Biology and Control of Major Diseases of Soybean

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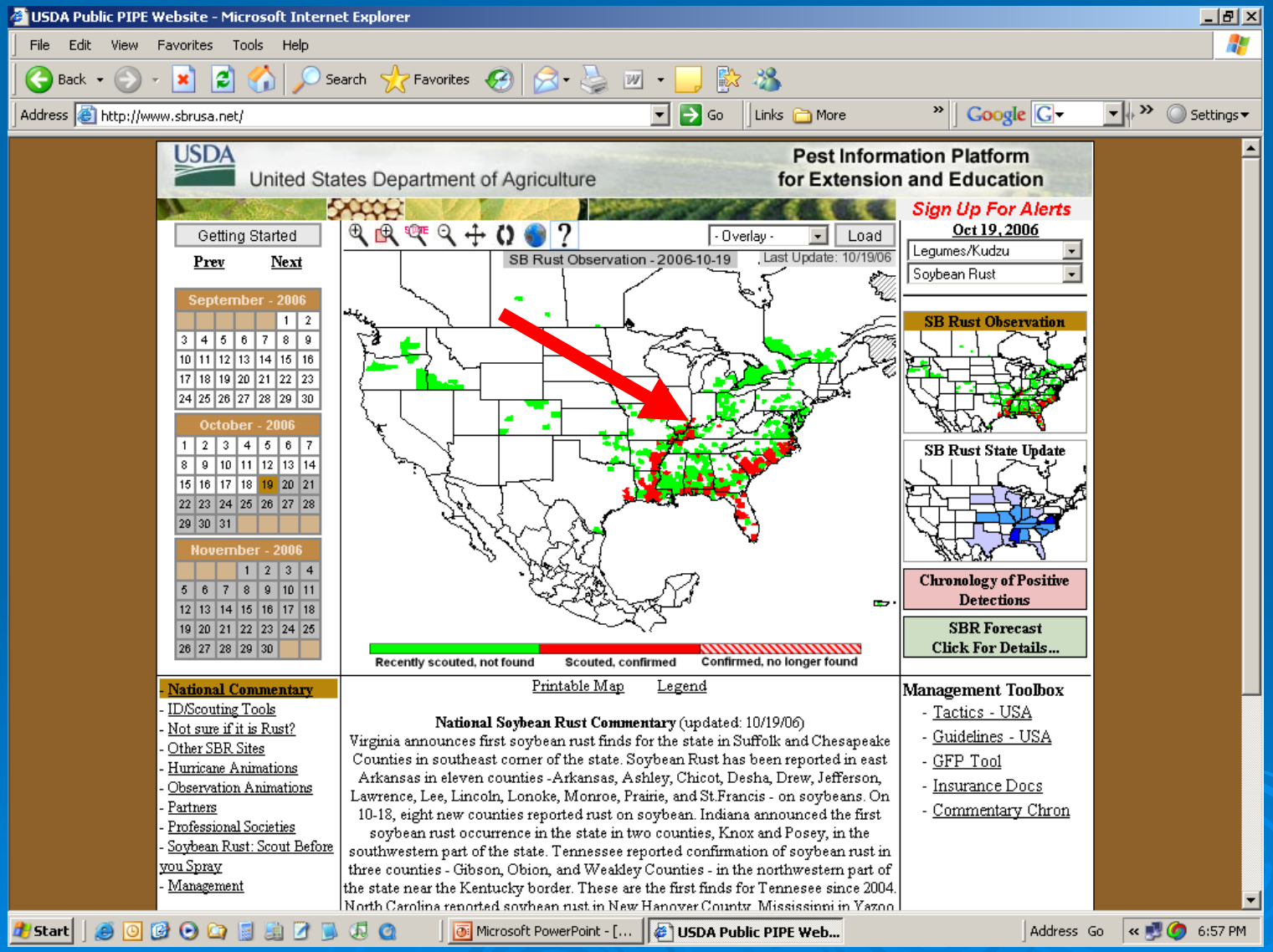
Rust in 2006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Pest Information Platform
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Oct 19, 2006
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Last Update: 10/19/06
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Chronology of Positive Detections
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Management
National Soybean Rust Commentary (updated: 10/19/06)
Virginia announces first soybean rust finds for the state in Suffolk and Chesapeake Counties in southeast corner of the state. Soybean Rust has been reported in east Arkansas in eleven counties -Arkansas, Ashley, Chicot, Desha, Drew, Jefferson, Lawrence, Lee, Lincoln, Lonoke, Monroe, Prairie, and St.Francis - on soybeans. On 10-18, eight new counties reported rust on soybean. Indiana announced the first soybean rust occurrence in the state in two counties, Knox and Posey, in the southwestern part of the state. Tennessee reported confirmation of soybean rust in three counties - Gibson, Obion, and Weakley Counties - in the northwestern part of the state near the Kentucky border. These are the first finds for Tennesee since 2004. North Carolina reported soybean rust in New Hanover County, Mississippi in Yazoo
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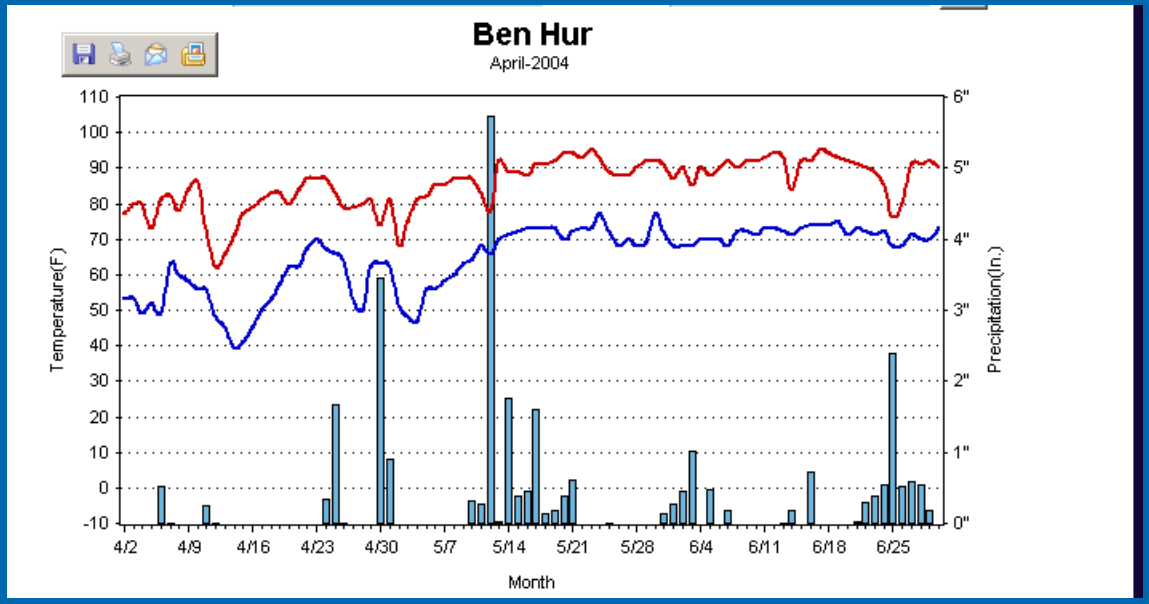
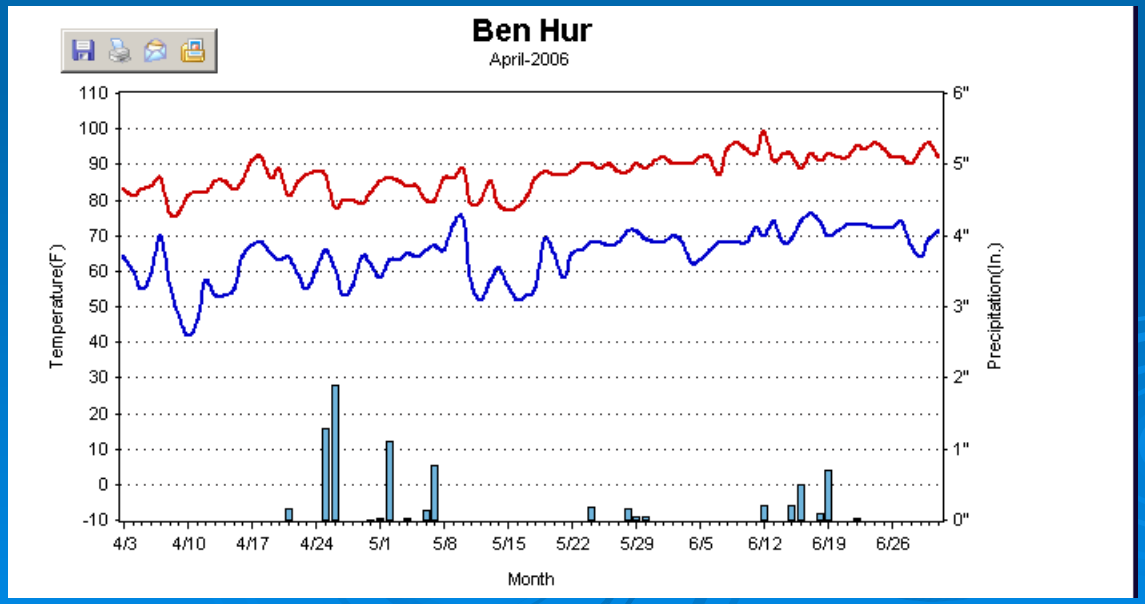
Weather Patterns in 2004 and 2006





