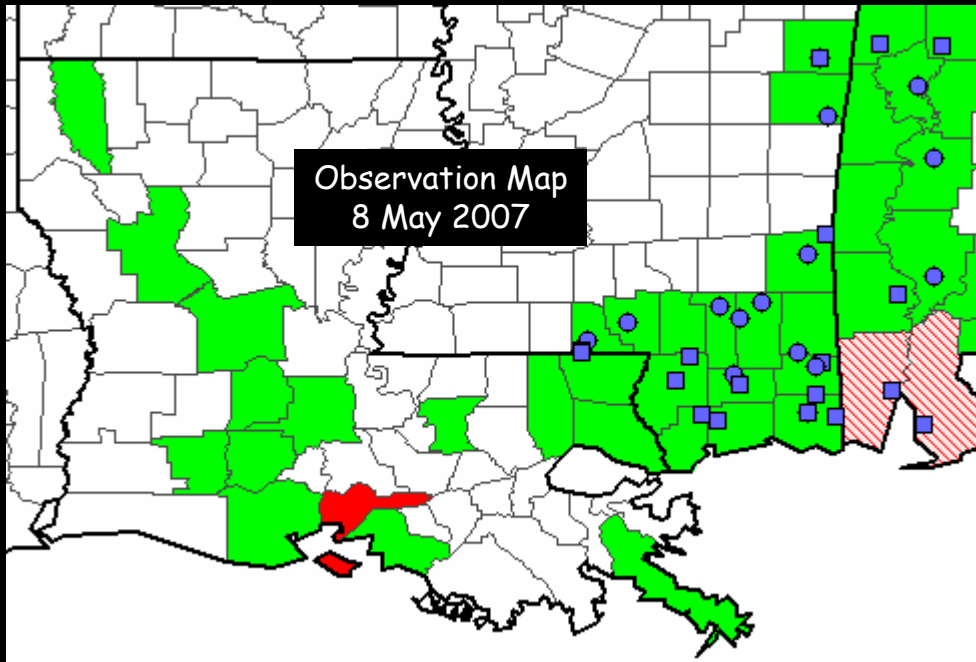


Evaluation of the 2007 Soybean Rust Ensemble Forecasting Program

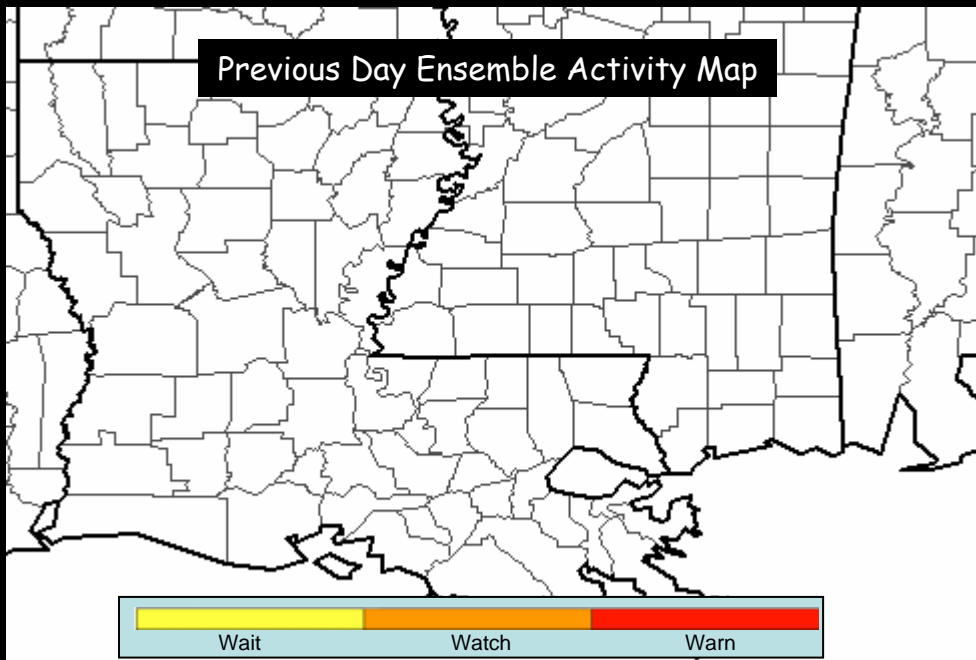
Scott A. Isard
(Departments of Plant Pathology and Meteorology
Penn State University)

&

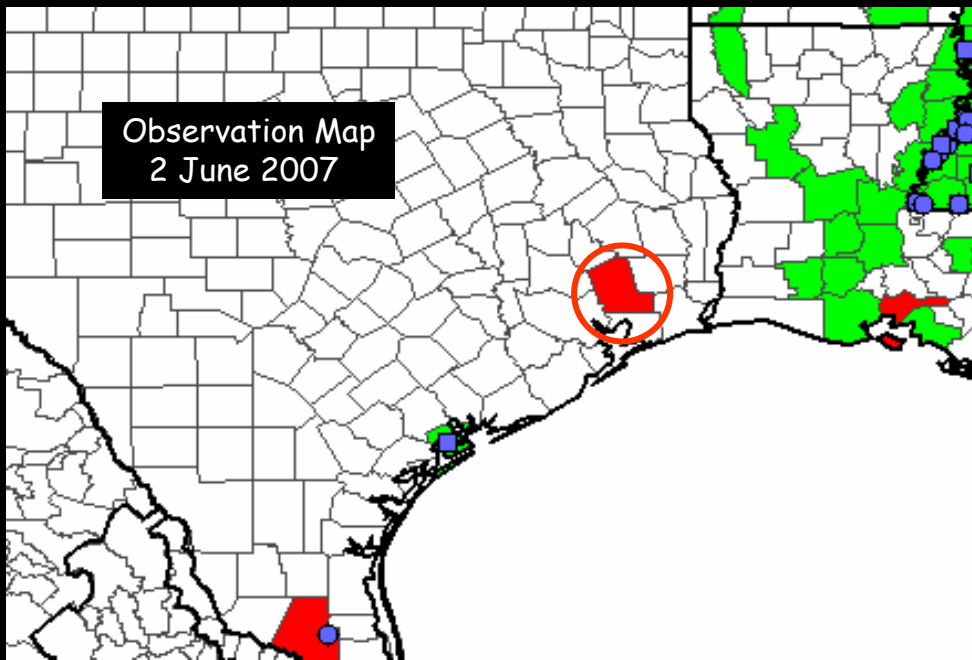
Joseph M. Russo
President, ZedX Inc.
Bellefonte, PA



