Southern Corn Rust: A Sleeping Giant or a Rusty Wimp?

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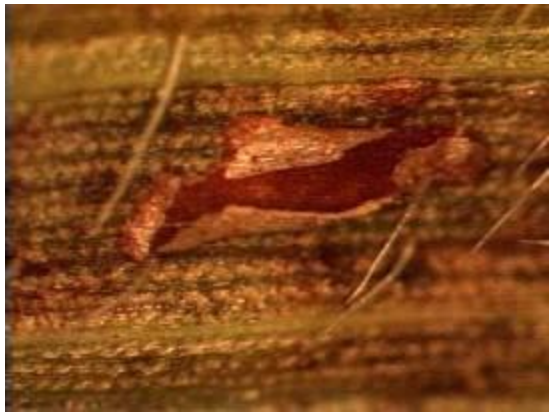
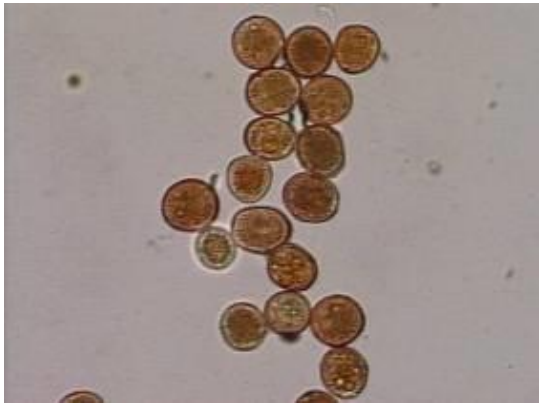
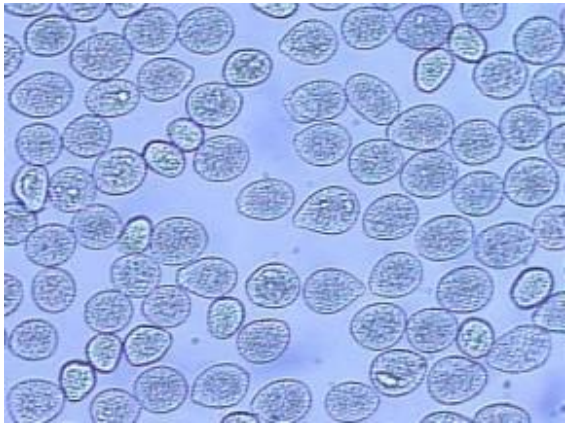
Corn Rusts

Common	Southern	Tropical
Puccinia sorghi	*Puccinia polysora*	*Physopella zeae*





Images: W. Dolezal

Common vs. Southern Rust

	Common	Southern
Ideal Environment	Cool-Warm Moist 59-77F (15-25C)	Warm-Hot Moist 77+ F (25+ C)
Appearance of Pustules	Large, circular to elongated	Small, circular, pinhead appearance
Color of Pustules	Brown to cinnamon-brown	Reddish-Orange
Location of Pustules	Both upper and lower leaf surfaces* Infects leaves only	Upper leaf surface May also infect husks

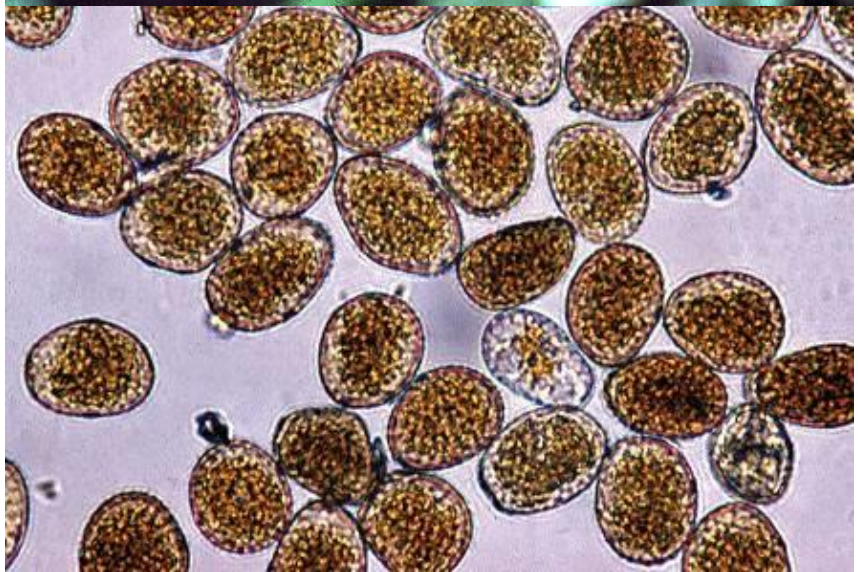
*Caution: some corn germplasm may show pustules on the upper surface only. Examine the spores to differentiate.

