Improving management of white mold in soybeans and dry beans: Impact of row spacing

Michael Wunsch
North Dakota State University Carrington Research Extension Center
Impact of row spacing on soybean agronomic performance under white mold pressure
Racine, Wisconsin (1977, 1980)

**White mold incidence** (% of plants; R7 growth stage)

Seeding rates: 15-inch row: 213,000 seeds/ac  30-inch row: 160,000 seeds/ac

- **15-inch row spacing**
  - Racine, WI (1977)
  - Hodgson: 41%
  - Corsoy: 52%
  - SRF-200: 54%
  - Wells: 65%
  - Steele: 70%
  - Asgrow 2656: 76%

- **30-inch row spacing**
  - Racine, WI (1977)
  - Hodgson: 3%
  - Corsoy: 15%
  - SRF-200: 26%
  - Wells: 30%
  - Steele: 6%
  - Asgrow 2656: 46%

- **10-inch**
  - Racine, WI (1980)
  - Corsoy: 36%
  - Wells: 54%

- **30-inch**
  - Corsoy: 37%
  - Wells: 56%
Impact of row spacing on soybean agronomic performance under white mold pressure
Racine, Wisconsin (1977, 1980)

**Soybean Yield** (bushels/acre; 13% moisture)

Seeding rates:
- 15-inch row: 213,000 seeds/acre
- 30-inch row: 160,000 seeds/acre


### 15-inch row spacing
- Racine, WI (1977)
  - Hodgson: 50
  - Corsoy: 41
  - SRF-200: 54
  - Wells: 45
  - Steele: 27
  - Asgrow 2656: 42

### 30-inch row spacing
- Racine, WI (1977)
  - Hodgson: 78
  - Corsoy: 86
  - SRF-200: 76
  - Wells: 70
  - Steele: 69
  - Asgrow 2656: 54

### 10-inch row spacing
- Racine, WI (1980)
  - Corsoy: 35
  - Wells: 27

### 30-inch row spacing
- Corsoy: 35
  - Wells: 33
Impact of row spacing on soybean agronomic performance under white mold pressure

**White mold incidence** (% of plants; R7 growth stage)

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Maple Arrow 9 in. 17 in. 27 in.</td>
<td>30 in. 7.5 in. 7.5 in.</td>
</tr>
<tr>
<td></td>
<td>Evans 9 in. 17 in. 27 in.</td>
<td>50 42 53</td>
</tr>
<tr>
<td></td>
<td>S1346 9 in. 17 in. 27 in.</td>
<td>28 25 23</td>
</tr>
<tr>
<td></td>
<td>Corsoy 79 9 in. 17 in. 27 in.</td>
<td>14 13 9</td>
</tr>
</tbody>
</table>

**Ontario** - Seeding rates: 9-inch row: 264,000 seeds/ac 18-inch row: 180,000 seeds/ac 27-inch row: 147,000 seeds/ac

**Michigan** - Seeding rates: 30-inch row: 174,000 seeds/ac 7.5-inch row: 174,000 and 224,000 seeds/ac
Impact of row spacing on soybean agronomic performance under white mold pressure

Eberts and Wallaceburg, Ontario (1985-1986)  
Ingham County, Michigan (1999-2000)

**Soybean Yield** (bushels/acre; 13% moisture)

Eberts and Wallaceburg, Ontario  
1985-1986

<table>
<thead>
<tr>
<th>Variety</th>
<th>Maple Arrow</th>
<th>Evans</th>
<th>S1346</th>
<th>Corsoy 79</th>
<th>Three varieties</th>
</tr>
</thead>
<tbody>
<tr>
<td>Row Width</td>
<td>9 in.</td>
<td>9 in.</td>
<td>9 in.</td>
<td>9 in.</td>
<td>30 in.</td>
</tr>
<tr>
<td>Seeding Rate</td>
<td>264,000</td>
<td>180,000</td>
<td>174,000</td>
<td>174,000</td>
<td>174,000</td>
</tr>
</tbody>
</table>

Ontario - Seeding rates: 9-inch row: 264,000 seeds/acre  
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Michigan - Seeding rates: 30-inch row: 174,000 seeds/acre  
7.5-inch row: 174,000 and 224,000 seeds/acre

