

Integrated Management for Wheat Diseases

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Outline

- Concepts in Integrated Management for Wheat Diseases
- Diseases, What Diseases?
- Results from 2008 Fungicide Trials
- Useful Resources

Integrated Management for Foliar Fungicides

- Commit to scouting the field
- Determine the potential number of applications
- Know the disease reaction for the wheat variety planted
- Estimate crop yield potential
- Know the disease(s)
- Scout fields
- Determine disease levels
- Select fungicide
- Understand the risks



Scouting

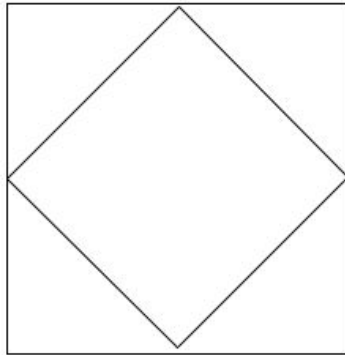
- Identify the **growth stage**
- The **flag leaf** and its **importance**
- **Scout** the **entire field** and make assessments from **different locations**
- Identify current **diseases** and **severity** levels



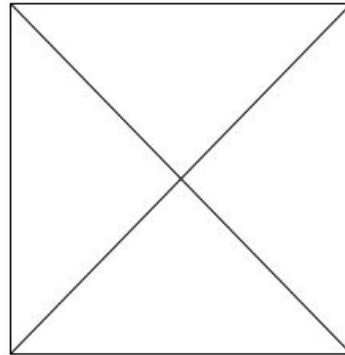
Growth Stages

- Feekes Scale:
 - F5/6 = Stem elongation into jointing
 - F7 = Formation of two nodes
 - F8 = Flag leaf appearance
 - F9 = Early boot stage
 - F10.5 = Heading complete
 - F10.5.1 = Beginning of flowering

Scouting the Field

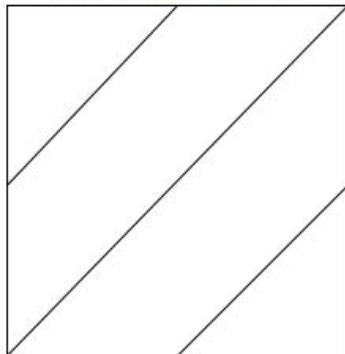


Diamond-shaped

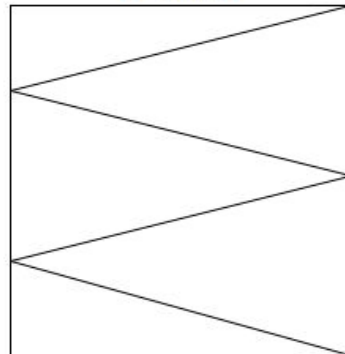


X-shaped

Triple diagonal-shaped



W-shaped



- Scout 10 locations within field
- Examine 10 plants selected at random from each of the locations
- Assess disease presence/absence (**incidence**) and how much area is infected (**severity**)





The Flag Leaf

- Fungicide applications are based on the risk of disease on the flag leaf
- Flag leaf becomes visible during Feekes 8
- Most important leaf for yield, accounting for upwards of 50% or more of final yield
- Disease on this leaf at scouting may indicate it is too late for a fungicide to reduce the effects of disease - scout early!



Changes in A3646

- **TABLE 5-5**

- Added category for control of Fusarium head blight
- Added section called “Remarks”
- Products added:
 - Bumper 41.8 EC (propioconazole), FRAC 3
 - Caramba (metconazole), FRAC 3
 - Folicur 3.6 F (tebuconazole), FRAC 3
 - Proline 480 SC (prothioconazole), FRAC 3
 - Prosaro 421 SC (propiconazole + tebuconazole), FRAC 3,11

Diseases, What Diseases?

- Disease occurrence varies over the spring into summer...
- Some examples:
 - Feekes 8 = Powdery mildew and Septoria leaf blotch
 - Feekes 9-10 = Rusts
 - Feekes 10.5.1 and later = Fusarium head scab and Glume blotch



- **Powdery mildew**
(*Blumeria graminis*)
- Infection favored under cool (50-71°F), wet weather and high relative humidity
- Management includes: resistance, fungicide seed treatments, foliar fungicides, balanced fertility



- **Septoria leaf blotch**
(*Septoria tritici*)
- Infection favored by cool conditions (59-68°F), leaf wetness (minimum of 6 hours)
- Management includes: certified disease-free seed and seed fungicides, rotation, foliar fungicides





- Wheat stripe, leaf, and stem rust
- Conditions vary for infection
 - Temperature: Stripe < Leaf < Stem
 - All require leaf wetness and/or high humidity
- Management focuses on resistance, foliar fungicides, and balanced fertility



- **Fusarium head scab (blight) (*Fusarium graminearum*)**
- Infection favored by warm temperatures (65-85°F) and prolonged periods of rain (dew) and high relative humidity
- Management includes rotation, fungicide sprays



- **Glume blotch (*Stagonospora nodorum*)**
- Infection favored by warmer temperatures (68-81°F) and leaf wetness from 6 to 16 hours
- Management includes certified disease-free seed and seed fungicides, rotation, foliar fungicides





Results from the 2008 Fungicide Trials



Variety x Timing

- Varieties: Kaskaskia and P 25R47
- Fungicides:
 - Quilt, 13 oz/A @ F7
 - Quilt, 7 oz/A @ F7 fb Quilt, 13 oz/A @ F8
 - Quilt, 14 oz/A @ F8
 - Quilt, 14 oz/A @ F10.5
 - Proline, 5 oz/A @ F10.51
- Disease assessments were made twice:
 - 17 May (plot measure)
 - 23 June (10 stems per plot)

