Overview of the Sentinel Monitoring System for 2005: How well did we do?

Loren J. Giesler, Extension Plant Pathologist, University of Nebraska-Lincoln

&

Donald E. Hershman, Extension Plant Pathologist, University of Kentucky
Dear Northern State Sentinel Coordinators:

Don Hoppling and I will be giving a summary of the sentinel plot activities at the APS symposium in Nashville. To help us prepare for this talk, would you please answer the following 21 questions? I apologize for some duplication in previous surveys, but all did not respond and more questions have been added to mirror a southern region survey being done by Don. (Please respond by October 14 if at all possible)

State:
Name:

1. How many official soybean sentinel plots were in your state? _________

2. How many kudzu patches were scouted on a regular basis? _________

3. What other crops were scouted at least periodically by SBR? [List]

4. Which agency(ies) established the sentinel plots in your state? (X all that apply)

State Dept of Agriculture
University Agronomist
University Plant Pathologist
Consultant
Ag Dealer
Extension Agent
Other (specify): _________

5. Were multiple soybean maturity groups planted? (X appropriate response)

At each sentinel location
At some sentinel locations
Throughout the state, but only one MG was planted at each location.
One MG was used state-wide

6. Were multiple planting dates implemented?:

At all locations
At some locations
One planting date per site (not counting rep/plot due to weed/stand issues)

7. Was early planting of sentinel plots a focus in 2003
Total Number of North America Sentinel

981 Total
1. How many official soybean sentinel plots were in your state?

822 Total
2. How many kudzu patches were scouted on a regular basis?

159 Total
3. What other crops were scouted at least periodically for SBR?

<table>
<thead>
<tr>
<th>Crop Type</th>
<th>Crop Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dry beans</td>
<td>Lima beans</td>
</tr>
<tr>
<td>Snap beans</td>
<td>Southern peas</td>
</tr>
<tr>
<td>Alfalfa</td>
<td>Crimson clover</td>
</tr>
<tr>
<td>Annual lespedeza</td>
<td>Lablab</td>
</tr>
<tr>
<td>Birdsfoot trefoil</td>
<td>Cowpea</td>
</tr>
<tr>
<td>Crownvetch</td>
<td>Garden beans</td>
</tr>
<tr>
<td>Kura clover</td>
<td>Pinto beans</td>
</tr>
<tr>
<td>Red clover</td>
<td>Shelly beans</td>
</tr>
<tr>
<td>Sweet clover</td>
<td>Pole beans</td>
</tr>
<tr>
<td>White clover</td>
<td>Green beans</td>
</tr>
<tr>
<td>Garden pea</td>
<td>Yellow blossom clover</td>
</tr>
<tr>
<td>Various weeds</td>
<td>Vegetable bean - edamame</td>
</tr>
</tbody>
</table>
4. Which entity(ies) established the sentinel plots in your state?
5. Were multiple soybean maturity groups planted?

- At each sentinel location
- At some sentinel locations
- Throughout state (only one MG was planted at each location)
- One MG was used state-wide

Percent

0 10 20 30 40
6. Were multiple planting dates implemented?

- At all locations
- At some locations
- One planting date per site (not counting replant due to frost/stand issues)
7. Was early planting of sentinel plots a focus in 2005?

- Yes
- No

<table>
<thead>
<tr>
<th>Percent</th>
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<tbody>
<tr>
<td>0</td>
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<tr>
<td>20</td>
</tr>
<tr>
<td>40</td>
</tr>
<tr>
<td>60</td>
</tr>
<tr>
<td>80</td>
</tr>
<tr>
<td>100</td>
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</table>
Sentinel Plot Design

- One or more soybean varieties
  - Early maturing variety in some.
  - (i.e. – Nebraska – many plots were a 1.9 MG in a 2.5 to 3.5 MG range state.)

- Planted early for the area
- 50’ X 50’ minimum area with center area scouted
8. Were mobile plots (soybean and/or kudzu) a big part of your SBR surveillance network in 2005?

- Yes
- No

Percent
9. At the start of the season, how were sentinel plots evaluated for SBR?

- Exclusively field evaluation (hand lens)
- Primarily field evaluation with some lab (microscopic) assessment
- Field and Lab evaluation about half and half
- Primarily lab evaluation with some field evaluation
- Exclusively lab evaluation

![Bar chart showing the percent distribution for different evaluation methods.]

- Primarily field evaluation with some lab (microscopic) assessment: 50%
- Field and Lab evaluation about half and half: 20%
- Primarily lab evaluation with some field evaluation: 10%
- Exclusively lab evaluation: 5%
- Exclusively field evaluation (hand lens): 0%
10. How were sentinel plots evaluated for SBR mid- to late-season?

- Exclusively field evaluation (hand lens)
- Primarily field evaluation with some lab (microscopic) assessment
- Field and Lab evaluation about half and half
- Primarily lab evaluation with some field evaluation
- Exclusively lab evaluation
11. For field assessments, were samples incubated prior to observation?

- Never: 50%
- Sometimes: 35%
- Usually: 15%
- Always: 0%

Percent
12. For lab assessments, were samples incubated prior to microscopic observation?

- Never
- Sometimes
- Usually
- Always

Percent
13. For laboratory assessments were the following routinely used?

- ELISA
- PCR
- Microscopic Observation

![Bar chart showing the percentage of routine use for laboratory assessments]
14. Who collected leaves from sentinel plots?

