Soybean Rust: Sentinel Plots

Soybean Rust Identification
- Bacterial blight
- Bacterial pustule
- Brown spot

Disease Progress Curve

Soybean Rust Management
- Fungicides: Aerial, Ground, Chemigation
- Scouting: Timing is Critical
- Planting Date / Maturity
**Soybean Rust Management**

- Fungicides: Aerial, Ground, Chemigation
- Scouting: Timing is Critical
- Planting date / Maturity

**Corn Plant Distribution**

- Population, Twin Rows, Equidistance

Dr. Dale Flowerday, DalMar Consulting
Keith Glewen, UNL Extension Educator

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**Corn Plant Distribution**

Row Width x Population
30,000 Plants/Acre Final Stand

<table>
<thead>
<tr>
<th>Row Width</th>
<th>Plants</th>
<th>Seeds @90%</th>
</tr>
</thead>
<tbody>
<tr>
<td>36&quot;</td>
<td>5.8&quot;</td>
<td>5.2&quot;</td>
</tr>
<tr>
<td>30&quot;</td>
<td>7.0&quot;</td>
<td>6.3&quot;</td>
</tr>
<tr>
<td>20&quot;</td>
<td>10.5&quot;</td>
<td>9.4&quot;</td>
</tr>
<tr>
<td>15&quot;</td>
<td>13.9&quot;</td>
<td>12.5&quot;</td>
</tr>
</tbody>
</table>

---

**Corn Plant Distribution**

30,000 Plants/Acre Final Stand
Twin Rows

<table>
<thead>
<tr>
<th>Row Width</th>
<th>Distance Between Plants</th>
<th>Seeds @90%</th>
</tr>
</thead>
<tbody>
<tr>
<td>36&quot;</td>
<td>11.6&quot;</td>
<td>10.4&quot;</td>
</tr>
<tr>
<td>30&quot;</td>
<td>13.9&quot;</td>
<td>12.5&quot;</td>
</tr>
<tr>
<td>20&quot;</td>
<td>20.8&quot;</td>
<td>18.8&quot;</td>
</tr>
</tbody>
</table>
Corn Plant Distribution

Twin Rows

1. How?
2. Why?
3. Yield Results?

Take Home Message #1
Uniform Seed Spacing and Uniform Planting Depth is Critical to Productive Plant Populations!

Take Home Message #2
Farming is a Thinking Man’s Game!

Yield Formula =
Kernels/ear x Ears/acre
____________________ = Bu/Ac
90,000 Kernels/Bushel
Corn Plant Distribution

- Crop production is sunshine to sugar thru leaves.
- More leaves per acre produces more ________?
  (corn leaves never light saturated)

Corn Plant Distribution

- How do we get more:
  - Leaves per acre?
  - Sunshine per leaf?

Corn Plant Distribution

Higher populations
More Leaves Per Acre
Narrower Rows
More Sunshine per Leaf

Corn Plant Distribution

Corn Populations!
What’s Right For Your Fields?
Relay Cropping

Use wheat as a nitrogen and water scavenger
**Relay Cropping Yields**

<table>
<thead>
<tr>
<th>Year</th>
<th>Wheat, bu/A</th>
<th>Soybeans, bu/A</th>
</tr>
</thead>
<tbody>
<tr>
<td>2002</td>
<td>68</td>
<td>55</td>
</tr>
<tr>
<td>2003</td>
<td>74</td>
<td>45</td>
</tr>
<tr>
<td>2004</td>
<td>86</td>
<td>50</td>
</tr>
</tbody>
</table>

Soybean yields were 10-15 bu/A below C-S yields

**Wheat Economics**

<table>
<thead>
<tr>
<th>Item</th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wheat Yield (75 bu/A @ $3.00/bu)</td>
<td>$225</td>
</tr>
<tr>
<td>Seed (90 lb/A @ $6.00/bu)</td>
<td>$9</td>
</tr>
<tr>
<td>Seeding (custom rate)</td>
<td>$15</td>
</tr>
<tr>
<td>Starter (70 lb of 11-52-0 @ $0.15/lb)</td>
<td>$11</td>
</tr>
<tr>
<td>Sidedress N (0-195 lb of 46-0-0 @ $0.18/lb)</td>
<td>$0 - 34</td>
</tr>
<tr>
<td>Irrigation (6 inches @ $3.00/inch)</td>
<td>$18</td>
</tr>
<tr>
<td>Harvest (rental @ $120/hr)</td>
<td>$17</td>
</tr>
<tr>
<td>Net Return</td>
<td>$121 - 155</td>
</tr>
<tr>
<td>Soybean Yield Reduction (15 bu/A @ $6/bu)</td>
<td>$90</td>
</tr>
</tbody>
</table>
Importance of PRE

- Widens Application Window
- PRE = known performance
- Advantage over two post
- LL – look for grass activity

Cost/A of the Liberty Link versus Roundup Ready

<table>
<thead>
<tr>
<th>Item</th>
<th>Roundup</th>
<th>Liberty Link</th>
</tr>
</thead>
<tbody>
<tr>
<td>Seed</td>
<td>$57.50</td>
<td>$61.00</td>
</tr>
<tr>
<td>Tech Fee</td>
<td>$6.50</td>
<td>$0</td>
</tr>
<tr>
<td>Herbicide 2/3 Pre</td>
<td>$17</td>
<td>$17</td>
</tr>
<tr>
<td></td>
<td>WMAX-$9</td>
<td>Liberty + ATZ-$18</td>
</tr>
<tr>
<td>Additives</td>
<td>$0.40</td>
<td>$0.10</td>
</tr>
<tr>
<td>Volunteer Cost</td>
<td>$2-3</td>
<td>$0</td>
</tr>
<tr>
<td>Total</td>
<td>$92.90</td>
<td>$96.10</td>
</tr>
</tbody>
</table>

Where does each one fit?