Impact of seeding rate on soybean agronomic performance under white mold pressure

Oakes, ND (2015-2017)  Combined analysis across three seeding rates: 132,000; 165,000; and 198,000 viable seeds/ac

**Canopy closure** (days before or after bloom initiation - 90% of plants at R1)

Row Spacing

<table>
<thead>
<tr>
<th>row</th>
<th>14 in</th>
<th>21 in</th>
<th>28 in</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dairyland DSR-0711</td>
<td>2015</td>
<td>0.3, 6, 11</td>
<td>-0.7, 2, 6</td>
</tr>
<tr>
<td>Pioneer 90Y90</td>
<td>2015</td>
<td>4, 10, 17</td>
<td>0, 10, 15</td>
</tr>
<tr>
<td>Dairyland DSR-0711</td>
<td>2016</td>
<td>14, 21, 28</td>
<td>14, 21, 28</td>
</tr>
<tr>
<td>Dairyland DSR-0711</td>
<td>2017</td>
<td>14, 21, 28</td>
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</tr>
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<td>2016</td>
<td>14, 21, 28</td>
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</tr>
<tr>
<td>Dairyland DSR-0711</td>
<td>2017</td>
<td>14, 21, 28</td>
<td>14, 21, 28</td>
</tr>
<tr>
<td>Dairyland DSR-0907</td>
<td>2016</td>
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<td>14, 21, 28</td>
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<tr>
<td>Pioneer P07T36R</td>
<td>2015</td>
<td>14, 21, 28</td>
<td>14, 21, 28</td>
</tr>
<tr>
<td>Pioneer P07T50R</td>
<td>2015</td>
<td>14, 21, 28</td>
<td>14, 21, 28</td>
</tr>
<tr>
<td>Pioneer P07T50R</td>
<td>2016</td>
<td>14, 21, 28</td>
<td>14, 21, 28</td>
</tr>
<tr>
<td>Pioneer 90M80</td>
<td>2016</td>
<td>14, 21, 28</td>
<td>14, 21, 28</td>
</tr>
<tr>
<td>Dairyland DSR-0988</td>
<td>2017</td>
<td>14, 21, 28</td>
<td>14, 21, 28</td>
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</tbody>
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Impact of seeding rate on soybean agronomic performance under white mold pressure
Oakes, ND (2015-2017) Combined analysis across three seeding rates: 132,000; 165,000; and 198,000 viable seeds/ac

White mold incidence (% of plants; R7 growth stage)
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**Soybean Yield** (bushels/acre; 13% moisture)
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Carrington, ND (2014) Seeding rate: 165,000 viable seeds/ac

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Row Spacing

- Pioneer P06T28R maturity = 0.6 2017
- Pioneer P08T96R maturity = 0.8 2017
- Pioneer P05T24R maturity = 0.8 2017
- Pioneer P08T59R maturity = 0.8 2017
- Pioneer P06T28R maturity = 0.6 2016
- Pioneer 90Y50 maturity = 0.5 2015
- ProSeed 20-70 maturity = 0.7 2015
- Mycogen 5B066 maturity = 0.6 2015
- Mycogen 5B080 maturity = 0.8 2015
Impact of seeding rate on soybean agronomic performance under white mold pressure

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**White mold incidence (% of plants; R7 growth stage)**

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<thead>
<tr>
<th>Row Spacing</th>
<th>14 in. 21 in. 28 in.</th>
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<th>14 in. 21 in. 28 in.</th>
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</thead>
<tbody>
<tr>
<td>Pioneer P06T28R</td>
<td>maturity = 0.6</td>
<td>2017</td>
<td>Pioneer P06T96R</td>
<td>maturity = 0.8</td>
<td>2017</td>
<td>Pioneer P05T24R</td>
<td>maturity = 0.5</td>
<td>2017</td>
<td>Pioneer P08T59R</td>
</tr>
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<td>maturity = 0.6</td>
<td>2017</td>
<td>Pioneer P06T28R</td>
<td>maturity = 0.6</td>
<td>2015</td>
<td>Pioneer 90Y50</td>
<td>maturity = 0.5</td>
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<td>ProSeed 20-70</td>
</tr>
<tr>
<td>Pioneer 5B066</td>
<td>maturity = 0.6</td>
<td>2015</td>
<td>Pioneer 5B066</td>
<td>maturity = 0.6</td>
<td>2015</td>
<td>ProSeed 20-70</td>
<td>maturity = 0.7</td>
<td>2016</td>
<td>Mycogen 5B066</td>
</tr>
<tr>
<td>Pioneer 5B080</td>
<td>maturity = 0.8</td>
<td>2016</td>
<td>Pioneer 5B080</td>
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<td>2016</td>
<td>Mycogen 5B066</td>
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<td>2015</td>
<td>Mycogen 5B080</td>
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Carrington, ND (2015, 2017) Combined analysis across three seeding rates: 132,000; 165,000; and 198,000 viable seeds/ac