Arlington

- Varieties were different ($P = 0.01$, $LSD = 6.7$)
 - Kaskaskia, 80.0 bu/A
 - P 25R47, 96.4 bu/A
- Effect of fungicides significant ($P = 0.019$, $LSD = 4.9$)

UTC	87.2 bu/A
Quilt, 13 oz/A, F7	87.0 bu/A
Quilt, 7 oz/A @ F7 fb 13 oz/A @ F8	89.3 bu/A
Quilt, 14 oz/A @ F8	87.5 bu/A
Quilt, 14 oz/A @ F10.5	83.4 bu/A
Proline, 5 oz/A @ F10.51	94.6 bu/A

- No interaction between varieties and fungicides
- Primary disease issue...Fusarium head blight

West Madison

- Varieties were different ($P < 0.10$, LSD = 7.9)
 - Kaskaskia, 103.6 bu/A
 - P 25R47, 118.8 bu/A
- No differences among fungicide treatments
- No interaction between variety and fungicides
- Why no response?

Efficacy Trial

- Variety: Kaskaskia
- Fungicides: 15 (including experimentals)
 - Applications were either at F9 or a combination application of F5/6 fb F9
- Disease assessments were made on:
 - 1 May, 20 May and 31 May (plot estimate)
 - 24 June (10 stems per plot)

Summary of Results

- Yield ranged from 86.7 to 98.6 bu/A
- The following treatments had yields higher than the untreated check ($P < 0.003$, LSD = 6.2)
 - Headline @ F9, + 7.2 bu/A
 - Quilt @ F9, + 10.2 bu/A
- Early (F5/6) + Late (F9) applications, while higher than untreated check, were not different from single application @ F9



2008 Fungicide Summary

- Results from the 2008 trials indicated that yield differences were influenced by:
 - Variety
 - Fungicide product
 - Application timing
 - Disease pressure

Useful Resources

- “The Soy Report”
- Field Crops Plant Pathology Website
- Coolbean.info
- Cereal Rust Laboratory
- Fusarium Head Blight Prediction Center

<http://thesoyreport.blogspot.com>



<http://www.uwex.edu/ces/croppathology>



<http://coolbean.info>



Phone: 608-890-1999
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<http://www.ars.usda.gov/mwa/cdl>

Cereal Disease Laboratory : Home

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Cereal Rust Situation Reports and Cereal Rust Bulletins

[Reports on the Current Rust Situation in the U.S. \(from the Cereal Rust Survey Listserv list*\)](#)

2008 Cereal Rust Bulletins:

- [Bulletin #1](#) (3/25/2008)
- [Bulletin #2](#) (4/8/2008)
- [Bulletin #3](#) (4/23/2008)
- [Bulletin #4](#) (5/6/2008)
- [Bulletin #5](#) (5/21/2008)
- [Bulletin #6](#) (6/4/2008)
- [Bulletin #7](#) (6/18/2008)
- [Bulletin #8](#) (7/2/2008)
- [Bulletin #9](#) (7/16/2008)
- [Bulletin #10](#) Final Bulletin for 2008 (8/14/2008)

Stem rust observation maps

(maps are updated as observations are received)
Please be aware these are large files.

2008

- [Wheat](#) (updated 10/31/08)
- [Oat](#) (updated 8/26/08)

2007

- [Wheat](#) (updated 7/30/07)
- [Oat](#) (updated 7/30/07)

2006

- [Wheat](#)
- [Oat](#)

Archived Cereal Rust Bulletins

- [2007](#)
- [2006](#)
- [2005](#)
- [2004](#)
- [2003](#)
- [2002](#)
- [2001](#)

Puccinia Pathway



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<http://www.wheatcab.psu.edu>



- Home
- Key items to obtain a prediction
- Model details
- Disease information
- Risk map tool

prediction center

prediction center Wheat Fusarium Head Blight



Wheat spikes with symptoms of Fusarium head blight

Fusarium head blight or head scab is caused by the fungus *Fusarium graminearum*. The disease causes tremendous losses by reducing grain yield and quality in many wheat production regions east of the Rocky Mountains.

The goal of this experimental predictive system is to help growers assess the risk of Fusarium head blight in their region. Major outbreaks of Fusarium head blight are associated with specific weather patterns prior flowering of the wheat crop. Researchers at Penn State University, Ohio State University, Kansas State University, Purdue University, North Dakota State University, and South Dakota State University have worked together to develop models that predict the risk of a major epidemic (greater than 10% field severity) based on observed weather patterns.

You can customize the forecast for your region and production practices by clicking on the wheat scab "[tool](#)" from the menu above.

[Comments/Questions?](#)

Acknowledgements

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- Industry Support

- Photo Credits: C. Grau and P. Esker (UW-Plant Pathology)

Winter Wheat Workshops 2009

- March 5: Janesville, WI
 - Local Host: Jim Stute
- March 6: Fond du Lac, WI
 - Local Host: Mike Rankin
- March 12: Sheboygan, WI
 - Local Host: Mike Ballweg
- Speakers include: Paul Esker (Plant Pathology), Shawn Conley (Agronomy), Eileen Cullen (Entomology)
- Topics: Growth stage wheat, nitrogen and herbicide management, disease diagnostics and seed treatment fungicides, insect diagnostics
- More information to follow and CCA credit is being requested
- Questions: Contact Paul @ (608) 890-1999 or pde@plantpath.wisc.edu