Development of High Yielding Turf-type Kentucky Bluegrass Varieties for Non-burn Seed Production

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Grower and University cooperators
Phase I

Diversity evaluation of USDA-ARS Kentucky bluegrass collection
Evaluation of Kentucky Bluegrass Germplasm
1994-1995
From the Western Regional Plant Introduction Station
• 228 PI accessions
• 17 Commercial cultivar checks
Developed a “Core Collection”

• Ward’s cluster analysis

• Identified 20 accessions representing the genetic diversity within the entire Kentucky bluegrass collection

• 16 additional PI accessions plus 9 commercial checks were established in residue management plots

• The 9 checks represented the 9 groups (types) of turf-type Kentucky bluegrasses
PI evaluation plots

Residue management plots 1996-1999
Seed production plot treatments: Burned, Baled, and Full Residue across bluegrass Accessions and Controls

- 20 Core collection accessions
- 16 “Free Picks”
- 9 commercial cultivars
Results:
Effect of residue management on seed yield compared to open-field burning

- Open-field burning – 100% seed yield
- Residue removed (baled) – 63% of OFB
- Residue retained – 27% of OFB

As expected,
Turf Quality was negatively correlated with Seed Yield
However,
Some accessions had seed yield and turf quality as high, or higher, than checks
<table>
<thead>
<tr>
<th>Bluegrass</th>
<th>Turf Quality</th>
<th>Burned Yield (lbs/acre)</th>
<th>Baled Yield (lbs/acre)</th>
<th>Residue Retained</th>
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Phase III

Selection within accessions for diversity in seed yield components
Nursery for individual plant agronomic and molecular characterization

2002 -2004

10 entries (8 PI and 2 checks); 28 plants per entry; 3 replications
Agronomic variation within accessions

PI 349188
Variation for plant height within PI 349188
Selection for yield components: for each entry, 100 seed were obtained from 5 selected plants:

A. plant with highest yield
B. plant with high seed weight
C. plant with high seed per panicle
D. plant with high panicles per unit area

Also:
F. 100 seed from the original population

TOTAL = 5,000 plants
(10 entries, 5 selections, 100 seed)
Phase IV

Seed increase for on-farm seed yield trials and university turf trials
Grow out of bluegrass seedlings in flats
5,000 space plants established at the USDA research site at Central Ferry, WA
Central Ferry  May 25, 2006

Midnight  Kenblue  23  68  75
2006 data collected

- Bloom date
- Harvest date
- Head height
- Leaf texture
- Leaf color
- Uniformity of heads

2006 data to do

- Seed yield
- Seed weight
Phase V

On-farm seed yield trials and turfgrass trials
On-farm Seed Production Plots

Currently:
10 selections x
5 parameters x
3 replications
= 150 plots
per location
Grass Seed Production Research