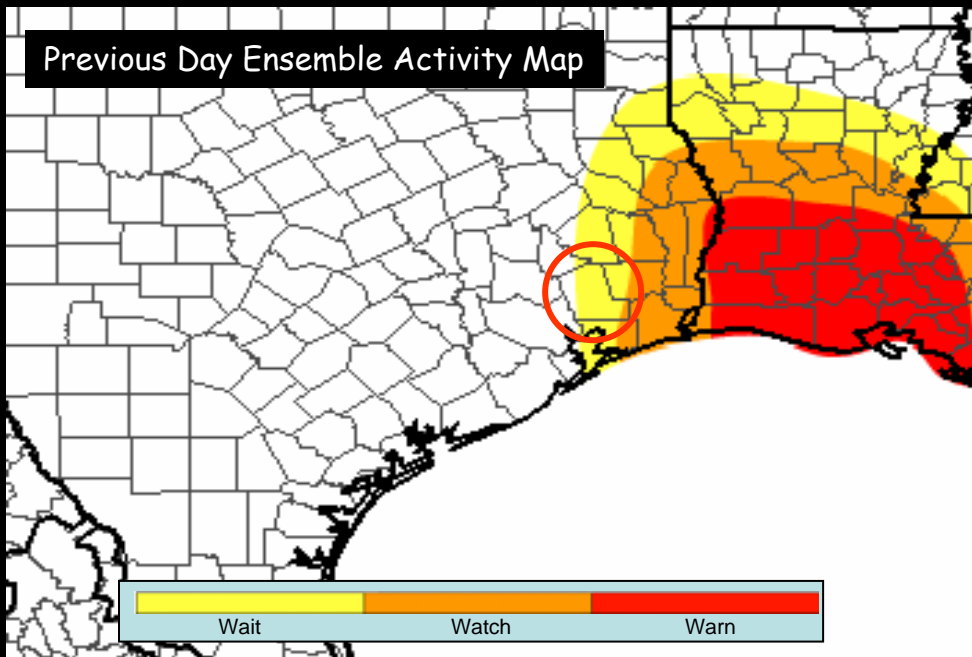
Early May



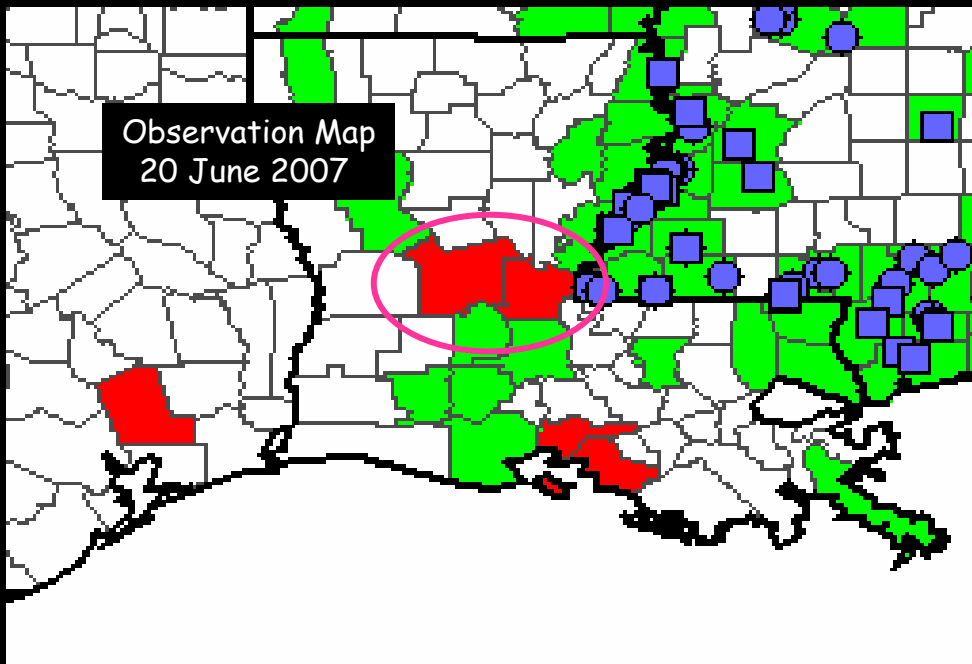
Iberia Parish LA - SBR detected on kudzu (overwintering site, Mexico?)



