


# Fungicide Efficacy: Wheat Stem Rust



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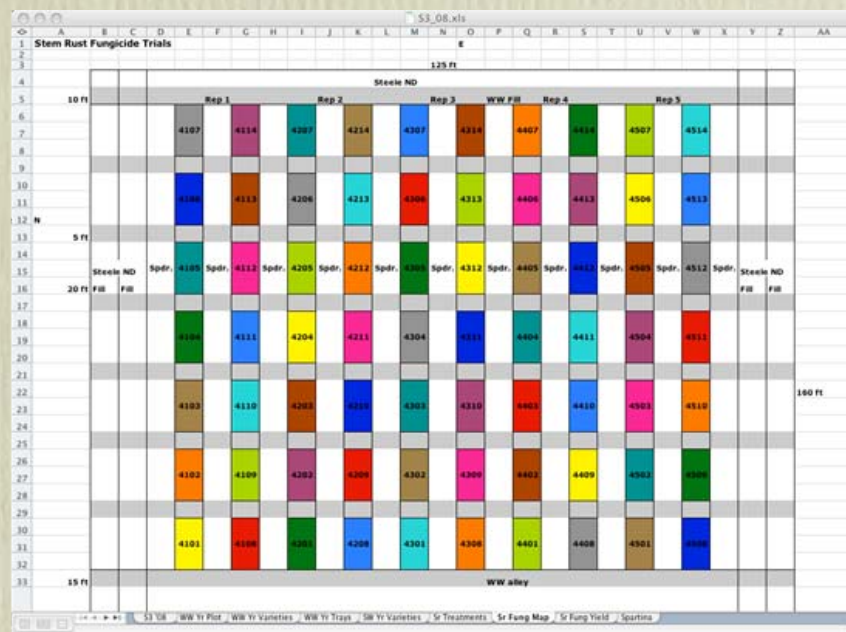
# Wheat Stem Rust

- *Puccinia graminis* f.sp. *tritici*
- Hosts: wheat, barley, other grasses.
- Minor losses for many years: barberry eradication and multiple resistance genes.
- Historical losses in US: Northern Great Plains.

# Field Study Methods

- Conducted in 2008, planted for 2009. SDSU Plant Path. Farm - Brookings, SD.
- Spring wheat variety 'Baart' (highly S to *Pgt*).
- Six fungicides / flat-fan vs. twin-jet nozzles.

Treatment	Rate
Control	N/A
Dithane	2 lbs/A
Folicur	4 oz/A
Headline	9 oz/A
Prosaro	8 oz/A
Quilt	10 oz/A
Tilt	4 oz/A



# Field Study Methods

- Natural inoculum (found in another nursery).
- Collected urediniospores and inoculated spreaders ~10 days before fungicide application.



# Field Study Methods cont.

- Applied fungicides at Feekes 10.5 using CO<sub>2</sub>-backpack sprayer, 20 gal/A.
- Inoculated 'Baart' 48 hours after application.
- Nursery was lightly misted at night for 10 days.



