

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

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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, 2012, over 1,500 promising turfgrasses and associated endophytes were collected in Romania, Turkey, Italy and the United Kingdom. These have had seed produced in The Netherlands and will be evaluated in New Jersey. Over 9,746 new turf evaluation plots, 74,070 spaced-plant nurseries and 6,000 mowed single-clone selections were established in 2012.

Over 246,000 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 10,000 bentgrasses were also screened during the winter in greenhouses and superior plants were put in spaced-plant nurseries. Over 250 new inter- and intra-specific Kentucky bluegrasses were harvested in 2012.

The following crossing blocks were moved in the spring of 2012: 7 hard fescues (350 plants), 4 Chewings fescues (159 plants), 10 perennial ryegrasses (553 plants), 6 strong creeping red fescues (103 plants), 3 tall

fescues (183 plants), 6 velvet bentgrasses (156 plants) 5 creeping bentgrasses (84 plants) and 2 colonial bentgrasses (52 plants).

To enhance our breeding for resistance to gray leaf spot, an early July 10, 2012 planting of 800 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 future varieties of perennial ryegrass. Over 15,000 perennial ryegrasses were planted in the spring of 2012

Figure 1. Large, space planted nursery at Rutgers University.



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 2012 were 'Pizzazz 2', 'Sideways', 'SR-4650', 'Karma', 'Wicked', 'Evolution', 'Pangea', 'Saltinas', 'Fusion', 'Trio', 'Troya' and 'Sox Fan' perennial ryegrasses; 'Toccoa', 'Regenerate' and 'Deputy' tall fescues; 'Radus', 'Treasure II' and 'Longfellow III' Chewings fescues; 'Matterhorn' and 'Blue Ray' hard fescues; 'Cardinal', 'Wrigley 2' and 'Shademater III' strong creeping red fescues; 'Fullback', 'Felder', 'Shannon' and 'Unite' Kentucky bluegrasses; and 'Barracuda', and 'Cobra 2' creeping bentgrasses.

Summary Points

- 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.
- Twelve perennial ryegrasses, 3 new tall fescues, 4 Kentucky bluegrasses and 8 fine fescues were released in 2012.
- Published or have in press over 5 referred journal articles in 2012.