Rust in 2006

Hemp sesbania

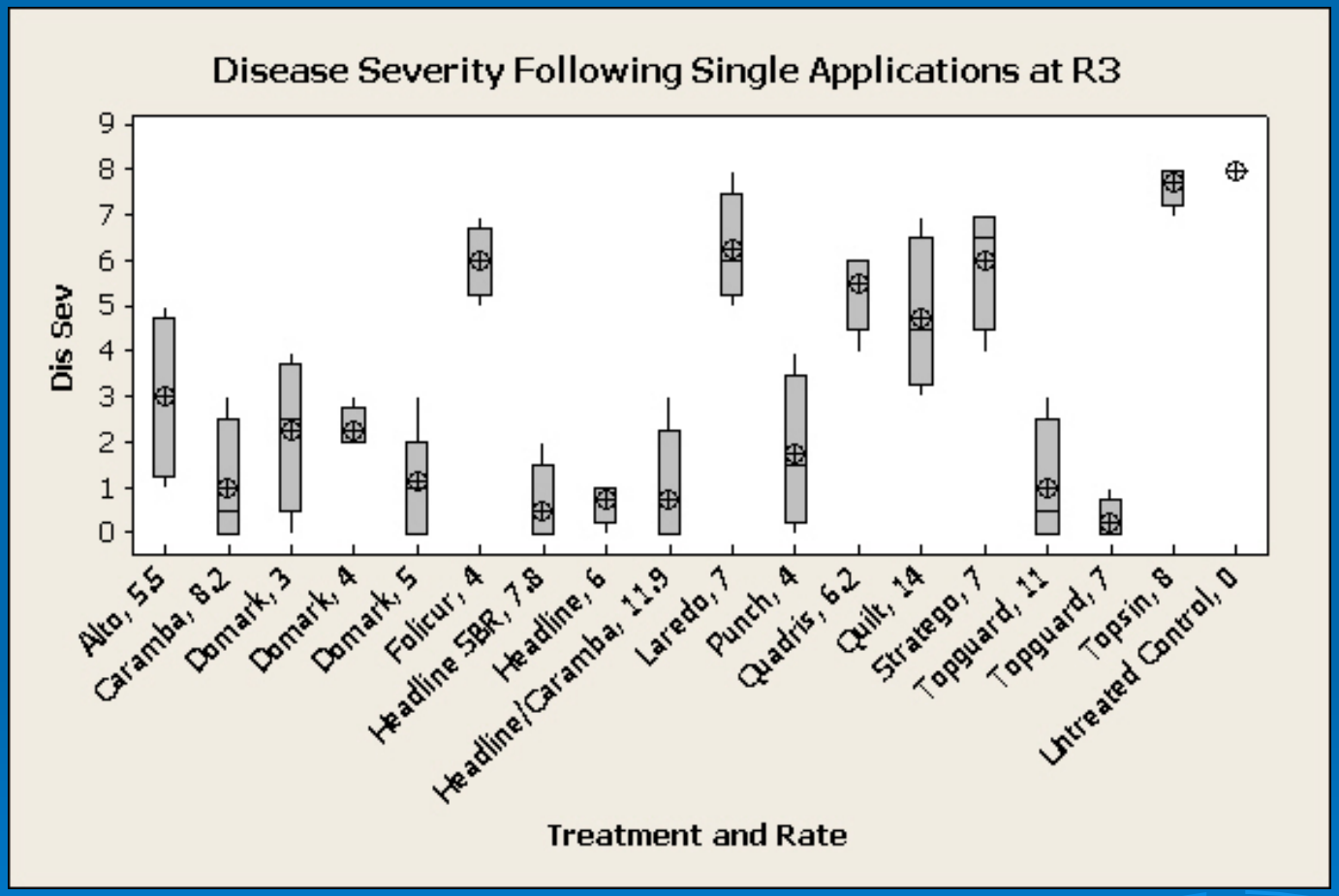
Fungicide Evaluations For Control of Rust and Other Late Season Diseases