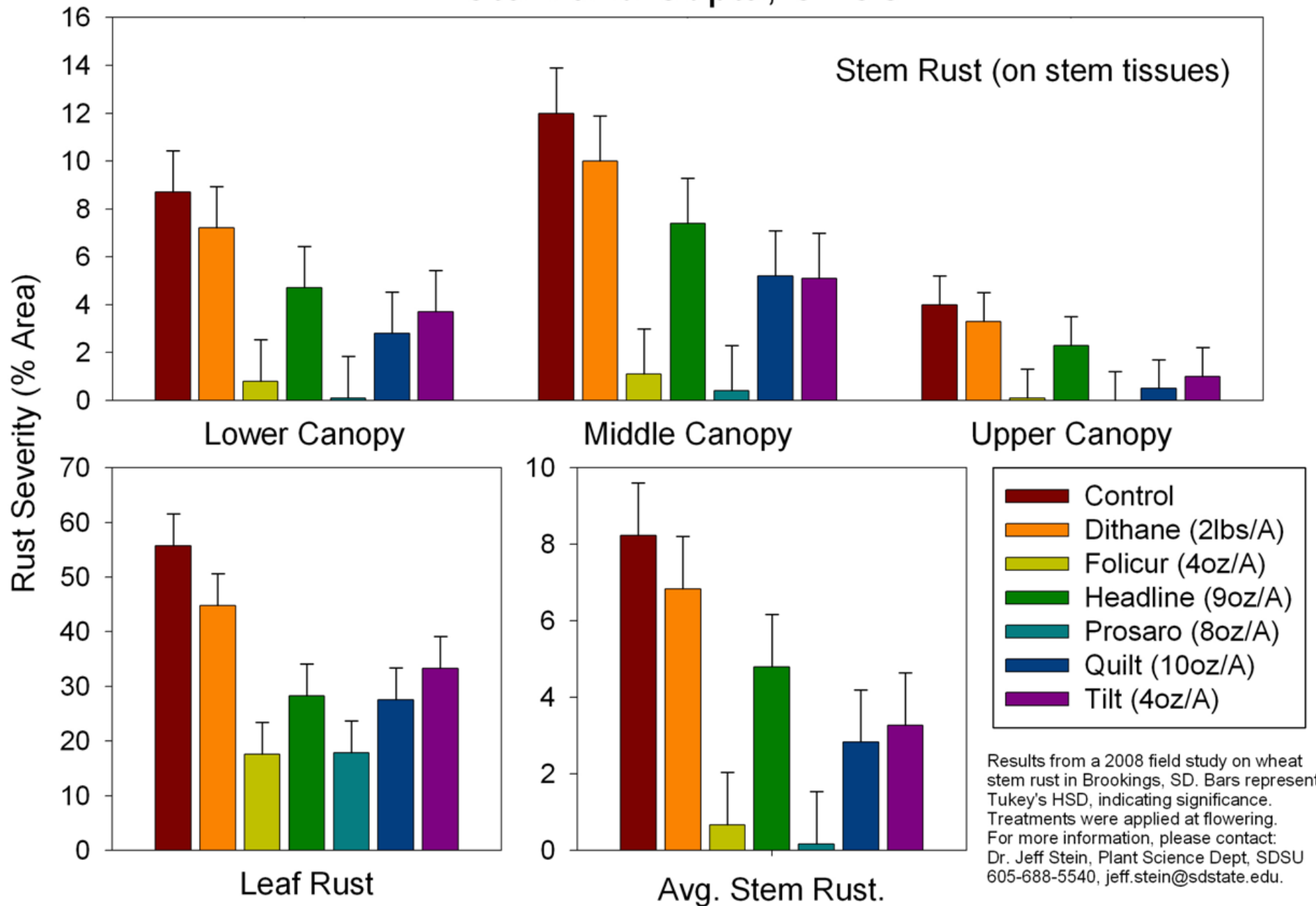
# Field Study Methods cont.

- Plots rated for leaf and stem rust at 14 days after inoculation: severity on lower, middle, and upper canopy tissues.
- Plots harvested: yield, test weight, etc.



# Wheat Stem Rust Fungicide Trial Results (2008)

## Stein and Gupta, SDSU.



# Field Study Summary

- The modern products tested significantly reduced symptoms - triazoles were best.
- Nozzle type did not matter in this study. Note: not typical application speeds.
- Yield was very low for all treatments: heavy leaf rust early, late planting date, etc. Significantly higher for all modern fungicides (i.e. all but Dithane).
- Concerns: strobilurins & FHB/DON issue -> only one class of fungicides for use (tolerance).



# Current Field Study

- Three states are participating: SD, MT (M. Burrows), IN (K. Wise). Small study in KS.
- Near complete list of products (12). Everything tested at 2+ locations.
  - Triazole: Alto, Caramba, Folicur, Proline, Prosaro, and Tilt.
  - Strobilurin: Headline and Gem.
  - Dual-MOA: Quilt, Stratego & Stratego Pro, and Twinline.

# Acknowledgements

- People: Vivek Gupta (Ph.D. student) and Chris Nelson (Ag. Res. Manager).
- Funding: USDA-CSREES (Critical Issues), SD Wheat Commission, SD. Ag. Exp. Station.

Thank You.

Questions?

# Other Projects

- “Poison plate” assay to determine impact of fungicides on urediniospore germination:  
strobilurins (<0.01 ppm) >> 2nd generation triazoles (2-4 ppm) > 1st generation triazoles (~15ppm).
- Infection model (temperature \* RH) for use in risk advisory systems.
- Working with breeders on developing resistant germplasm (parents).