Summary of soybean rust communication activities in North America

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Communication

- To whom are we communicating?
- What are we communicating?
  - General information about status of rust
  - Warning of an imminent epidemic
- How are we communicating?
If an epidemic develops

- How quickly can we get the message out?
- What proportion of soybean growers can we reach?
- How can we counter misinformation?
Method

- Sent a few questions to soybean rust specialists in each state
  - Response from 10 states, 11 people
- Looked at all the state soybean rust web sites we could find
State web sites

- University or state department of agriculture
- Considerable variation in style
Web site content

- General background about rust
- Local meeting schedule
- Fungicide labels
- Fungicide recommendations
- Links to other sites
- News
- Soybean rust hotline
General information about SBR

ASIAN SOYBEAN RUST
Asian soybean rust, caused by the fungus *Phakopsora pachyrhizi*, was first found in the continental United States in November and December of 2004 in 9 states. The introduction of soybean rust spores to the continental U.S. was most likely due to Hurricane Ivan.

BIOLOGY OF SOYBEAN RUST
Environment. *Phakopsora pachyrhizi* prefers moderate temperatures and wet environments. The temperature range for spore germination is 46 to 97°F; however, the optimum temperature range for spore germination is 61 to 75°F. The temperature range for infection is 52 to 82°F; however, the optimum temperature range for infection is 66 to 75°F. A minimum of 6 hours leaf wetness is required for infection to occur.

Disease cycle. Because *Phakopsora pachyrhizi* needs a green host to survive year-round, it will most likely only be able to overwinter in very southern locations in the U.S. Kudzu, which is a prominent weed in the southeastern U.S. and a host for soybean rust, may serve as this overwintering host. Only one type of spore (known as an urediniospore) is important in the disease cycle of soybean rust. This spore is airborne and can travel many miles. These urediniospores infect leaves, which will in-turn produce more spores. Soybean rust will have multiple disease cycles under a favorable environment, making it a poly cyclic disease. With this type of disease, the amount of inoculum (spores) will increase exponentially, making it more difficult to manage. For this disease to reach North Dakota, spores must be blown in. This is similar to how North Dakota wheat growers can have wheat fields infected by wheat leaf rust (See Puccinia Pathway).

Host range. *Phakopsora pachyrhizi* can infect 31 legume species in 17 genera. Hosts grown commercially in North Dakota include soybean, dry edible bean, and dry pea. Some forage crops are also susceptible. For a more complete list of hosts, click here (PDF file - Click here to download Adobe Acrobat Reader).

MANAGEMENT OF SOYBEAN RUST
Fungicides are currently the only way to manage soybean rust. For North Dakota, the presence and severity of North Dakota will most likely be different from year to year. The severity of soybean rust will depend on when (or if) spores arrive in North Dakota, the local weather, and the stage of crop development. Monitoring the presence of soybean rust in states to the south of North Dakota and scouting fields just prior to the R1 through the R6 development stages is important in determining the need to apply a fungicide for preventative or post-infection control in North Dakota. To monitor the spread of soybean rust throughout the United States, check the USDA Public Soybean Rust Website on a regular basis.
Fungicide Labels