Chemical Evaluations

Photos Taken October 10, 2006

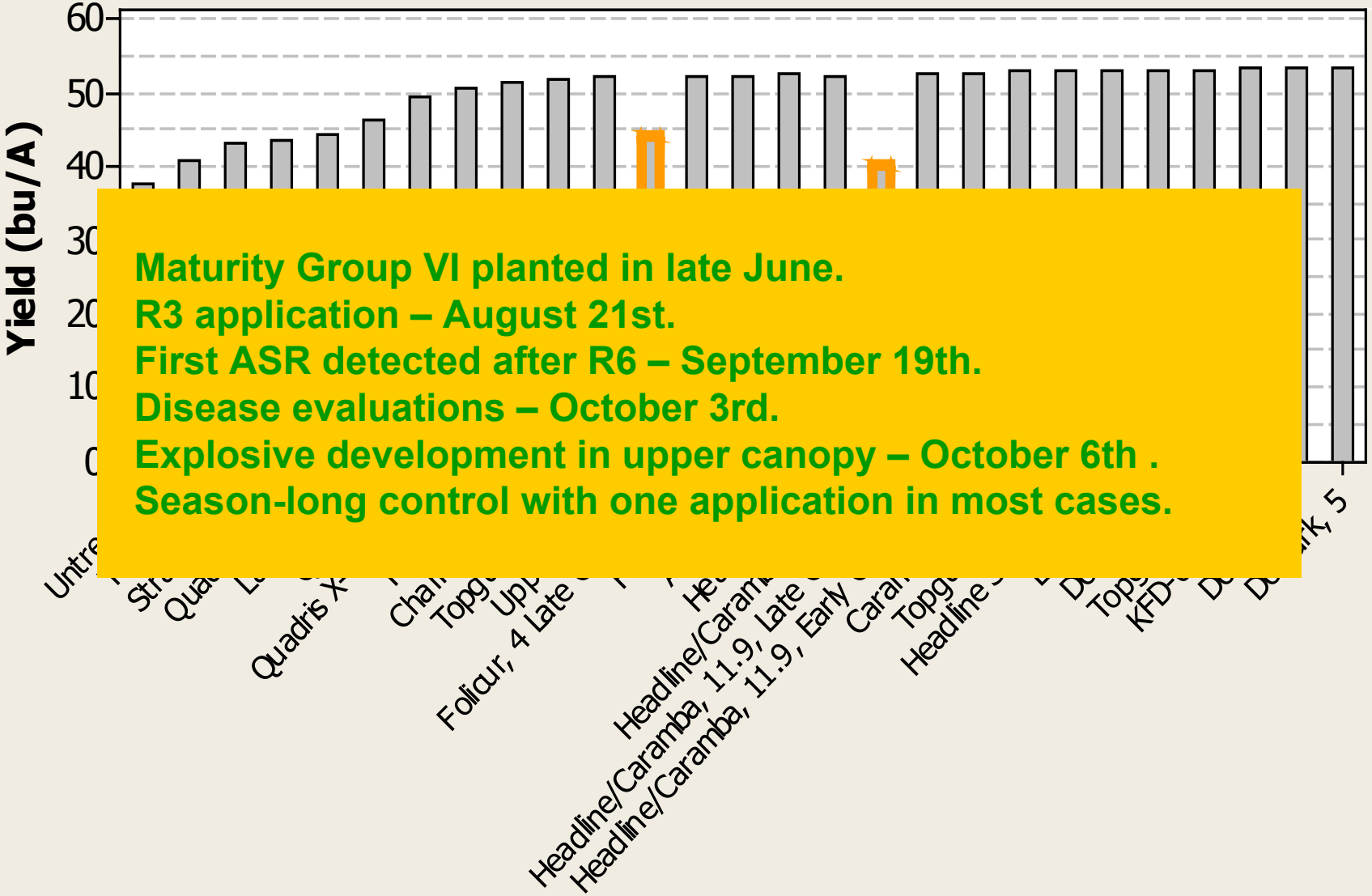
Photos Taken October 20, 2006

Surprising Disease Control with Single R3 Applications



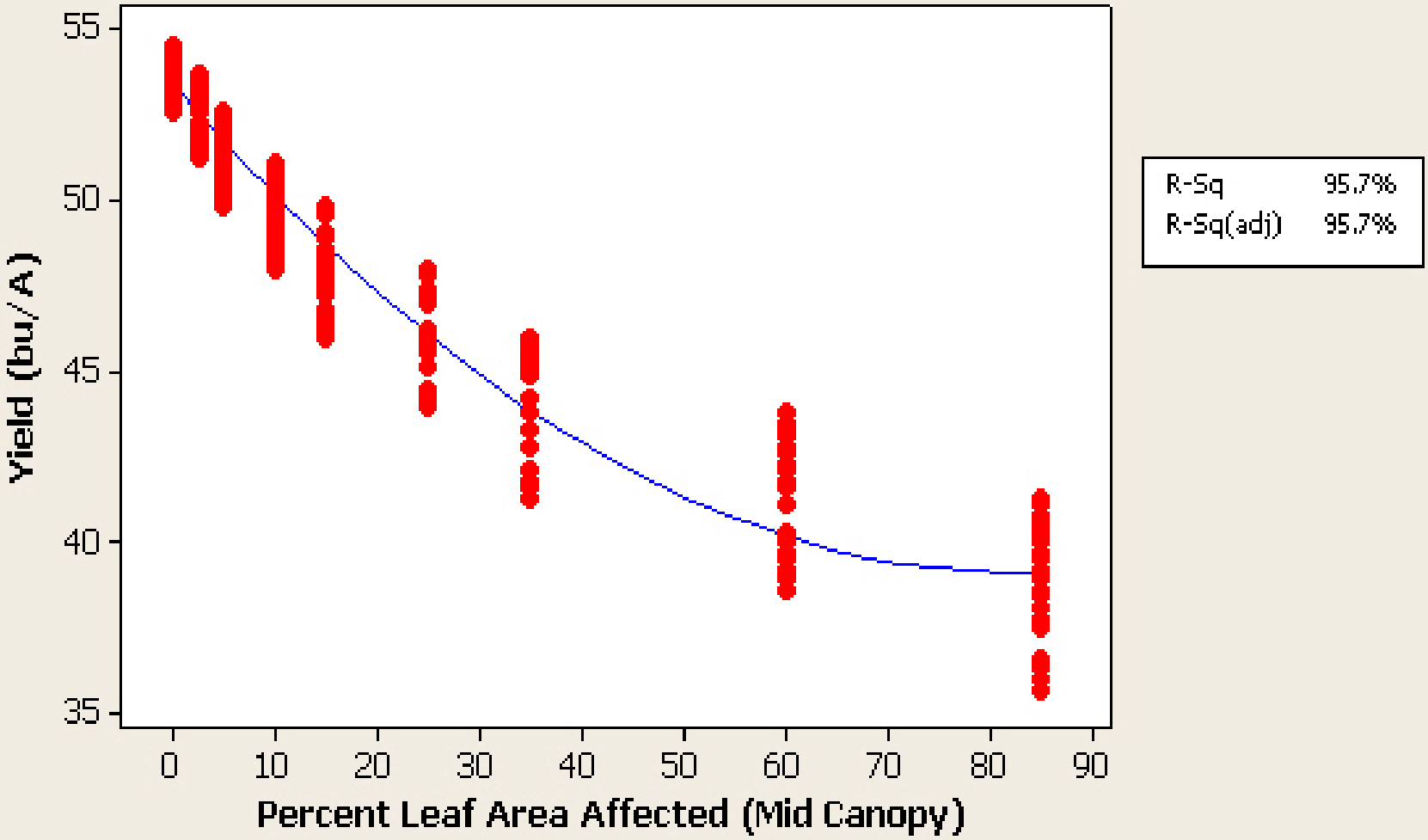
R3 application – August 31st
First ASR detected – September 19th
Disease evaluations – October 3rd
Explosive development in upper canopy – October 6th