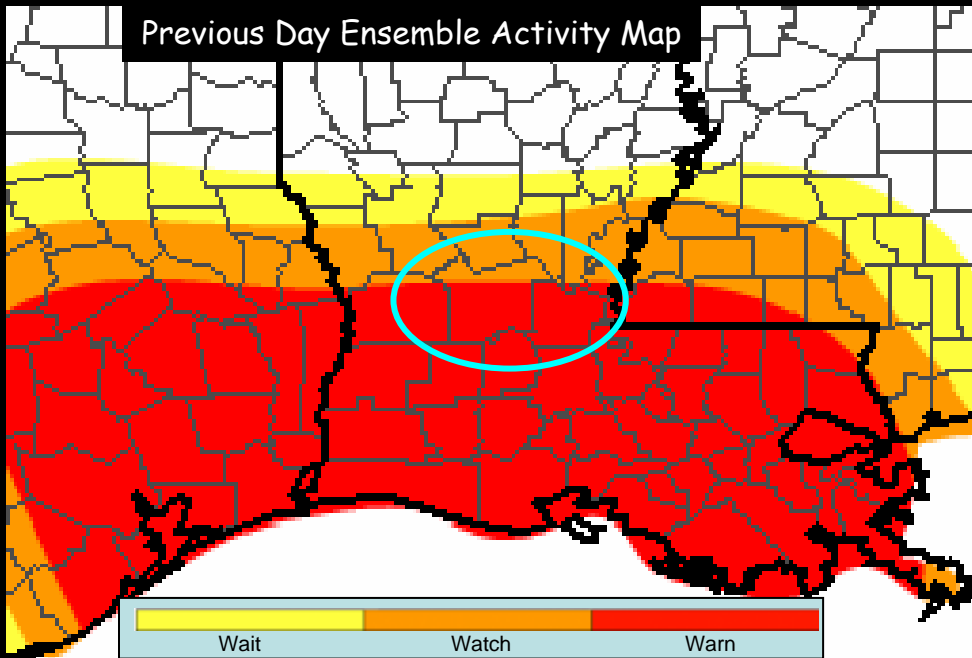
Early June



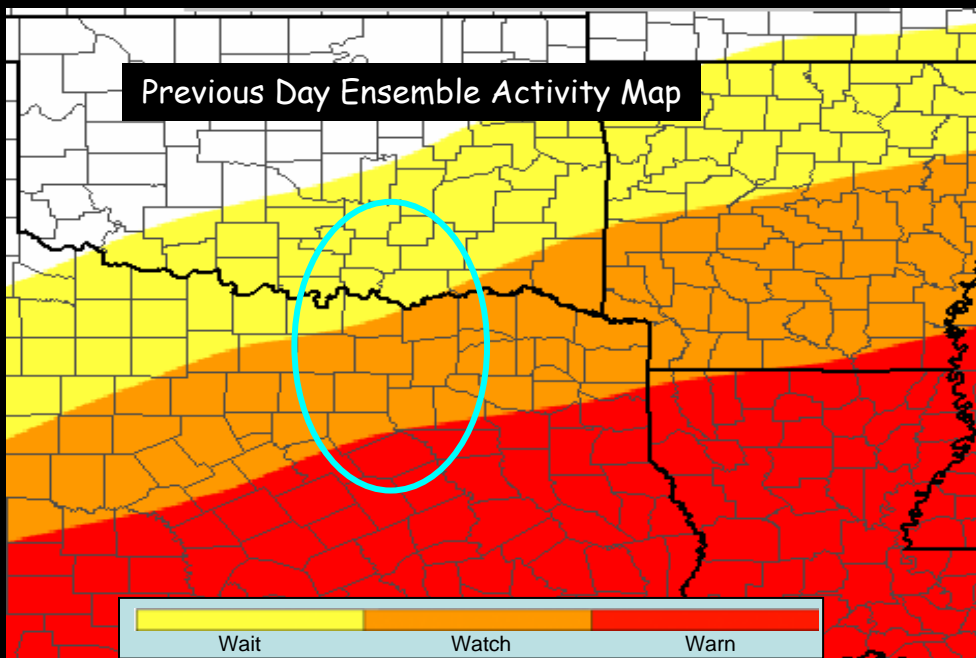
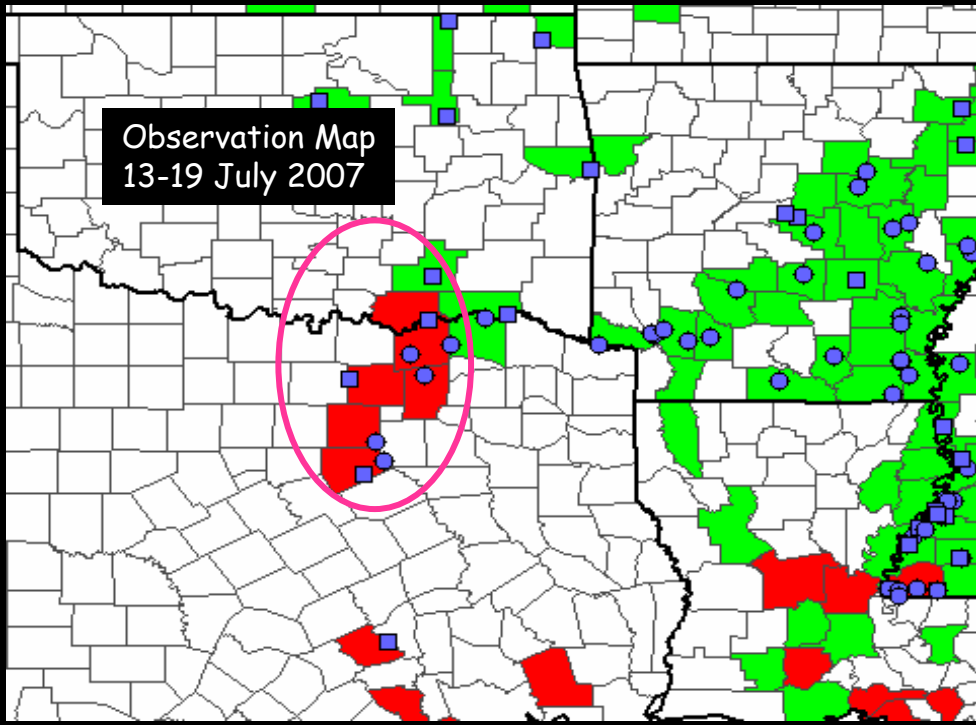
Liberty Co. TX - SBR detected on kudzu (overwintering site)



MidJune

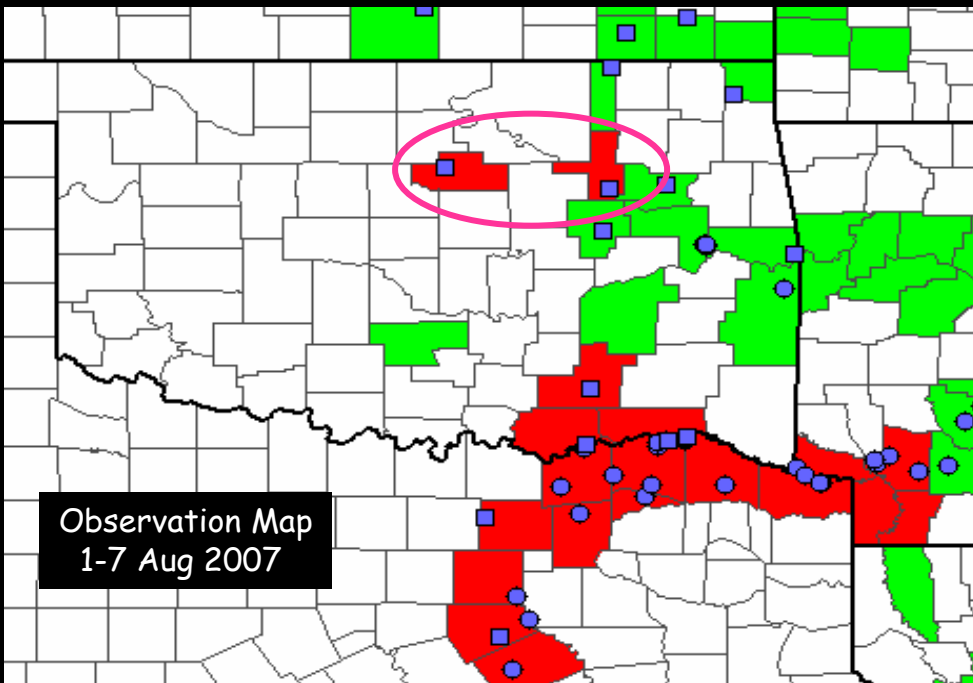


Rapides & Avoyelles Parishes, LA - SBR detected on soybean (sentinel plot)