- Ag Extension agents: 28%
- Crop consultants or ag industry: 10%
- University faculty (including emeritus)/post docs: 27%
- State Dept of Agriculture personnel: 10%
- AphIS personnel: 2%
- Students and other temporary laborers: 12%
- Other (specify): 8%
15. How many leaves were *routinely* examined (field or laboratory) for each sample date, each location?

<table>
<thead>
<tr>
<th>Mean:</th>
<th>97.9</th>
</tr>
</thead>
<tbody>
<tr>
<td>Range:</td>
<td>20 - 300</td>
</tr>
</tbody>
</table>
16. How often were sentinel plots monitored?

- Weekly all season
- Two or more times a week all season
- Weekly in the beginning, then two or more times weekly
- Other (specify):

“Other” response included: Extreme variation among participants…interest waned through the season, weekly with several scouts reporting once every one-two weeks
17. How much did the soybean sentinel network cost your state in 2005?

Mean: $40,290

Range: $2,000 – $125,000
19. Please comment on the strengths and weakness of your state’s sentinel network in 2005.

Strengths:

"The clear strength of this system during 2005 - was that when the rumors started to use fungicides -- we had the data to say no it is not here - with certainty."

"Excellent cooperation between university departments, extension agents and other groups involved in the collection process"

"Good distribution of plots relative to production areas. Most plots were some of the earliest planted soybeans in the area."
“Fruit” of 2005 SBR Sentinel Network

- Sentinel Network worked!
2005 SBR Sentinel Network

- 146 first detections (unique finds; 136 unique counties).
  * 1st: Pasco County, FL (Feb 23, kudzu).
  * Most recent: Whitfield County, GA (Nov 21, kudzu).

  * 109 detections in soybean; 37 kudzu.

- 32 first detections (22.2%) in sentinel plots (31 soybean, 1 kudzu).

- 114 first detections (78.1%) in non-sentinel (mobile) plots (76 soybean, 38 kudzu).
SBR Detection Timeline

- Detection period spanned ~ 9 months
- Feb 23 – June 30: 10 first detections
- July: 12
- August: 38
- September: 10
- October: 56
- November: 20
Summary of 2005 Sentinel Finds

- **Florida:** 23 counties *(Feb 23 – Oct 13)*
- **Georgia:** 35 counties *(Apr 26 – Nov 20)*
- **Alabama:** 31 counties *(Jun 28 – Nov 10)*
- **Mississippi:** 2 counties *(July 13 - Aug 5)*
- **S. Carolina:** 23 counties *(Aug 9 – Nov 12)*
- **N. Carolina:** 15 counties *(Oct 25 – Nov 18)*
- **Louisiana:** 1 county *(Oct 28)*
- **Texas:** 1 county *(Nov 4)*
- **Kentucky:** 1 county *(Nov 18)*
## SOYBEAN STAGE WHEN SBR DETECTED

<table>
<thead>
<tr>
<th>Stage</th>
<th>Number</th>
<th>Percent*</th>
</tr>
</thead>
<tbody>
<tr>
<td>V stages</td>
<td>0</td>
<td>0%</td>
</tr>
<tr>
<td>R1-R2</td>
<td>0</td>
<td>0%</td>
</tr>
<tr>
<td>R3-R4</td>
<td>7</td>
<td>11.5%</td>
</tr>
<tr>
<td>R5-R6</td>
<td>23</td>
<td>37.7%</td>
</tr>
<tr>
<td>R7-R8</td>
<td>31</td>
<td>50.8%</td>
</tr>
<tr>
<td>?</td>
<td>48</td>
<td></td>
</tr>
</tbody>
</table>

*of total where stage was recorded
• Always showed up first in earliest MG group for any planting.

• All low level first detections found in lower canopy.

• Most soybean first detections evident in scattered foci at very low incidences (1-5%) and severity (<0.1%).

• All low level first detections were found and confirmed with microscopic observations in the laboratory, not field.

• All low level first detections were based on the presence of sporulating pustules (usually requiring incubation).
More Observations in 2005

- Incubation:
  * Helped promote sporulation of suspect pustules.
  * Incubation never resulted in lesions when leaves lacked visual evidence of infections.

- Other diseases did not impact rust development, but did complicate observations.
KUDZU OBSERVATIONS
- Generally, if SBR was not detected in kudzu early in season, it was never detected, even if nearby soybean became infected.

- Kudzu does not appear to be as susceptible as soybean (lots of questions).

- Primary role may be as principal overwintering host, but soybean appears to be more susceptible.

- Growing season role of kudzu uncertain.

- SBR was not found on any other legume host except FL Beggarweed?. 
Implications for 2006

- Non-sentinel plots very productive and should not be neglected.
- For soybean, intensive scouting prior to the onset of flowering may not be necessary.
- Early planting should continue to be a focus, but include early and late-maturing varieties.
- Kudzu should not be a focus of scouting if reproductive soybean available.
- Increase laboratory observation and do not rely solely on field observations.
- Scouting fewer plots, but with more emphasis on microscopic observations, may bear more fruit than field scouting a larger number of plots.
Sentinel Network also provided many on-the-job training opportunities and other pest scouting.
And spore trapping opportunities
Facilitated disease progress studies and observations

DISEASE PROGRESS IN SENTINEL PLOTS
(includes Marion County)

INCIDENCE (%)

WEEK

0 1 2 3 4 5 6 7 8 9

0 20 40 60 80 100

WEEKS AFTER DETECTION

SEVERITY

0 1 2 3 4 5 6

Data: Jim Marois, Univ.of FL, Quincy
Opportunity to eat fresh boiled peanuts in Alabama!!
Teamwork is the key!

Thanks to all Cooperators! Land Grant Universities, NCSRP, USB, and USDA!