Soybean Disease Update

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Crop Production Clinics

Session Goals

• Participants will learn to identify important diseases affecting soybean.
• Attendees will be familiarized with disease management options.
• Participants will learn about fungicide resistance in Nebraska.
Frogeye Leaf Spot (FLS)

*Cercospora sojina* (fungus)

- Symptoms
  - Small tan/gray lesions
  - Red/purple border
  - Upper leaves

- Favorable Conditions
  - Optimal temp (77-86 °F)
  - Humidity
  - Frequent rain/irrigation
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Frogeye Leaf Spot Management

- Select resistant varieties (when available)
- Avoid growing continuous soybean
- Apply foliar fungicides
  - only after scouting
  - at the right stage
There are 3 classes of fungicides typically used

<table>
<thead>
<tr>
<th>FUNGICIDE</th>
<th>FRAC GROUP</th>
</tr>
</thead>
<tbody>
<tr>
<td>QoI, also known as strobilurin fungicides</td>
<td>Group 11</td>
</tr>
<tr>
<td>DMI fungicides</td>
<td>Group 3</td>
</tr>
<tr>
<td>SDHI fungicides</td>
<td>Group 7</td>
</tr>
</tbody>
</table>
Group 11-QoI fungicides

- Historically most effective

- BUT resistance is becoming more common in other states and now Nebraska

- Resistance reduces efficacy
Widespread QoI resistance in *C. sojina*

- First reported: Tennessee, 2010
- By 2017, QoI resistance was reported in 240 counties from 14 states
First report in Nebraska: 2019

2019 - QoI Fungicide Resistance Confirmed in *Cercospora sojina* causing Frogeye Leaf Spot in (all) 10 Nebraska counties sampled
Understanding the distribution of resistance in Nebraska

Counts sampled in 2020

Soybean Production in Nebraska

Samples collected from 128 fields in 47 counties
Current research

• Developing a rapid test for fungicide resistance to the QoI group

• Advantages of the test
  – 2-3 hours
  – In lab and in field
  – Timely suggestions for fungicide selection
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Soybean Foliar Fungicide Survey

• Distributed by email and hard copy
• Please complete only once
• GOALS
  – Understand knowledge level about fungicides
  – Understand the factors affecting fungicide use decisions
• OBJECTIVE
  – Improve further education in Nebraska

Nebraska Soybean Foliar Fungicide Use Survey

To better serve our clients and provide recommendations that are in your best interest, we are conducting the following survey about fungicide use in Nebraska. Please take a few minutes to complete the following survey. This is completely voluntary, and responses will be kept anonymous.

Q1) What is your primary occupation?
   - Farmer/producer
   - Farm manager
   - UNL or Extension employee
   - Crop consultant (grocery
   - Other

Q2) In which county/county are you most of your field area located? Write in answer.

Q3) Did you grow/manage soybean in the last 5 years?
   - Yes
   - No

Q4) How many total crep acres do you farm, manage, or otherwise influence?
   Select an approximate range from the following:
   - 0-99
   - 100-299
   - 300-499
   - 500-999
   - 1,000-4,999
   - 5,000-9,999
   - 10,000-49,999
   - 50,000-99,999
   - 100,000-999,999
   - 1,000,000+

Q5) What are the most important diseases of soybeans? Select up to 5 most important diseases in your field.
   - Bacterial blight
   - Brown rot (Cercospora)
   - Brown stem rot (BSR)
   - Cercospora leaf blight
   - Fusarium root rot
   - Pod and stem blight
   - Phytophthora root / stem rot
   - Neonatal disease
   - Sclerotinia stem rot
   - Soybean vein necrosis (SVN)
   - Soybean blight (SB)
   - White mold / Sclerotinia stem rot
Soybean Foliar Fungicide Survey continued

- Takes about 10 min to complete
- Completely anonymous
- For research purposes only
- No known risks taking the survey
- Can stop at any time with no penalty

Q1) What is your primary occupation?
- Farmer/producer
- Farm manager
- UNL or Extension employee
- Crop consultant/entomologist
- Other

Q2) In which county/county in Nebraska is are most of your field area of work located? Write in answer:

Q3) Did you grow/manage soybean in the last 5 years?
- Yes
- No

Q4) How many total crop acres do you farm, manage, or otherwise influence?
- Select an approximate range from the following:
  - 0-5 acres
  - 1,000-2,999
  - 3,000-5,999
  - 7,000-9,999
  - 10,000+ acres

Q5) What are the most important diseases of soybean? Select up to 5 most important diseases in your field.
- Bacterial blight
- Brown spot (Septoria)
- Brown stem rot (BSR)
- Cercospora leaf blight
- Purple head blight
- Fusarium leaf spot (FLS)
- Fusarium root rot
- Pod and stem blight
- Phytophthora root / stem rot
- Sclerotinia disease
- Stem canker
- Soybean cyst nematode (SCN)
- Sudden death syndrome (SDS)
- White mold / Sclerotinia stem rot
2021 GUIDE FOR WEED, DISEASE, AND INSECT MANAGEMENT

Changes to the Disease Management Section

• New Section Editor added –
  • Dr. Melissa Bartels, Educator – Butler and Polk Counties

• Addition of the “Alfalfa: Foliar Fungicide and Bactericide Product Information” table

• Recent changes summarized in the “What’s New in Plant Pathology” presentation
# New foliar disease management products for soybean