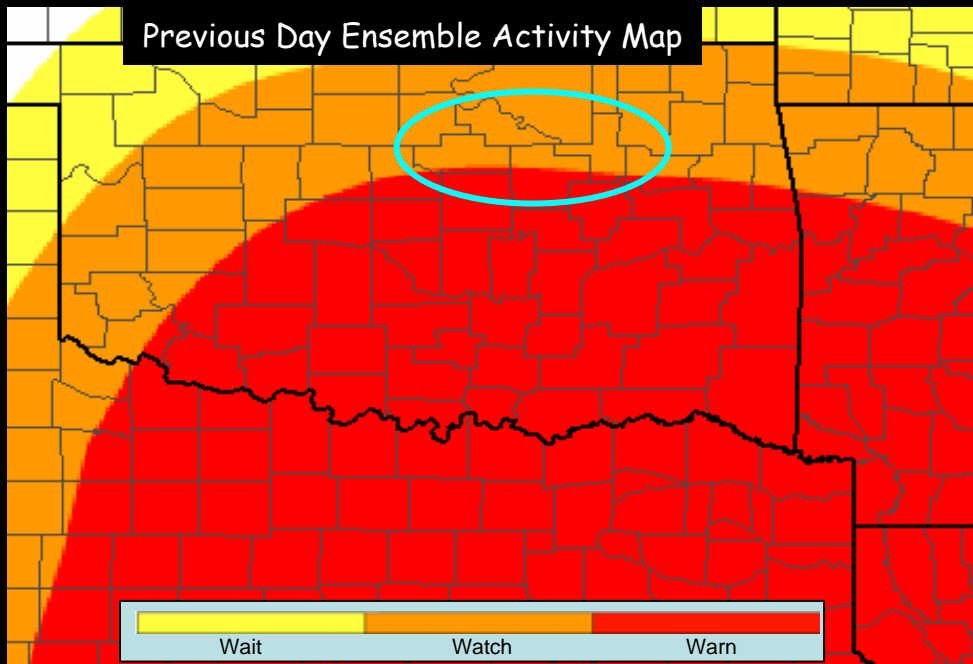


MidJuly

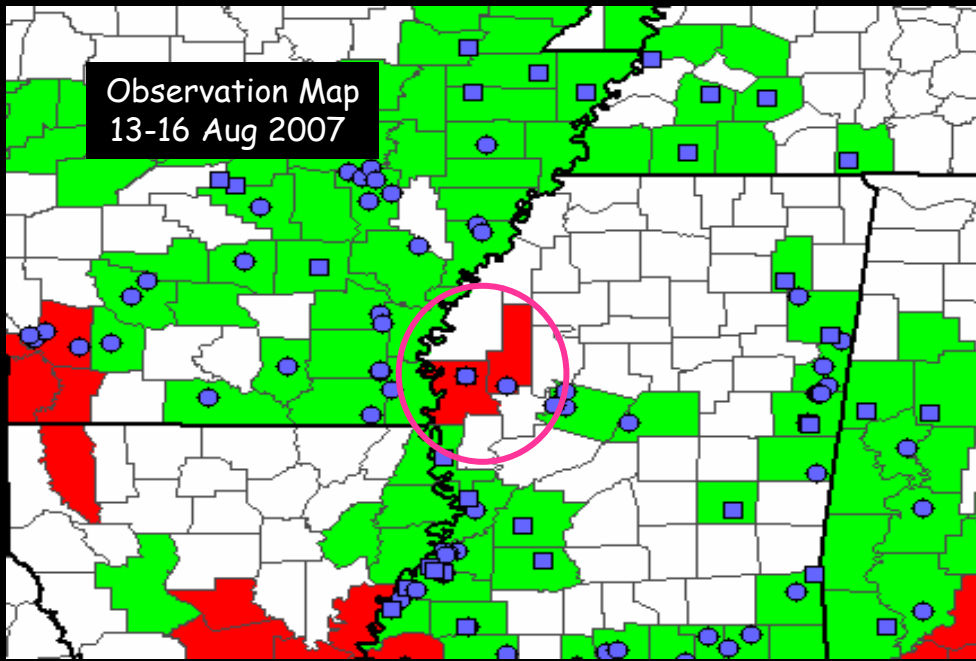
Bryan, Co, OK & Fannin, Colin, Hunt, Dallas, & Ellis Co, TX - SBR detected on soybean (commercial fields)



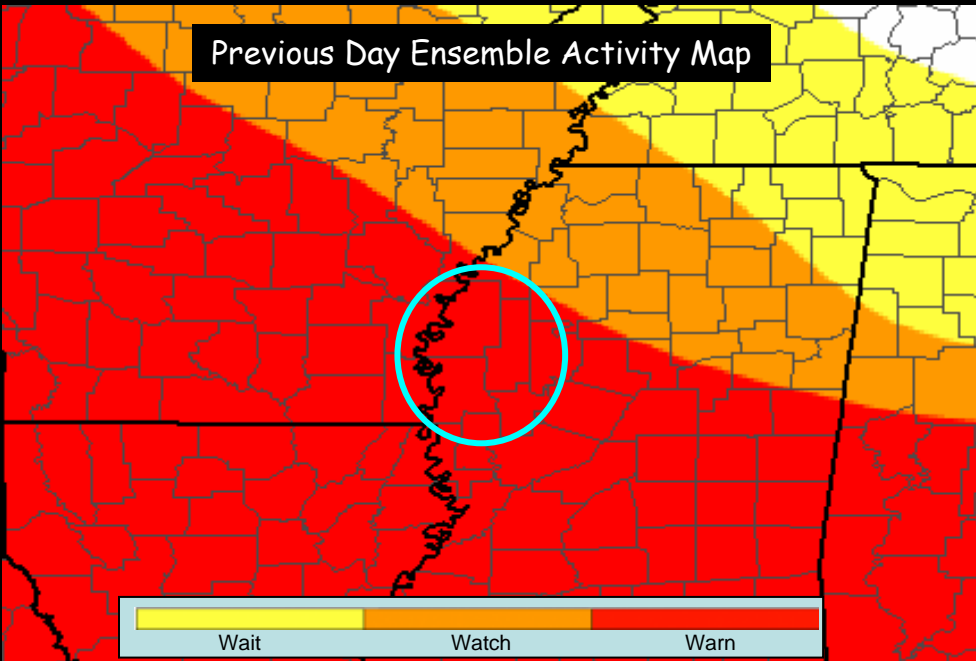
Early August



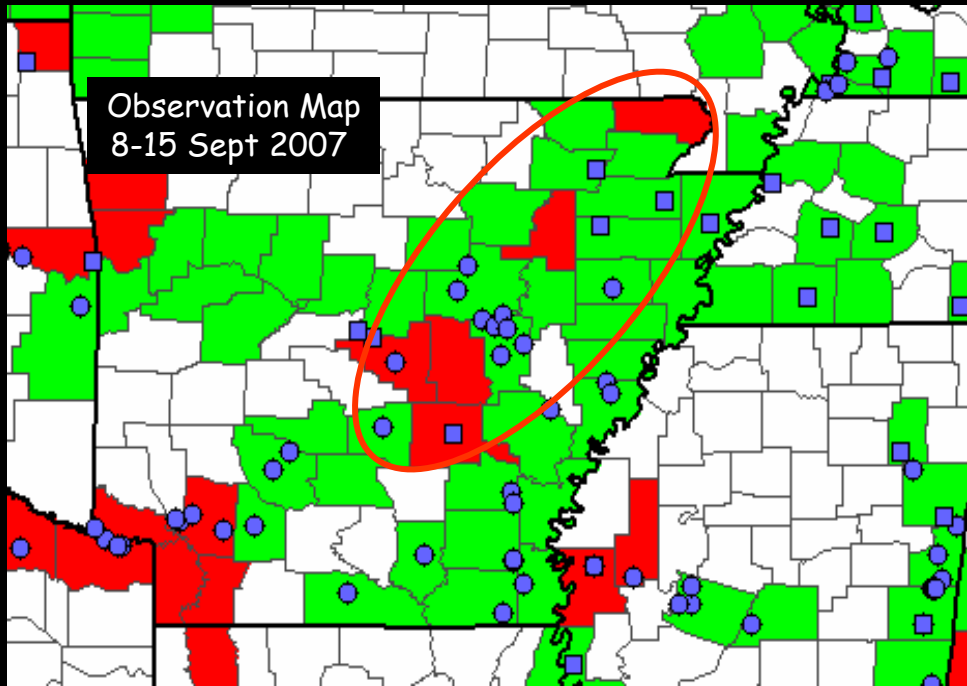
Payne & Tulsa, Counties, OK - SBR detected on soybean (sentinel plots)