- Do you want to use glyphosate in corn or beans?
- Do you like the seed company?
- Is the HT trait part of the package?
- How do you want to deal with volunteer corn?
**System Comparisons**

<table>
<thead>
<tr>
<th></th>
<th>Glyphosate</th>
<th>Liberty</th>
</tr>
</thead>
<tbody>
<tr>
<td>GMO</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Residual</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>Tank Mixes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Other herbs.</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Crop Stage Limit</td>
<td>Up to 30&quot;</td>
<td>Up to 24&quot;</td>
</tr>
<tr>
<td></td>
<td>48&quot; - drops</td>
<td>36&quot; - drops</td>
</tr>
<tr>
<td>Crop Safety</td>
<td>Good</td>
<td>Good</td>
</tr>
<tr>
<td>Var. weed hrs.</td>
<td>Adj. Rate</td>
<td>Rate Limited</td>
</tr>
<tr>
<td>Vol control in beans</td>
<td>Yes - S</td>
<td>RR beans</td>
</tr>
</tbody>
</table>

**Hard-Core Soybean Irrigation Questions**

1. If you produce both Irrigated Corn and Irrigated Soybean and your Corn Yield / Soybean Yield Ratio is not equal to 3.25
   (examples: 175/53.8; 200/61.5; 225/69.2; 250/76.9; 275/84.6; 300/92.3; 325/100), then you are mistreating one or the other crop. Which one do you usually mistreat?

**Estimated Soybean ET (m/day)**

- Germination and Emergence
- Rapid Growth
- Flower
- Pod Fill
- Seed Fill
- Maturation

**Understanding where the water losses are**

- Canopy Evaporation
- Soil Evaporation
- Deep Percolation
- Wind Erosion

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Growing Point

- Grass
- Broadleaf

Volunteer Corn is a Weed

- Hybrid vigor loss = - 25% yield
- Loss of traits ie. resistance
- Clump = no yield
- 1 Clump/100ft² = 2% yield loss

Herculex is Liberty Link

- LL is a selectable marker
- LL is resistant to Liberty
- Herculex is resistant to Liberty

Herbicide Characteristics

- Liberty - contact
- Glyphosate - translocated
Blocked-End Furrows

- Stored Moisture
- Deep Percolation

Poorly Managed Blocked End Furrows

Properly Managed Blocked-End Furrows

Potential Effect of Length of Run

Field Length (miles)

- 1/4
- 1/2

Infiltrated Water (inches)

- Stored Water
- Stored Water
- Deep Percolation
- Deep Percolation for half mile rows

Land Grading

- Low spots and reverse grades
  - Advance times become longer, decreasing uniformity
  - Surge irrigation performance can be severely impacted

Leaky Gates and Gaskets

- Decrease irrigation efficiency
  - Decrease system capacity
  - Fewer gates can be opened
  - More sets required, extra pumping to fully water the crop
  - Produce less grain when deficit irrigating
  - May increase leaching loss at top of field

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**Every-other Furrow**
- Applies water to one side of every ridge
- Takes less time to irrigate field
- Applies less water per irrigation
- Reduces total water application 20 to 30%
- Leaves more room for storing precipitation
- Research has proven yields comparable to every furrow irrigation

**Surge Irrigation**
- Applies water to a group of furrows intermittently in a series of on-off periods called cycles.
- Furrow wetting and drying cycles reduce infiltration rate in furrow.

**Impact of furrow packing on advance time reduction (%)**

<table>
<thead>
<tr>
<th>Continuous Soft</th>
<th>Surge Soft</th>
<th>Continuous Packed</th>
<th>Surge Packed</th>
</tr>
</thead>
<tbody>
<tr>
<td>80</td>
<td>90</td>
<td>60</td>
<td>70</td>
</tr>
</tbody>
</table>

**Corn Nitrogen Credits**
- Soybean credits, are they real?
- Soil N release, how much can you count on?
- Putting it all together
Manure/Compost

<table>
<thead>
<tr>
<th>N form</th>
<th>Dry</th>
<th>Lbs/ton</th>
</tr>
</thead>
<tbody>
<tr>
<td>Organic N</td>
<td>0.49 %</td>
<td>7.0</td>
</tr>
<tr>
<td>Ammon. N</td>
<td>113 ppm</td>
<td>0.2</td>
</tr>
<tr>
<td>Nitrate</td>
<td>58 ppm</td>
<td>0.1</td>
</tr>
<tr>
<td>Total N</td>
<td>0.50 %</td>
<td>7.3</td>
</tr>
</tbody>
</table>

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Plant Early – More Nodes

Plant Early – Crop Height Effect

Plant Early – More Crop Season

Plant Early – But Do It Right!
- Know the calendar date of last-ever spring frost for your area.
- Plant no earlier than 14 days prior to that calendar date.
- Use a variety with slightly later flowering (i.e., later maturing).
- Use high quality seed treated with a fungicide & insecticide!
### Fertilizer Use Strategies Compared

<table>
<thead>
<tr>
<th>Strategy</th>
<th>WREC</th>
<th>Clay Center</th>
<th>ARDC</th>
<th>HAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yield Goal</td>
<td>170 bu/a</td>
<td>170-200 bu</td>
<td>170 bu</td>
<td>90 bu</td>
</tr>
<tr>
<td>Fertilizer $/acre</td>
<td>54</td>
<td>56</td>
<td>62</td>
<td>27</td>
</tr>
<tr>
<td>Yield Bu/acre</td>
<td>167</td>
<td>186</td>
<td>152</td>
<td>83</td>
</tr>
</tbody>
</table>

MB – Maintenance + Build; DC – Deficiency Correction
Average cost and yield over 7 years