Are Soybean Leaf Diseases Causing Economic Loss in Wisconsin?

Dr. Craig Grau, Dept. of Plant Pathology
John Gaska, Dept of Agronomy
Bryan Jensen, IPM Program

Discussion Items

- Economics of Foliar Disease Control; WI Data
  - Disease control
  - Plant health
- Update on Asian Soybean Rust

Common Foliar Soybean Diseases

- Fungal Diseases
  - (Septoria) Brown Spot
  - Powdery Mildew
  - Downy Mildew
- Bacterial Diseases
  - Bacterial Blight
  - Bacterial Pustule

Fungicide Use Caution

- Accurate Identification
  - Fungal vs bacterial pathogens
- Choose appropriate product
  - Section 3 (FIFRA)
  - Section 18 (emergency exemption)

Fungicide Research Projects

- Onfarm Research Project
  - Headline (2005 & 2006)
  - Quadris (2006)
- Small Plot Research (2005 & 2006)
  - Arlington ARS
  - Lancaster ARS
  - West Madison ARS

On Farm Research Project

- 2 treatments
  - Sprayed
  - UTC
- Replicated
- Multiple locations throughout state
  - Multiple environments
  - Multiple varieties/MGs
  - Multiple diseases
  - Variable disease pressure
- Farm Scale Equipment

Headline Protocol

- Headline @ 6 oz product/A + NIS
- Spray Timing
  - R2- R3, 2005
  - R3, 2006
- Application Criteria
  - 15-25 GPA
  - Medium (250-350 microns) droplet size
- Minimum 2 reps/field
- Foliar disease ratings (% disease foliage)

Determining Economics of Control

Estimated yield gain needed to cover the cost of a fungicide ($270/gallon at 6 fl oz/a) at various soybean prices and application costs

	Application Costs ($/A)		
	7.00	**7.50**	**8.00**
Soybean price/bu.	----------Yield bu/a ----------		
$5.75	**3.4**	**3.5**	**3.6**
$6.00	**3.3**	**3.4**	**3.5**
$6.25	**3.1**	**3.2**	**3.3**
$6.75	**2.9**	**3.0**	**3.1**

2005 Results:Headline

- Combined yield results across locations (9)
  - Statistical yield advantage of 1.4 bu/a (P=0.05)
  - Non economic
- Individual field yield results
  - No statistical yield difference
  - 2 fields had numerical (but statistically insignificant!) economic yield advantage
    - 3.4 bu/a
    - 6.5 bu/a

2006 Headline Results

- Combined yield results across six locations
  - Statistical yield advantage of 2.8 bu/a (P=0.05)
  - Non economic
- Individual field results
  - Green County, +5.65 bu/a
  - Marshfield
    - MG 1.5, + 6.35 bu/a
    - MG 0.8, + 5.05 bu/s
  - 4 fields NSD in yield

Acknowledgements

- Nutrient and Pest Management Program
  - Paul Kivlin
  - Richard Proost
  - Karen Talarczyk
- UW Extension
  - Bill Halfman, Monroe County
- UW Ag. Research Station
  - Mike Bertram, Marshfield ARS
- UW Research Staff
  - John Gaska, Dept. of Agronomy

2006 Quadris Results

- Bill Halfman, UWEX Monroe Co.
- Steve Huntzicker, UWEX LaCrosse County

- 5 locations in Monroe, LaCrosse, Trempeleau Counties
- Protocol: similar to Headline Plots
  - Quadris @ 6 ozs product/Acre + 1% COC
  - Applied at R3

Quadris Results

- Yield; NSD across locations
- Individual Field Yield Result
  - 1 field, statistically significant, but not economic, yield advantage of 2.0 bu/a
  - 4 fields, NSD in yield

Small Plot Research
2005 & 2006

- Funding supplied by WI Soybean Marketing Board
- Lancaster, Arlington and West Madison Agricultural Research Stations
- 8 trials
- Multiple products (labeled and unlabeled)
- Section 3 and Section 18 labeled products
- Multiple fungicide classes
- Multiple Timings (R2, R3, R2+3, R5, V5 + R3, R3 + 21 da)

Small Plot Results

- 126 product comparison
  - 3-4 reps./plot
- 3 fungicides w/ significantly reduced yields
  - Chlorothalonil
  - 2 strobilurins + triazol combinations
- 1 product with significant and economic yield increase
- 122 w/ NSD in yield

Summary

- Fungicides are not a replacement for IPM practices
  - Variety selection
  - Rotation
  - Scouting
- Have not identified a single key factor that would predict an economic return from a fungicide application
- WI results similar to other midwest data

Asian Soybean Rust Update

- Hot dry spring/summer prevented movement of ASBR
- Late September spore dispersal up the East coast and Mississippi River Valley
- December 31, 2006
  - 231 counties on soybeans
  - 15 states including
    - Illinois
    - Indiana
    - Kentucky
    - Missouri