Information: W. Dolezal

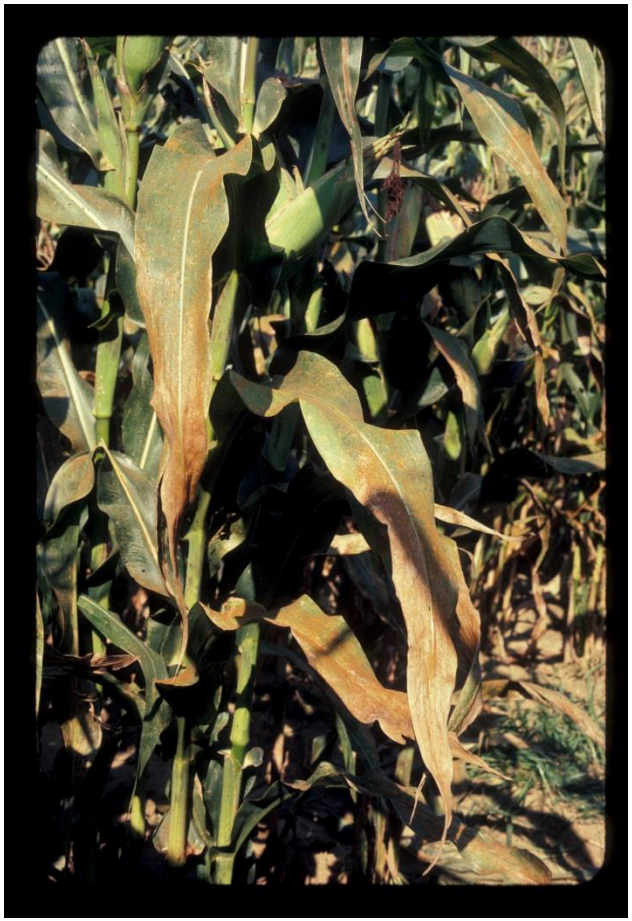
Southern Rust

Puccinia polysora

- Pustules mostly on upper leaf surface
  - occasionally will find some mid-rib pustules on the bottom of the leaf.
  - Pustules also on husk.
- Pustules usually a *orange to a reddish-orange* color
- Disease develops in warm, moist conditions
- Urediniospores usually oblong, ellipsoid but most are NOT ROUND.
- Caution: Immature spores are round