Soybean Yield (bushels/acre; 13% moisture)

Row Spacing

<table>
<thead>
<tr>
<th>Seeding Rate</th>
<th>2015</th>
<th>2017</th>
<th>2015</th>
<th>2017</th>
<th>2015</th>
<th>2017</th>
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<tr>
<td>Pioneer P06T28R</td>
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<td>61</td>
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<tr>
<td>Pioneer P08T96R</td>
<td>71</td>
<td>70</td>
<td>64</td>
<td>64</td>
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<td>57</td>
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<tr>
<td>Pioneer P05T24R</td>
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<td>57</td>
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<tr>
<td>Pioneer P08T59R</td>
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<td>43</td>
<td>43</td>
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<td>Pioneer P06T28R</td>
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<td>39</td>
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<tr>
<td>Pioneer 90Y50</td>
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<td>37</td>
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<tr>
<td>ProSeed 20-70</td>
<td>35</td>
<td>35</td>
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<td>36</td>
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<td>Mycogen 5B066</td>
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<tr>
<td>Mycogen 5B080</td>
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</tbody>
</table>
Carrington, ND 2015: 0.3-maturity soybean variety
Combined analysis, three seeding rates (132,000; 165,000; 198,000 viable seeds/ac) and four row spacings
**SCLEROTINIA MANAGEMENT**

**Row spacing**

### Carrington, ND 2015: 0.3-maturity soybean variety

Combined analysis across three seeding rates (132,000; 165,000; 198,000 viable seeds/ac)

<table>
<thead>
<tr>
<th>Row spacing</th>
<th>Canopy Closure</th>
<th>Sclerotinia Incidence</th>
<th>Soybean Yield</th>
<th>Sclerotia in Grain</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Days after 90% bloom</td>
<td>Sept. 5-6; R7 %</td>
<td>13% moisture bu/ac</td>
<td>% by weight</td>
</tr>
<tr>
<td><strong>IRRIGATION: R2 to R4 growth stage (July 22 - Aug. 3)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7-inch 5</td>
<td>37 (b)</td>
<td>40 (ab)</td>
<td>1.25 (a)</td>
<td></td>
</tr>
<tr>
<td>14-inch 6</td>
<td>38 (b)</td>
<td>43 (ab)</td>
<td>1.42 (a)</td>
<td></td>
</tr>
<tr>
<td>21-inch 14</td>
<td>35 (ab)</td>
<td>44 (a)</td>
<td>1.26 (a)</td>
<td></td>
</tr>
<tr>
<td>28-inch 19</td>
<td>29 (a)</td>
<td>39 (b)</td>
<td>1.02 (a)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>CV: 22.0</td>
<td>CV: 10.0</td>
<td>CV: 22.7</td>
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</tr>
<tr>
<td><strong>IRRIGATION: R4 to R7 growth stage (Aug. 8 - 31)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7-inch 4</td>
<td>31 (b)</td>
<td>51 (ab)</td>
<td>0.77 (a)</td>
<td></td>
</tr>
<tr>
<td>14-inch 5</td>
<td>33 (b)</td>
<td>54 (a)</td>
<td>0.72 (a)</td>
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</tr>
<tr>
<td>21-inch 14</td>
<td>28 (ab)</td>
<td>51 (ab)</td>
<td>0.57 (a)</td>
<td></td>
</tr>
<tr>
<td>28-inch 21</td>
<td>23 (a)</td>
<td>48 (b)</td>
<td>0.51 (a)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>CV: 19.8</td>
<td>CV: 32.1</td>
<td>CV: 6.2</td>
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</tr>
<tr>
<td><strong>IRRIGATION: R5 to R7 growth stage (Aug. 16 - 31)</strong></td>
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</tr>
<tr>
<td>7-inch 4</td>
<td>23 (b)</td>
<td>49 (bc)</td>
<td>0.53 (a)</td>
<td></td>
</tr>
<tr>
<td>14-inch 6</td>
<td>24 (b)</td>
<td>53 (a)</td>
<td>0.42 (a)</td>
<td></td>
</tr>
<tr>
<td>21-inch 12</td>
<td>19 (ab)</td>
<td>52 (ab)</td>
<td>0.42 (a)</td>
<td></td>
</tr>
<tr>
<td>28-inch 23</td>
<td>15 (a)</td>
<td>47 (c)</td>
<td>0.36 (a)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>CV: 19.8</td>
<td>CV: 32.1</td>
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</tr>
</tbody>
</table>
Impact of seeding rate on soybean agronomic performance under white mold pressure
Carrington, ND (2017)
Combined analysis across three seeding rates: 132,000; 165,000; and 198,000 viable seeds/ac

