Soil Applied Contans WG as an Integrated Management Approach to White Mold

Photo credit: Danielle Stephens, SMA, 2016
White Mold

- White fuzzy mycelium on infected stalks of susceptible hosts
- Pathogen - *Sclerotinia sclerotiorum*

Canola

Dry bean
Risk of Sclerotinia Varies with Crop

Resistant

• Cereals
• Wheat
• Barley
• Oats
• Corn
• Grass forages

Susceptible

• Canola
• Lentil
• Sunflower
• Mustard
• Dry bean
• Field pea
• Soybean
• Borage

408 plant species vulnerable
Why Consider Biological Control of Sclerotinia with Contans?

- High frequency of susceptible crops under irrigation
- Maximum humidity in canopy every year during growing season favours conditions for disease development and buildup of sclerotia
- Helps maintain fungicide as a tool to fight sclerotinia - rotation of control strategies
- Attacks root cause of sclerotinia
- Control is possible even if weather does not cooperate and prevents application of fungicide
Integrated Control Strategies

- Broad range of hosts – crop rotation has limited success controlling sclerotinia
- Other strategies
  - Foliar fungicides
  - Disease resistant varieties
  - Agronomic practice
    (lower plant population, wider rows)
  - Contans WG (Biological control)
Influence of Ascospores

- Dr. Luis Del Rio Mendoza, North Dakota State University
- SSR Incidence declined 50% within 12-17 m from source (ascospore)
- SSR caused mainly by inoculum produced within the field
- Economic losses observed within 25 m from source
Contans WG Petri Dish Display – 14 DAT

Original sclerotia

New sclerotia

Contans fungi

Photo credit: Dale Ziprick, UAP
Field Testing of Contans WG in North Dakota

- Wunsch, Schaefer and Kraft – NDSU, 2013
- Contans reduced viability and vigour of sclerotia
  - # of sclerotia germinating to form apothecia
  - # of apothecia per sclerotia
- Fall application more effective than spring application
- Application rate had little effect on performance
  - 450 g/ac = 900 g/ac
- Harrowing = irrigation (1 inch overhead) for incorporation
- Sclerotia were on surface of soil when Contans applied
Crop rotation is not too successful
What are other alternatives?

• With so many susceptible hosts crop rotation can help suppress Ss but not to the fully desired effect.
• Other options
  • Foliar fungicides
  • Disease resistant varieties
  • Agronomic practice (lower plant population)
  • Avoidance (highly unlikely)
• Contans WG
## Sclerotinia Control with Contans on Soybeans

**Michael Wunsch, NDSU**  
*Carrington, ND 2012*

<table>
<thead>
<tr>
<th>Product Applied</th>
<th>Time of application</th>
<th>Incorporation</th>
<th>Apothecia per m²</th>
<th>Carpogenic Sclerotia/m²</th>
<th>Sclerotia Incidence&lt;sup&gt;1&lt;/sup&gt; (%)</th>
<th>Yield (bu/ac)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2 lb/ac</td>
<td>Fall</td>
<td>Harrow</td>
<td>3</td>
<td>1.0</td>
<td>13</td>
<td>59</td>
</tr>
<tr>
<td>2 lb/ac</td>
<td>Fall</td>
<td>Irrigation</td>
<td>3</td>
<td>0.9</td>
<td>10</td>
<td>59</td>
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<tr>
<td>2 lb/ac</td>
<td>Fall</td>
<td>Both</td>
<td>5</td>
<td>1.7</td>
<td>9</td>
<td>59</td>
</tr>
<tr>
<td>2 lb/ac</td>
<td>Fall</td>
<td>Neither</td>
<td>2</td>
<td>0.9</td>
<td>11</td>
<td>57</td>
</tr>
<tr>
<td>None</td>
<td>Fall</td>
<td>Irrigation</td>
<td>26</td>
<td>4.6</td>
<td>18</td>
<td>56</td>
</tr>
<tr>
<td>None</td>
<td>Fall</td>
<td>Harrow</td>
<td>18</td>
<td>2.9</td>
<td>16</td>
<td>57</td>
</tr>
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<sup>1</sup> Sclerotia produced apothecia
# Sclerotinia Control with Contans on Soybeans

**Michael Wunsch, NDSU**  
**Carrington, ND 2012**

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<th>Carpogenic Sclerotia/m²</th>
<th>Sclerotia Incidence¹ (%)</th>
<th>Yield (bu/ac)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2 lb/ac</td>
<td>Spring</td>
<td>Harrow</td>
<td>5</td>
<td>1.4</td>
<td>13</td>
<td>59</td>
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<tr>
<td>2 lb/ac</td>
<td>Spring</td>
<td>Irrigation</td>
<td>6</td>
<td>2.3</td>
<td>9</td>
<td>60</td>
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<tr>
<td>2 lb/ac</td>
<td>Spring</td>
<td>Both</td>
<td>5</td>
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</tbody>
</table>

¹ Sclerotia produced apothecia
### Contans 2017 Yield data (lb/ac)
Contans Applied in Spring and Fall of 2016

<table>
<thead>
<tr>
<th>Treatment (2-3 in. ppt)</th>
<th>Lentil (3.5” irrigation)</th>
<th>Yield Increase (lb/ac)</th>
<th>Dry Bean (8 “irrigation)</th>
<th>Yield Increase (lb/ac)</th>
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</thead>
<tbody>
<tr>
<td>Contans</td>
<td>2693</td>
<td>125 (5%)</td>
<td>2887</td>
<td>190 (7%)</td>
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<tr>
<td>Without Contans</td>
<td>2568</td>
<td></td>
<td>2697</td>
<td></td>
</tr>
</tbody>
</table>

- Wheat stubble
- No Fungicide 2017
- 0.6 kg/ac Contans in 2017
- 3.5” Irrigation
- Supposed to be Canola in 2017

- Canola stubble
- Contegra Fungicide
- 0.2 kg/ac Contans in 2017
- 8” Irrigation
- Supposed to be Wheat in 2017

saskatchewan.ca
Contans 2018 Yield Data
L252 Canola

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Yield (bu/ac)</th>
<th>Seeding method</th>
<th>Seeding rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Control</td>
<td>77.5</td>
<td>11” row spacing</td>
<td>1.8 lb/ac</td>
</tr>
<tr>
<td>Control</td>
<td>77.2</td>
<td>22” row spacing</td>
<td>1.8 lb/ac</td>
</tr>
<tr>
<td>Contans</td>
<td>78.9</td>
<td>11” row spacing</td>
<td>1.8 lb/ac</td>
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</tbody>
</table>

Contans applied at 0.2 kg/ac in fall 2017. Also applied in spring and fall of 2016

All three treatments received a two pass blanket application of foliar fungicide for control of sclerotinia
Warning

• Pivot application of Contans is not registered in Canada

• Three years minimum of Contans use to control sclerotia bodies accumulated in irrigated soil is encouraged. For additional details on use of Contans in irrigated rotations, please contact a UAP or BayerCropScience representative, or ICDC.
Questions??

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