

Breeding and Evaluation of Kentucky Bluegrasses, Tall Fescues, Fine Fescues Perennial Ryegrasses and Bentgrasses for Turf

William Meyer and Stacy Bonos
Rutgers University



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Objectives:

1. *Collect and evaluate useful turfgrass germplasm and associated endophytes.*
2. *Continue population improvement programs to develop improved cool-season cultivars and breeding synthetics.*
3. *Develop and utilize advanced technology to make current breeding programs more effective and efficient.*

As of October 30, 2013, over 1,800 promising turfgrasses and associated endophytes were collected in Poland, Bosnia, Serbia, Crete, Norway, Finland, Latvia and Norway. These are having seed produced in The Netherlands and will be evaluated in New Jersey. Over 11,588 new turf evaluation plots, 108,784 spaced-plant nurseries plots and 10,000 mowed single-clone selections were established in 2013.

Over 224,000 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 20,000 tall fescues, 10,000 Chewings fescues, 18,000 hard fescues, 50,000 perennial ryegrasses and 5,000 bentgrasses were also screened during the winter in greenhouses and superior plants were put in spaced-plant nurseries. Over 180 new inter- and intra-specific Kentucky bluegrasses were harvested in 2013.

The following crossing blocks were moved in the spring of 2013: 8 hard fescues (275 plants), 6 Chewings fescues (179 plants), 14 perennial ryegrasses (550 plants), 3 strong creeping red fescues (53 plants), 15 tall fescues (570 plants), 6 velvet bentgrasses (154 plants) 9 creeping

bentgrasses (164 plants) and 5 colonial bentgrasses (149 plants).

To enhance our breeding for resistance to gray leaf spot, a July 15, 2013 planting of 1800 perennial ryegrasses were seeded. Excellent Pythium blight control was attained and a good gray leaf spot epidemic occurred. This data will be used to select

Figure 1. Drought response of tall fescue genotypes grown in a rainout shelter in 2013 (water was withheld for 120 days).



future lines for varieties of perennial ryegrass. Over 16,800 perennial ryegrasses were planted in the spring of 2013 as spaced-plants. They were allowed to develop seed heads in the late spring and selections were made for stem and crown rust resistance.

The breeding program continues to make progress breeding for disease resistance and improved turf performance. New Promising varieties named and released in 2013 were Provost, Premium, Fastball, Stellar 3GL, Grand slam 3GLD, Rio Vista, Greenfield Supreme, Amazing +, Amazing GS, perennial ryegrasses; Hot Rod tall fescues; Fairmont Chewings fescues; Oasis Kentucky bluegrass; and Proclamation, Luminary and V-8 creeping bentgrasses.

Summary Points

- Continued progress was made in obtaining new sources of turfgrass germplasm. These sources are being used to enhance the breeding program.
- Modified population backcrossing and continued cycles of phenotypic and genotypic selection combined with increasing sources of genetic diversity in turfgrass germplasm. This has resulted in the continued development and release of top performing varieties in the NTEP.
- Evaluation work also continues in rain out shelter for drought and heat resistant tall fescues.
- Nine perennial ryegrasses, 1 new tall fescue, 1 Kentucky bluegrass, 1 fine fescue, and 3 creeping bentgrasses were released in 2013.
- Published or have in press over 11 referred journal articles in 2013.

Figure 2. New turf plots of tall fescue established in September, 2013 at the Rutgers Plant Biology and Pathology Research and Extension Farm in Freehold, NJ.