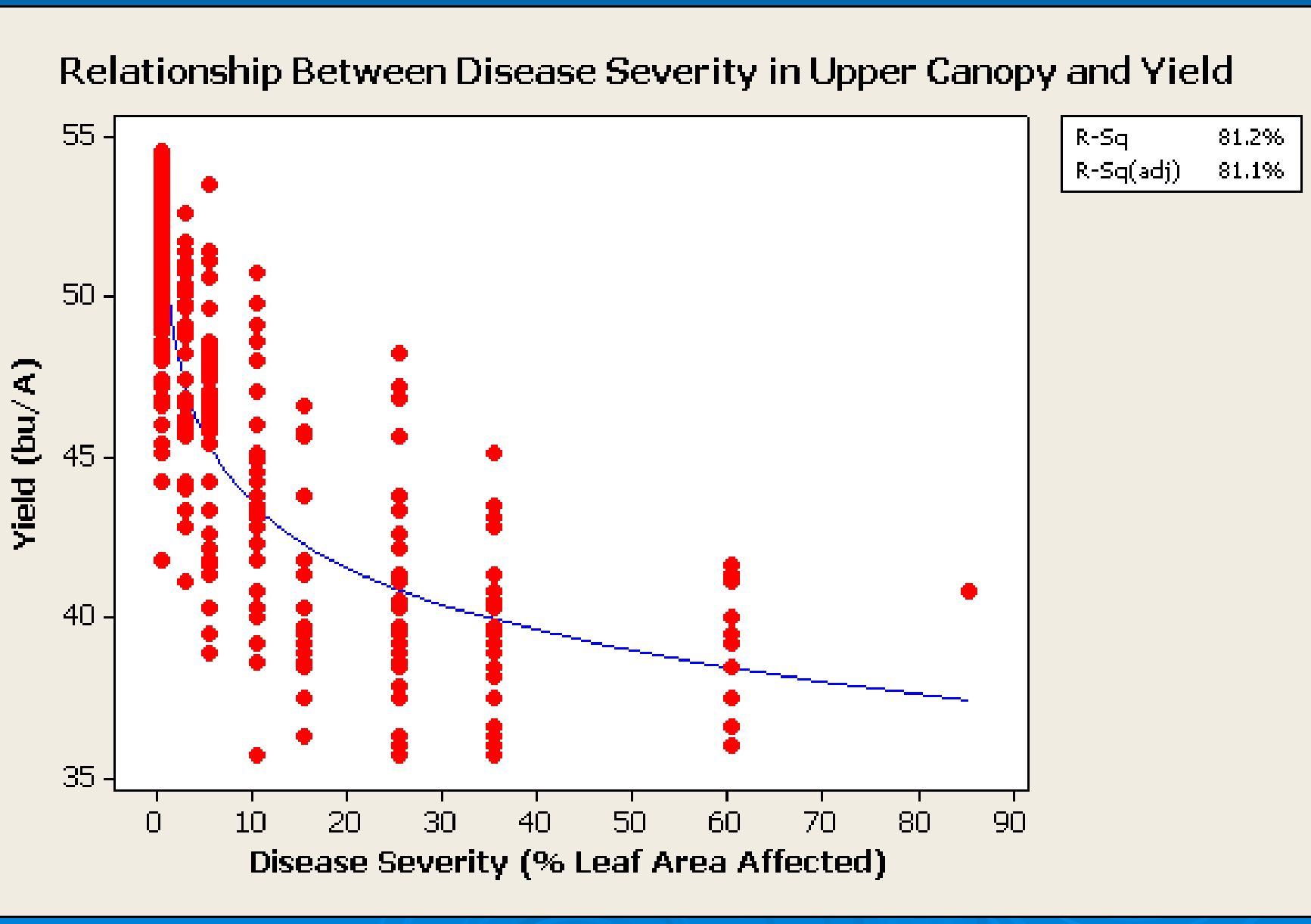
Yield Response to Selected Fungicides



Chemical	Manufacturer	Rate of Application (oz/A)	Control of Rust[1]	Control of Cercospora Leaf Blight[2]
Domark	Valent	4, 5 or 6	++++	++
Folicur	Bayer	4	++++	- -
Headline SBR	BASF	7.8	++++	+
Headline/Caramba	BASF	11.9	++++	+++
Echo 720	Sipcam	20	++++	NT
Topguard	Cheminova	7	++++	+
Alto	Syngenta	4	++++	++
Laredo	Dow	8	++++	- -
KFD-09-01	CerexAgri	4	++++	NT
KFD-21-01	CerexAgri	20	++++	NT
Punch	DuPont	4	+++	- -
Headline	BASF	6	++	+
Quilt	Syngenta	14	++	+
Uppercut	DuPont	4	++	NT
Charisma	DuPont	10	++	-
Quadris	Syngenta	6.2	-	- -
Topsin	CerexAgri	8 or 16	- - -	++
Stratego	Bayer	7	- - -	- -
Laredo	Dow	7	- - -	-
Untreated control	-	-	- - -	- -

