Kentucky Bluegrass for Non-burn Seed Production


DOE ABPRTF Meeting Spokane, WA
February 8, 2011
Objective 1
Identify Kentucky bluegrass germplasm that has good turfgrass quality while producing sustained seed yield under non-burn seed production

Objective 2
Evaluate effectiveness of seed yield component selection to enhance non-burn seed production while maintaining turf quality
Germplasm Source

Initially, more than 225 accessions were tested

- 45 accessions evaluated in seed production and turfgrass trials
- 10 selection made for seed yield under bale residue removal and good turfgrass quality
## Origin of Selections

<table>
<thead>
<tr>
<th>PI</th>
<th>Location</th>
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<tbody>
<tr>
<td>368241</td>
<td>Palmer, Alaska</td>
</tr>
<tr>
<td>349188</td>
<td>Haines, Alaska</td>
</tr>
<tr>
<td>371775</td>
<td>Juneau, Alaska</td>
</tr>
<tr>
<td>371768</td>
<td>Hope, Alaska</td>
</tr>
<tr>
<td>539057</td>
<td>Siberia</td>
</tr>
<tr>
<td>539059</td>
<td>Siberia</td>
</tr>
<tr>
<td>230132</td>
<td>Iran</td>
</tr>
<tr>
<td>574523</td>
<td>(‘Belturf’)</td>
</tr>
<tr>
<td>‘Midnight’</td>
<td>Oregon, Pure Seed Testing</td>
</tr>
<tr>
<td>‘Kenblue’</td>
<td>Univ. Kentucky</td>
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</tbody>
</table>
Selection for Seed Yield Components

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

- 50 entries planted in a randomized complete-block design with 3 replications; rated monthly
- Quality

May 2008
Seed Production (Irrigated and Non-irrigated); Pullman, WA

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

- Seed yield
Seed yield (2008) vs. turf quality (2007-2008). Dashed circle is PI368241 and one Kenblue. Solid red circle is PI371775.
Non-irrigated seed yield (2009) vs. turf quality (2009). Circle is PI368241 and one Kenblue.
Non-irrigated seed yield (2010) vs. turf quality (2010). Circle is PI368241 and one selection of ‘Kenblue’.
Conclusions (2008-2010 Project)

- Several selections showed promise as high yielding turf-type bluegrass for non-burn seed production

- PI368241

- Kenblue selection seed/head for non-irrigated
2011 – 2014

- Continue to evaluate seed production under no-burn management in diverse environments (dryland and irrigated) for 4th (2011) harvest.

- Continue to test selections for turf quality at several locations (Pullman, WA; Auburn, AL; Puyallup, WA).

- Begin seed increase of promising selections for on-farm testing.
Spring 2011 plant for seed increase:

PI368241 seed/head (irr.); head/area (non-irr.)
Kenblue seed/head (non-irr.)
Midnight seed wt. (irr. or non-irr.)
PI371768 head/area (irr.)
Cook 4: NH₄OH/KOH (60 min. cook time)

Cook 1: 5% NaOH/5% KOH

Hydrostraw

WSU Turfgrass and Agronomy Research Center
6/25/2010
Cook 4: NH₄OH/KOH (60 min. cook time)
Hydrostraw with Guar
Seedling emergence 6/25/10

- Hydrostraw
- Paper mulch
- Wood mulch
- Guar
- KBG Cook 1 (5% NaOH/5% KOH)
- KBG Cook 2 (10% KOH)
- KBG Cook 4 (NH4OH/KOH)
- Check

Seeding emergence (1 = worst; 9 = best)
Percent Broadleaf and Grass Weeds in Turfgrass Stand
Soil volumetric water (6/25/10)
Justification

Burning no longer permitted in WA

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

Less economic return