Asian Soybean Rust Section 18
Fungicide Labels For Indiana

Updated June 6, 2006 - Click on thumbnail to download individual pdf files

**Bumper 41.3EC**  **Foliar 3.8 F**  **Headline SBR**

**Laredo EG**  **Laredo EW**  **Orus**

Fungicides for management of soybean rust in Kentucky

<table>
<thead>
<tr>
<th>Brand Name</th>
<th>Common Name</th>
<th>Fungicide Class</th>
<th>Current Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bravo</td>
<td>chlorothalonil</td>
<td>Aromatic nitrite</td>
<td>Section 3**</td>
</tr>
<tr>
<td>Enco 720</td>
<td>chlorothalonil</td>
<td>Aromatic nitrite</td>
<td>Section 3**</td>
</tr>
<tr>
<td>Quadris</td>
<td>azoxystrobin</td>
<td>Streblurin</td>
<td>Section 3**</td>
</tr>
<tr>
<td>Headline</td>
<td>pyraclostrobin</td>
<td>Streblurin</td>
<td>Section 3**</td>
</tr>
<tr>
<td>Headline SBK</td>
<td>pyraclostrobin + tebuconazole</td>
<td>Streblurin + DMI-Triazole COP</td>
<td>Section 3 + Section 18** Approved</td>
</tr>
<tr>
<td>Tilt, PropMax, Bumper</td>
<td>propiconazole</td>
<td>DMI-Triazole</td>
<td>Section 18** Approved</td>
</tr>
<tr>
<td>Folurc, Uproot</td>
<td>tebuconazole</td>
<td>DMI-Triazole</td>
<td>Section 18** Approved</td>
</tr>
<tr>
<td>Laredo</td>
<td>myclobutanil</td>
<td>DMI-Triazole</td>
<td>Section 18** Approved</td>
</tr>
<tr>
<td>Domark</td>
<td>tebuconazole</td>
<td>DMI-Triazole</td>
<td>Section 18** Approved</td>
</tr>
<tr>
<td>Orus</td>
<td>tebuconazole</td>
<td>DMI-Triazole</td>
<td>Section 18** Approved</td>
</tr>
<tr>
<td>Stratego</td>
<td>propiconazole + trifloxystrobin</td>
<td>DMI-Triazole + Streblurin</td>
<td>Section 18** Approved</td>
</tr>
<tr>
<td>Pristine</td>
<td>pyraclostrobin + boscalid</td>
<td>Streblurin + Carboxyamidide</td>
<td>BASF withdrew 2/3/2005</td>
</tr>
</tbody>
</table>

** Standard label
*** Emergency exemption
Local meeting schedule

- Some web sites list locations and times of meetings
# Fungicide recommendations

**Soybean Rust Fungicides - Updated May 2, 2006**

2006 KY Soybean Rust (SBR) Spray Decision Aid

## Crop Growth Stage SBR Risk 1st Spray 2nd Spray

<table>
<thead>
<tr>
<th>Crop Growth Stage</th>
<th>SBR Risk</th>
<th>1st Spray</th>
<th>2nd Spray</th>
</tr>
</thead>
<tbody>
<tr>
<td>Early-mid vegetative</td>
<td>--</td>
<td>Do not spray</td>
<td>--</td>
</tr>
<tr>
<td>Late veget. through R5 (Critical window for application)</td>
<td>Low</td>
<td>Do not spray</td>
<td>--</td>
</tr>
<tr>
<td>R6 or later</td>
<td>High</td>
<td>Section 18</td>
<td>Section 18</td>
</tr>
<tr>
<td></td>
<td>--</td>
<td>Non-economical</td>
<td>Non-economical</td>
</tr>
</tbody>
</table>

On Ohio State University rust web page

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### 2005 Soybean Rust Fungicide Use Guidelines

<table>
<thead>
<tr>
<th>Fungicide strategy for 1st application</th>
<th>Crop stage</th>
<th>Disease level</th>
<th>1st application</th>
<th>Fungicide application 2nd, if needed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre-infection</td>
<td>R1 through R5</td>
<td>No disease observed</td>
<td>Chiorothalonil OR Trisazole OR Premix</td>
<td>Premix OR Trisazole</td>
</tr>
<tr>
<td></td>
<td>R6 or later</td>
<td>No disease observed but RISK HIGH</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

| Early-post infection                  | R6 or later | Irrelevant | Trisazole OR Premix OR Trisazole | Premix |

**SPRAYING NOT RECOMMENDED**

**BENEFIT TO SPRAYING UNCERTAIN**

Limited product availability/non-economical
News
(Items viewed 15 Nov 2006)

Kentucky News updated as of October 21, 2006

- Asian Rust Found on Kentucky Soybeans (read more)
- Soy Rust Hotline available offers new service
- NY Soybean Rust Hotline (868-327-6771) is now being updated bi-weekly; weekly updates will begin in May.
- Name of Cheminova's Section 18 soybean rust product containing fludioxonil changed to TOPGUARD (pdf)
- Putting 2005 Soybean Rust Spore Tracking Efforts into Proper Perspective by Glen Horsham (pdf)
- Do Soybean Production Practices Need to Change Due to Soybean Rust? by Jim Horsiek and Chad Lee
  (Source = Kentucky Pest News, April 25, 2005)
  (archived news page) (through April, 2005)