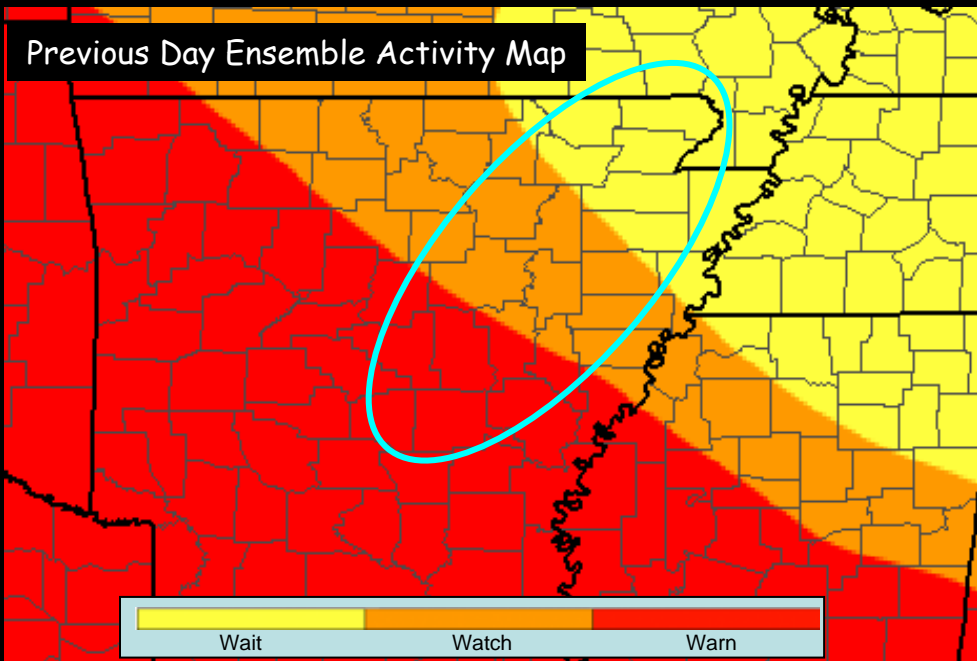
Mid August



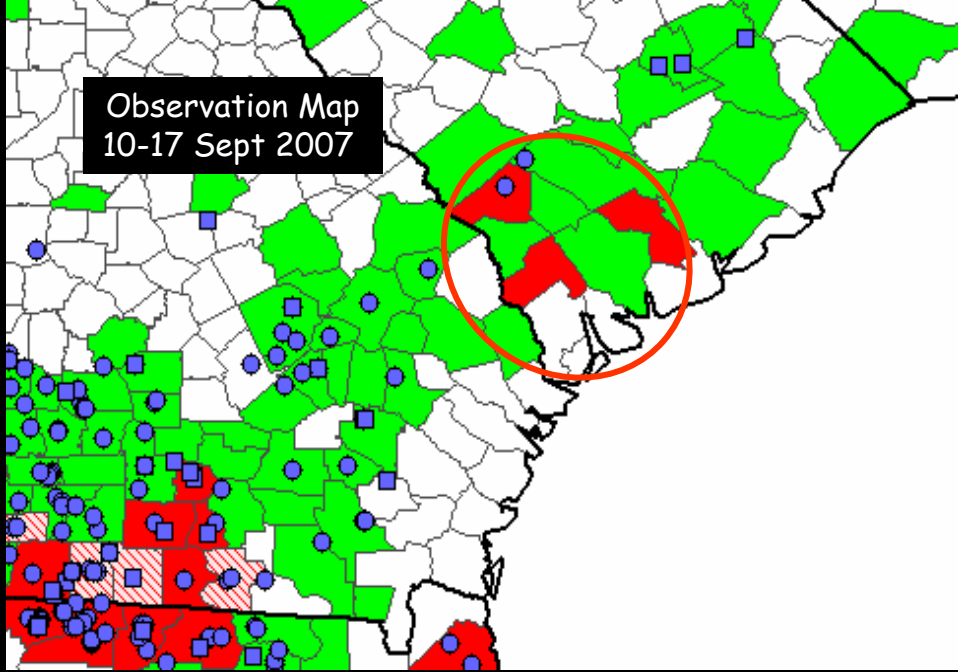
Washington and Sunflower, Counties,
MS - SBR detected on soybean
(sentinel plots)