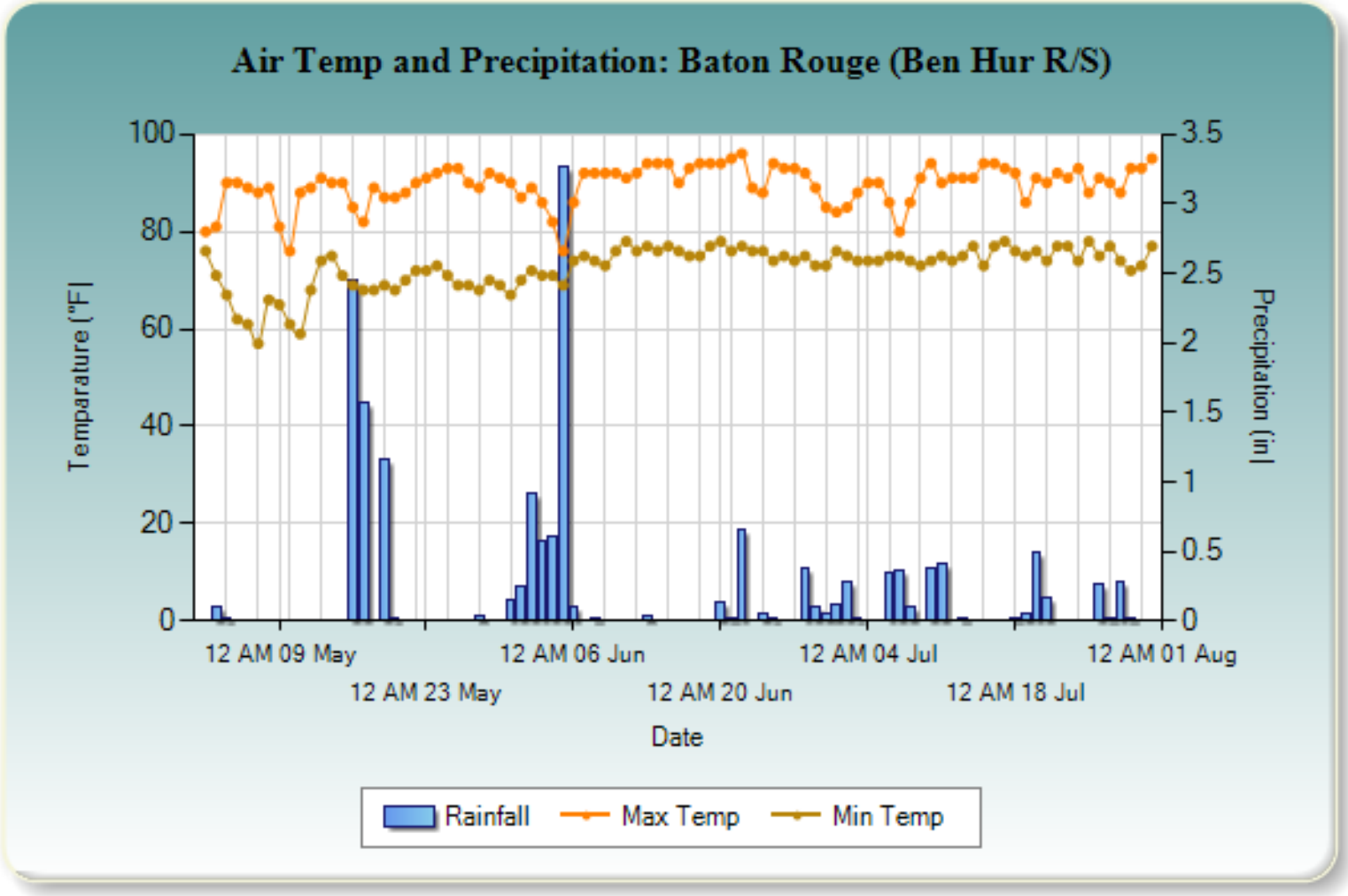
Southern Corn Rust
Yield Losses



Yield loss reported can be big:

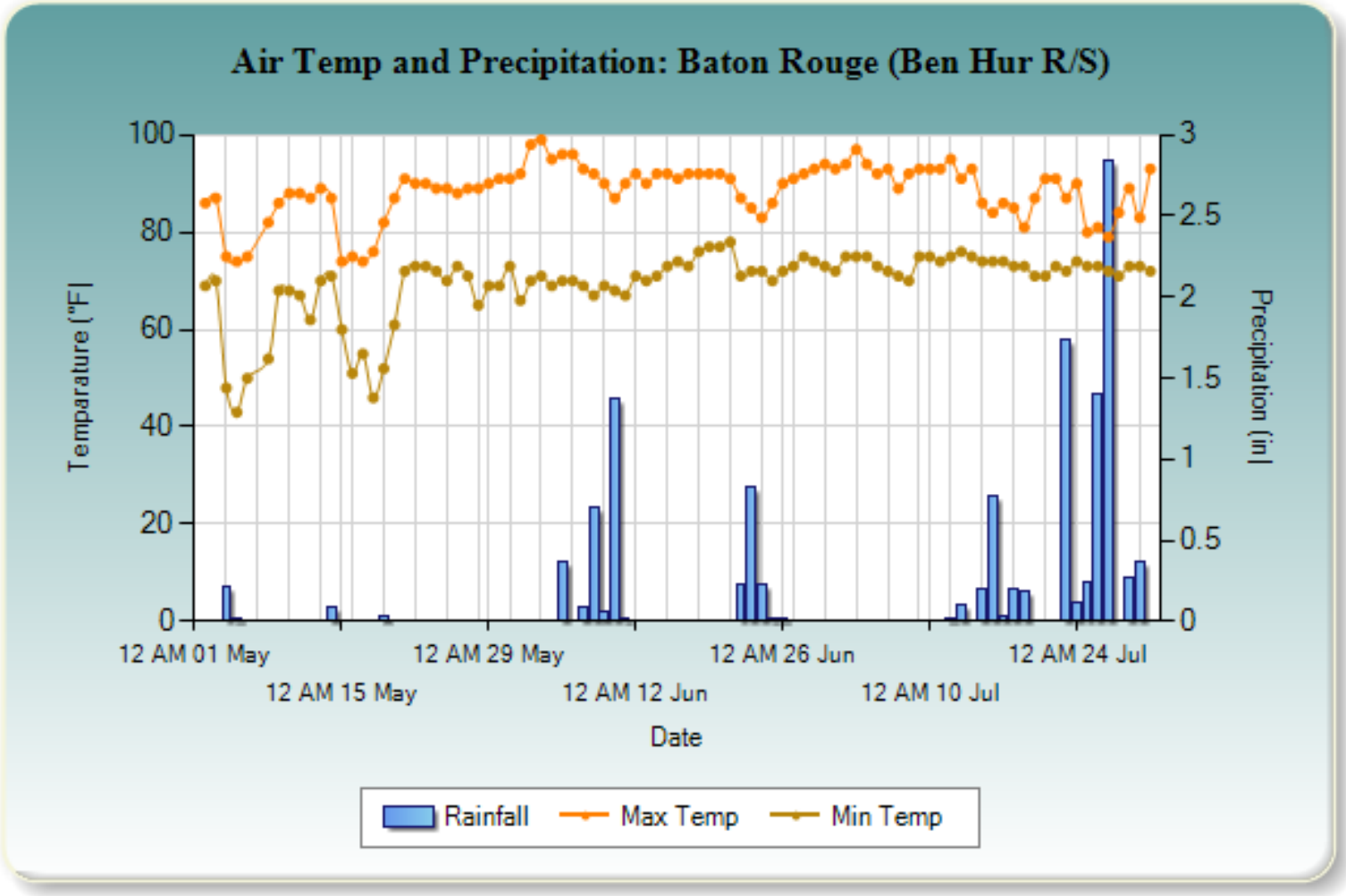
- USA up to 75%
- Africa – 1950s > 50%
- Philippines 1956 > 80%