White mold incidence (% of plants; R7 growth stage)

<table>
<thead>
<tr>
<th></th>
<th>Dryland DSR-0711</th>
<th>Dryland DSR-0619</th>
<th>Irrigated V5-R4 DSR-0711</th>
<th>Irrigated V5-R4 DSR-0619</th>
<th>Irrigated R2-R5 DSR-0711</th>
<th>Irrigated R2-R5 DSR-0619</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>14 in. 21 in. 28 in.</td>
<td>14 in. 21 in. 28 in.</td>
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<td>14 in. 21 in. 28 in.</td>
</tr>
<tr>
<td>6</td>
<td>19 a</td>
<td>52 a</td>
<td>74 a</td>
<td>83 b</td>
<td>54 a</td>
<td>79 ab</td>
</tr>
<tr>
<td>5</td>
<td>19 a</td>
<td>50 a</td>
<td>73 a</td>
<td>84 a</td>
<td>58 a</td>
<td>80 ab</td>
</tr>
<tr>
<td>7</td>
<td>21 a</td>
<td>58 a</td>
<td>76 a</td>
<td>78 a</td>
<td>57 a</td>
<td>74 ab</td>
</tr>
<tr>
<td>4</td>
<td>16 a</td>
<td>45 a</td>
<td>65 a</td>
<td>78 a</td>
<td>51 a</td>
<td>79 ab</td>
</tr>
</tbody>
</table>
Impact of seeding rate on soybean agronomic performance under white mold pressure

Carrington, ND (2017)

Combined analysis across three seeding rates: 132,000; 165,000; and 198,000 viable seeds/ac

**Soybean Yield** (bushels/acre; 13% moisture)

<table>
<thead>
<tr>
<th>Dryland</th>
<th>Irrigated V5-R4</th>
<th>Irrigated R2-R5</th>
</tr>
</thead>
<tbody>
<tr>
<td>DSR-0711</td>
<td>DSR-0619</td>
<td>DSR-0711</td>
</tr>
<tr>
<td>DSR-0619</td>
<td>DSR-0711</td>
<td>DSR-0619</td>
</tr>
</tbody>
</table>

**Row Spacing:**

- DSR-0711: 7, 14, 21, 28
- DSR-0619: 7, 14, 21, 28
- DSR-0711: 7, 14, 21, 28
- DSR-0619: 7, 14, 21, 28
- DSR-0711: 7, 14, 21, 28
- DSR-0619: 7, 14, 21, 28

- **53 b**
- **56 a**
- **48 c**
- **48 b**
- **50 b**
- **54 a**
- **45 c**
- **38 a**
- **41 a**
- **38 a**
- **40 a**
- **29 a**
- **27 a**
- **27 a**
- **28 a**
- **41 b**
- **42 b**
- **45 a**
- **40 b**
- **28 ab**
- **28 bc**
- **31 a**
- **26 c**
White mold incidence:
Wide (28- to 30-inch) vs. Narrow (14- or 15-inch) rows

Soybean maturity: 00 and 0

Locations: Carrington, Hofflund, Langdon, and Oakes, ND

Years: 2013-2017

- 2013-2014: Single seeding rate (165,000 viable seeds/ac)
- 2015-2017: Combined analysis across three seeding rates (132,000; 165,000; 198,000 viable seeds/ac)

