'Derby Extreme', 'Amazing GS', 'Manhattan 5 GLR', 'Gray Star', 'Kokomo II', 'Primary', 'Uno', 'Transformer', 'Gray Goose', 'Gray Fox', and 'Palmer GLS'.

New promising Kentucky blue-

grasses and Texas x Kentucky bluegrass hybrids are 'Ridgeline', 'Aries', 'Aura', 'Delight', 'Futurity', 'Katie', 'Rhapsody', 'Hampton', 'Juliet', and 'Gaelic'.

Continued developments of turf-type tall fescue are being released with improved brown patch resistance. They include 'Falcon NG', 'Jamboree', 'Terrier', 'Rocket', 'Essential', 'Fat Cat', 'Bullseye', 'Virtuosa', 'Mustang 4', 'Firecracker LS', 'Titanium LS', and 'Cochise IV'.

'Foxfire' strong creeping red fescue and 'Intrigue II' Chewings fescue were released in 2008.

Summary Points

- Continued progress was made in obtaining new sources of turfgrass germplasm from old turf areas in Europe. 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 and beneficial endophytes enables significant improvements in the performance of new cultivars. Thirteen new perennial ryegrasses were released during 2008 with improved gray leaf spot resistance.
- Twelve new improved tall fescues were released in 2008.
- Substantial progress was made in developing intra- and inter-specific hybrids of Kentucky bluegrass. Ten new promising Kentucky bluegrass cultivars were released in 2008.
- Two new fine fescue for low maintenance turf were released.
- One creeping bentgrass was released called 13M with dollar spot resistance. Colonial bentgrass clones with improved brown patch resistance were used to develop 4 populations. Clones of velvet bentgrass found with resistance to copper spot, dollar spot, brown patch, and pythium were used in velvet population increases.