FHB Management in Spring Grains

Lessons Learned, Successes, Future Needs

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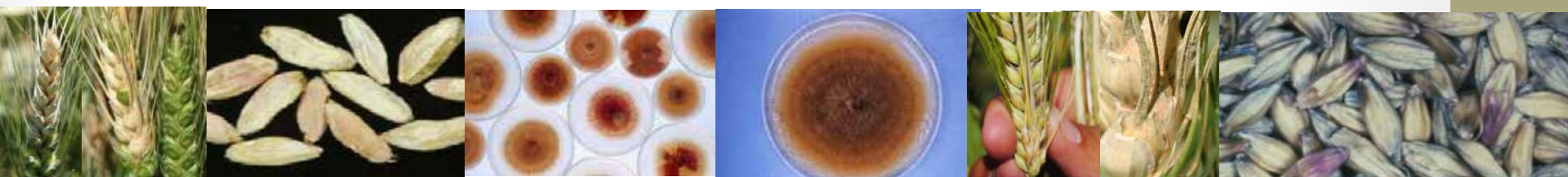
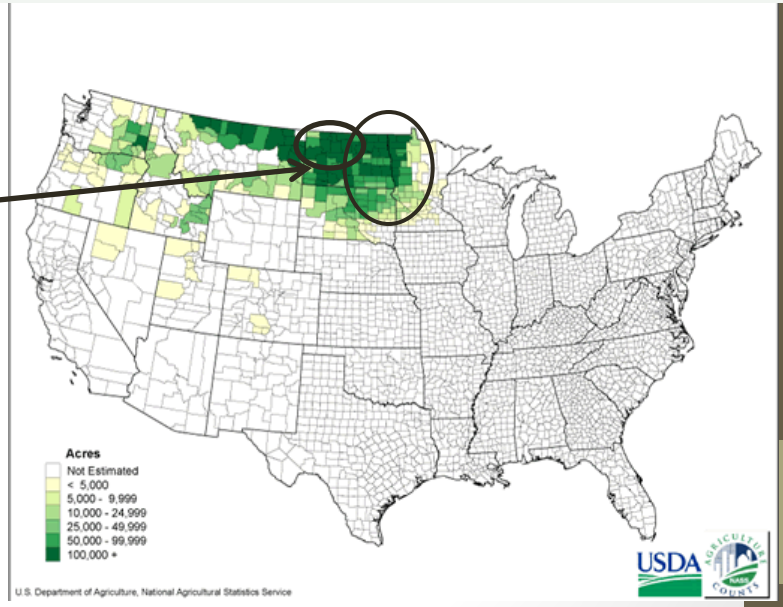


Spring Grain Region Generally Impacted by FHB

hard red spring wheat, durum wheat, spring barley,)

~ 10 million acres potentially impacted



1993 Regional Headlines after FHB Epidemic

Diseases ravage wheat

Grain/ Wheat scab is forcing farmers to abandon crops

Valley grain diseased

To harvest or destroy crops? Disasters force tough choices on farms

Vomitoxin rears its ugly head

Wheat scab shocks Valley

- Disease is widespread, elevators expect discounts

THE LONG, WET SUMMER

A blight on the land

Crop disease, flood damage will be felt in the N.D. economy

- Lawmakers seek compensation to farmers for diseased wheat

Crop scouts think harvests will be smaller than expected

WHEAT WOOZIES

Farmers panic

Fields of disappointment

Early Lessons Learned

- Huge crisis on most important crops definitely **increases interest of** producers to find answers, use management options
- Immediate response to crisis is necessary
- Strong research/extension infrastructure enables effective response
- All impacted communities must be brought together
- Must have shared planning, shared results

Rapid Dissemination of Information

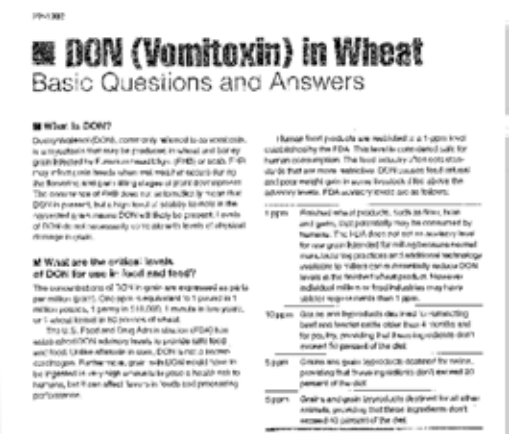
* Phone calls
* News releases
* Radio

TV

Meetings with commodity groups, producers

Field visits

Fact sheets



DON (Vomitoxin) in Wheat

Basic Questions and Answers

1993 Networks in Place

- Wheat extremely important in ND, SD, MN, MB
- All 3 US states had good county and regional extension networks and state small grain specialists
- Excellent relations among commodity and grower groups, agencies and Land Grant Universities

