2016 Soybean Update

A) Variety options for 2016
   “RR2 & RR2 Extend”, “Enlist duo”
   LL- Old and new events
   Conventional
   RR1

B) Variety releases from the Delta Center

C) “IleVO” seed treatment results under severe nematode pressure
RR2 and RR2 extend

- Only a few new releases of RR2 for 2016
- Companies want to move to “RR2 Extend”
- Awaiting approval from China- Already advertisements on TV
- A few seed companies including Monsanto will have “RR2 Extend” varieties for 2016?
- Do not expect any drop off in yield
- Drift Issues must be managed
“Enlist” system

- RR and 2,4-D tolerance
- Less drift because of less volatile 2,4-D formulation
- Varieties appear to be a ways off for the South
- Progress is better in group II and earlier
LL old and new events

- Old event- LL27 where the LL trait was inserted in a RM 2.7 maturity. Most varieties with this LL gene until 2015

- New event-LL55- LL55 is a different gene (s) inserted in a RM 5.5 or southern background. The LL55 event is used in all new and stacked liberty traits.

- Credenz new identifier for Bayer beans – big LL & RR lineup

- Note: Progeny 5414LLS shows resistance to root knot. Check with other suppliers for other choices for root knot issues.
Conventional soybeans?

- Seed costs are less than RR2 or Liberty
- Many varieties are competitive in yield
- Already using conventional herbicides on RR beans because of RR resistant weeds
- Some elevators & poultry feed suppliers are offering a premium for non-GMO soybeans
- Farmers are succeeding with them
Breeding for - RR1 & conventional soybeans

- Public soybean breeding programs probably will be the source of RR1 & conventional soybeans - U of MO, U of AR, U of TN, KS State, U of IL, NC. State

- Lots of interest in conventional & RR1 soybeans

- RR1 – off patent, no tech fees and lower costs

- Some RR1 varieties are patented (Pioneer), cannot save the seed.
Update - seed releases U of MO

Five lines proposed for release from the Delta Center Soybean Breeding Team

Melissa Crisel
Scotty Smothers
Stewart Selves
Michael Clubb
Jamie Manuel
Grover Shannon

Five part time (students)
Dr. M. Ali – flood and drought tolerance
Dr. Henry Nguyen- Genetic markers
Importance of nematodes

SCN accounts for 17% of all disease losses

Root knot nematode (RKN) is a big issue in SEMO and other states

All nematodes account for 35% of all yield losses- Often more than one species in a field
Nematodes in AR, TN, NC & MO

• SCN surveys- Races 2 and 5 or any race other than 3 and 14. Need varieties with Hartwig-type SCN resistance- a few to choose from.

• Need both SCN and root knot resistance on especially on sands and sandy loams

• Possibly a new RKN species in MO- *M. javanica*
Three root knot species affect soybeans

- **Genus Meloidogyne**

- **Southern root knot- M. incognita**

- **Peanut root knot- M. arenaria**

- **Javanese root knot- M. javanica**
How to determine your nematode situation

Take a soil sample to test for presence of SCN or RKN

No need to check for SCN race, it is probably either race 2 or 5
U of MO Delta Center Releases
One conventional; Two glyphosate tol.
with multiple nematode resistance

- Late group IV to early group V maturity
- Yields $\geq$ RR2Y checks
- Resistant to 1, 2, 3, 5 and 14 SCN (Hartwig type)
- Moderately resistant to Root knot nematode
- Excellent tolerance to Sudden death syndrome (SDS)
- Resistant to Frogeye leaf spot- two of the three lines
- Chloride excluder for Salt tolerance
Performance of U of MO 5.2 conventional vs Asgrow AG 5332R2Y across 3 soil types and 17 sites in SEMO 2012-15 and Uniform Regional tests at 9 sites, 2014

<table>
<thead>
<tr>
<th>Line</th>
<th>Relative maturity</th>
<th>Loam BU/A</th>
<th>Clay BU/A</th>
<th>Sand BU/A</th>
<th>SEMO Mean</th>
<th>UPT</th>
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<td>UMO 5.2 Conv</td>
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<td>6</td>
<td>3</td>
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Performance of two new U of MO RR1 releases compared to Asgrow AG 5332R2Y across 3 soil types and 17 sites in SEMO, 2012-15 and Uniform Group tests, 2014 at 10 sites

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<th>UPT IV</th>
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New releases resistant to SDS and frogeye
U of MO Releases to seedsman in 2016

• How to get seed of new Missouri releases
  Two RR1s 4.9 and 5.0 maturities
  One conventional 5.2 maturity

• Contact Richard Arnett at Missouri Seed Improvement Association
  573-449-0586 or moseed@aol.com

• Can I save my seed? Yes, but cannot sell it to others
More conventional releases- early 2017

- S12-3782- 4.7 maturity- SCN 3, 14; RKN frogeye
- S12-2418S- 4.8 maturity- STS, SCN 3, 14; RKN, frogeye, salt
- S11-20124- 5.1 maturity– SCN (all), RKN, frogeye, salt
- S12-4718- 5.2 maturity – SCN 3 and 14, frogeye, salt

Strong performance against RR2 varieties of similar maturity

Awaiting additional data from Uniform Regional tests across southern states
Best RR bets for nematode problems

• Resistant varieties- Hartwig type SCN and RKN 14 to 18 bushel yield advantage vs a susceptible variety

• Seed treatments for nematodes?
  Illevo (Bayer) – cost $18 per acre?
SDS and SCN go hand in hand
Root Knot Nematode Injury
Effect of Ilevo on soybean lines differing in SCN & RKN resistance on a nematode infested soil

- Resistant to both RKN & SCN - S11-20337
- Resistant to SCN but susceptible to RKN - S11-20345
- Susceptible to both RKN & SCN - S08-17361
- Field is sandy & nematode infested at Clarkton, MO
Yield (BU/A) of 3 soybean lines differing resistance to SCN & RKN with & without Ilevo

<table>
<thead>
<tr>
<th>Variety</th>
<th>Treated</th>
<th>Untreated</th>
<th>Difference</th>
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<tbody>
<tr>
<td>S11-20337 R to SCN, RKN</td>
<td>60</td>
<td>54</td>
<td>+6</td>
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<tr>
<td>S11-20345 R to SCN only</td>
<td>54</td>
<td>41</td>
<td>+13</td>
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<tr>
<td>S09-17361 Susceptible</td>
<td>34</td>
<td>30</td>
<td>+4</td>
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Your Soybean Checkoff Dollars at Work

Appreciation extended to Missouri soybean farmers, the United Soybean Board and the Missouri Soybean Merchandising Council for Research Support