FHB Management: Progress and Potential Knowledge Gaps

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Establishing a Vision for the Future of FHB Management

- What is the goal of FHB Management?
- How are management recommendations developed?
- What progress have we made?
- How do we move forward?

What is the Goal of FHB Management?

- Safe and affordable food supply

How Are Management Recommendations Developed?

- Primary factors that influence management recommendations
  - Understanding of epidemiology
  - Available technology

Historical Perspectives on Fusarium Epidemiology

- High levels of genetic resistance unavailable, but some differences in susceptibility
- Fungus known to survive in debris of many cultivated and wild grasses
- Wheat is most vulnerable to infection at anthesis
- Weather during anthesis critical for disease development

Historical Management Recommendations

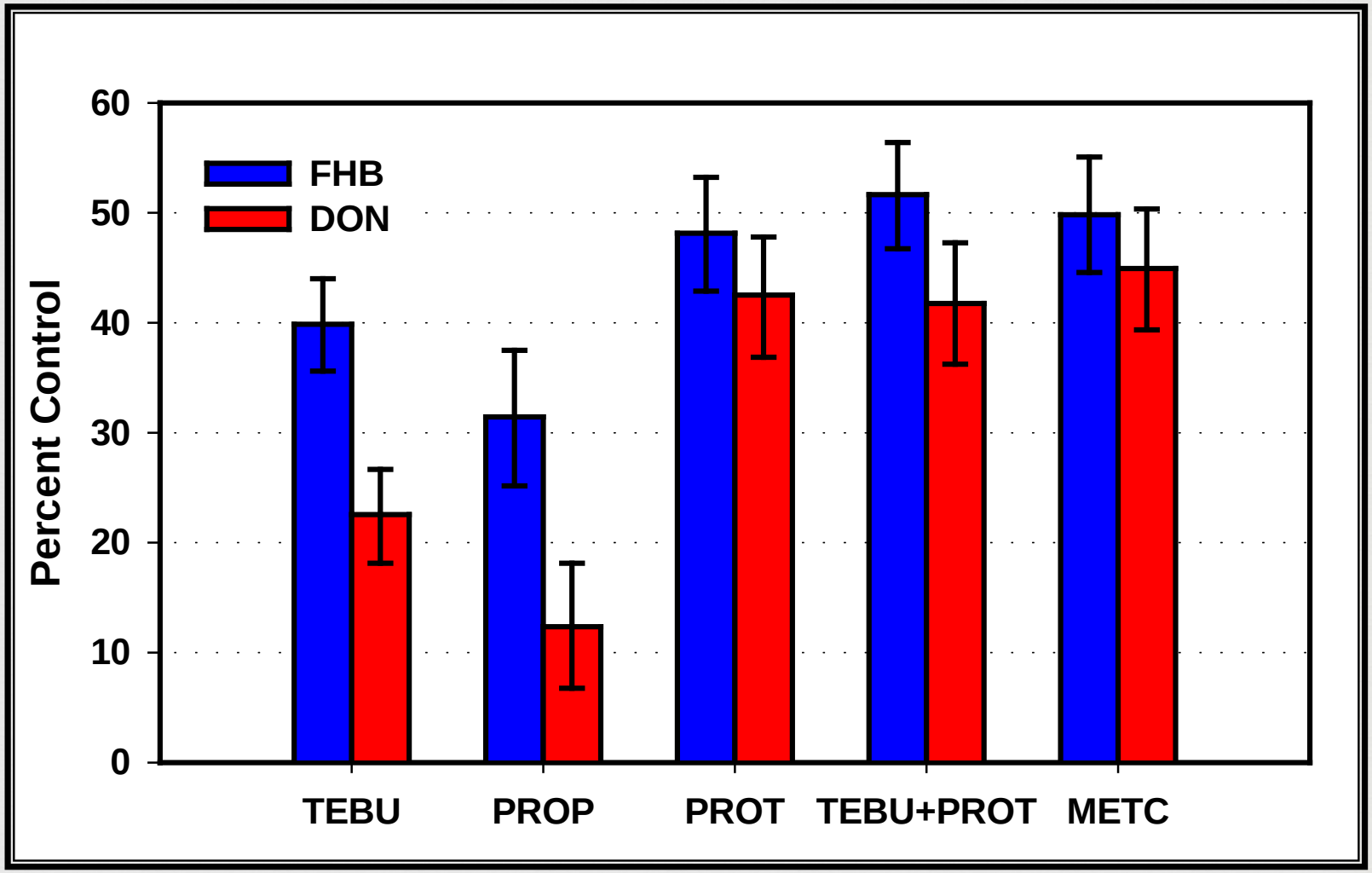
- Avoid highly susceptible varieties
- Use crop residue management and rotation to reduce the risk of disease
- Fungicides not a strong option
  - Low levels of efficacy (propiconazole)
  - Labels prohibited application after flag leaf emergence

What Progress Have We Made?