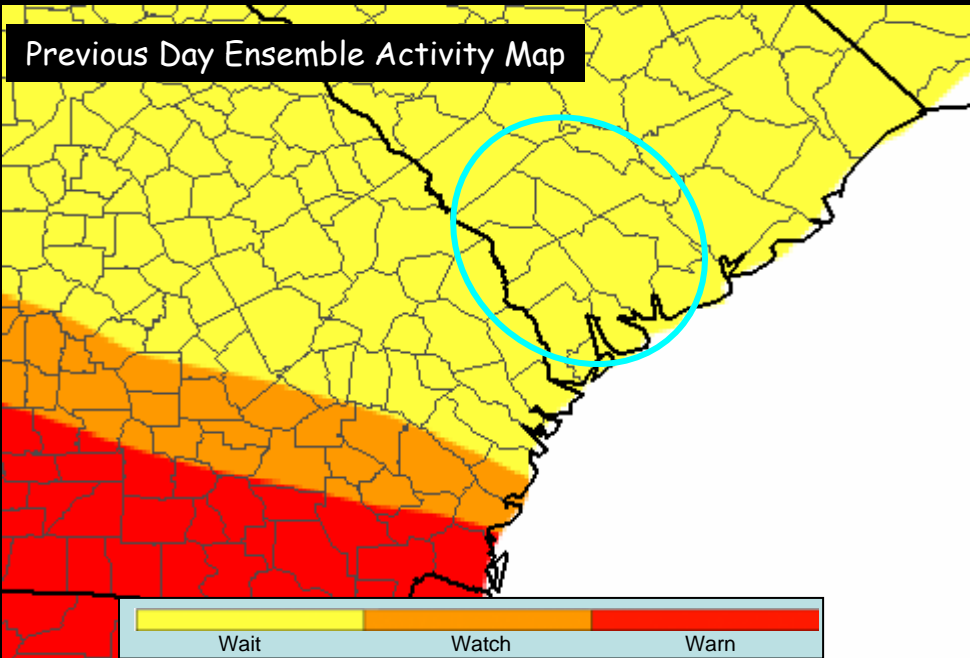
Early September



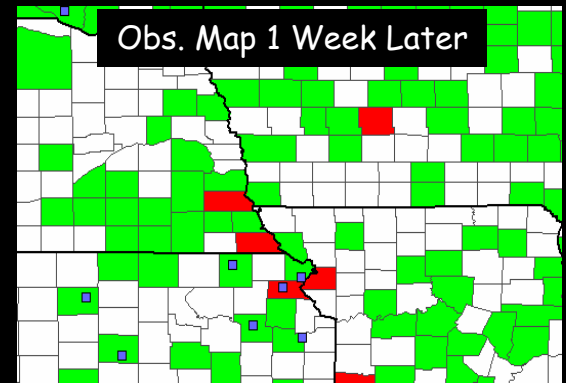
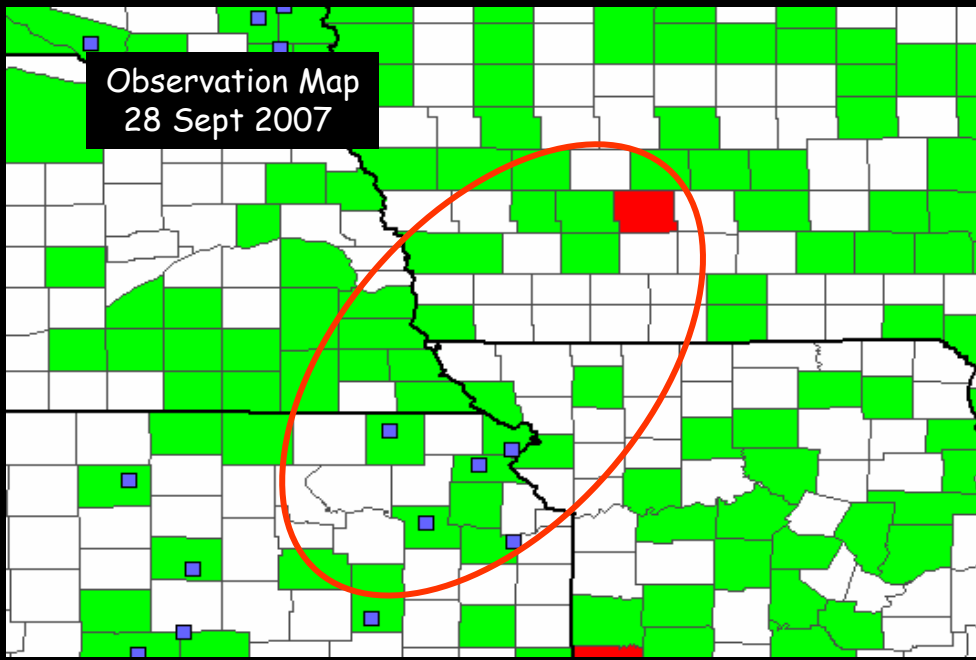
Jackson, Lonoke, Pulaski, Jefferson & Clay Counties, AR - SBR detected on soybean (sentinel plots)



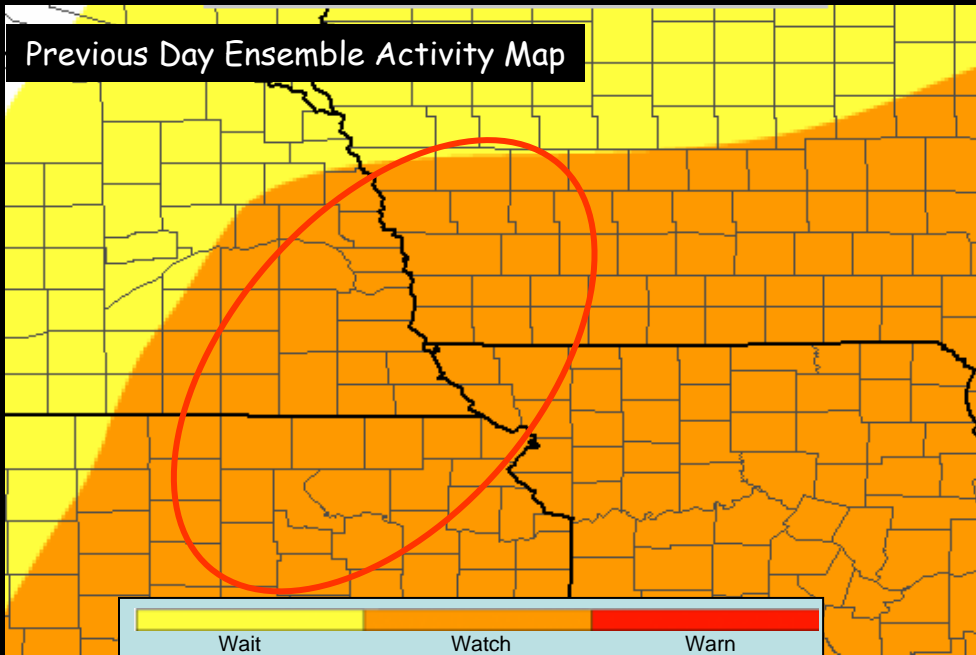
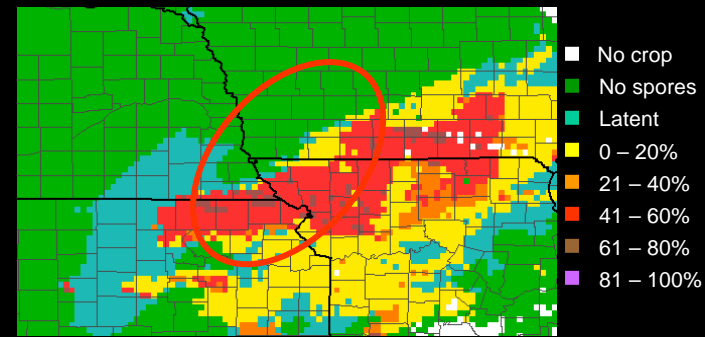
Mid September



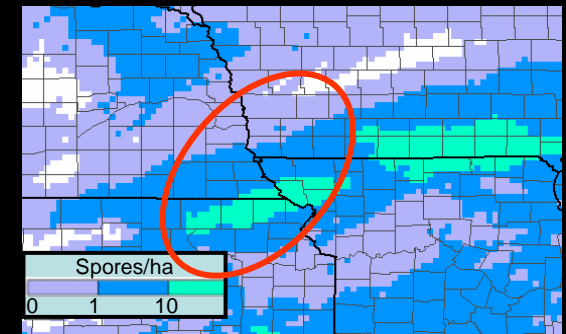
Hampton, Barnwell & Dorchester Counties, S.C. - SBR detected on soybean (commercial fields)



