Development of Kentucky Bluegrass for Non-burn Seed Production

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DOE Ag Burning Task Force
June 9, 2009
Justification

Burning no longer allowed in WA
Bale to remove residue

Shorter rotations (< 3 yrs)
Environmental concerns
Impact on soil and water quality
Pesticides

Less economic return
Objective 1 (1994-2006)

Identify Kentucky bluegrass germplasm that has good turfgrass quality while producing sustained seed yield under non-burn seed production.
Germplasm Source

Initially, more than 200 accessions were tested

1994-1995

- 40+ selections in seed production and turfgrass trials
- 8 Selected for seed yield under bale residue removal and good turfgrass quality

1996-1999
Origin of Accessions:

PI368241 Palmer, Alaska
PI349188 Haines, Alaska
PI371775 Juneau, Alaska
PI371768 Hope, Alaska
PI539057 Siberia
PI539059 Siberia
PI230132 Iran
PI574523 (‘Belturf’) 
Midnight Oregon, donated by Pure Seed Testing
Kenblue donated by U. Kentucky
Selection for Seed Yield Components

**2002-2004**
28 individual plants of each accession replicated 3 times

Selection was for plant with highest:
1) # Panicles per area
2) # Seeds per panicle
3) 1000 Seed weight
4) Seed yield per plant
+ Base population
Seed Increase 50 Selections at Central Ferry, WA

2004

2006
Objective 2 (2007-2011+)

Evaluate effectiveness of seed yield component selection to enhance seed production while maintaining turf quality
Turfgrass Trial

- 50 entries planted in a randomized complete-block design with 3 replications
- **Quality**, Color, Texture, and Chlorophyll rated monthly

May 2008
Seed Production (Irrigated and Non-irrigated)

- 50 entries planted in a randomized complete-block design with 3 replications
- Seed yield

Non-irrigated  June 2008

Irrigated
Kentucky bluegrass seed yield (2008) vs. turf quality (mean of 2007 and 2008) for entry x selection parameters at Pullman, WA
## “The Winners”

<table>
<thead>
<tr>
<th>Germplasm</th>
<th>Yield component</th>
<th>Seed yield (lbs/acre)</th>
<th>Quality (1-9; 9 best)</th>
</tr>
</thead>
<tbody>
<tr>
<td>371775</td>
<td>Seeds per head</td>
<td>825</td>
<td>7.2</td>
</tr>
<tr>
<td>371775</td>
<td>Yield per plant</td>
<td>660</td>
<td>7.2</td>
</tr>
<tr>
<td>371775</td>
<td>Base</td>
<td>656</td>
<td>7.2</td>
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<tr>
<td>371775</td>
<td>Heads per area</td>
<td>642</td>
<td>7.4</td>
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<td>Kenblue</td>
<td>Seeds per head</td>
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<td>Yield per plant</td>
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<td>Base</td>
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<td>Seeds per head</td>
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<tr>
<td>368241</td>
<td>Heads per area</td>
<td>718</td>
<td>6.6</td>
</tr>
</tbody>
</table>
Conclusions (2007-2009 Project)

- Several selections showed promise as higher yield-higher turf types for non-burn production

- Selection for yield components was not clearly linked to high yield and high turf types

- Currently only one year of seed yield data
Current proposal: (2009 – 2011)

- Continue to evaluate seed production under bale management in diverse environments (dryland and irrigated) for 2\textsuperscript{nd} (2009) and 3\textsuperscript{rd} (2010) harvests.

- Continue to test selections for turf quality and stress tolerance at several locations.