Change in White Mold Incidence
percentage-point change as soybean row spacing narrowed from 28 or 30 inches to 14 or 15 inches

y = -0.2591 + 0.3404x - 0.0018x^2
R^2 = 0.5482

White mold incidence (% of plants diseased) in soybeans seeded in 14- or 15-inch rows
White mold incidence:
Wide (28- to 30-inch) vs. Intermediate (21- or 22.5-inch) rows

Soybean maturity: 00 and 0  Locations: Carrington, Hofflund, Langdon, and Oakes, ND  Years: 2013-2017
• 2013-2014: Single seeding rate (165,000 viable seeds/ac)
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White mold disease pressure
White mold incidence (% of plants diseased) in soybeans seeded in 21- or 22.5-inch rows

\[
y = -0.7647 + 0.3807x - 0.0026x^2
\]

\[R^2 = 0.5476\]
Soybean yield:
Wide (28- to 30-inch) vs. Narrow (14- or 15-inch) rows

Soybean maturity: 00 and 0  
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Sclerotia contamination of the grain:
Wide (28- to 30-inch) vs. Narrow (14- or 15-inch) rows

Soybean maturity: 00 and 0  Locations: Carrington, Hofflund, Langdon, and Oakes, ND  Years: 2013-2017
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Change in Sclerotia Contamination
percentage-point change (% by weight) as soybean row spacing narrowed from 28 or 30 inches to 14 or 15 inches

White mold disease pressure
White mold incidence (% of plants diseased) in soybeans seeded in 14- or 15-inch rows

$y = 0.0005 + 0.0004x + 0.00005x^2$
$R^2 = 0.61111$
Sclerotinia contamination of the grain:
Wide (28- to 30-inch) vs. Intermediate (21- or 22.5-inch) rows

Soybean maturity: 00 and 0  
Locations: Carrington, Hofflund, Langdon, and Oakes, ND  
Years: 2013-2017
• 2013-2014: Single seeding rate (165,000 viable seeds/ac)
• 2015-2017: Combined analysis across three seeding rates (132,000; 165,000; 198,000 viable seeds/ac)

Change in Sclerotinia Contamination

percentage-point change (% by weight) as soybean row spacing narrowed from 28 or 30 inches to 21 or 22.5 inches

\[ y = 0.0005 + 0.0004x + 0.00005x^2 \]

\[ R^2 = 0.61111 \]

White mold disease pressure
White mold incidence (% of plants diseased) in soybeans seeded in 21- or 22.5-inch rows
Impact of row spacing on white mold:

- When end-of-season white mold incidence was less than 50%, soybean yield was maximized when soybeans were grown in narrow (14- or 15-inch) or intermediate (21- or 22.5-inch) rows.

- **Intermediate row spacing was optimal.** Soybeans seeded to 21- or 22.5-inch rows generally developed less white mold and had higher yields than soybeans seeded to 14- or 15-inch rows.

- The **increase in sclerotia contamination of grain** associated with planting to narrow or intermediate rows was negligible when end-of-season white mold incidence was less than 30% and moderate when white mold incidence was less than 50%.
Dry bean performance in narrow vs. wide rows under white mold pressure

- Oakes (2016)
- ‘Lariat’ pinto beans
- Seeding rate: 85,000 or 92,000 pure live seeds/ac
- Supplemental irrigation applied to facilitate disease pressure
<table>
<thead>
<tr>
<th>Row Spacing:</th>
<th>2013</th>
<th>2014</th>
<th>2016</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Carrington</td>
<td>Carrington</td>
<td>Oakes</td>
</tr>
<tr>
<td><strong>SCLEROTINIA SEVERITY INDEX</strong> (% of canopy diseased)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>14 inches</td>
<td>54</td>
<td>a</td>
<td>32</td>
</tr>
<tr>
<td>28 inches</td>
<td>45</td>
<td>a</td>
<td>30</td>
</tr>
<tr>
<td>CV: 32.4</td>
<td>CV: 4.9</td>
<td>CV: 19.7</td>
<td></td>
</tr>
<tr>
<td><strong>YIELD</strong> (pounds per acre)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>14 inches</td>
<td>1984 a</td>
<td>2004 a</td>
<td>3090 a</td>
</tr>
<tr>
<td>28 inches</td>
<td>1949 a</td>
<td>2245 a</td>
<td>2679 b</td>
</tr>
<tr>
<td>CV: 7.1</td>
<td>CV: 13.2</td>
<td>CV: 8.0</td>
<td></td>
</tr>
</tbody>
</table>
Carrington (2014):
Differential irrigation utilized to facilitate early vs. late disease onset