Progress: Fungicides

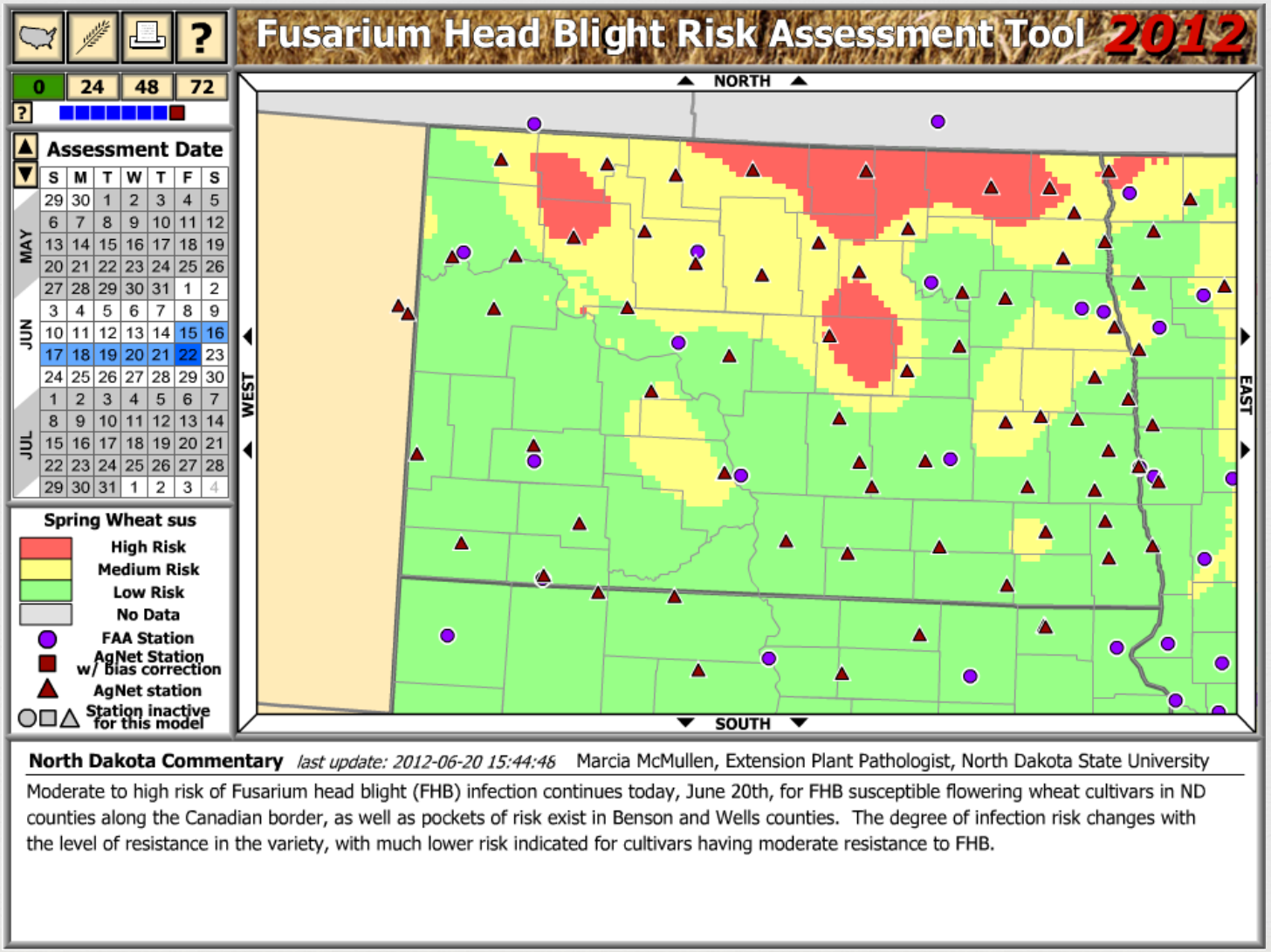
- Identifying more efficacious fungicide options
  - Tebuconazole, Prothiconazole, Metaconazole
- Confirmation of early anthesis as a good time to apply the fungicide
- Advances in application technology

Management with Fungicides



Paul, P. A. et al. Phytopathology 98: 999-1011.