THE PROCEEDINGS OF THE 1993 REGIONAL SCAB FORUM

NOVEMBER 3, 1993 • MOORHEAD, MINNESOTA

Proceedings prepared by
MN Wheat Research &
Promotion Council

Communities That Joined Forces

- **Regional Forums:** 1993 – 1996 (MN, ND, SD and Manitoba)
- **Groups represented**:
  - Growers
  - Commodity Groups
  - University, USDA and Private Company Scientists
  - Crop Protection Industry
  - Private and State Seed Labs
  - Millers
  - FDA
  - Elevators
  - Fed. Grain Inspection Service

Purpose of Forum: Initiate communications in order to facilitate understanding and coordination of research activities associated with Scab & DON.

Goals:

1. Highlight current national, international research
2. Identify research needs
3. Prioritize, coordinate future research
4. Discuss possible funding options

Sponsors:

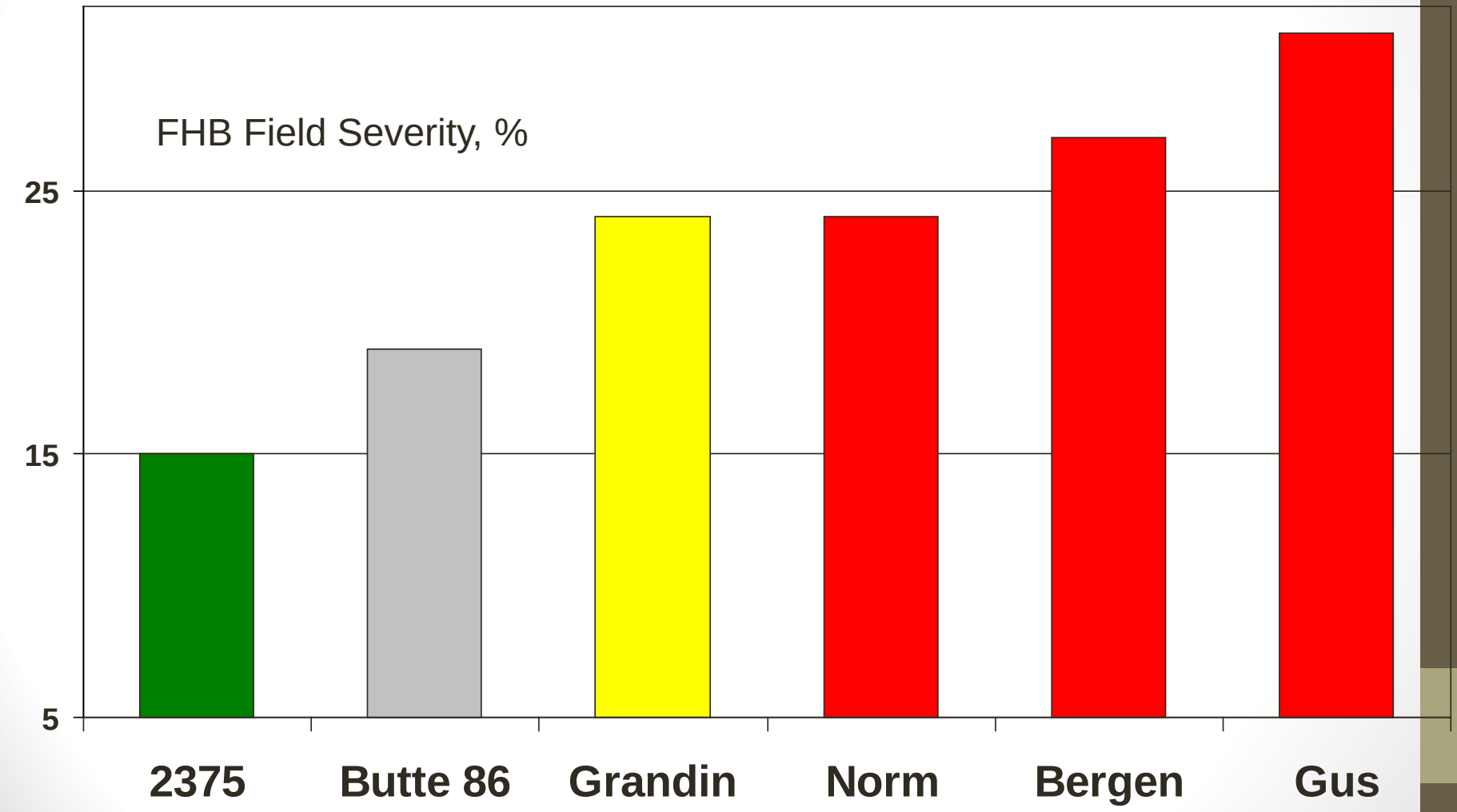
MN Wheat Research & Promotion Council; SD Wheat Commission; ND Grain Growers Assoc.; MN Barley Research & Promotion Council

