

Corn Yield Losses to Ear Rots, Leaf Diseases and Nematodes

What's New For 2015



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When you leave here today...

- Climate: Is weather today a clue for the corn season?
 - Sentinel plots management of southern corn rust
- Fungicide Programs: 2013 vs 2014 and why
- Management update for 2014
 - Azoxystrobin.....
 - Resistance management
 - New Fungicides...
 - Timing of fungicide applications applications
 - For Rust
 - For Northern corn leaf blight
 - Use of fungicides based upon planting date
 - Nematicides and nematode management
 - Chemigation... hope for the future.



Investments for 2015

- SEED
 - Disease resistant varieties
- SEED TREATMENTS
 - Nematicide seed treatments
- MANAGEMENT OF FOLIAR DISEASES
 - Fungicides, timing and number
- MANAGEMENT OF NEMATODES
 - Nematicides

Phil Cardoso

<http://dairyfocus.illinois.edu/content/corn-silage-foliar-disease-silent-killer>

- Much attention is given to grain for harvest, much less to leaves and stalks.
- Corn leaves are much more digestible than stalks, so more leaf material is better.
- Bacteria present on the leaves are important for fermentation.
- Cellular content is lost in infected leaves.
- Infected leaves tend to have increases in acid detergent fiber and lignin content.

Points to Consider

- Fungal diseases have potential to reduce yield.
- Loss of dry matter because of tissue death, early plant death resulting in poor ear fill and small kernels, and stalk lodging result in reduction of yields and quality.
- Certain fungal organisms contaminate grain and stalks with mycotoxins, such as vomitoxin, causing serious quality problems.

Points to Consider

- Leaf diseases on silage corn result in formation of lesions on leaves and can result in tissue death, including early death of entire plants, and increased susceptibility to stalk rots.
- Fungicides can be used to improve plant health resulting in higher grain (starch) yields, which is desirable whether the crop will be harvested for grain or silage.

Points to Consider

- There have been limited fungicide studies with corn silage, although benefits derived for grain corn should similarly benefit corn silage producers.
- A 2007 – 2011 field trial conducted by University of Wisconsin Extension specialists showed that fungicide treatment resulted in a 0.7 ton gain in silage dry matter yield and a 1.9 percent boost in starch content.

Points to Consider

- Best management tactic for reducing the risk of corn diseases is use of a strategy that includes:
 - hybrid selection for resistance to specific corn diseases.
 - crop rotation and residue management.
 - best yield response to a foliar fungicide application (both within Wisconsin and across the region) when disease severity was higher ($> 5\%$).

Points to Consider

- Farmers question if fungicide applications have any negative effect on the plants' anaerobic bacteria populations.
- Anaerobic bacteria are responsible for fermentation in silages that are not inoculated with a commercial product.
- Experts confirm that the mode of action of fungicides has no detrimental effect on anaerobes responsible for fermentation.

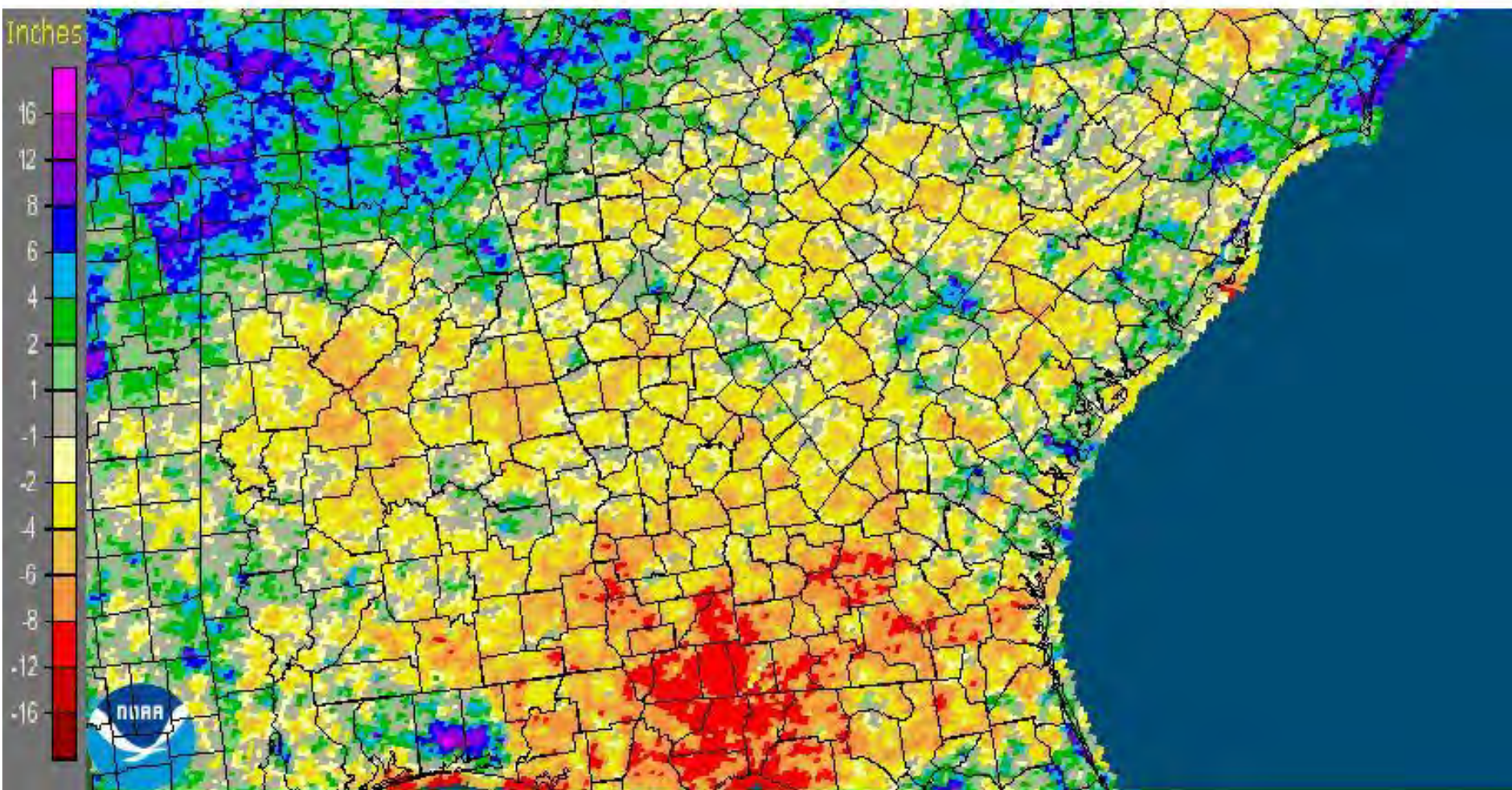
Points to Consider

- Stressed corn stressed with limited grain yield potential, ~1 ton of silage/A obtained for each 5 bu grain/A.
 - 50 bu/A can expect about 10 tons/A of 30% dry matter silage (3 tons/A dry matter yield).
- Corn yielding ≥ 100 bu/A, 1 ton silage/A is expected for each 6 -7 bu of grain.
 - A grain yield of 125 bu/A, corn silage yields will be about 18-20 tons/A of 30% dry matter silage (5 to 6 tons/A dry matter yield).

