Long Term Impact of Soybean Rust on the Chemical Industry
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- The **Impact of Soybean Rust** began when the disease was first discovered in Louisiana.
- How does the Ag Chemical Industry allocate resources to a market that is decreasing and to the soybean fungicide market that has been limited to only a small portion of the southern market.
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- Soybean Rust has the potential to become a market that could sustain a product, but with many challenges.
- The long term impact is about allocation of resources not added resources.
- The following activities started allocation of these resources without notice!
U.S. SBR DISTRIBUTION, 2005

November 18, Caldwell County, KY
773 miles

November 10, Liberty County, TX
910 miles

November 3, Hyde County, NC
758 miles

Pasco County, FL, February 23

Legend:
- Green: scouted, not found
- Red: scouted, confirmed
SPORE TRAPPING PROJECT
(13 STATES + SYNGENTA)

DR. JOHN RUPE
UA DIVISION OF AGRICULTURE

POTENTIAL – EARLY WARNING, SPORES DETECTED AVG 31 DAYS BEFORE DISEASE

WEAKNESSES – CANNOT POSITIVELY ID ASIAN SOYBEAN RUST SPORES – TRAPS MANY OTHER SPORES TOO

LABOR – INTENSIVE; SLIDES BREAK

NEEDS MORE WORK
Environmental conditions that favor the development and spread of soybean rust

- **Temperature:** 57°F to 84°F (68-77°F optimum)
- **Leaf wetness:** 6 hrs or longer continuous moisture over extended duration (days/weeks)
  - Rain
  - Dew
- **Relative humidity**
  - Dew point
  - Spore desiccation
- **Wind and air currents**
  - Spore distribution
- **UV exposure**
  - Spore desiccation
Progression of Rust on Soybean
Under Ideal Disease Environment

Day 1 – 0% symptoms

6 Days later

13 Days later

27 days
The Drought Monitor focuses on broad-scale conditions. Local conditions may vary. See accompanying text summary for forecast statements.

http://drought.unl.edu/dm
Soybean appears to be the dominant SBR host.

- SBR not found on forage legumes.
- Main role of kudzu is as overwintering host.
- Also found on Florida beggarweed (Dixie tick-trefoil), snap bean, lima bean, and scarlet runner bean.
## Fungicide Registration Status

<table>
<thead>
<tr>
<th>FUNGICIDE</th>
<th>CHEMISTRY</th>
<th>LABELED?</th>
<th>RATES</th>
</tr>
</thead>
<tbody>
<tr>
<td>QUADRIS-SYNG</td>
<td>STROBILURIN</td>
<td>YES (FULL)</td>
<td>6.2 – 9.2 OZ</td>
</tr>
<tr>
<td>HEADLINE-BASF</td>
<td>STROBILURIN</td>
<td>YES (FULL)</td>
<td>6 – 12 OZ</td>
</tr>
<tr>
<td>HEADLINE SBR</td>
<td>STROB + TRIAZ</td>
<td>YES (18)</td>
<td>4.5 H + 4 OZ F</td>
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<tr>
<td>QUILT-SYNGENT</td>
<td>STROB + TRIAZ</td>
<td>YES (18)</td>
<td>14 – 20.5 OZ</td>
</tr>
<tr>
<td>STRATEGO-BCS</td>
<td>STROB + TRIAZ</td>
<td>YES (18)</td>
<td>5.5 – 10 OZ</td>
</tr>
<tr>
<td>FOLICUR-BCS</td>
<td>TRIAZOLE</td>
<td>YES (18)</td>
<td>3-4 OZ</td>
</tr>
<tr>
<td>TILT-SYNGENTA</td>
<td>TRIAZOLE</td>
<td>YES (18)</td>
<td>4 – 8 OZ</td>
</tr>
<tr>
<td>PROPIMAX-DAS</td>
<td>TRIAZOLE</td>
<td>YES (18)</td>
<td>4 – 8 OZ</td>
</tr>
<tr>
<td>BUMPER-AGAN</td>
<td>TRIAZOLE</td>
<td>YES (18)</td>
<td>4 – 8 OZ</td>
</tr>
<tr>
<td>LAREDO-DAS</td>
<td>TRIAZOLE</td>
<td>YES (18)</td>
<td>4 – 8 OZ</td>
</tr>
<tr>
<td>LAREDO EW-DAS</td>
<td>TRIAZOLE</td>
<td>YES (18)</td>
<td>4.8 – 9.6 OZ</td>
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<tr>
<td>DOMARK-VAL</td>
<td>TRIAZOLE</td>
<td>YES (18)</td>
<td>10 – 13 OZ</td>
</tr>
<tr>
<td>BRAVO, ECHO, EQUUS-VARIOUS</td>
<td>CHLOROTHALONIL</td>
<td>YES (FULL)</td>
<td>1.5 – 2.25 PTS</td>
</tr>
</tbody>
</table>
Long Term Impact of Soybean Rust on the Chemical Industry