Relationship Between Severity of Asian Soybean Rust and Yield



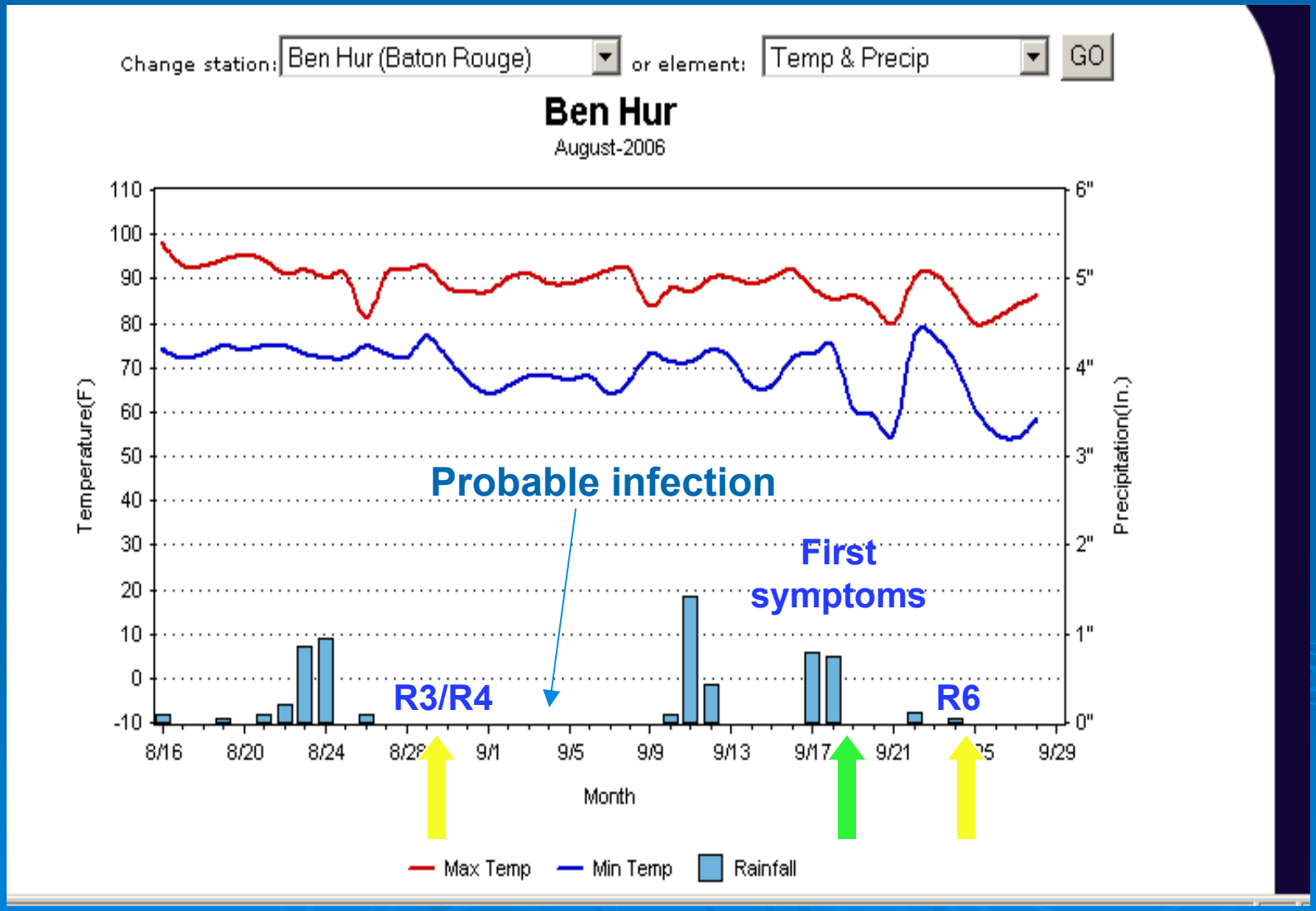

Relationship Between Disease Severity in Upper Canopy and Yield
R-Sq 81.2%
R-Sq(adj) 81.1%
Yield (bu/A)
55
50
45
40
35
0
10
20
30
40
50
60
70
80
90
Disease Severity (% Leaf Area Affected)

Key Points with Fungicides

- Rust *exploded* from very low severity and incidence in the lower canopy to extremely severe within 7-10 days at early R6. This is very different from other foliar diseases.
- Fungicides lost effectiveness when disease began to move. Window of opportunity is very small.
- First symptoms appeared after R6.
- There are many chemical options for controlling rust and Cercospora leaf blight, however -

- Attentive and frequent scouting within canopy is critical.

Time of Fungicide Applications and Latent Infection



Objectives for Yield Loss Prediction

- Devise methods to quantify yield loss for individual diseases.
- Develop yield loss forecasting models based on semi quantitative, reproducible traits.
- Integrate models into financial decision making schemes with Kurt Guidry.