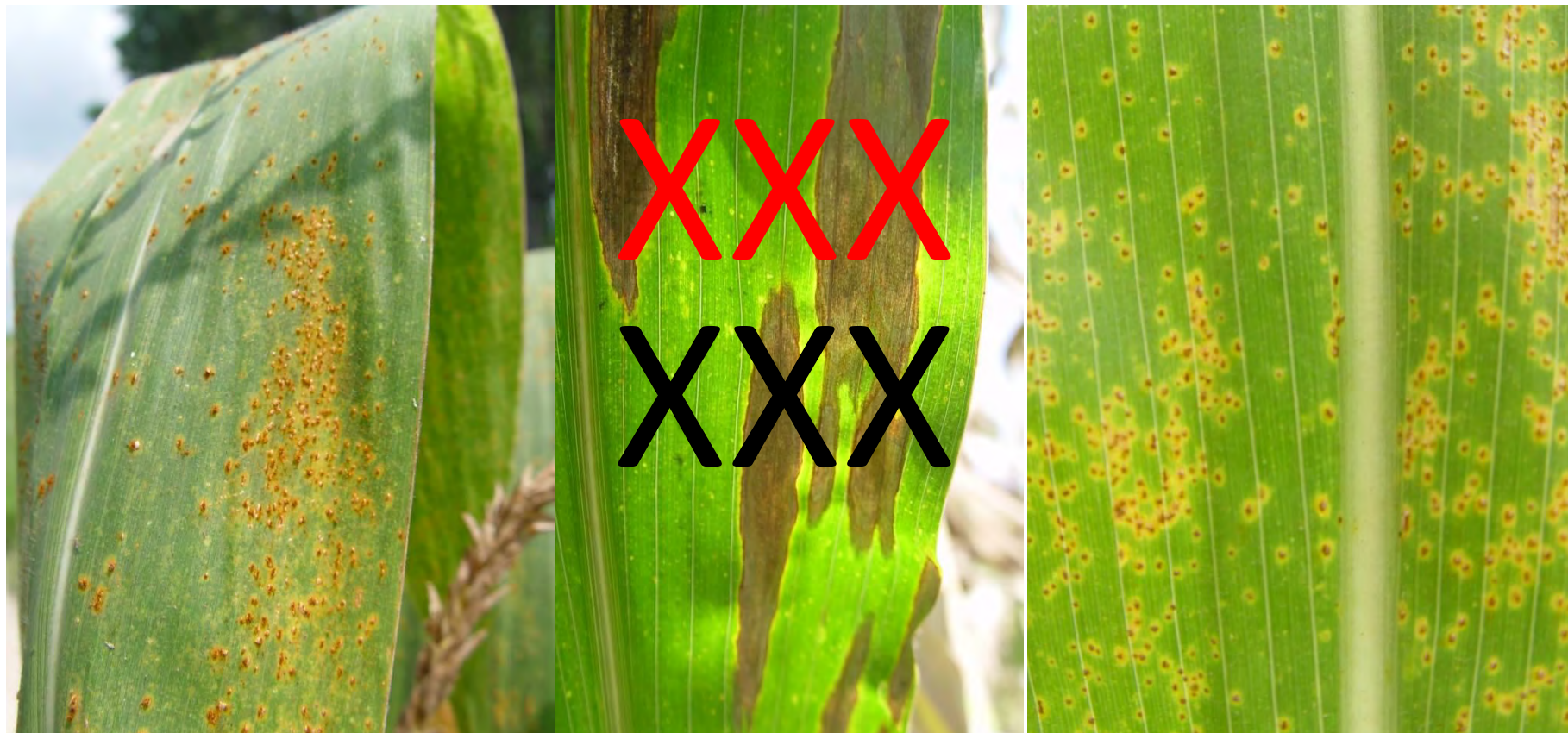
2014 Field Season

Georgia: Current 90-Day Departure from Normal Precipitation

Valid at 8/21/2014 1200 UTC- Created 8/22/14 0:23 UTC



Southern Rust and Northern Leaf Blight



Diplodia Ear Rot



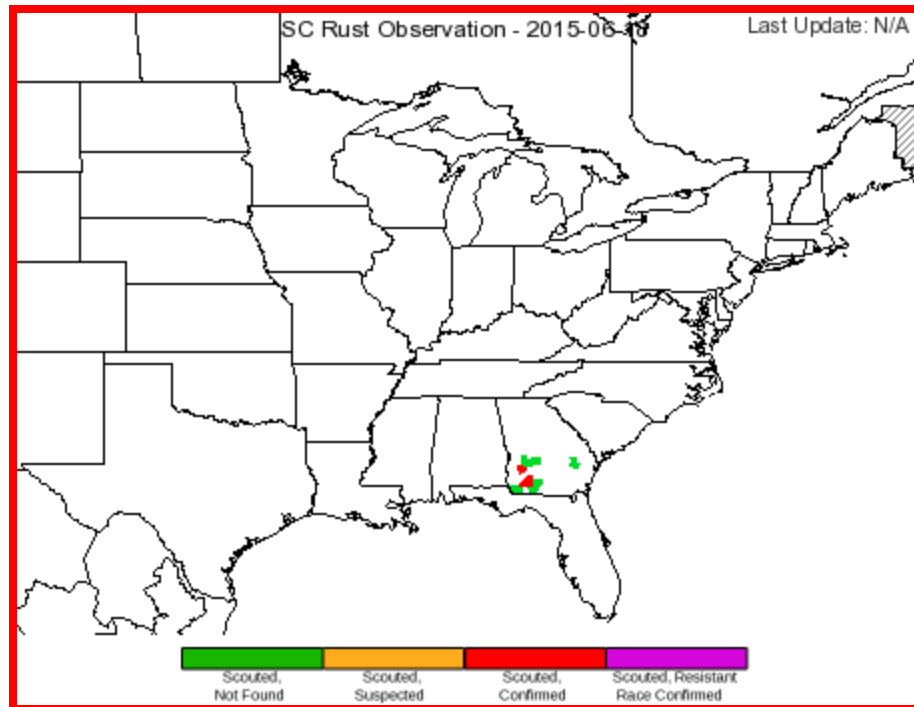