2010



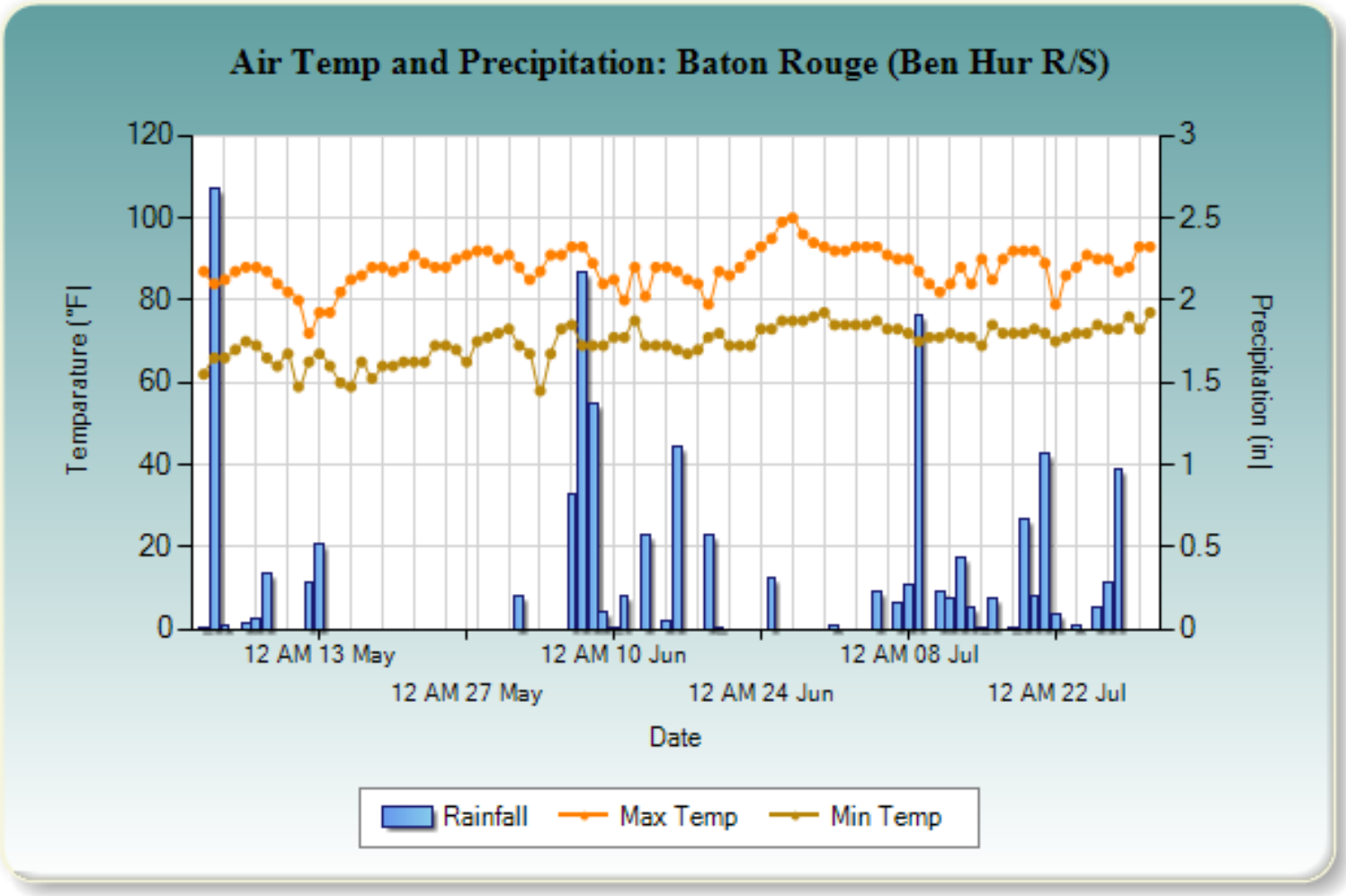
Source: Southern Region Office of Climatology, LSU