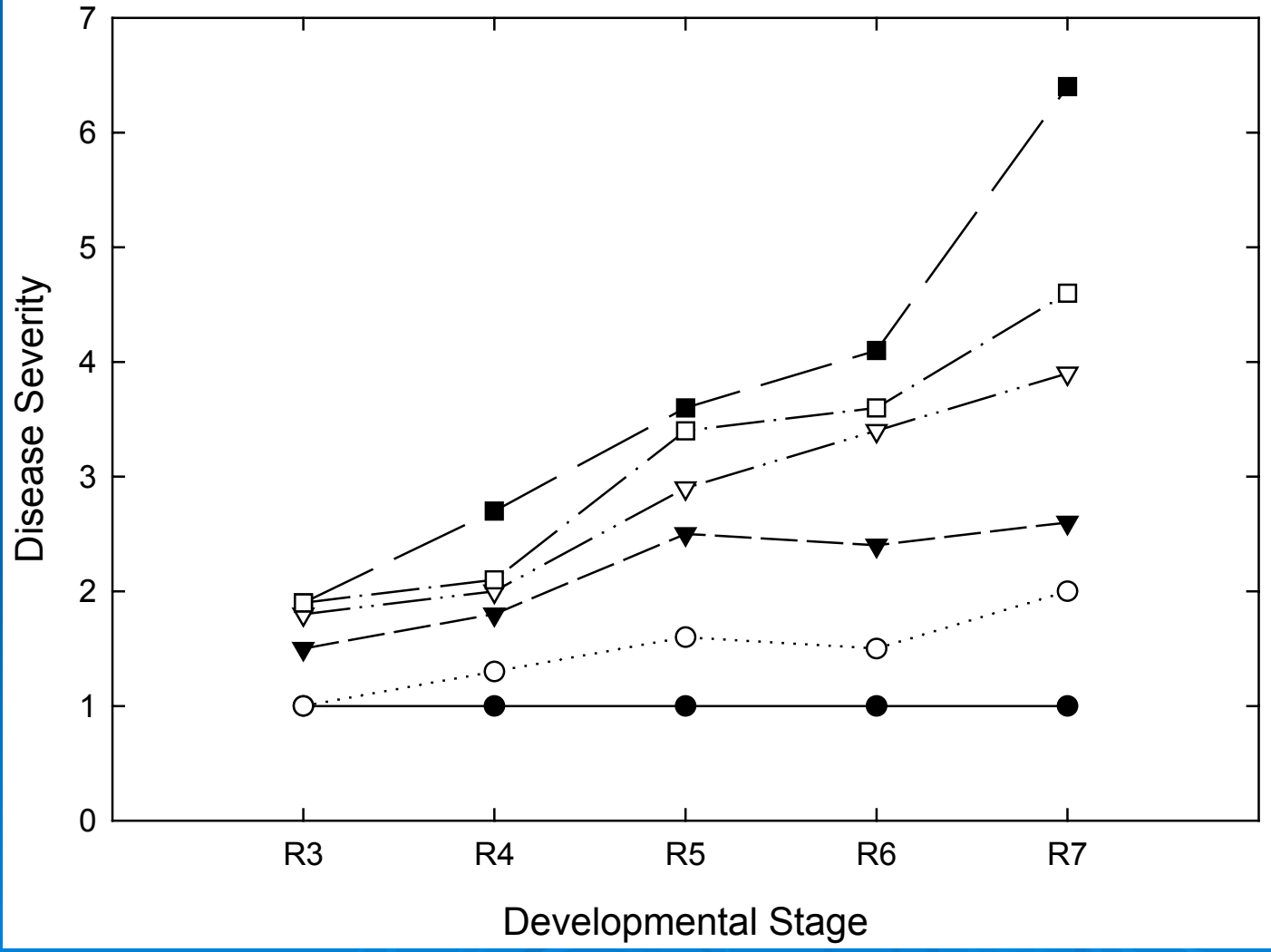
Cercospora Leaf Blight

Frogeye Leaf Spot

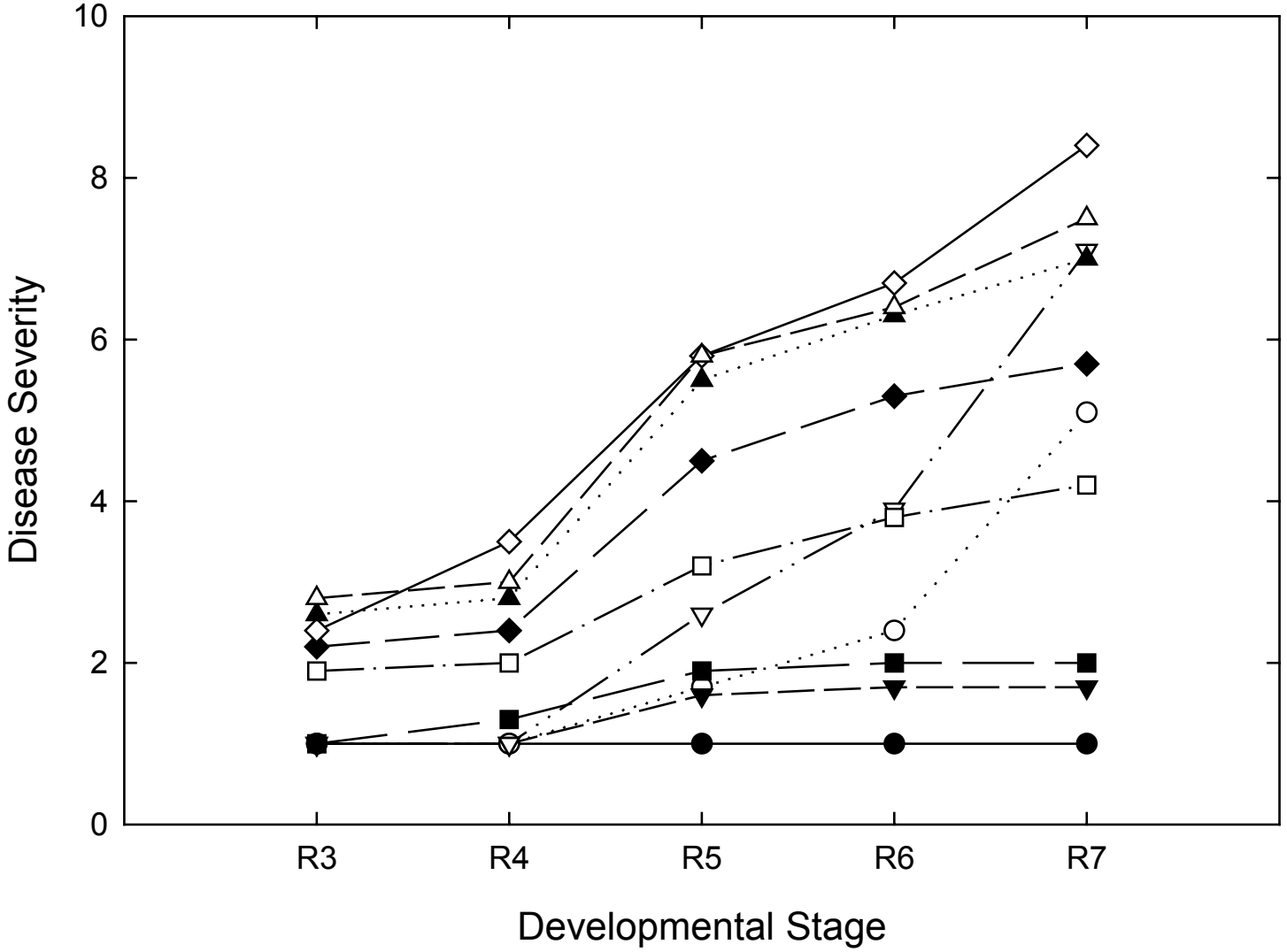
Differential Fungicides

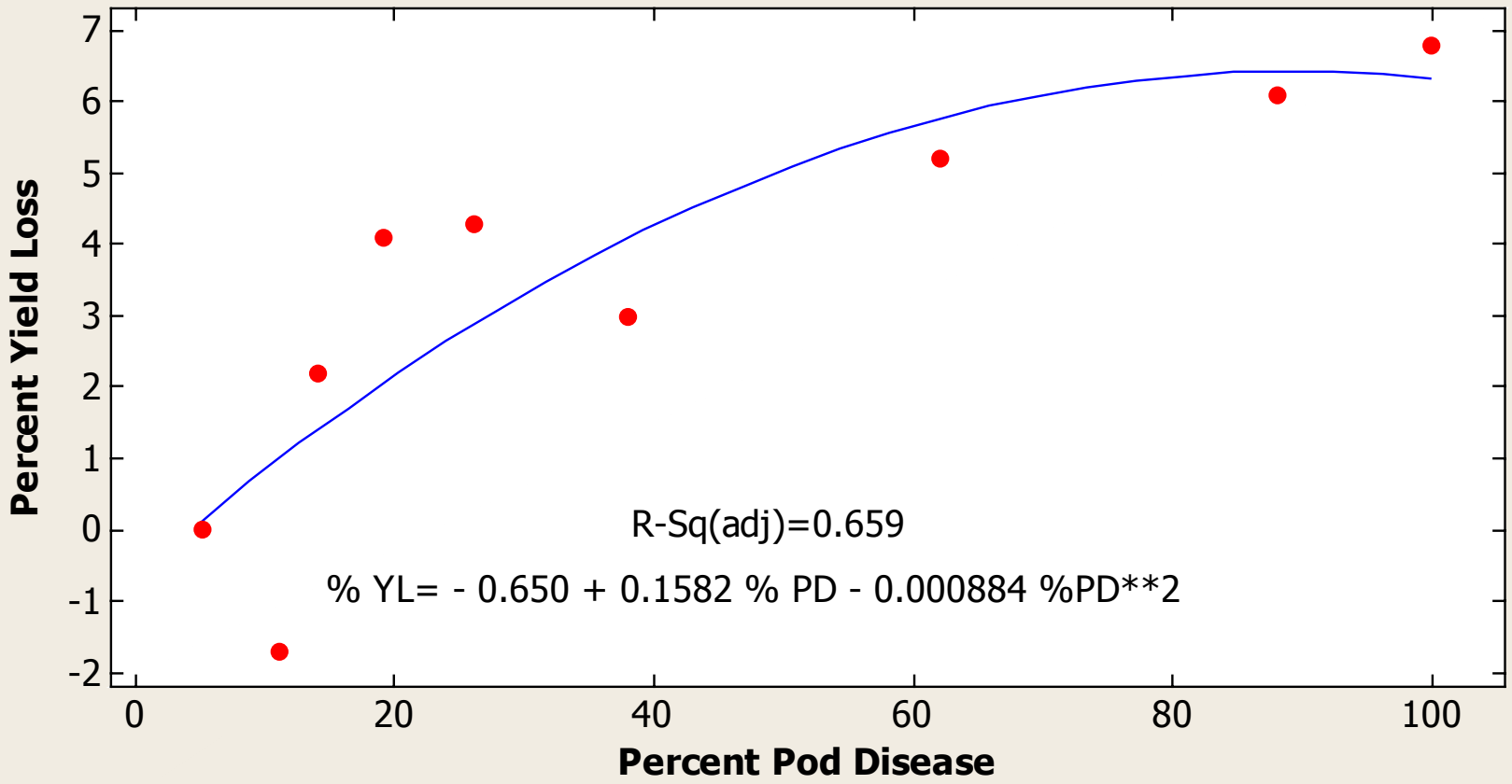
- Quadris applied at R3 at different rates (1-8 oz/A) differentially controls pod and stem diseases but not Cercospora diseases.
- Topsin M (0.25 – 1.0 lb/A) differentially controls Cercospora diseases.