<table>
<thead>
<tr>
<th>Trade Name</th>
<th>Active Ingredient(s)</th>
<th>Fungicide Class(es)</th>
<th>Change(s) Made</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lucento</td>
<td>Flutriafol 26.5% + Bixafen 15.6%</td>
<td>Mixed Modes of Action (Groups 3 + 7)</td>
<td>Added to corn, sorghum, soybean, and wheat tables for foliar disease management</td>
</tr>
</tbody>
</table>
| Miravis Neo| Propiconazole 11.6%  
Pydiflumetofen 7.0%  
Azoxystrobin 9.3%                        | Mixed Modes of Action (Groups 3 + 7 + 11)    | Added to corn and soybean tables for foliar disease management                                                                               |
| Revytek    | Mefentrifluconazole 11.61%  
Pyraclostrobin 15.49%  
Fluxapyroxad 7.74%                      | Mixed Modes of Action (Groups 3 + 7 + 11)    | Added to corn and soybean tables for foliar disease management                                                                               |
| Veltyma    | Mefentrifluconazole 17.56%  
Pyraclostrobin 17.56%                            | Mixed Modes of Action (Groups 3 + 11)        | Added to corn, potato, soybean, sugar beet tables for foliar disease management                                                              |

*Taken from supplemental presentation “What’s New in Plant Pathology”  
Additional content can also be found in the “2021 Guide for Weed, Disease, and Insect Management”*
2020 Foliar Fungicide Trial

- UNL-HAL, Concord, NE
- NK S29-K3X planted 12 May @ 140,000 seed/A
- 4-row plots, 30’ long, 6 reps in RCB
- Applications on 22 July @ R3
- Disease ratings 7 Aug (R5), 21 Aug (R6), 4 Sept (R7)
- Statistics - Fisher’s LSD test ($P > 0.10$)
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White Mold

Incidence (% plants)

- NTC
- Quadris, 6 fl oz
- Vertisan, 10 fl oz
- Topguard, Lucento, 7 fl oz
- Revytek, 5 fl oz
- Topsin XTR, 8 fl oz
- Delaro Complete, 20 fl oz
- Falls, 8 fl oz
Frogeye Leaf Spot

<table>
<thead>
<tr>
<th>Product</th>
<th>Units</th>
<th>AUDPC</th>
</tr>
</thead>
<tbody>
<tr>
<td>NTC</td>
<td></td>
<td>a</td>
</tr>
<tr>
<td>Quadris, 6 fl oz</td>
<td></td>
<td>b</td>
</tr>
<tr>
<td>Vertisan, 10 fl oz</td>
<td></td>
<td>c</td>
</tr>
<tr>
<td>Topguard, 7 fl oz</td>
<td></td>
<td>d</td>
</tr>
<tr>
<td>Lucento, 5 fl oz</td>
<td></td>
<td>f</td>
</tr>
<tr>
<td>Revytek, 8 fl oz</td>
<td></td>
<td>ef</td>
</tr>
<tr>
<td>Topsin XTR, 20 fl oz</td>
<td></td>
<td>c</td>
</tr>
<tr>
<td>Delaro Complete, 8 fl oz</td>
<td></td>
<td>de</td>
</tr>
</tbody>
</table>
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Yield

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Bushels/acre</th>
</tr>
</thead>
<tbody>
<tr>
<td>NTC</td>
<td>62.1</td>
</tr>
<tr>
<td>Quadris, 6 fl oz</td>
<td>64.3</td>
</tr>
<tr>
<td>Vertisan, 10 fl oz</td>
<td>65.5</td>
</tr>
<tr>
<td>Topguard, 7 fl oz</td>
<td>64.1</td>
</tr>
<tr>
<td>Lucento, 5 fl oz</td>
<td>69.4</td>
</tr>
<tr>
<td>Revytek, 8 fl oz</td>
<td>69.2</td>
</tr>
<tr>
<td>Topsin XTR, 20 fl oz</td>
<td>63.3</td>
</tr>
<tr>
<td>Delaro Complete, 8 fl oz</td>
<td>68.3</td>
</tr>
</tbody>
</table>
Disease Management Starts NOW with Seed Selection

- **Frogeye Leaf Spot (FLS)**
  - Resistant varieties are available
- **Soybean Cyst Nematode (SCN)**
  - “New” source of resistance – PI 89772
  - 2 varieties MG 2.3
    - Golden Harvest brand GH2329X
    - NK brand S23-G5X
- **Sudden Death Syndrome (SDS)**
  - Can reduce SDS severity by ≤80%
Take Home Points

• Management of frogeye leaf spot can be achieved with a combination of disease-resistant varieties, crop rotation, and foliar fungicides.

• But, resistance to Group 11 QoI fungicides has been confirmed in the frogeye leaf spot fungus in some Nebraska soybean fields.
  • Testing of samples will continue in 2021, as well as a fungicide survey.

• Another source of resistance to SCN is now available and could be used as part of a rotation with PI88788 and/or Peking to better manage SCN.
Crop Disease Resources

- Crop Watch - [http://cropwatch.unl.edu/](http://cropwatch.unl.edu/)
  - Newsletter, efficacy trial data, and publications

- Market Journal – weekly episode or see videos at: [http://marketjournal.unl.edu/](http://marketjournal.unl.edu/)

- Videos – YouTube – UNL CropWatch channel
  - short Corn and Soybean Disease videos

- Crop Protection Network [http://cropprotectionnetwork.org](http://cropprotectionnetwork.org)

- Tamra Jackson-Ziems on Twitter - @tjcksn
- Contact local county Extension office
Frequently Asked Questions

• When should you begin scouting for diseases?
• What are the best management strategies for Phytophthora root and stem rot (PRSR)?
• For frogeye leaf spot (FLS) management, if you’re concerned about Group 11 fungicide resistance, what would be the most effective management strategy?