Disease Forecasting and FHB Alerts



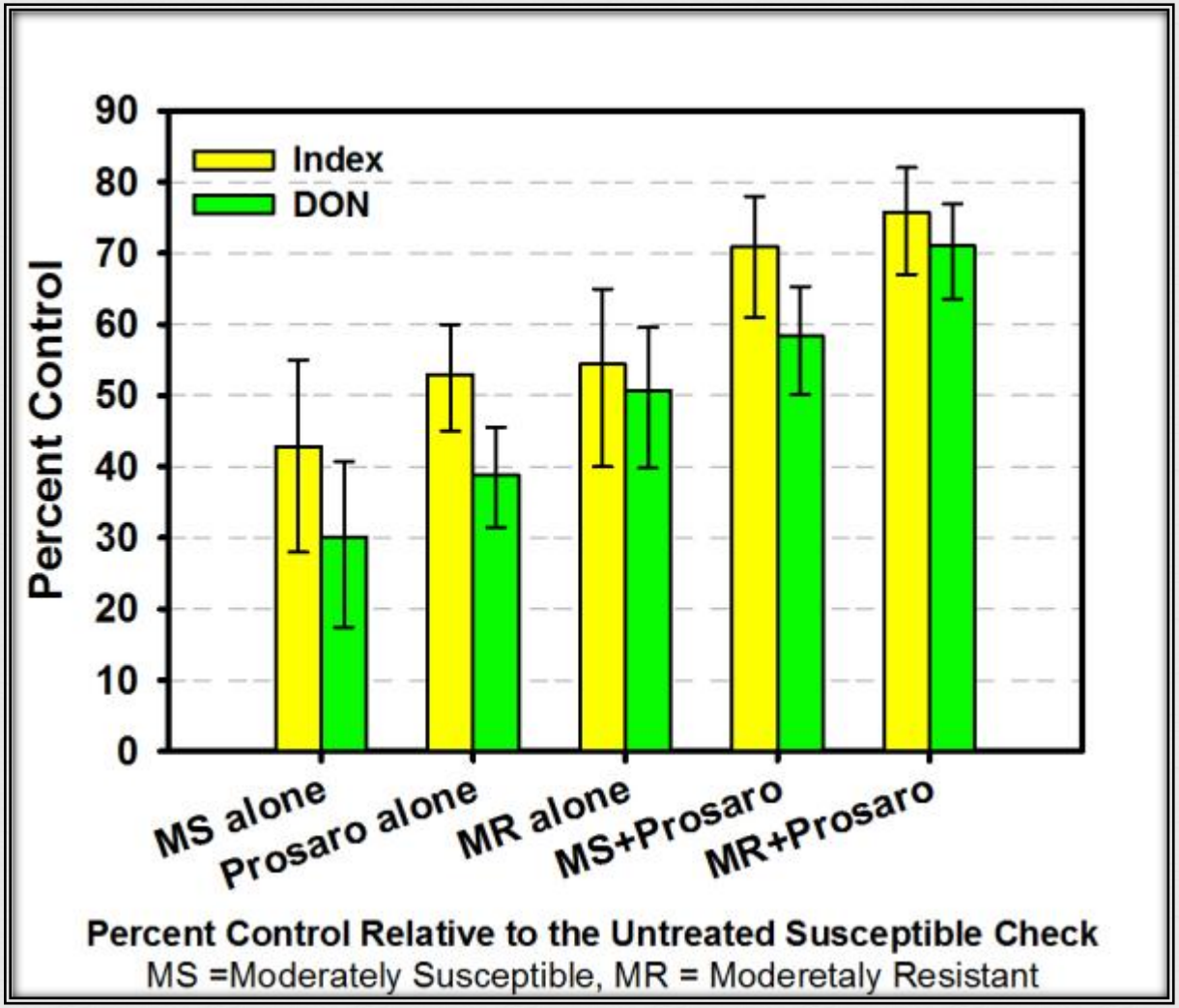
Progress: Genetic Resistance

- Screening: Better descriptions of variety reactions FHB and DON
- Breeding: Moderate levels of resistance available in many market classes wheat and barley
- Demand: Continued desire for high yielding varieties with FHB resistance and other desirable traits

Integrated Management

- Critical concepts with integrate management:
  - No single management option provides a high level of control
  - Combine best available resistance with best available fungicides

Integrated Management



FHB MGNT CP 2007-2010, >40 trials for 12 states

Willyerd et al. Plant Disease 96:957-967

Stability of Management

Is the treatment better than the Check?