- Stratego was variable from year to year and in different locations.

Examples of Disease Progress Curves for Frogeye Leaf Spot



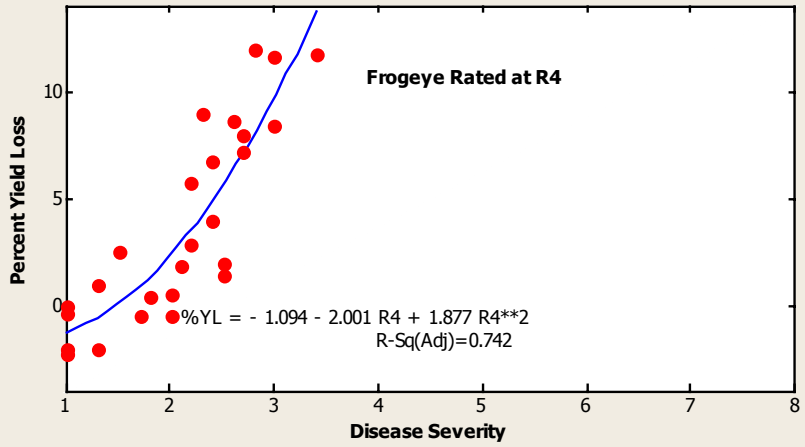
Examples of Disease Progress Curves for Cercospora Leaf Blight

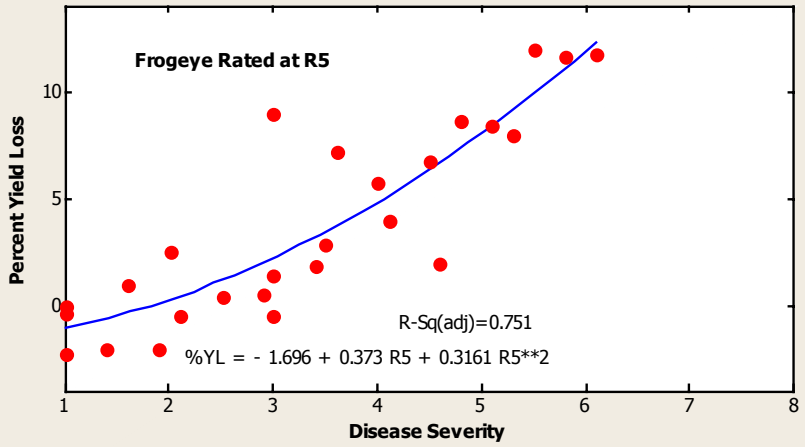


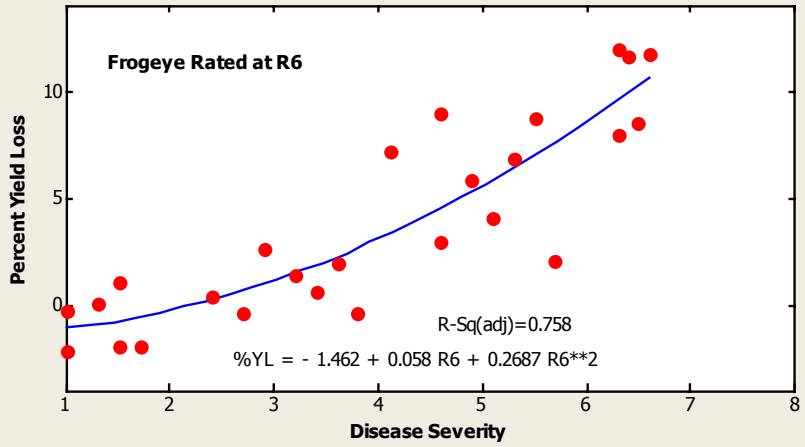


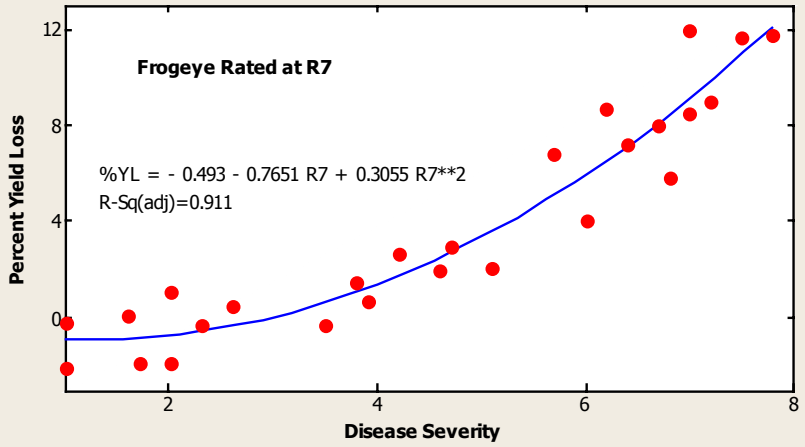
Probably accounts for yield boost with Quadris and Headline.