BACTERIAL ROT 2015



SCR.ipmpipe.org

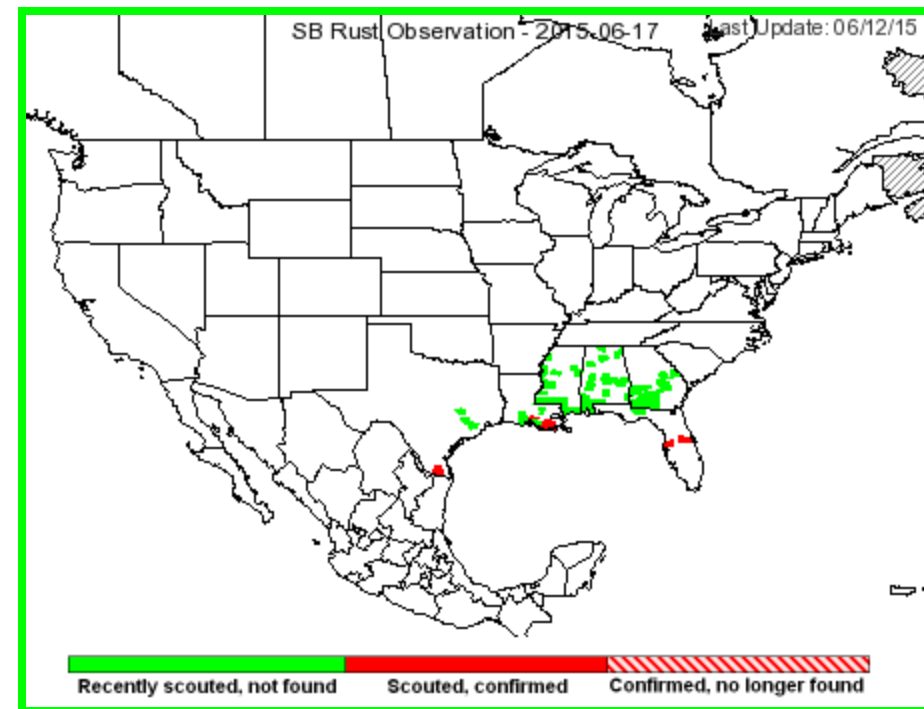
Southern Corn Rust

June 18, 2015



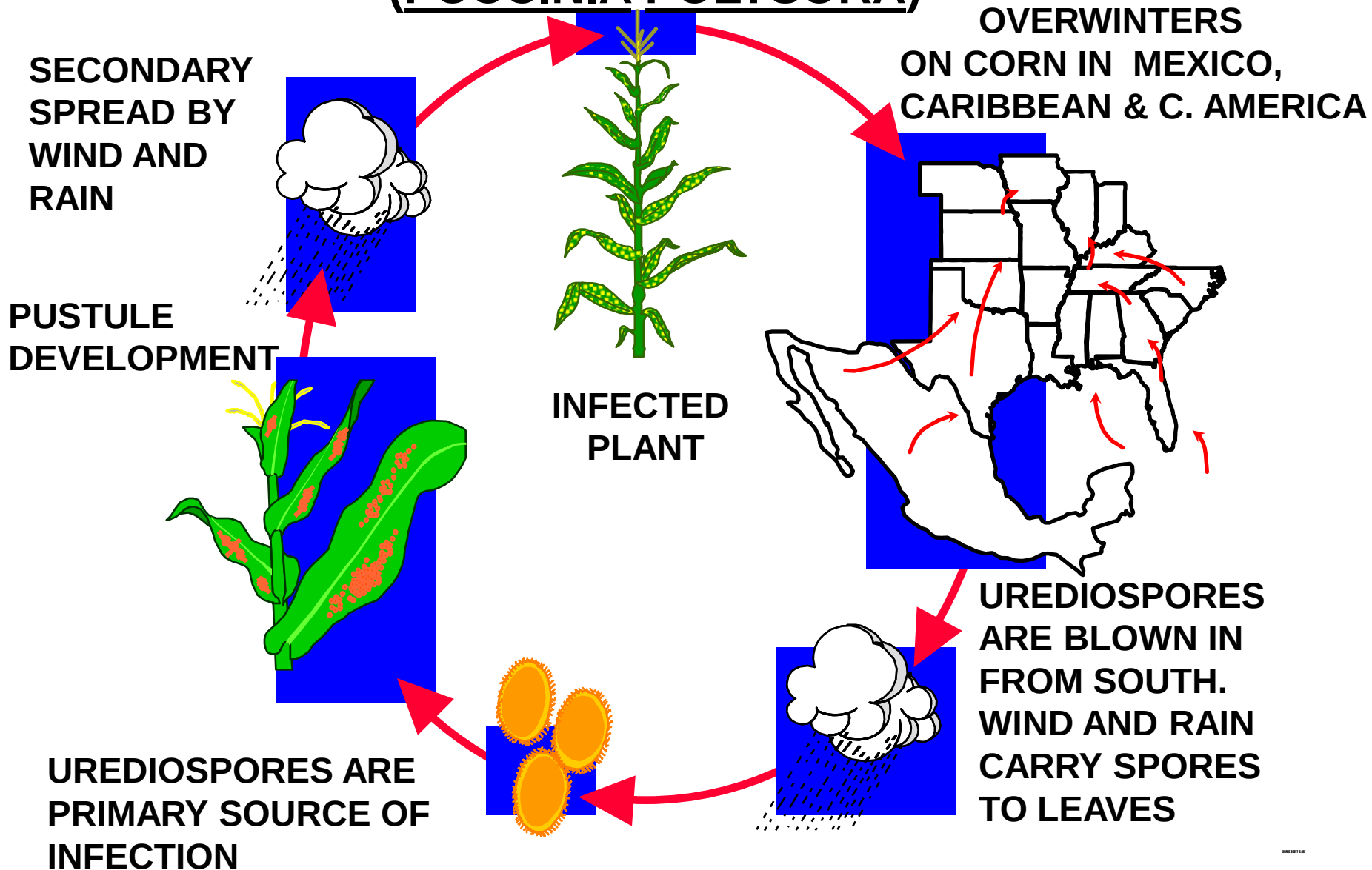
www.sbrusa.net

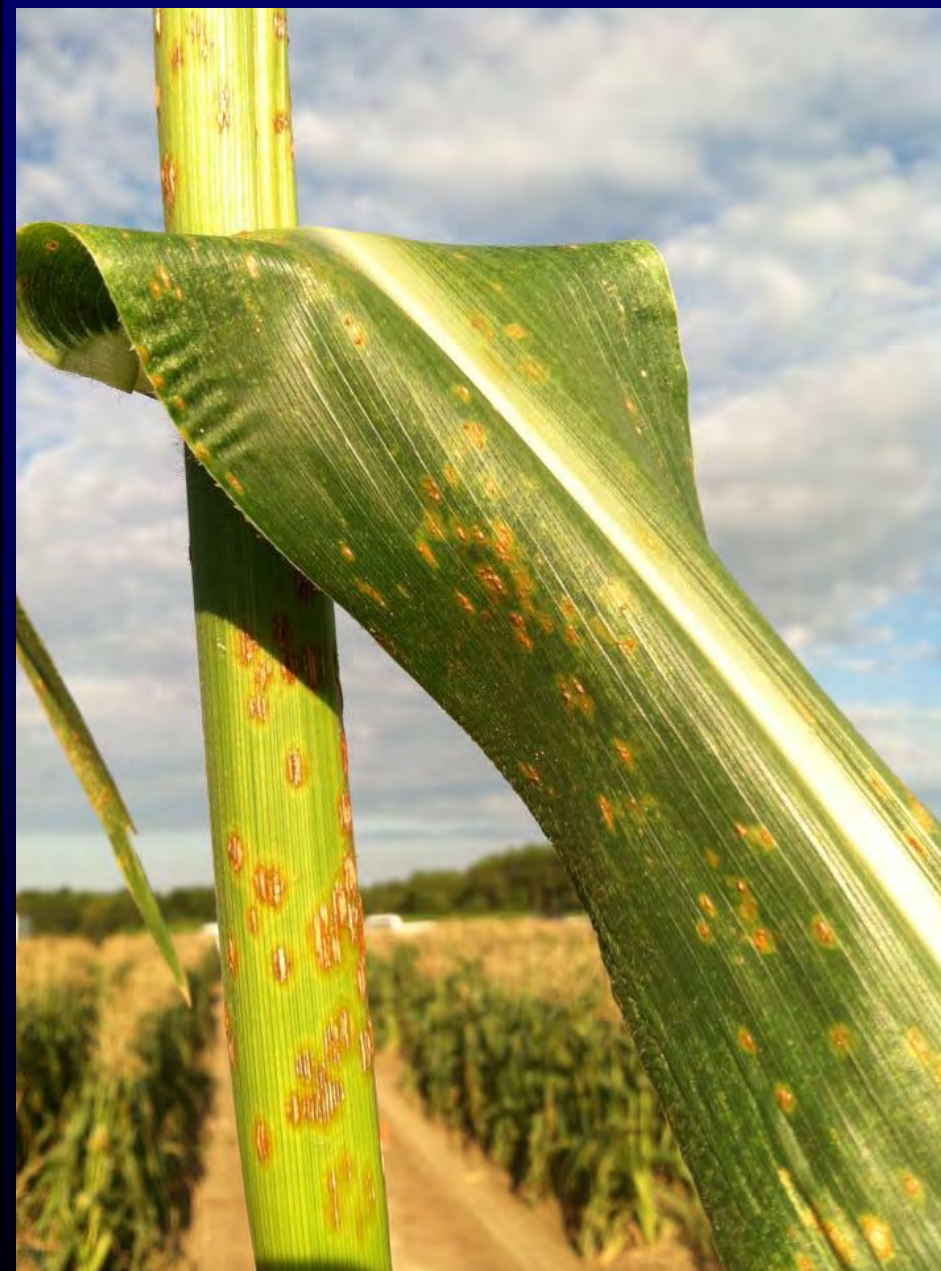
Asian Soybean Rust



SOUTHERN RUST DISEASE CYCLE

(PUCCINIA POLYSORA)