Ranking scale

5: Always
4: Almost always
3: More often than not
2: Sometimes
1: Never

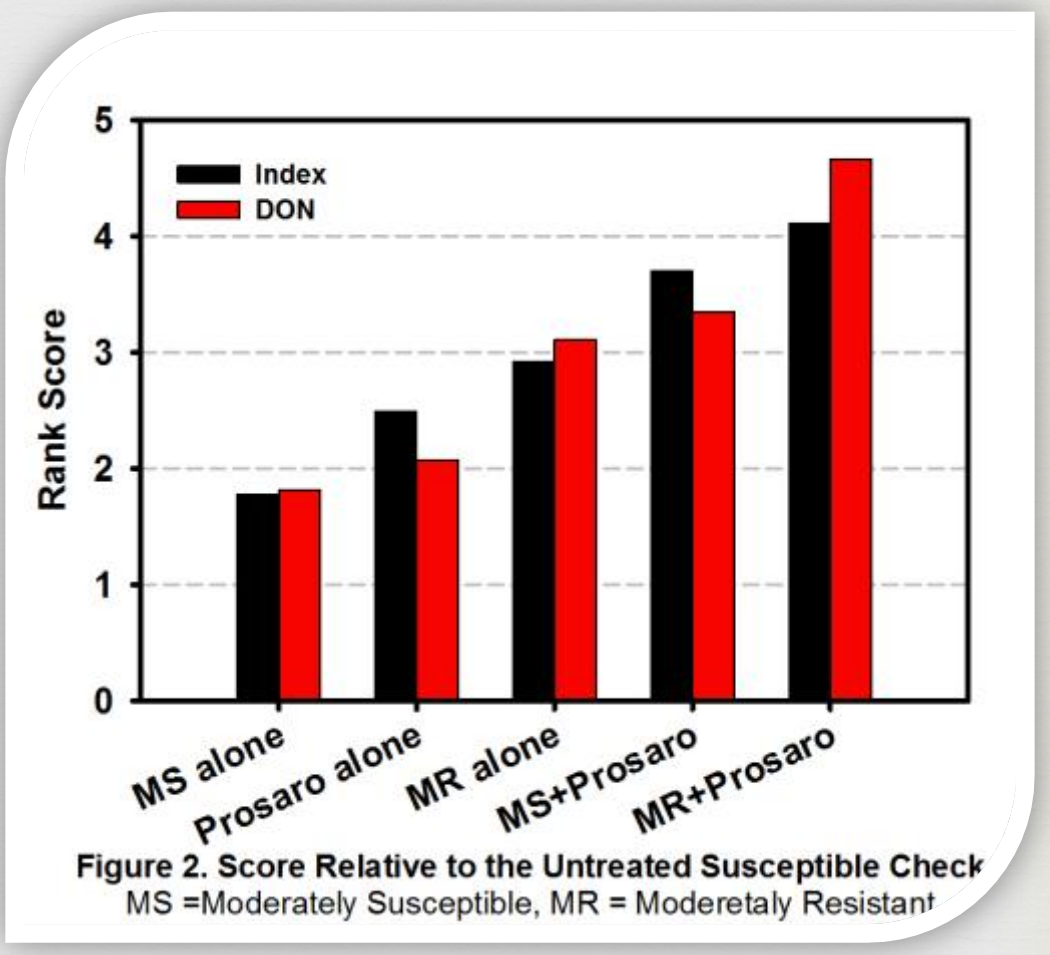


Figure 2. Score Relative to the Untreated Susceptible Check
MS =Moderately Susceptible, MR = Moderetaly Resistant

FHB MGNT CP 2007-2010

Willyerd et al. Plant Disease 96:957-967

Potential Knowledge Gaps

- Are the current fungicide recommendation meeting the needs of producers?
- Is the information about genetic resistance readily available, user-friendly, and timely?
- Is there a potential for fungicide resistance in the Fusarium population?
- How can we better influence people to better use the available technologies?

How Do We Move Forward?

- Leveraging current information and future research to address knowledge gaps
- Identify ways to better communicate research-based information

Research and Extension Needs

- More robust fungicide recommendations
  - Better define the window for application to provide more flexibility
  - Better address the influence of adverse weather conditions
  - Expand communication efforts related to forecasting and FHB Alerts
- Better organize and promote the information about varieties

Research and Extension Needs

- Better organize and promote the information about varieties
- ScabSmart website

What is the Goal of FHB Management?

- Safe and affordable food supply

Questions?

Progress: Crop Residues

- Confirmed that debris from corn and other grass crops are sources of inoculum
- Inoculum can move considerable distances
- Combination of local and regional inoculum sources are important