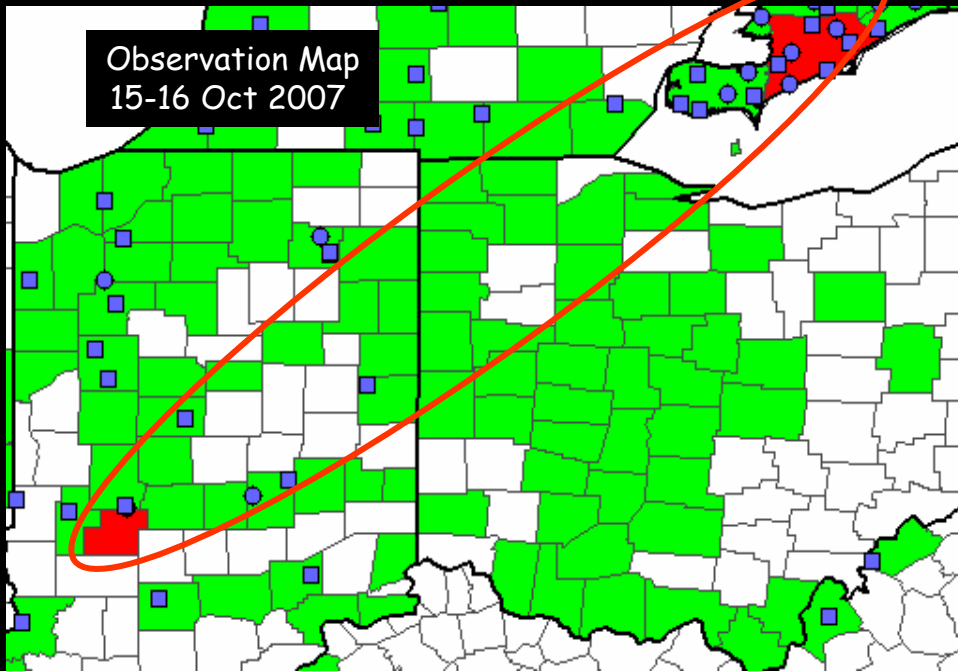
Previous Day Disease Severity Map



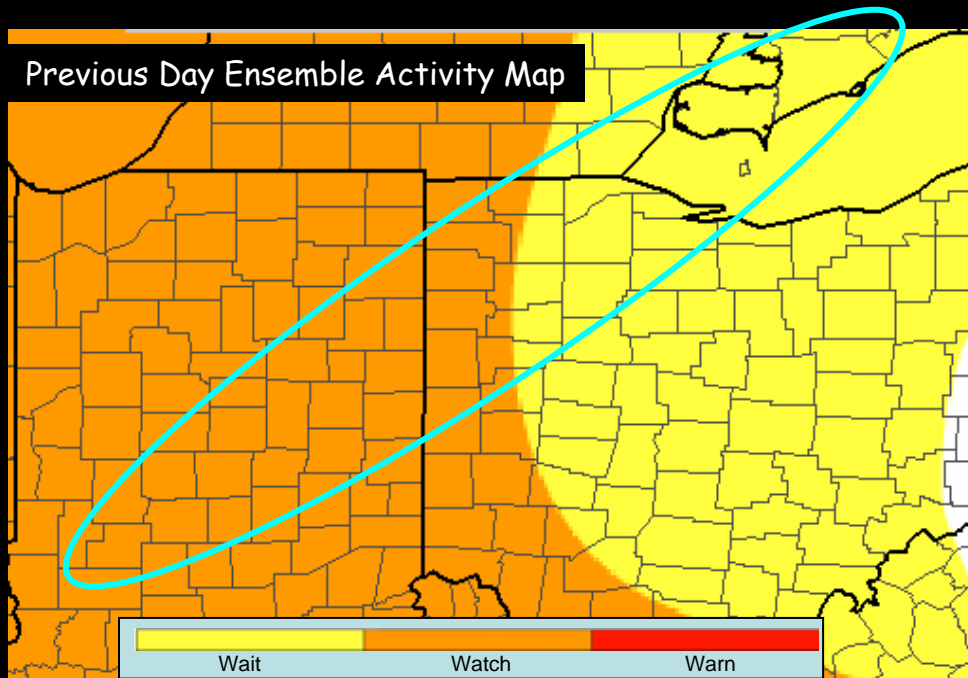
**Wet Deposition Map: 23-24 Aug 2007
36 days prior to discovery**



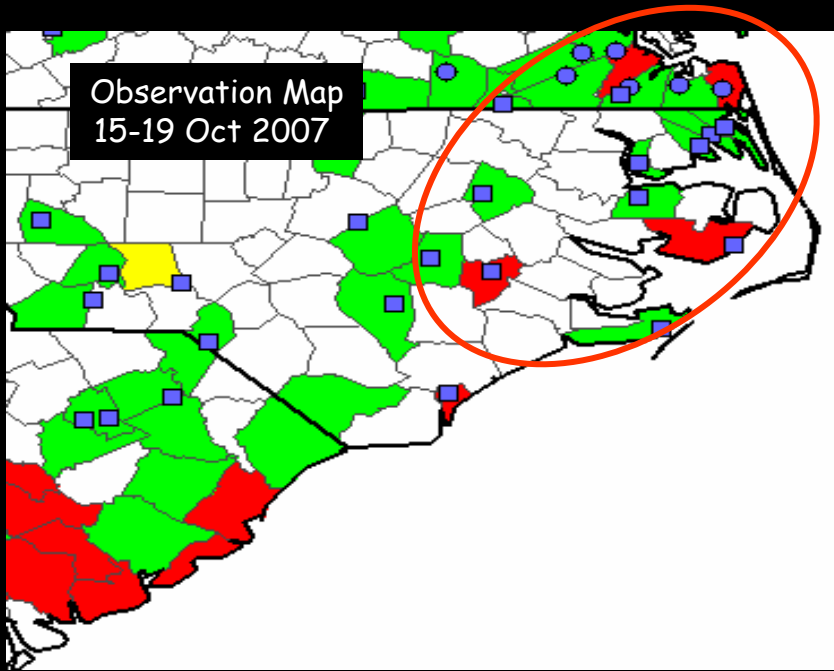
Dallas Co. IA, Otoe & Richardson Co. NE, Buchanan Co. MO, & Atchison Co. KS - sentinel plots & commercial fields



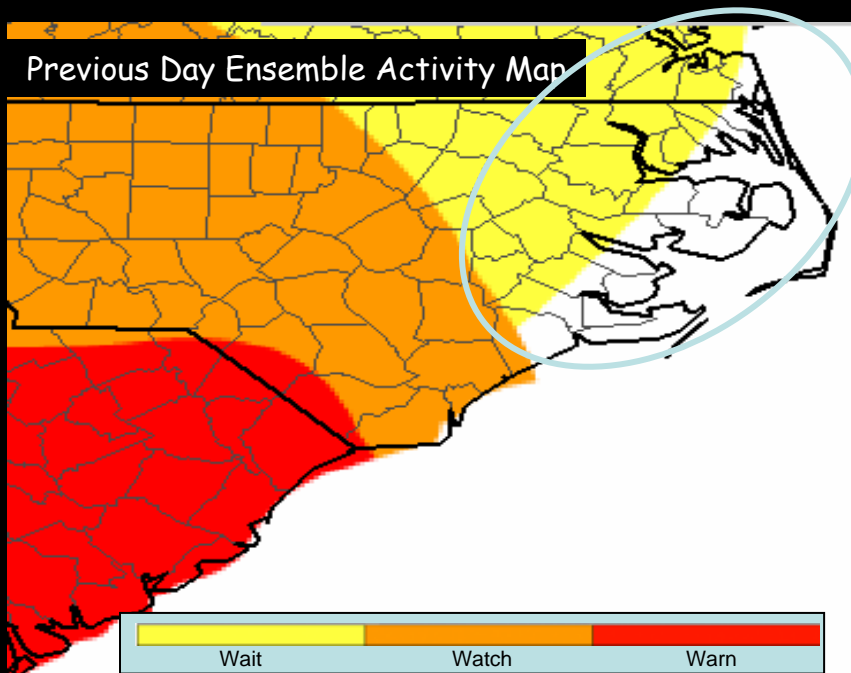
Mid October



Owens County, Indiana & Chatham-Kent
Division, Ontario, Canada - SBR
detected on soybean (commercial field
& research plot)



Mid October



Lenoir & Hyde Counties, N.C. & Isle of Wright & Virginia Beach VA- SBR detected on soybean (commercial fields)

Best Estimate of Days Between Spore Transport and Initial Find

Location	Date of Initial Find	Number of Counties Positive within 7 days	Host	Estimated Date of Transport	Days Between Transport and Find
southern LA	8 May	1	Kudzu	?	?
eastern TX	2 Jun	1	Kudzu	?	?
central LA	20 Jun	2	Soybean	23 May	28
southern OK & northern TX	13 Jul	6	Soybean	19 or 27 Jun	16 or 24
northern OK	1 Aug	2	Soybean	27 Jun	34
western MS	13 Aug	2	Soybean	10 Jul	34
eastern AR	8 Sep	5	Soybean	?	?
southern SC	10 Sep	3	Soybean	?	?
central IA, northeast KS, northwest MO & southeast NE	28 Sep	5	Soybean	23-24 Aug	35-36
central IN & southwest Ontario	15 Oct	2	Soybean	8 or 26 Sep	19 or 38
eastern NC & southeast VA	15 Oct	4	Soybean	?	?