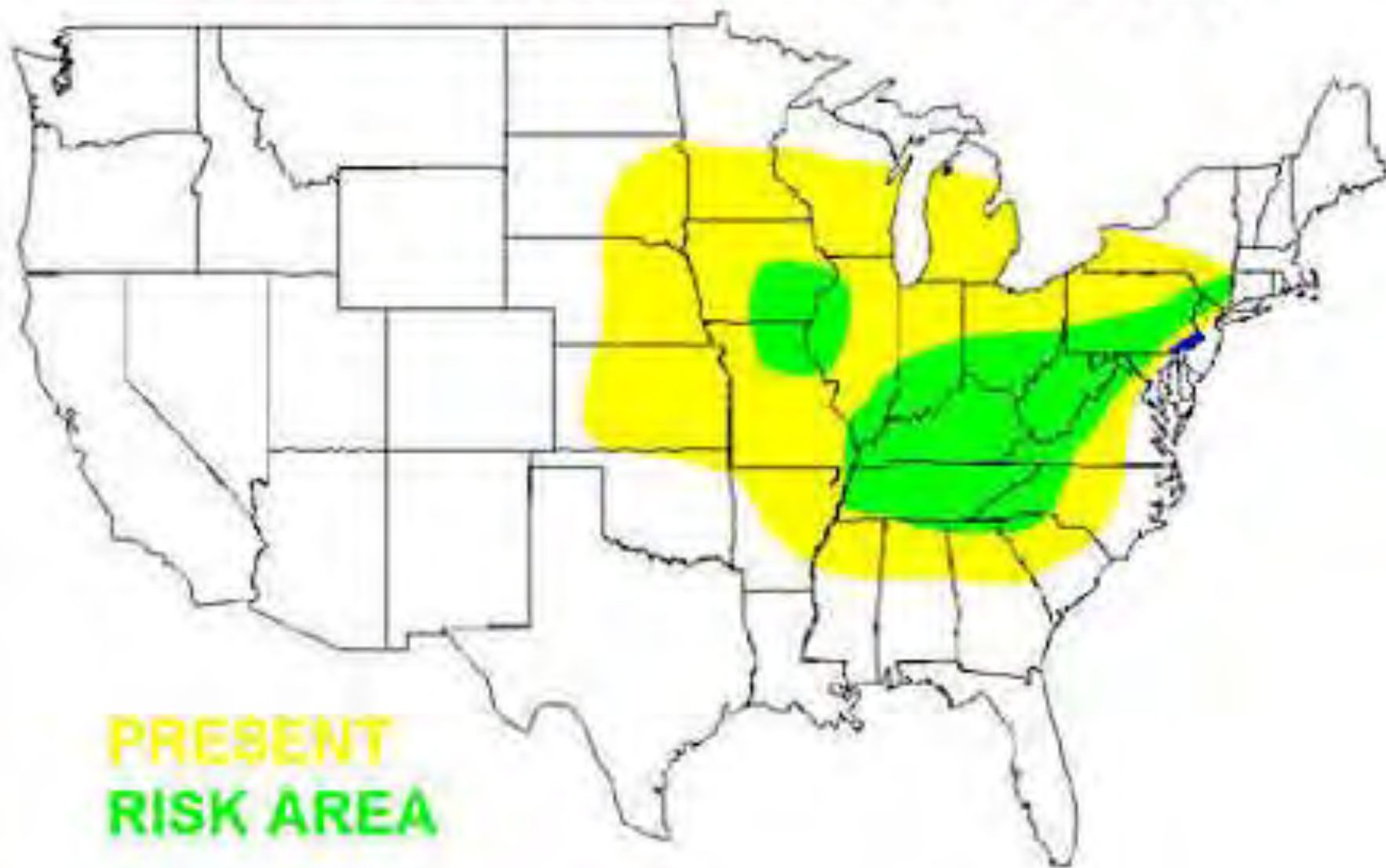
Varietal differences in NCLB



Grey Leaf Spot



GRAY LEAF SPOT DISTRIBUTION



Risk Assessment to Determine Likely Response to Foliar Fungicides in Corn

Factors that Increase Risk

- Susceptible hybrid (primarily GLS)
- Continuous corn
- No-till
- Late planting
- High plant population and/or yield potential
- Irrigation
- Disease activity at tasseling
- Disease-favorable weather forecasted
- Field history of disease and lodging



2015 Fungicides for Corn

- Tilt (propiconazole): 2-4 fl oz/A



- "Folicur" (tebuconazole): 6 fl oz

- Stratego (Tilt + trifloxystrobin): 7.0-12.0 fl oz/A



- Stratego YLD: (Prothioconazole + trifloxystrobin)



- Quilt Xcel: Quadris + Tilt (10.5-14.0 fl oz/A)



- Headline (pyraclostrobin): 6.0 fl oz



- Headline AMP: 10 fl oz/A

2015 Fungicides for Corn

- EVITO 480 SC (2.0-5.7 fl oz/A)



- **EVITO T** (4-9 fl oz/A)



- Domark 230ME

- PRIAXOR (4-8 fl oz/A)



- Aproach/Aproach-Prima



- FORTIX

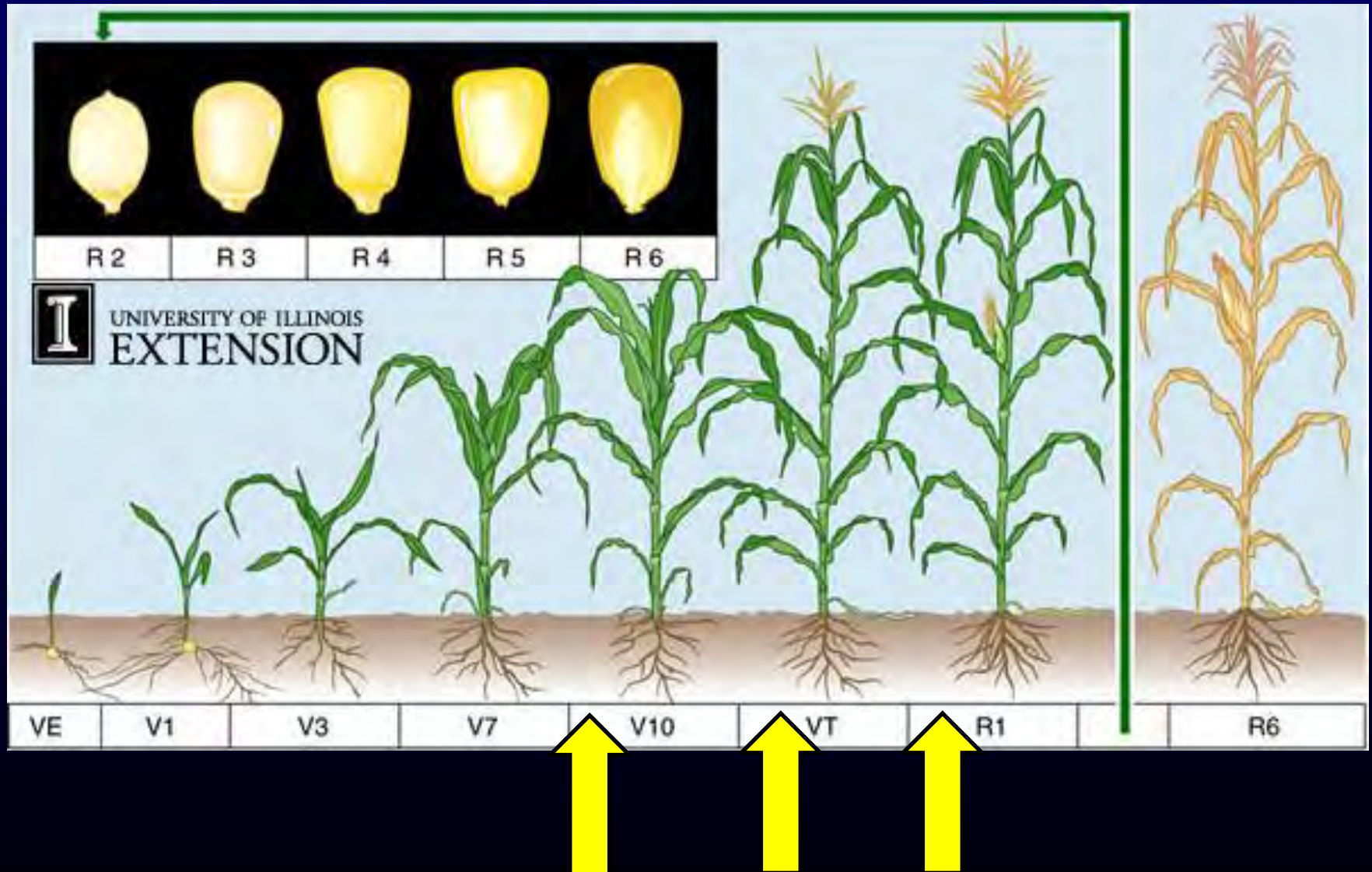


- **TRIVAPRO** (propiconazole, azoxystrobin, solatenol)