Frogeye Yield Loss Models

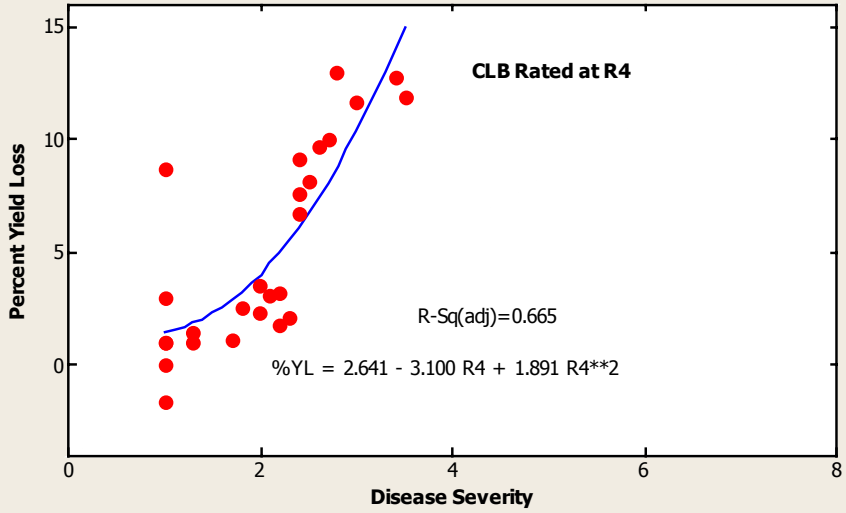


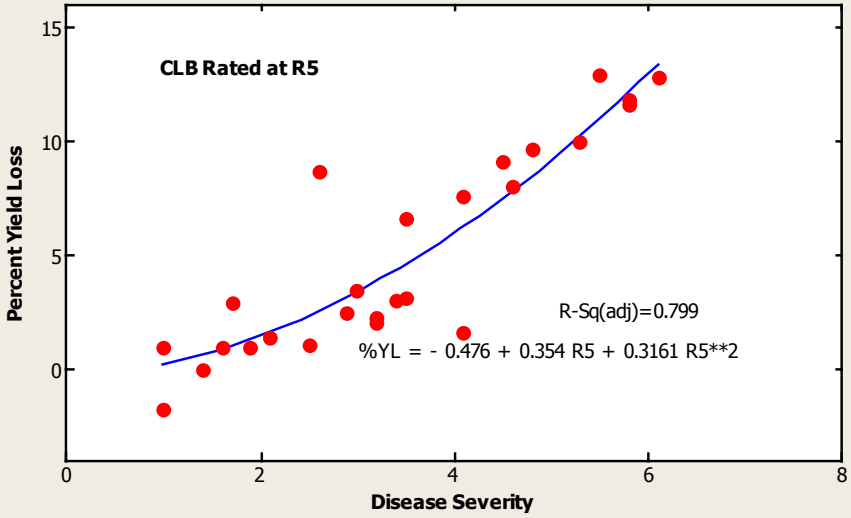


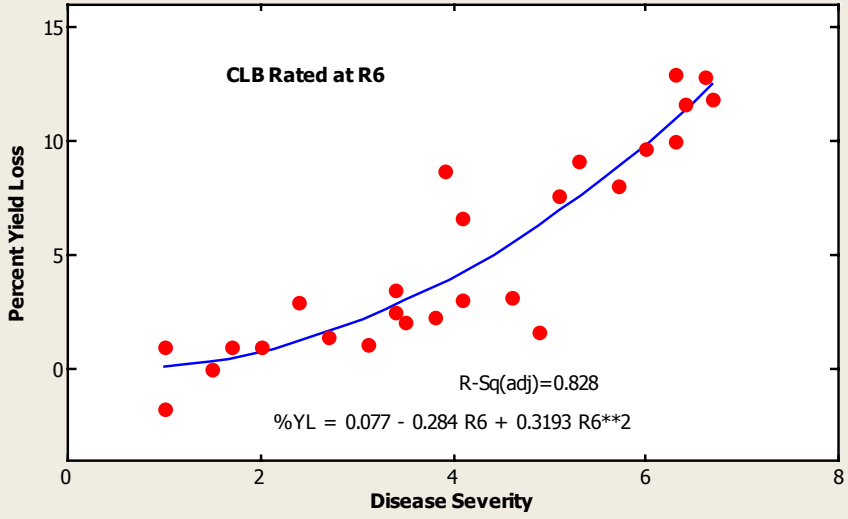


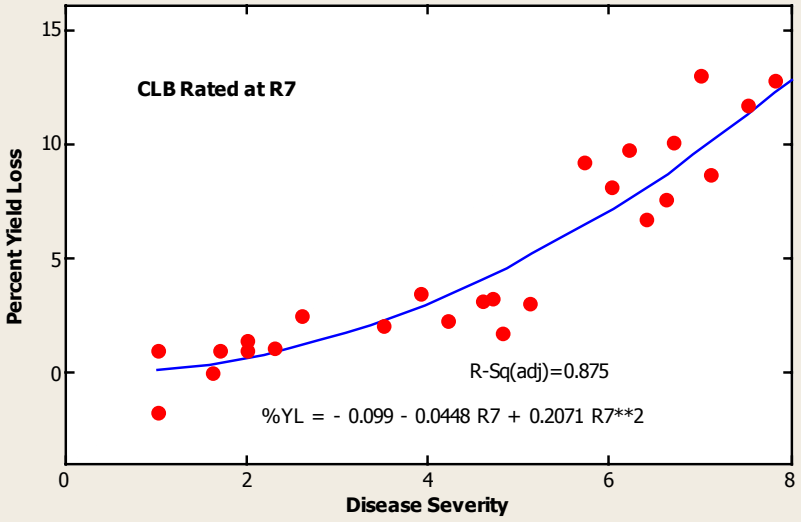


Cercospora Leaf Blight Disease Loss Models









Conclusions

- Elimination of extraneous variables was critical to development of models.
- Reproductive stages may last several weeks.
- Historical yields must be known.
- Web-based decision assistance will incorporate:
  - Yield loss models
  - Cost of disease control
  - Price of beans
- Pre-infection application of fungicides may be beneficial

Acknowledgements

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