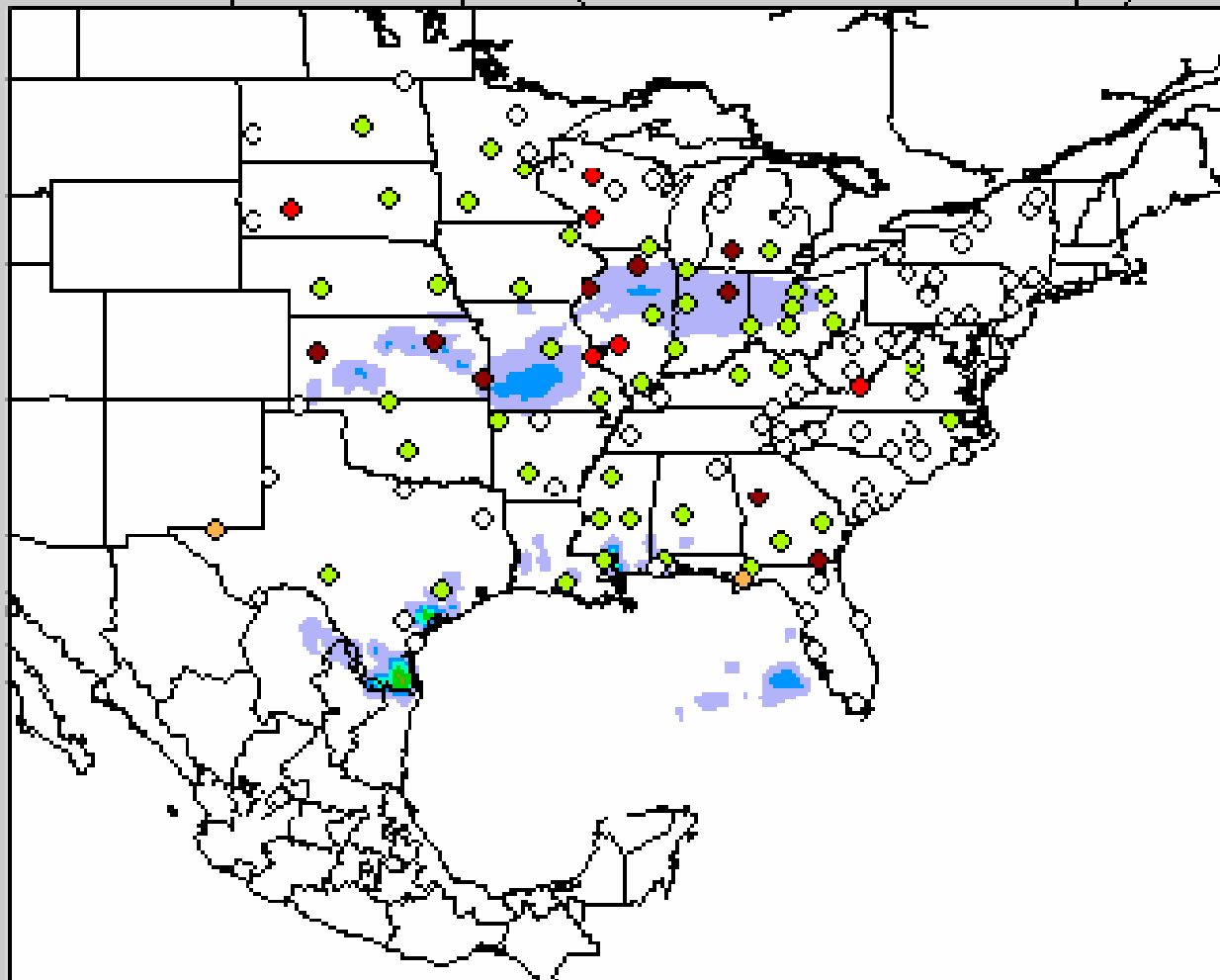
Summary of SBR Long Distance Transport Events and Forecast Performance

Location	Date of Initial Find	Number of Counties Positive within 7 days	Host	Ensemble Forecast	IAMS Disease Severity Forecast
southern LA	8 May	1	Kudzu	No	No
eastern TX	2 Jun	1	Kudzu	Wait	No
central LA	20 Jun	2	Soybean	Warn	No
southern OK & northern TX	13 Jul	6	Soybean	Warn/Watch	Yes
northern OK	1 Aug	2	Soybean	Warn/Watch	No
western MS	13 Aug	2	Soybean	Warn	No
eastern AR	8 Sep	5	Soybean	Warn/Watch	No
southern SC	10 Sep	3	Soybean	Wait	No
central IA, northeast KS, northwest MO & southeast NB	28 Sep	5	Soybean	Watch	Yes
central IN & southwest Ontario	15 Oct	2	Soybean	Wait/Watch	Yes
eastern NC & southeast VA	15 Oct	4	Soybean	Wait/Watch	No

Some Constraints to Forecasting

- Unknown sources of inoculum (kudzu and soybean in U.S., Mexico, Caribbean islands)
- Estimation of inoculum production in known sources
- Effect of host (stage of development, cultivar) and environmental factors on disease progression through the latent stage
- Quality of the meteorological data (e.g., radar precipitation estimates)

Wet Deposition of Spores (IAMS Model and NADP Traps)



21 August

PCR Assays
(Spores/m²)

- no data
- negative
- <20
- 21-80
- 81-320
- > 320

Mable Spore #/Land Area (#/ha)



2007 Post-Detection Sentinel Plot Observations

Location	Date of 1 st Post-detection Observation	Number of Post-detection Observation	Growth Stage at 1 st Post-detection Observation
Baldwin, AL	27 Jul	1	R8
Crawford, AR	12 Sep	1	R8
Little River, AR	12 Sep	1	R8
Ballard, KY	9 Oct	2	R7
Fulton, KY	10 Oct	1	R7
Tensas, LA	24 Sep	1	R4
Concordia, LA	9 Aug	1	R7
Washington, MS	13 Aug	1	R6
Washington, MS	13 Aug	1	R6
Washington, MS	13 Aug	1	R5.8
Nemaha, NE	15 Oct	1	R7
Otoe, NE	15 Oct	1	R7
Pawnee, NE	15 Oct	1	R7
Burleson, TX	15 Aug	3	R6
Collin, TX	20 Aug	1	R7

Summary

1. Ensemble forecasting team did a good job in 2007
- there were no surprises
2. The IAMS disease severity forecast requires further calibration
3. Mexico and the Caribbean basin may be an important inoculum source for infections that appear in the south early in the season
4. In 2007, the detection time (the time between predicted spore deposition and disease detection) appeared to be 3 to 5 weeks.

SBR Activity Ensemble: Current Conditions (2007-06-29)