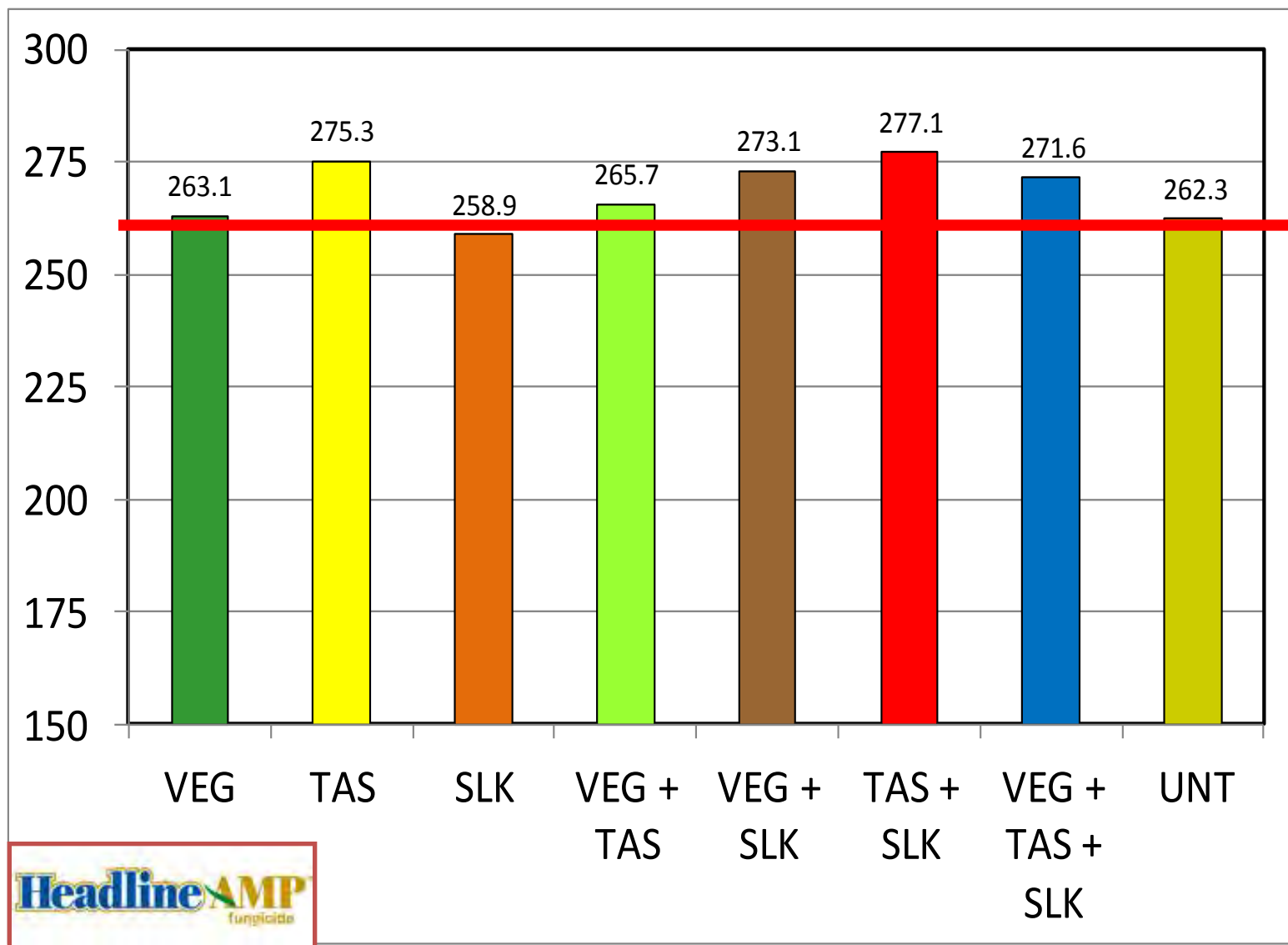
Crop Growth Stage for 2014

Timing for disease control and "safety"



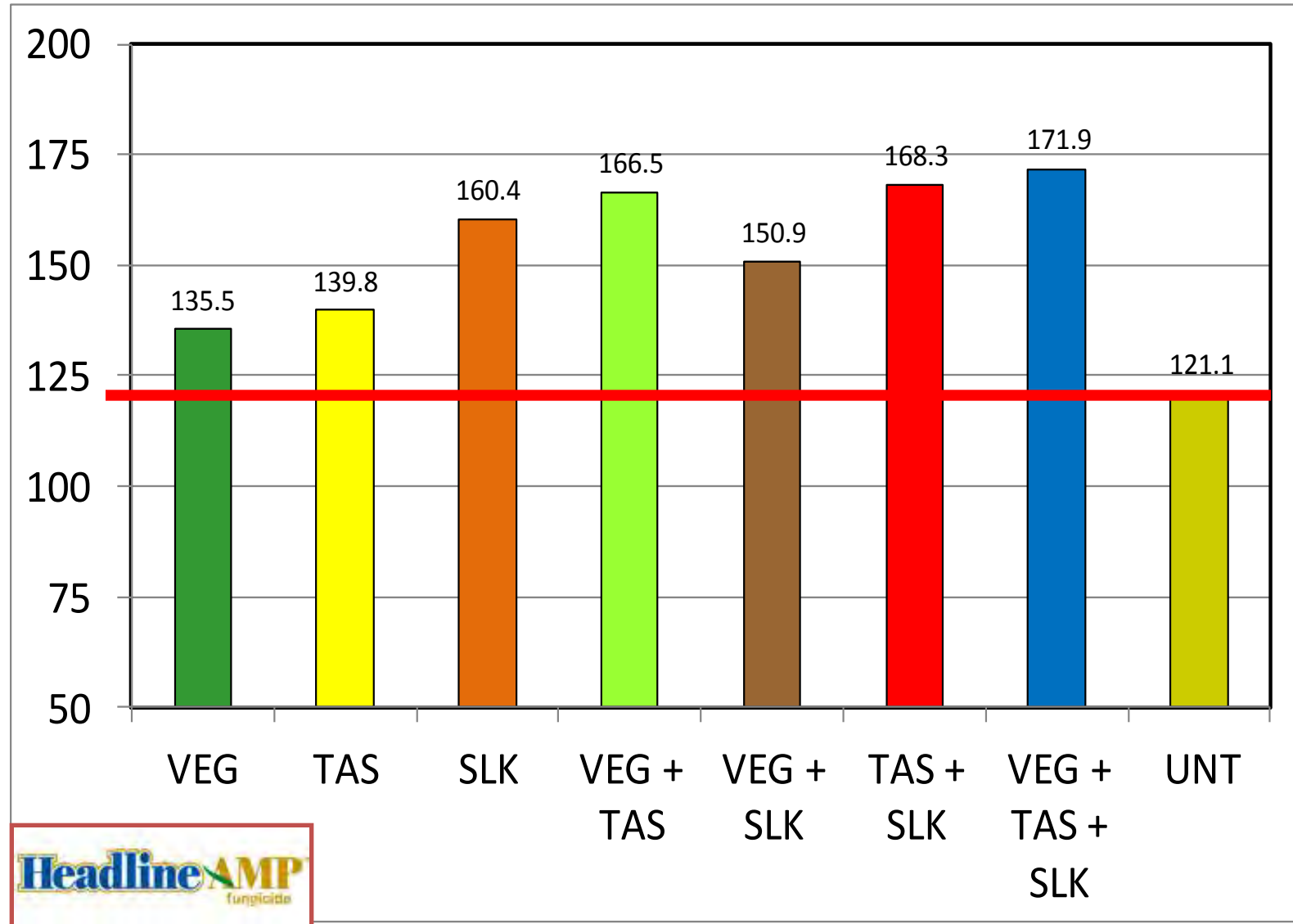
2012 Tifton Early-Planted Study

Yield (bu/A)