2011



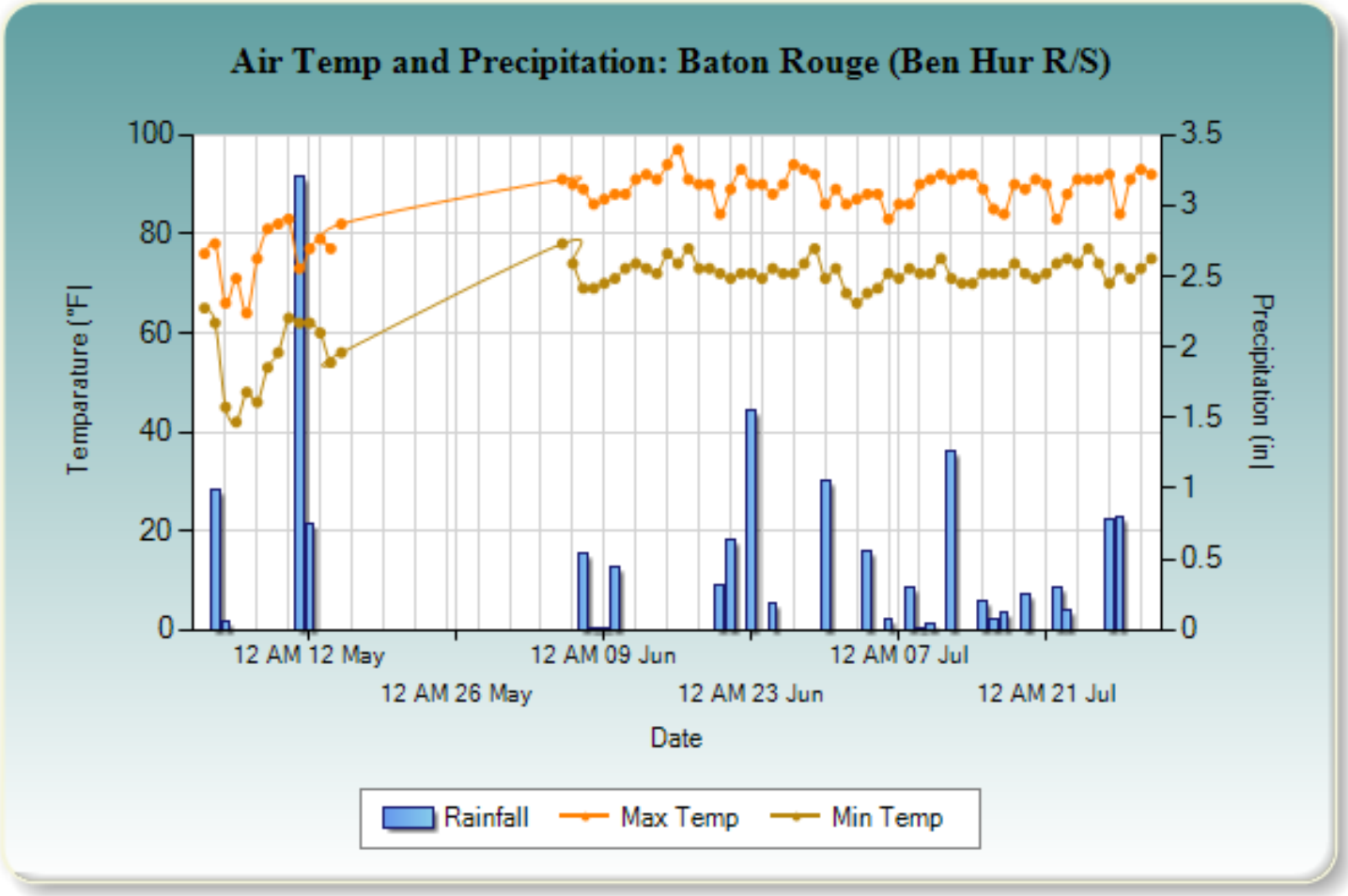
Source: Southern Region Office of Climatology, LSU

2012



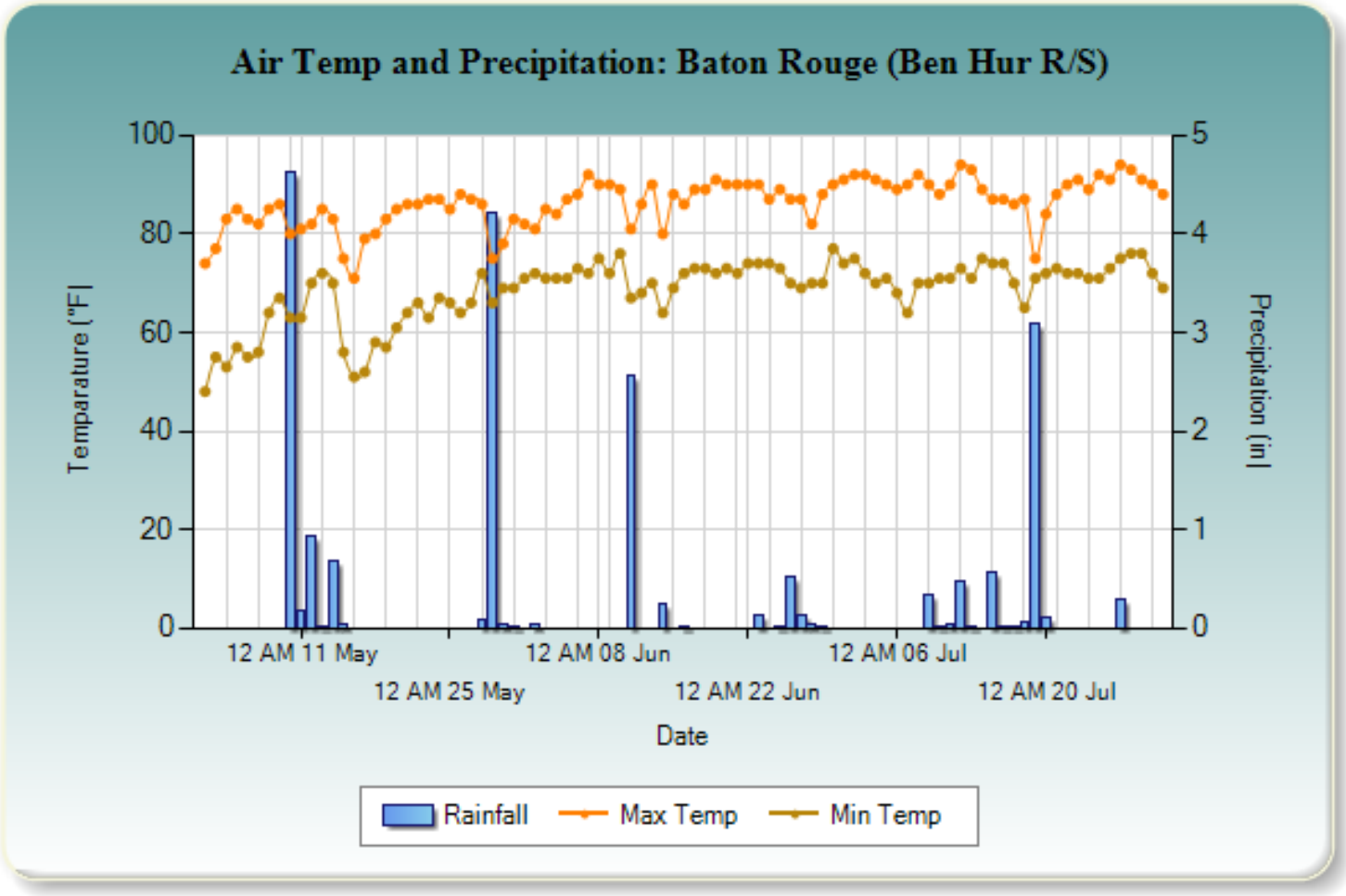
Source: Southern Region Office of Climatology, LSU

