# Breeding and Evaluation of Kentucky Bluegrass, Tall Fescue, Perennial Ryegrass, and Bentgrass for Turf

**Dr. C. Reed Funk**

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**Goals:**

- *Collect and evaluate potentially useful turfgrass germplasm.*
- *Collect and evaluate endophytes associated with cool-season turfgrass species.*
- *Continue the breeding and development of new cool-season turfgrasses.*

**Cooperators:**

*William A. Meyer*
*Jennifer Johnson-Cicalese*
*James Murphy*
*Michael Richardson*
*James White*
*Dirk Smith*
*Ronald Bara*
*Melissa Mohr*
*Rachael Roux*
*Christine Kubik*
*Pedro Perdomo*
*Stacy Bones*
*Joseph Clark*
*William K. Dickson*
*Barbara Smith*

The USGA has enjoyed a very long and productive relationship with Dr. Reed Funk at Rutgers University. Today, the financial contribution of the USGA to his breeding program is small compared other royalty income received. Due to the efforts of Dr. Funk and the international stature of his breeding program, Dr. William Meyer has joined Rutgers University to carry on the outstanding contribution this institution and its faculty have made to the turfgrass industry.

Dr. William A. Meyer was assigned leadership of the newly invigorated turfgrass breeding program in April 1996. A total of over 50,000 plots of turfgrass cultivars, experimental selections, and germplasm sources are under observation and evaluation in field trials at Adelphia, North Brunswick, and Pittstown, New Jersey.

Over 8,500 new seeded turfgrass evaluation plots, over 20,000 clonal evaluation plots, and over eleven acres of spaced-plant nurseries were established in 1996.

Promising turfgrass germplasm and associated endophytes were collected from Poland, Austria, Switzerland, Germany, New Jersey, Connecticut, New York, and Oregon. Increased emphasis was placed on collecting creeping, colonial, dryland, and velvet bentgrasses.

Germplasm developed at the New Jersey Agricultural Experiment Station was used in a number of new turfgrass varieties including Palmer III, Premier II, Catalina, Wizard, and Divine perennial ryegrasses;

Genesis, Tarheel, Renegade, Jaguar 3, Grande, Barlexas, SR-8210, Gazelle, and Duster tall fescues; Treasure Chewings fescue; and Nordic hard fescue.

Studies were initiated to develop a more rapid method of screening for resistance to the stripe smut disease.

Kentucky bluegrasses with good field resistance to current races of stripe rust are being evaluated for other useful characteristics.

A seedling screening technique has proven successful in identifying promising hybrids in large populations obtained from crossing highly apomictic Kentucky bluegrasses.

Moderate wear treatments on newly established turfs have been effective in identifying fescues and perennial ryegrasses with improved resistance to net blotch and leaf spot diseases.

Chinch bugs caused severe damage to endophyte-free strong creeping and Chewings fescues, whereas half-sib progenies of the same fine fescues containing endophytes showed enhanced resistance in both field and laboratory tests. Petri-dish preference tests, using first-instar chinch bugs, were used to compare E+ fine fescue combinations with the E- - counterparts. A significantly higher percentage of nymphs were found on the E- tillers for four of the five comparisons. These studies demonstrated endophyte-enhanced chinch bug resistance for the first time in strong creeping red fescue.

Population improvement programs continue to show progress in the genetic improvement of perennial ryegrasses, tall fescues, Chewings fescues, hard fescues, strong creeping red fescues, and creeping bentgrass. Similar population improvement programs have been initiated on recent collections of colonial, dryland, and velvet bentgrasses.

Continued progress is being made in identifying and developing Kentucky bluegrasses with improved performance under severe summer stress and also at reduced maintenance.