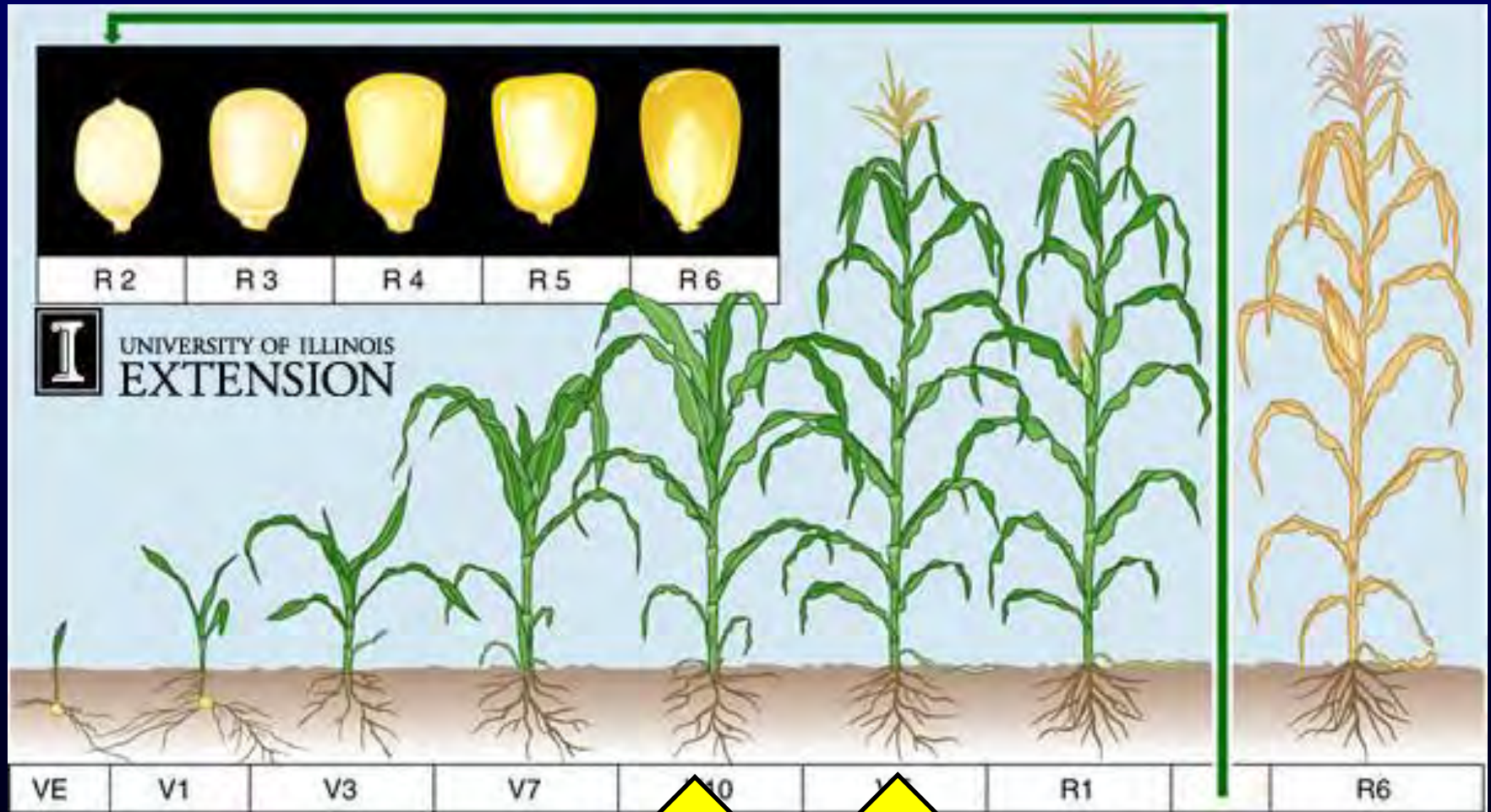
2012 Tifton Late-Planted Study

Yield (bu/A)



Crop Growth Stage for 2015

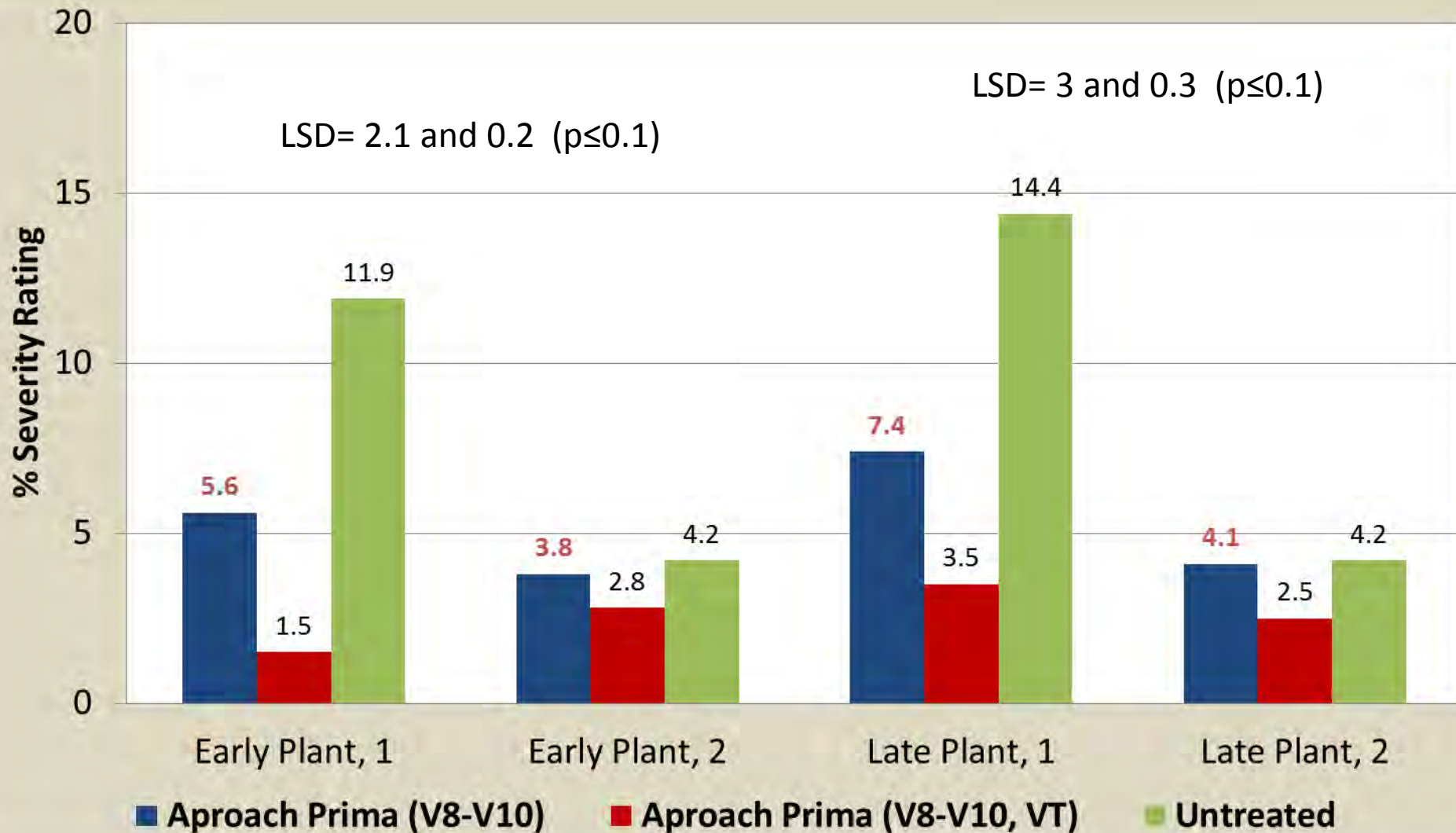
Timing for disease control and "safety"