Pest and Host Information

NEW! 1-06 Three new field hosts identified. University of FL plant pathologists and agronomist identify soybean rust on three more legumes in Quincy trial. Just before the winter holiday, Drs. Jim Marois and David Wright collected samples from a legume trial on the Quincy, FL, research farm. Three of the legumes tested positive for soybean rust, and were confirmed by PCR analysis at the Gainesville, FL, lab of Dr. Philip Harmon and at the federal level by the APHIS/PPQ/NIS identifier, Mary Palm. Detailed sample information and photographs have been submitted to Plant Disease for publication. The three legumes identified were lima bean, kidney bean, and scarlet runner bean. Pustules and spores were found on all three species. The plants were fully mature but leaves had not yet begun to senesce. No disease was found on the plants prior to 12-7-05; the plants were being scouted one last time before impending frost when they were found. The legume trial is a collaborative effort with Dr. Glen Hartman, USDA Soybean Research Laboratory, IL. The trial was not inoculated, but was exposed to spores produced by a border row from a soybean fungicide trial.
Phone numbers on web

SOYBEAN RUST

The Alabama soybean rust Web page provides information about surveillance, reporting, prediction, and management of soybean rust for the 2005 growing season.

General Information

- Soybean Rust Hotline
- Background Information
- Symptoms
- Survival and Development

Soybean Rust Hotline

Growers can receive free rust updates by telephone from the Auburn University Soybean Rust Hotline. The Hotline provides information on soybean rust with reports of outbreaks in the U.S. as well as general information on the use of fungicides to control the disease. The hotline will be updated regularly as new information becomes available. You can call the soybean rust hotline by dialing 1-800-774-2847 (BUGS).
Web site issues

- Goal of web site
- Ease of discovery
  - Google “Soybean rust in <State>”
- Ease of navigation
- How current is information?
Recommendations

- Include date of latest revision web site
- If site contains news, make sure it’s current
- Remove or archive news stories after some brief period
- If there is a state phone line, display this prominently
- Link to PIPE
Assumption for web site development

- Growers will use site for current information
  - Web allows site to be updated frequently
  - Clearly the intention for PIPE

- How many growers use the Internet?

- Will growers continue to use a site that is not regularly updated?
How common is internet use by farmers?

- Several published studies
- Use is increasing
  - 32% in 1991; 44% in 2004 in OH
- Most common uses are record keeping and financial transactions
- Some farmers use Internet to access information (e.g., 38% in OH in 2004)
- Use may not be much over 60%
Characteristics of users

- Younger
- More educated
- Larger farms
  - More debt/greater risk
  - Leased land
- More diverse farming operations
- Full-time farmers
- Heartland farms (Corn Belt)
Visits to and hits on PIPE

The peak number of visits (15,632) is only a fraction of the number of U.S. soybean farmers.
Hits on Purdue’s rust Web site

(2006)
Phone lines

- Some states have a hotline (4 of 10)
- Toll-free in most cases
- Update frequency varies
- Many are active only during the growing season
Direct contact with specialists

### Soybean Rust Contact List

**University of Minnesota**

- Soybean Pathology Extension and Research - Dr. Dean Malvick (612) 625-5282
- Soybean Research – Dr. Jim Kurle (612) 625-3167
- Plant Disease Diagnostician – Amy Holm (612) 625-5175
- Extension Agronomist - Dr. Seth Naeve (612) 625-4298
- Regional Extension Educator- Lisa Behnken

**Minnesota Department of Agriculture**

- Primary Contact - Geir Friisoe (651) 297-7174
- Monitoring – Mark Abrahamson (651) 296-6509
- Pesticide Registrations – John Sierk (651) 296-4292
Publications

- Many states have put out print or on-line publications
  - Rust background
  - Spray technology and recommendations
- Many states have newsletters that contain rust information
Are we reaching everyone we should?

- Web pages may only reach a small fraction of farmers
- Phone lines may reach more people
- We have not yet had a crisis that tests the communication system
If the need for rapid communication does arise...

- County extension offices will be a critical link
- Direct access to farmers
- Contacts with local radio and TV stations