2013



Source: Southern Region Office of Climatology, LSU

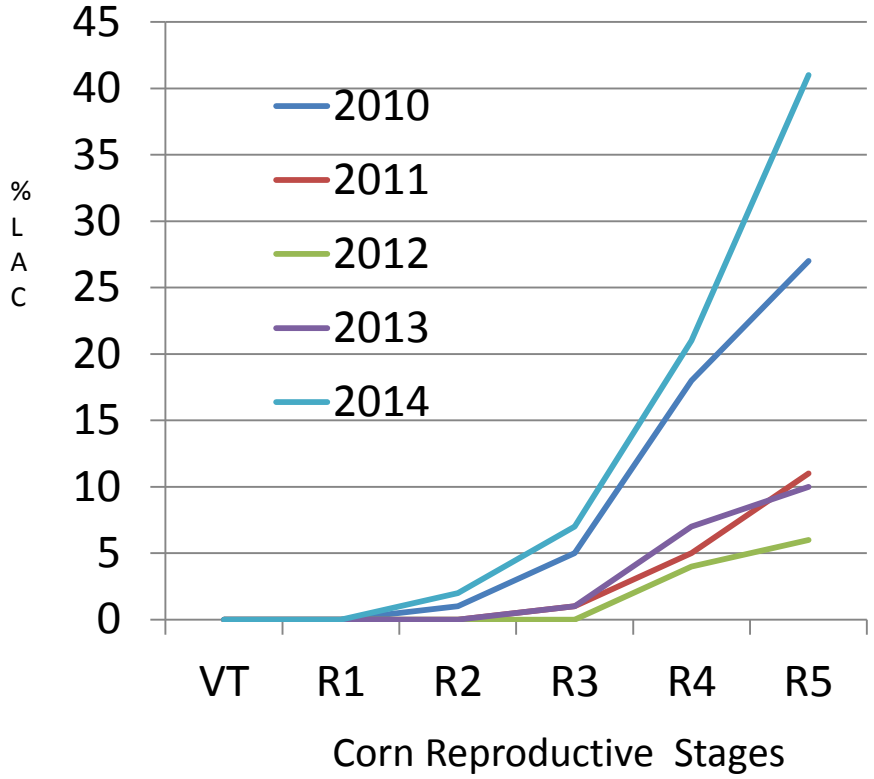
2014



Source: Southern Region Office of Climatology, LSU

Sleeping Giant or Wimp?