2014 Corn Variety X Fungicide, Stripling Irrigation Park

Southern Corn Rust

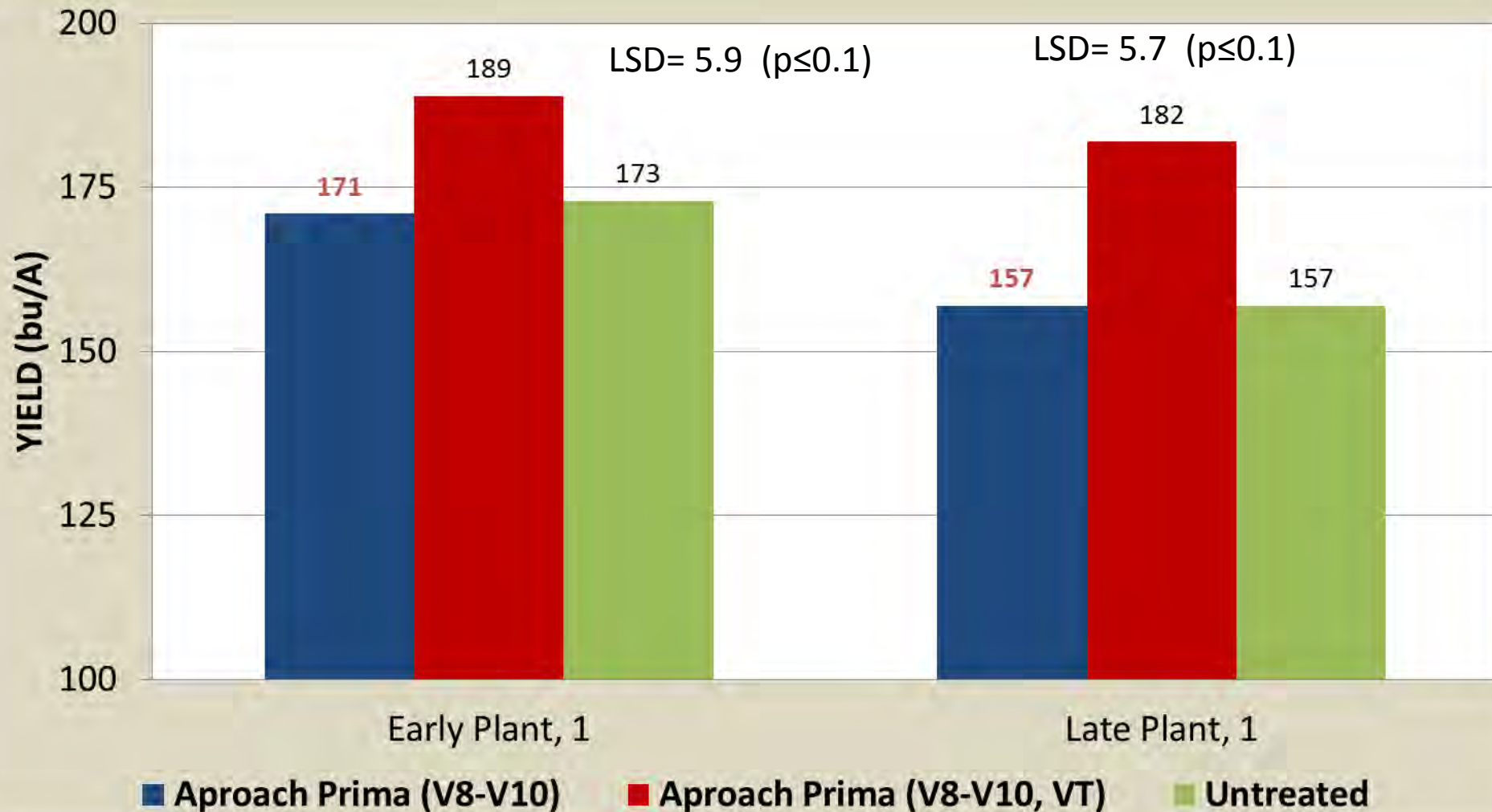
Severity Rating



2014 Corn Variety X Fungicide, Stripling Irrigation Park

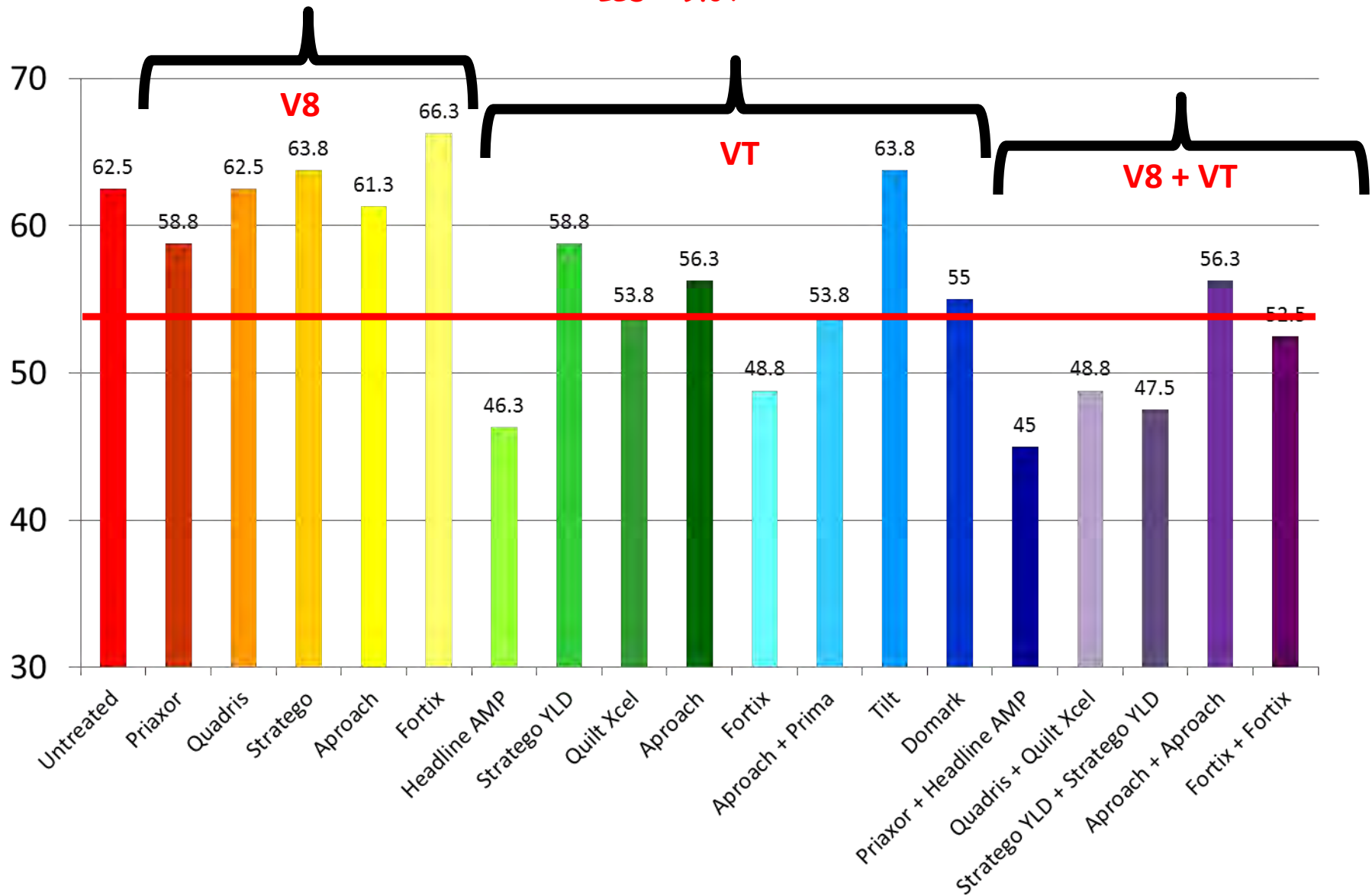
Southern Corn Rust

YIELD

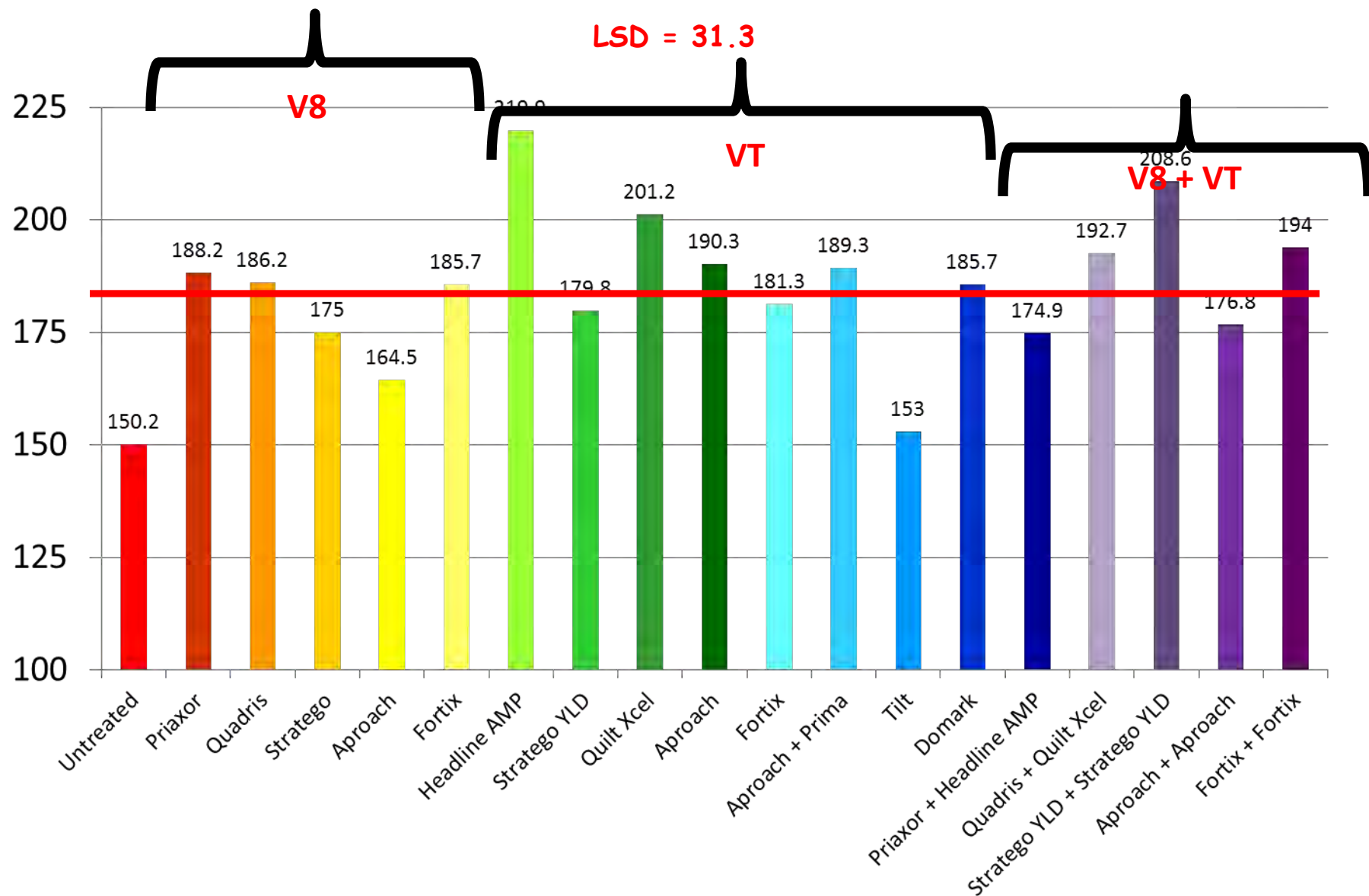


2014 Uniform Corn, Attapulgus Leaf Necrosis (%)

LSD = 9.34



2014 Uniform Corn, Attapuligus Yield (bu/A)



Corn Fungicide Chemigation Trial

- Pioneer 2023 hybrid treated at V5 stage fb R1 vs R1 Stage alone.
- Southern Rust primary corn disease evaluated on 0-100 % severity scale.
- Ear leaf was evaluated for So. Rust severity at 14 and 28 days following R1 stage application.
- Treatments applied in .12 in. irrigation in vegetable oil (1 pt/acre) + Blendex™ emulsifier.

Treatments

- Aproach 6.0 floz applied at V5 stage corn fb Aproach Prima 6.8 floz at R1 stage (approximately 21 day interval)
- Aproach Prima at R1 stage alone 6.8 floz.
- Untreated Check
- Plot size under chemigation approximately .25 acres each



Aproach Prima 6.8 floz
R1 Alone chemigated

This image shows a close-up of a corn leaf. The leaf is green with several small, light green, elongated spots scattered across its surface, which are characteristic of early-stage rust infection. The background shows other corn leaves, slightly out of focus.

Rust Severity 15%
Infection 14 dat ear leaf



This image shows a close-up of a corn leaf. The leaf is green but has large, irregular, yellowish-brown patches that cover a significant portion of its surface. These patches represent more advanced rust infection compared to the first image. The background shows other corn leaves, slightly out of focus.

Rust Severity 30%
Infection at 14 dat

A close-up photograph of corn leaves. The leaves are mostly green and healthy, with a few very small, faint yellowish-brown spots visible, indicating low levels of rust infection.

Approach 6.0 floz V5
fb Approach Prima 6.8 floz R1
chemigated

Rust Severity 7%
On Ear Lf @14 dat

A close-up photograph of corn leaves showing significant rust infection. Large, irregular yellowish-brown lesions are visible on the leaf surface, indicating a high level of disease severity.

Untreated Check

Rust Severity 30%
Infection at 14 dat

Corn Chemigation Trial

Camilla, Ga. 2014

Treatment	Southern Rust % severity on Ear leaf 14 dat	Southern Rust % severity on Ear leaf 28 DAT
Aproach 6.0 floz @ V5 fb Aproach Prima 6.8 floz @ R1	7%	40%
Aproach Prima alone at 6.8 floz R1 stage	15%	49.6%
Untreated	30%	86%

Pioneer 2023 hybrid Treatments applied in .12 inches irrigation with 1 pint / acre Vegetable oil. Fungicide and oil emulsified with Blendex™