• Even without significant ASR, the Ag Chemical Industry has invested substantial resources!
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• What additional challenges does the industry face- information presented based on feedback from industry- basic manufacturer, national distribution, independent wholesale distributor
Supply and Demand

• Predictions of ASR of 7 out 10 years in the southern soybean area to 1-3 years out of 10 in the midwest soybean area.

• Difficulty in predicting the occurrence of ASR & how widespread creates a problem in fungicide availability!
Supply and Demand

Map of the United States with designated areas for Supply and Demand observations.
Supply and Demand

• With no guarantee of market
  – may lead to taking an opportunistic approach to ASR outbreak
  – shortages of fungicides in years of widespread of ASR
  – what will be the effect of widespread outbreaks in U.S. & Brazil in the same year
Supply and Demand

• How will this problem be solved
• When there is ASR, fungicides will be required
• How can soybean producers be assured that fungicides will be available
• How does the AG Chem industry protect their investment
Supply and Demand

• Bottomline
  – Ag Chem Industry has always invested and met producer needs
  – Have gone to expense to insure their personnel is educated on ASR & other soybean diseases
  – Have sought Section 18’s and Section 3 labels with their products
Research & Development

• Search for new modes of action

• ASR will be integrated into the screens

• New products introduced will have broader disease spectrum/multicrop use

• Mixtures will continue to broaden spectrum & resistance management
Research & Development

- **rust will develop resistance** to the triazoles & strobilurin fungicides - industry should monitor & will require new control strategies

- **Cultivar resistance** - will be developed and due to rust populations change, control will be partial still requiring fungicide programs

- **Improved quality** of spray applications will be continued & new technology will be integrated
Research & Development

• Focus USDA/University resources in the Southeast U. S. where it is most likely to generate useful data—is that transferable to the Midwest?

• Develop predictive models for ASR

• Increased awareness of soybean disease control, both ASR and late season diseases
Research & Development

• **Bottomline**
  
  – ASR will be a disease screened-new MOA needed-new products developed
  
  – Partial resistance will develop
  
  – Resistant cultivars will be released
  
  – New & improved disease forecasting systems
Market Dynamics

• Parts of the southern soybean market may plant alternate crops due to cost associated with controlling ASR-reduces market potential

• In areas where soybean yield potential is high, the use of fungicides may increase even in the absence of ASR-increases market potential
Market Dynamics

• When and if rust hits the U.S. market early enough to impact yields, it will most certainly impact prices

• The market for a global commodity such as soybeans is, in the best of times, noisy, turbulent, and confusing. Unraveling the effect soybean rust will have on the market will be difficult
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• **Key questions!**

• What will it require for the AG Industry to consider the soybean rust market sustainable? 10 M acres annually, 15 M acres annually, or 30 M acres over a 5 year period-time will tell
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• What will be the trigger that drives additional resources to developing chemistry with new modes of action?

• When will agronomic quality rust resistant soybean cultivar(s) be introduced & what affect will it have on the market?
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• Will the soybean acreage remain stable or will there be a transition to alternative crops in areas with high rust potential or even low rust potential?

• Will the soybean price stabilize to allow the producer to budget rust control in their production practices?
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• Widespread distribution suggests rust is here to stay!

• The speed & frequency in which it reaches the major soybean belt will impact the long term investment in this disease/market