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, 2011, over 1,500 promising turfgrasses and associated endophytes were collected in Turkey, Italy, and the United Kingdom. These have had seed produced in The Netherlands and will be evaluated in New Jersey. Over 9,531 new turf evaluation plots, 74,856 spaced-plant nurseries and 8,000 mowed single-clone selections were established in 2011.

Over 236,000 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, 16,416 Chewings fescues, 21,024 hard fescues, 50,000 perennial ryegrasses, and 10,000 bentgrasses were also screened during the winter in greenhouses and superior plants were put in spaced-plant nurseries. Over 393 new inter- and intra-specific Kentucky bluegrasses were harvested in 2011.

The following crossing blocks were moved in the spring of 2011: 5 hard fescues (203 plants), 2 Chewings fescues (82 plants), 8 perennial ryegrasses (358 plants), 3 strong creeping red fescues (71 plants), 8 tall fescues (332 plants), 2 velvet bentgrasses (37 plants) 5 creeping bentgrasses (60 plants) and 4 colonial bentgrasses (78 plants).

To enhance our breeding for resistance to gray leaf spot, an early July 15, 2011 planting of 200 perennial ryegrasses were seeded along with the 2010 NTEP perennial ryegrass test. Excellent *Pythium* blight control was attained and a good gray leaf spot epidemic occurred. This data will be used to select future varieties of perennial ryegrass. Over 14,000 perennial ryegrasses were planted in the spring of 2011 as spaced-plants. They were allowed to develop seedheads in the late spring and selections were made for stem and crown rust resistance.

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The breeding program continues to make progress breeding for disease resistance and improved turf performance. New promising varieties named and released in 2011 were 'Aramada' Kentucky bluegrass; 'Shenandoah Elite', 'Trerrano', and 'Penn RK-4' tall fescues; 'Shademater III', 'Contender', 'Parkbench', and 'Navigator II' strong creeping red fescues; 'Radar' Chewings fescue; and 'Barracuda' creeping bentgrass.

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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. This has resulted in the continued development and release of top performing varieties in the NTEP
- Three new tall fescues and 6 fine fescues were released in 2011.
- Published or have in press over 9 referred journal articles in 2010.