Performance of Roundup Ready Soybeans in the Midwest

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The Move to Roundup Ready

• More flexibility in herbicide application timing
• Simplicity - less confusion of mixes and rates
• Better control of perennial weeds

• Easier switch to conservation tillage practices
The Move to Roundup Ready

2001 Conservation Tillage Survey
American Soybean Association
n=452

“In the past five years, what changes in technology have made it possible for you to reduce tillage or increase crop residue?”

• 63% Roundup Ready technology
• 47% Better equipment
• 12% Better chemicals - not specified
More Survey Results

• >50% of growers polled credited biotech-derived soybeans as the main reason they were able to adopt reduced tillage practices leading to less loss of topsoil, reduced soil compaction, and significant fuel savings

• The American Soybean Association (ASA) study confirmed that 73 percent of the growers in the study leave more crop residue on the soil surface than they did five years ago before herbicide-tolerant soybeans were introduced.

• 48% have increased their no-till acres
2001-Roundup Ready in Review

- New acreage records across Midwest
- Renewed concerns about marketing
- More glyphosate choices
- More organic/food grade acreage
# Roundup Ready Marketing

<table>
<thead>
<tr>
<th>Seed Company</th>
<th>2000</th>
<th>RR</th>
<th>2001</th>
<th>RR</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dairyland Seeds</td>
<td>44</td>
<td>48%</td>
<td>42</td>
<td>67%</td>
</tr>
<tr>
<td>Garst and Agripro</td>
<td>115</td>
<td>50%</td>
<td>136</td>
<td>65%</td>
</tr>
<tr>
<td>Golden Harvest</td>
<td>165</td>
<td>56%</td>
<td>159</td>
<td>67%</td>
</tr>
<tr>
<td>Great Lakes</td>
<td>34</td>
<td>53%</td>
<td>31</td>
<td>71%</td>
</tr>
<tr>
<td>Midland Genetics</td>
<td>25</td>
<td>52%</td>
<td>22</td>
<td>77%</td>
</tr>
<tr>
<td>Monsanto</td>
<td>110</td>
<td>85%</td>
<td>111</td>
<td>75%</td>
</tr>
<tr>
<td>Mycogen</td>
<td>46</td>
<td>33%</td>
<td>47</td>
<td>57%</td>
</tr>
<tr>
<td>NC+ Hybrids</td>
<td>41</td>
<td>61%</td>
<td>30</td>
<td>71%</td>
</tr>
<tr>
<td>Pioneer</td>
<td>114</td>
<td>48%</td>
<td>88</td>
<td>51%</td>
</tr>
<tr>
<td>Syngenta</td>
<td>57</td>
<td>42%</td>
<td>58</td>
<td>60%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>751</td>
<td>55%</td>
<td>724</td>
<td>65%</td>
</tr>
</tbody>
</table>

*Seed Today Oct/Nov/Dec 2001*
Wisconsin Testing Procedure
RCB Nested Design

- **Rep IV**: Roundup Ready, Conventional
- **Rep III**: Conventional, Roundup Ready
- **Rep II**: Roundup Ready, Conventional
- **Rep 1**: Conventional, Roundup Ready

J. Gaska UW Madison 2002
Roundup Ready and Conventional Entries in WI Variety Trials

% of Entries

<table>
<thead>
<tr>
<th>Year</th>
<th>CN</th>
<th>RR</th>
</tr>
</thead>
<tbody>
<tr>
<td>1997</td>
<td>90</td>
<td>10</td>
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<tr>
<td>1998</td>
<td>70</td>
<td>30</td>
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<td>1999</td>
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<td>50</td>
</tr>
<tr>
<td>2000</td>
<td>50</td>
<td>50</td>
</tr>
<tr>
<td>2001</td>
<td>60</td>
<td>40</td>
</tr>
</tbody>
</table>
Average Yield of Roundup Ready and Conventional Soybean Varieties in WI. 1998

**Northern Region**
- CN 29  RR 24

**North-Central Region**
- CN 54  RR 53

**Central Region**
- CN 72  RR 70

**Southern Region**
- CN 70  RR 68
Average Yield of Roundup Ready and Conventional Soybean Varieties in WI. 2001

- **Northern Region**
  - CN 38  RR 38

- **North-Central Region**
  - CN 53  RR 52

- **Central Region**
  - CN 50  RR 52

- **Southern Region**
  - CN 59  RR 61
Top Yield of Conventional and RR Soybean Varieties in WI. 1998

Northern Region
CN 35 RR 25

North-Central Region
CN 64 RR 57

Central Region
CN 79 RR 76

Southern Region
CN 77 RR 73
Top Yield of Conventional and RR Soybean Varieties in WI. 2001

- **Northern Region**: CN 42, RR 42
- **North-Central Region**: CN 65, RR 58
- **Central Region**: CN 56, RR 59
- **Southern Region**: CN 66, RR 66
Performance of Conventional vs RR Soybean Varieties in the Midwest. 2001

CN 43  RR 33
CN 46  RR 34
CN 61  RR 60
CN 54  RR 53
CN 64  RR 63
CN 60  RR 57
CN 60  RR 59
CN 60  RR 60
CN 58  RR 61
CN 54  RR 54
CN 46  RR 51
CN 41  RR 40
CN 50  RR 49
Comparison of Protein and Oil Quality of Roundup Ready vs. Conventional Soybean Varieties

1999 Variety Evaluation Program
Seed Size of Roundup Ready vs. Conventional Varieties
Wisconsin Soybean Variety Evaluation Program
Summary

What’s right with Roundup Ready
• Agronomically the same yields as CN
• Tested extensively
• Many good varieties
• Ease of weed management
• One herbicide system
• Control of perennial broadleaf weeds
• Responsible for aiding in adoption of reduced tillage and increased crop residue

What’s wrong Roundup Ready
• Export concerns
• Technology fees ~$7.50/50 lb
• GMO food labeling
• 5¢ to 35¢ /bu premiums for non-GMO soybeans in 20% of Midwestern elevators
Thank You!

- Questions?
- Comments?