Carrington, ND (2014)
‘Lariat’ pinto

14-INCH ROW SPACING

28-INCH ROW SPACING
### Growth stages at which intensive irrigation was applied:
- **V4 to R6**
- **R2 to R6**
- **R3 to R6**

### SCLEROTINIA SEVERITY INDEX (% of canopy diseased)

<table>
<thead>
<tr>
<th>Row Spacing</th>
<th>14 inches</th>
<th>28 inches</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td><strong>86</strong></td>
<td><strong>77</strong></td>
</tr>
<tr>
<td>CV: 3.1</td>
<td><strong>75</strong></td>
<td><strong>72</strong></td>
</tr>
<tr>
<td>CV: 7.8</td>
<td><strong>63</strong></td>
<td><strong>70</strong></td>
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<tr>
<td>CV: 10.8</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### YIELD (pounds per acre)

<table>
<thead>
<tr>
<th>Row Spacing</th>
<th>14 inches</th>
<th>28 inches</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td><strong>1638</strong></td>
<td><strong>1484</strong></td>
</tr>
<tr>
<td>CV: 8.3</td>
<td><strong>2063</strong></td>
<td><strong>1606</strong></td>
</tr>
<tr>
<td>CV: 7.3</td>
<td><strong>2735</strong></td>
<td><strong>2122</strong></td>
</tr>
<tr>
<td>CV: 4.1</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Carrington (2015): Differential irrigation utilized to facilitate early vs. late disease onset

- Irrigated June 29 - July 17 (V3 - R1 growth stage)
- Irrigated June 29 - July 31 (V3 - R3 growth stage)
- Irrigated June 29 - July 17, Aug. 8 - 18 (V3 - R1, R4-R6 growth stage)
<table>
<thead>
<tr>
<th>Row Spacing:</th>
<th>Growth stages at which intensive irrigation was applied:</th>
<th>SCLEROTINIA SEVERITY INDEX (% of canopy diseased)</th>
<th>YIELD (pounds per acre)</th>
</tr>
</thead>
<tbody>
<tr>
<td>14 inches</td>
<td>V3 to R1, V3 to R3, V3-R1, R4-R6</td>
<td><img src="#" alt="Bar charts for Sclerotinia severity index" /></td>
<td><img src="#" alt="Bar charts for Yield" /></td>
</tr>
<tr>
<td>28 inches</td>
<td></td>
<td><img src="#" alt="Bar charts for Sclerotinia severity index" /></td>
<td><img src="#" alt="Bar charts for Yield" /></td>
</tr>
</tbody>
</table>

### Sclerotinia Severity Index

- **14 inches**
  - V3 to R1: 38 (CV: 16.6)
  - V3 to R3: 53 (CV: 8.2)
  - V3-R1, R4-R6: 36 (CV: 6.3)

- **28 inches**
  - V3 to R1: 36 (CV: 11.2)
  - V3 to R3: 55 (CV: 13.9)
  - V3-R1, R4-R6: 38 (CV: 8.1)

### Yield

- **14 inches**
  - V3 to R1: 2294 (a)
  - V3 to R3: 2003 (a)
  - V3-R1, R4-R6: 2478 (a)

- **28 inches**
  - V3 to R1: 2072 (a)
  - V3 to R3: 1752 (a)
  - V3-R1, R4-R6: 2297 (a)
Dry bean performance in narrow vs. wide rows under white mold pressure

Except under very high disease pressure, yields were optimized in 14-inch rows.

Cautionary notes:
• Impact on seed quality is unclear.
• A single variety (‘Lariat’) from a single market class (pinto) was evaluated.
Thank You!

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Northarvest Bean Growers Association
North Dakota Crop Protection Product Registration and Harmonization Board