Corn Yield Losses to Ear Rots, Leaf Diseases and Nematodes
What's New For 2015

Robert C. Kemerait, Jr. PhD
Professor and Extension Specialist
Department of Plant Pathology
University of Georgia College of Agriculture and Environmental Sciences
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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
• Much attention is given to grain for harvest, much less to leaves and stalks.
• Corn leaves are much more digestable 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
SCR.ipmpipe.org
Southern Corn Rust

www.sbrusa.net
Asian Soybean Rust

June 18, 2015
SOUTHERN RUST DISEASE CYCLE
( PUCCINIA POLYSORA )

INFECTED PLANT

OVERWINTERS ON CORN IN MEXICO, CARIBBEAN & C. AMERICA

UREDIOSPORES ARE BLOWN IN FROM SOUTH. WIND AND RAIN CARRY SPORES TO LEAVES

UREDIOSPORES ARE PRIMARY SOURCE OF INFECTION

PUSTULE DEVELOPMENT

SECONDARY SPREAD BY WIND AND RAIN

SHANE SCOTT 4/97
Varietal differences in NCLB
Grey Leaf Spot
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

More risk
Response more likely

Less risk
Response less likely
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: (Prothioconzole + trifloxystrobin)

• Quailt 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)

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Yield (bu/A)</th>
</tr>
</thead>
<tbody>
<tr>
<td>VEG</td>
<td>263.1</td>
</tr>
<tr>
<td>TAS</td>
<td>275.3</td>
</tr>
<tr>
<td>SLK</td>
<td>258.9</td>
</tr>
<tr>
<td>VEG + TAS</td>
<td>265.7</td>
</tr>
<tr>
<td>VEG + SLK</td>
<td>273.1</td>
</tr>
<tr>
<td>TAS + SLK</td>
<td>277.1</td>
</tr>
<tr>
<td>VEG + TAS + SLK</td>
<td>271.6</td>
</tr>
<tr>
<td>UNT</td>
<td>262.3</td>
</tr>
</tbody>
</table>
2012 Tifton Late-Planted Study

Yield (bu/A)

- VEG
- TAS
- SLK
- VEG + TAS
- VEG + SLK
- TAS + SLK
- VEG + TAS + SLK
- UNT

Yield values:
- VEG: 135.5
- TAS: 139.8
- SLK: 160.4
- VEG + TAS: 166.5
- VEG + SLK: 150.9
- TAS + SLK: 168.3
- VEG + TAS + SLK: 171.9
- UNT: 121.1
2014 Corn Variety X Fungicide, Stripling Irrigation Park

Southern Corn Rust

Severity Rating

LSD = 2.1 and 0.2 (p≤0.1)

LSD = 3 and 0.3 (p≤0.1)

<table>
<thead>
<tr>
<th></th>
<th>Aproach Prima (V8-V10)</th>
<th>Aproach Prima (V8-V10, VT)</th>
<th>Untreated</th>
</tr>
</thead>
<tbody>
<tr>
<td>Early Plant, 1</td>
<td>5.6</td>
<td>1.5</td>
<td>11.9</td>
</tr>
<tr>
<td>Early Plant, 2</td>
<td>3.8</td>
<td>2.8</td>
<td>4.2</td>
</tr>
<tr>
<td>Late Plant, 1</td>
<td>7.4</td>
<td>3.5</td>
<td>14.4</td>
</tr>
<tr>
<td>Late Plant, 2</td>
<td>4.1</td>
<td>2.5</td>
<td>4.2</td>
</tr>
</tbody>
</table>
2014 Corn Variety X Fungicide, Stripling Irrigation Park

Southern Corn Rust

YIELD

LSD = 5.9 (p≤0.1)

LSD = 5.7 (p≤0.1)

YIELD (bu/A)

Early Plant, 1

Late Plant, 1

- Aproach Prima (V8-V10)
- Aproach Prima (V8-V10, VT)
- Untreated
2014 Uniform Corn, Attapulgus Leaf Necrosis (%)

LSD = 9.34

V8

VT

V8 + VT
2014 Uniform Corn, Attapulgus Yield (bu/A)

LSD = 31.3
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
Rust Severity 30%
Infection at 14 dat ear leaf

Rust Severity 15%
Infection 14 dat ear leaf

Untreated Check
Aproach 6.0 floz V5 fb Aproach Prima 6.8 floz R1 chemigated

Rust Severity 7% On Ear Lf @14 dat

Rust Severity 30% Infection at 14 dat
## Corn Chemigation Trial Camilla, Ga. 2014

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Southern Rust % severity on Ear leaf 14 dat</th>
<th>Southern Rust % severity on Ear leaf 28 DAT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aproach 6.0 floz @ V5 fb Aproach Prima 6.8 floz @ R1</td>
<td>7%</td>
<td>40%</td>
</tr>
<tr>
<td>Aproach Prima alone at 6.8 floz R1 stage</td>
<td>15%</td>
<td>49.6%</td>
</tr>
<tr>
<td>Untreated</td>
<td>30%</td>
<td>86%</td>
</tr>
</tbody>
</table>

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

Trial SOH-14-699
Aproach 6 floz at V5 fb
A. Prima at R1 chemigated

So. Rust severity
40% at 28 dat

So. Rust Severity
86% at 28 DAT
## Corn Chemigation Trial
Camilla, Ga. 2014

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

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.

Trial SOH-14-699
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 (*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