- Yield Losses (from my yield loss plots)
  - 2010 = 15.2%
  - 2011 = 1.0%
  - 2012 = 3.2%
  - 2013 = 3.9%
  - 2014 = 18.9%



Source: C. Hollier, LSU

Yield Losses Due to Southern Corn Rust, Ben Hur Research Farm, LSU AgCenter, 2010

Hybrid[1]	Trtment[2]	%SCR[3] Tassel	%SCR[3] T + 14	%SCR[3] T + 28	Yield[4] Bu/a (yld loss)
Pi31D59	none	0	6.25	23.50	147.92 (13.8%)
Pi31D59	H AMP X3	0	1.00	1.25	169.55
Pi31G71	none	0	4.00	20.75	139.44 (11.4%)
Pi31G71	H AMP X3	0	0.00	0.00	157.32
Pi33F87	none	0	4.00	18.75	107.48 (20.3%)
Pi33F87	H AMP X3	0	0.00	0.00	134.81

[1]Hybrids have differing levels of southern rust susceptibility.
[2]Treatment with Headline AMP was done three times (at tassel +14 +28 days) @ maximum label rate
[3]Mean % leaf area coverage (ear leaf) at time of application
[4]Yield in bushels/acre (% yield loss in parentheses)

Yield Losses Due to Southern Corn Rust, Off-Station Farm, South Central, LA, 2010

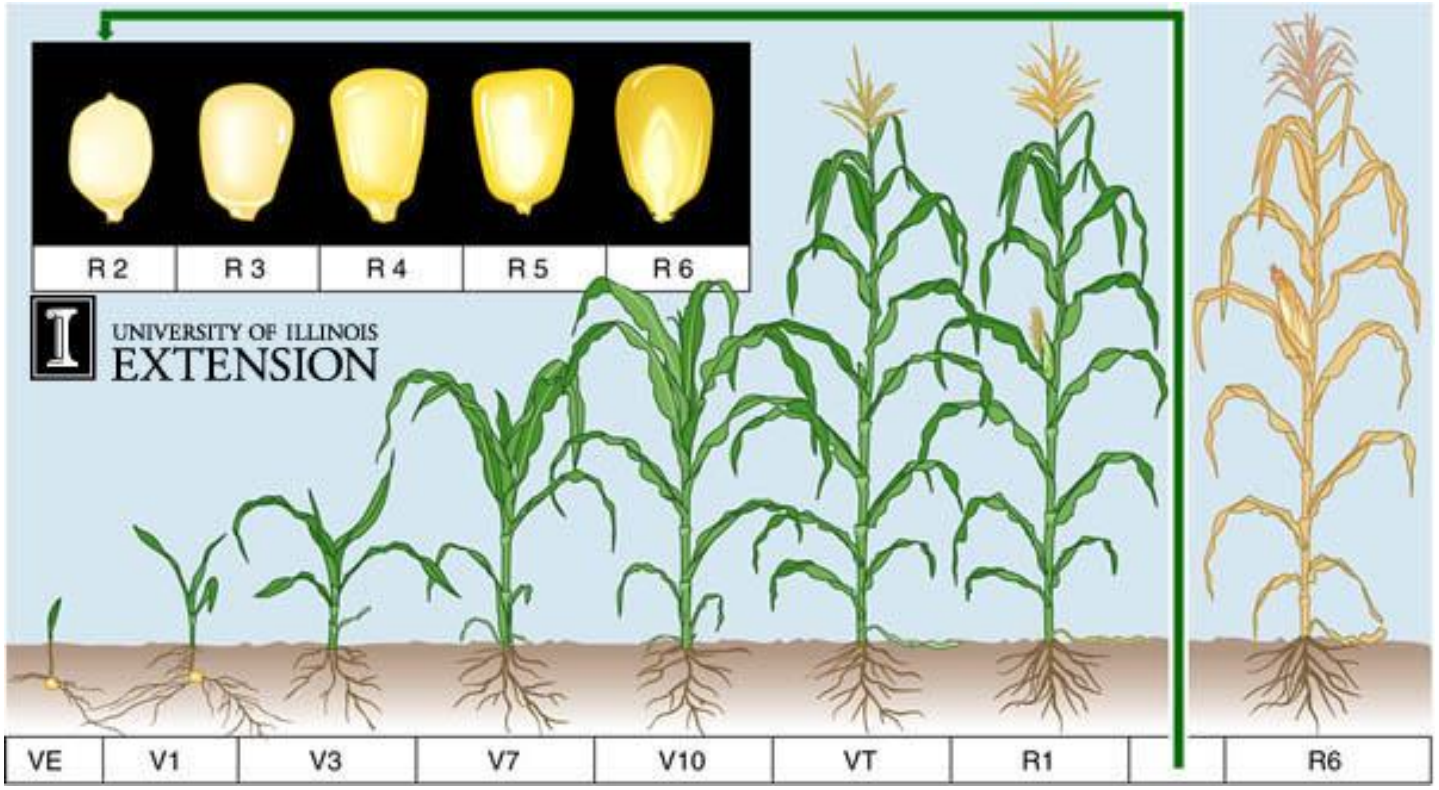
Hybrid[1]	Trtment[2]	%SCR[3] Tassel	%SCR[3] T + 14	%SCR[3] T + 28	Yield[4] Bu/a (yld loss)
Pi31D59	none	0.00	7.50	30.25	141.45 (21.1%)
Pi31D59	H AMP X3	0.00	0.00	1.00	179.25
Pi31G71	none	0.00	5.50	23.00	125.20 (19.2%)
Pi31G71	H AMP X3	0.00	0.00	0.00	154.78
Pi33F87	none	0.00	4.75	20.25	117.22 (23.3%)
Pi33F87	H AMP X3	0.00	0.00	0.00	152.76