Asian Soybean Rust Update

- Late season movement should help modelers understand movement
- Late season detection has no bearing on 2007 rust potential
- Must overwinter on green tissue
- Does serve as a good reminder of the potential for movement when conditions are favorable
- Greatest potential for movement from spores originating from TX, LA,MS

ASBR Activity in Wisconsin

Wind Vane Trap

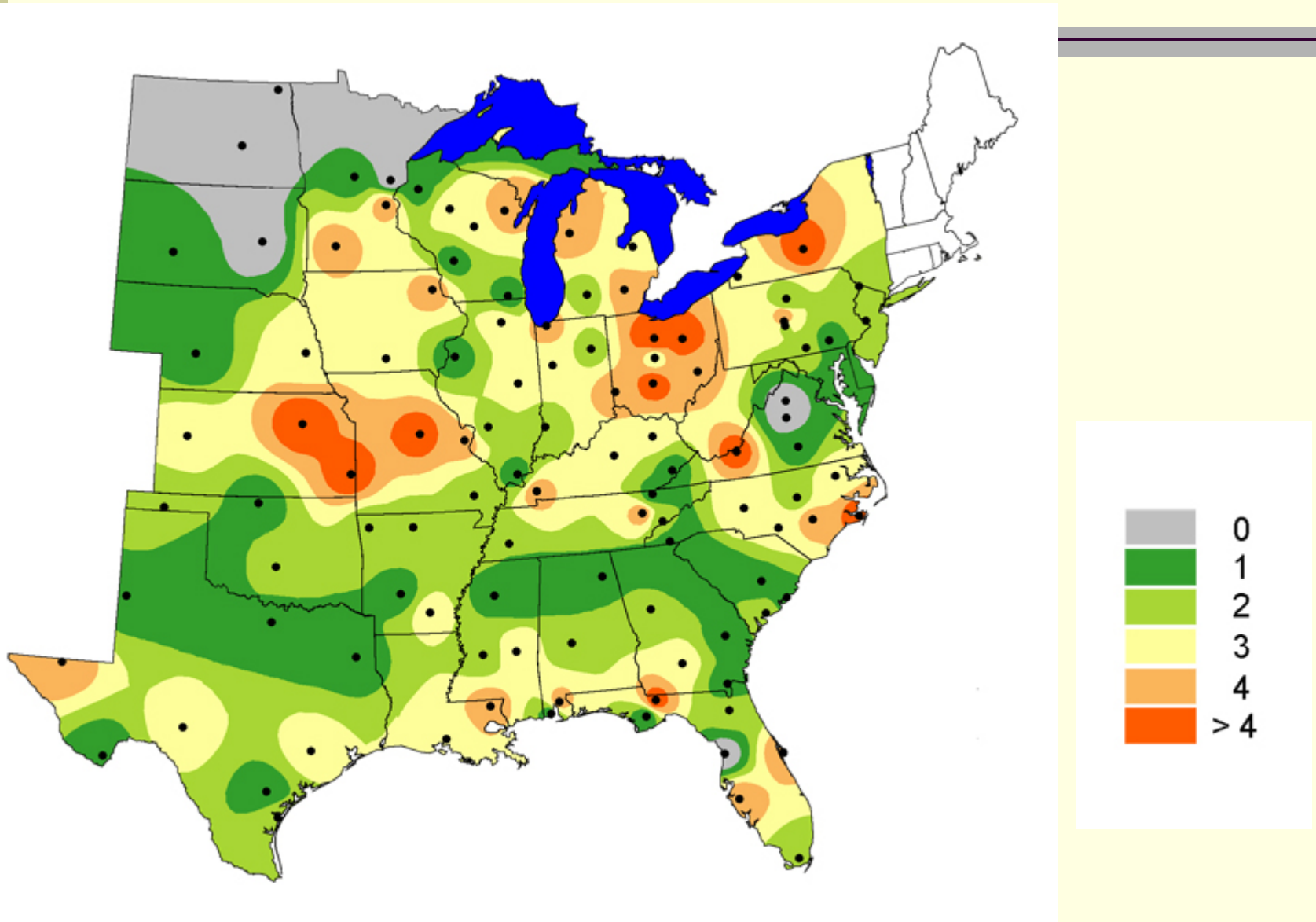
- “Soybean Rust-like spore”
- Unknown Viability
- WI detects;2006

Columbia County 7/26-8/3 8/8-8/22	Rock county 7/31-8/7 9/5-9/12
Dane County 8/21-9/8 9/18-9/28	Grant County 8/8-8/16 8/16-23

