

1983-01-001

Project Title: 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.

Start Date: 1982

Project Duration: Continuous

Total Funding: \$ 10,000 per year

As of October 30, 2017 over 2543, promising turfgrasses and associated endophytes were collected in Corsica, Sardinia, Guernsey, Jersey, Hungary and Romania These are having seed produced in the Netherlands and will be evaluated in New Jersey starting in fall 2017. Over 8,107 new turf evaluation plots, 139,345 spaced-plant nurseries plants and 10,000 mowed single-clone selections were established in 2017.

Over 200,000 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 38,770 tall fescues, 7,000 Chewings fescues, 4,000 hard fescues, 43,500 perennial ryegrasses and 5,000 bentgrasses were also screened during the winter in greenhouses and superior plants were put in spaced-plant nurseries. Over 85 new inter- and intra-specific Kentucky bluegrasses were harvested in 2017.

The following crossing blocks were moved in the spring of 2017: 2 hard fescues (45 plants), 4 Chewings fescues (101 plants), 11 perennial ryegrasses (437 plants), 17 tall fescues (574 plants), 6 creeping bentgrasses (97 plants), 6 velvet bentgrasses (183 plants) and 6 colonial bentgrasses (169 plants).

The breeding program continues to make progress breeding for disease resistance and improved turf performance. New Promising varieties named and released in 2017 were Shield, Furlong, Umpqua, Monsieur and Xcellerator perennial ryegrasses, new tall fescues were Trinity, Selkirk, Leonardo, Rockwell, Fantasia, Michelangelo, Reflection, Motiff, Valyrie LS and Bloodhound. There was also one creeping red fescue named Marvel. There was two new creeping bentgrasses named Chinook and Cohoo.

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
- Five perennial ryegrasses, 10 new tall fescues, 1 fine fescue, and 2 creeping bentgrasses in 2017
- Published or have in press over 5 referred journal articles in 2017
- 20 Plant variety certificates issued and 14 PVP's applied for in 2017.



Figure 1. Hybrid Kentucky bluegrass nursery in Freehold, NJ.



Figure 2. Hard fescue nursery in Freehold, NJ.