[1]Hybrids have differing levels of southern rust susceptibility.
[2]Treatment with Headline AMP was done three times (at tassel +14 +28 days) @ maximum label rate.
[3]Mean % leaf area coverage (ear leaf) at time of application
[4]Yield in bushels/acre (% yield loss in parentheses)

Questions from Corn Producers

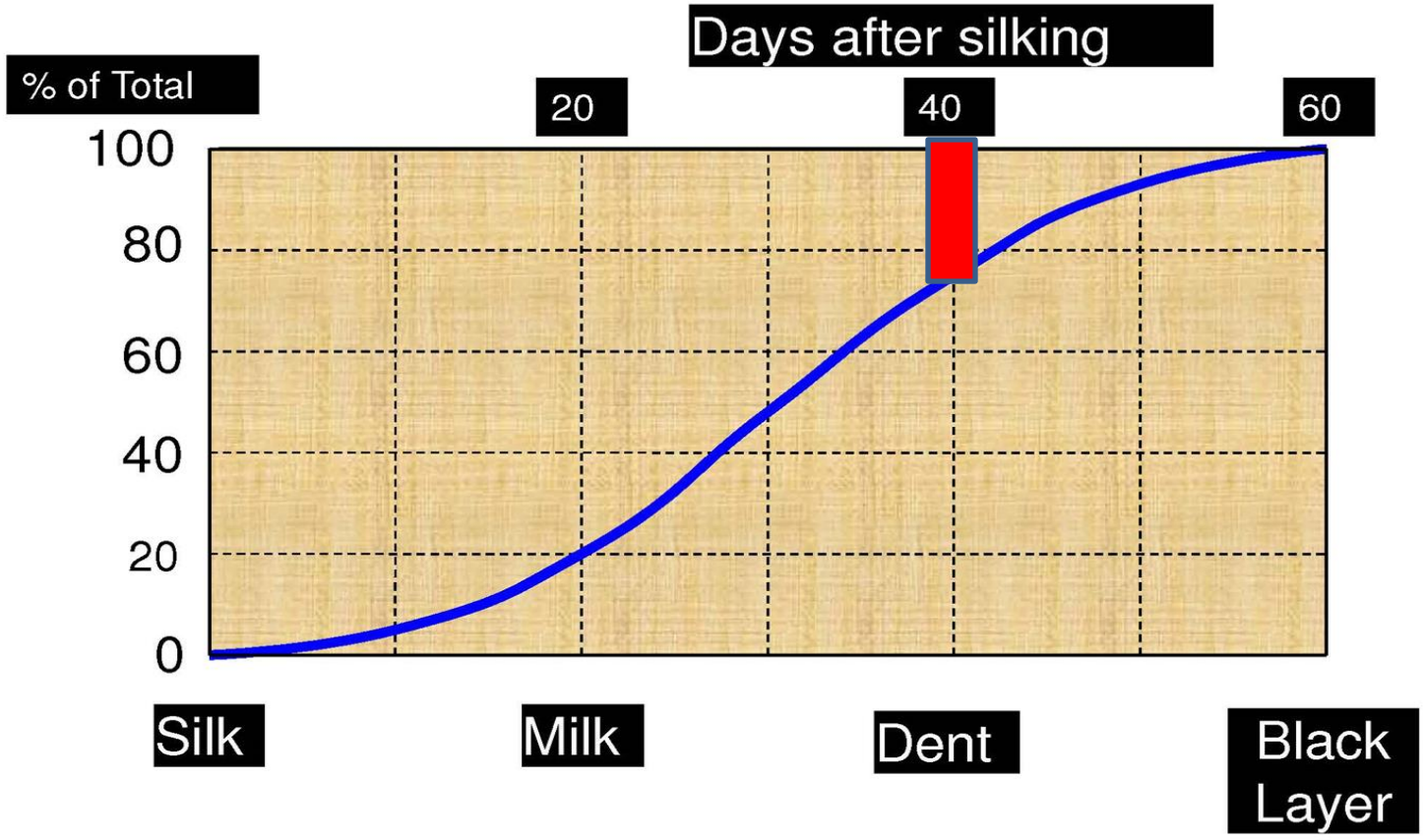
- What is the last corn growth stage that I can apply a fungicide and still get economic benefit?
- Is there a “plant health” benefit from using a fungicide on “disease-free” plants?

Corn Growth Stages



Source: University of Illinois

Corn Grain Fill



Source: E. Larson, Mississippi State University

Yield Losses Due to Southern Corn Rust, Off-Station Farm, South Central, LA, 2010
Single Late (1 week Pre-Dent) Application

Hybrid	Treatment	%SCR[1] (mean of 6 reps)	Yield (bu/a)	% Yield loss
Pioneer 31D59	Headline AMP (max label rate)	6.75	175.91	-
Pioneer 31D59	none	7.50	165.25	6.1

[1]SCR level @ application. By black layer, the treated was rated @ 8.5% while the untreated was rated @ 30%.

Thank you for your attention.