A close-up photograph of a corn plant. The leaves are primarily green with some yellowing and small brown spots. The central stalk is green and appears healthy. The overall appearance is that of a well-maintained plant.

**Aproach 6 floz at V5 fb
A. Prima at R1 chemigated**

**So. Rust severity
40% at 28 dat**

A photograph of a corn plant showing significant signs of stress and disease. The leaves are mostly brown and withered, with some green areas still visible. The plant appears much less healthy than the one in the first image.

Untreated

**So. Rust Severity
86% at 28 DAT**

Corn Chemigation Trial

Camilla, Ga. 2014

Treatment	Corn Yield* Avg. of 4 replicates	Yield Range Low to High
Aproach 6.0 floz @ V5 fb Aproach Prima 6.8 floz @ R1	189 bu/acre 5 subsample average	173 bu / acre 211 bu /acre
Aproach Prima alone at 6.8 floz R1 stage	178 bu/acre 6 subsample average	161 bu /acre 190 bu /acre
Untreated	177 bu/acre 4 subsample average	162 bu/acre 190 bu/acre

Pioneer 2023 hybrid Yield taken on 8/21/14 subplots harvested and averaged

**Note: Yields may have been negatively impacted by severe storm and high winds when corn was nearing maturing.*

Managing Corn Diseases with Fungicides

- Southern corn rust, northern corn leaf blight, southern corn leaf blight, gray leaf spot??
- Southern rust
 - Tassel application typically appropriate
- NCLB associated with significant yield loss on SUSCEPTIBLE hybrids.
 - **Vegetative application** is important followed by a second application.
- **Early planted corn- insurance (4-10 bu/A)**
- **Late planted corn- investment (25+ bu/A)**

2012 Coffee County.. Behind cotton





Stubby-root nematode





Parasitic Nematodes of Corn

- Root-knot nematodes
 - cotton (*M. incognita*) and peanut (*M. arenaria*)
- Lesion nematodes
 - peanut (*Pratylenchus*)
- Sting nematodes
 - cotton (*Belonolaimus*)
- Stubby-root nematode (*Paratrichodorus*)
- Columbia lance nematode
 - cotton (*Hoplolaimus*)

Managing Nematodes of Corn

- Use of Telone II (3 gal/A):

- Increase yields
- Increase earliness??
- Better utilize nutrients
- Improve growth
- Improve stands



- Choice of nematicide:

- **Telone II** gives marked growth response. Also; often great yield response. Better use of nutrients and irrigation?
- **Counter 20G**- standard treatment; often growth response, should help yields.
- **AVICTA Complete Corn**- seems to help growth, reduce early season damage and may help yields in low-mod pressure fields.
- **PONCHO VOTiVO**- systemic insecticide and biological seed treatment for control of nematodes.



QUESTIONS