Rainfall Spore Trap

- Locations
  - Rock
  - Grant
  - Dane
  - Columbia
  - Buffalo
  - Chippewa
  - Monroe
- Spore Viability Unknown
- No detects

Contour maps showing numbers of NADP sites testing positive for *P. pachyrhizi* using the nest real-time PCR assay for 2006



Monitoring SBR Movement

- National Sentinel Plots Network
  - Kudzu
  - Soybean
  - Funded by USDA and NCSRP
- WI sentinel plots
  - Projected 15-20 plots in 2007
  - UW Extension Agents
  - UW Staff
  - UW ARS Staff

Tracking Movement of ASBR

- PIPE Network

  (Pest Information Platform for Extension and Education)

  http://www.sbrusa.net/

- UW Plant Disease Clinic Soybean Rust Hotline
  - 1-866-787-8411 (RUST 411)

werPoint - [2007 aglime.ppt]

PIPE Website - Windows Internet Explorer

http://www.sbrusa.net/

ew Favorites Tools Help

Go Bookmarks Popups okay Check AutoLink AutoFill Send to

SDA Public PIPE Website

USDA United States Department of Agriculture

Pest Information Platform for Extension and Education

Getting Started

Prev Next

November - 2006

			1	2	3	4
5	6	7	8	9	10	11
12	13	14	15	16	17	18
19	20	21	22	23	24	25
26	27	28	29	30		

December - 2006

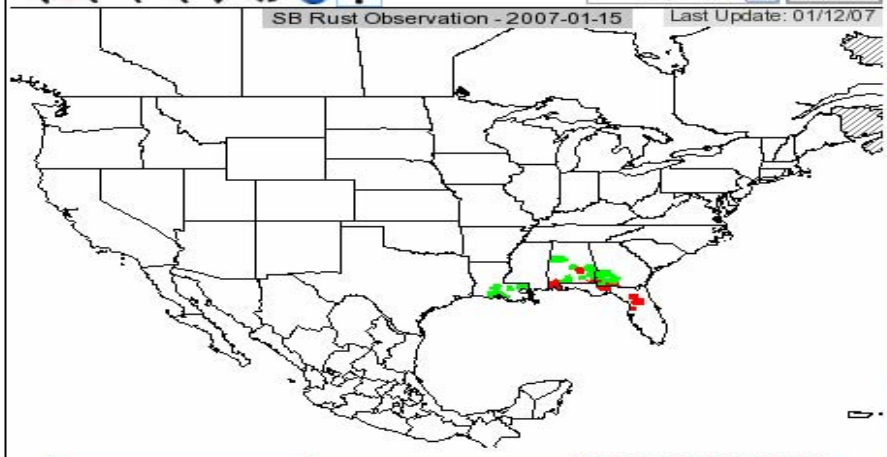
					1	2
3	4	5	6	7	8	9
10	11	12	13	14	15	16
17	18	19	20	21	22	23
24	25	26	27	28	29	30
31						

January - 2007

	1	2	3	4	5	6
7	8	9	10	11	12	13
14	15	16	17	18	19	20
21	22	23	24	25	26	27
28	29	30	31			

- Overlay - Load

SB Rust Observation - 2007-01-15 Last Update: 01/12/07



Recently scouted, not found | Scouted, confirmed | Confirmed, no longer found

Sign Up For Alerts

Jan 15, 2007

Legumes/Kudzu

Soybean Rust

SB Rust Observation

SB Rust State Update

Chronology of Positive Detections

SBR Forecast Click For Details...

- **National Commentary**
- ID/Scouting Tools
- Not sure if it is Rust?
- Other SBR Sites
- Hurricane Animations
- Observation Animations
- Partners
- Professional Societies
- Soybean Rust: Scout Before you Spray
- Management

USDA SBR Website

Printable Map Legend

National Soybean Rust Commentary (updated: 01/12/07)

Alabama reported soybean rust finds on kudzu from two southeast counties: Houston and Geneva. Consult state commentary for more information. This year rust has been reported in five Florida counties, four Georgia counties and five counties in Alabama.

In 2006, soybean rust was found in 274 counties in 15 states including 26 in Alabama, 28 in Arkansas, 24 in Florida, 17 in Georgia, eight in Illinois, six in Indiana, 18 in Kentucky, 26 in Louisiana, nine in Mississippi, five in Missouri, 42 in North Carolina, 21 in South Carolina, 19 in Tennessee, seven in Texas, and 18 in Virginia. Scouting efforts are continuing in many southern states where kudzu may still be green or greening up.

Management Toolbox

- Tactics - USA
- Guidelines - USA
- GFP Tool
- Insurance Docs
- Commentary Chron

Terms and Conditions **Sources of Geographic Data**

Internet

Eudora - [Out] Microsoft Powe... 2 Internet Ex... My Computer Local Disk (C:)