Topics Discussed - 1993 Forum

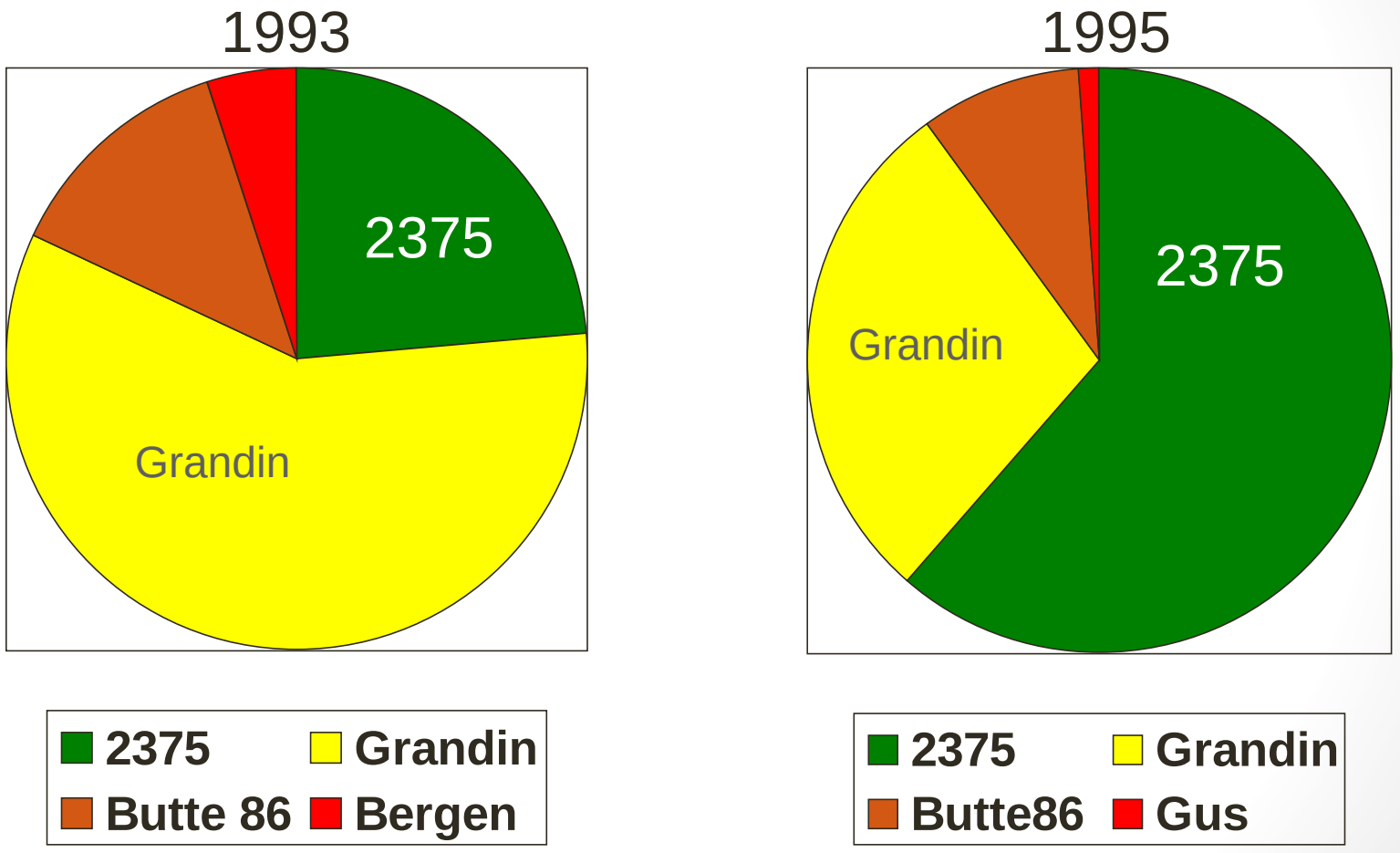
Historical overview
Biology of disease
Breeding Programs - MN, ND, SD, AgriPro
Management

Testing Procedures for DON
Milling Research and Baking Information
Livestock Feeding
Detoxification
FDA Research and Information

1993 NDSU Spring Wheat Variety Scab Assessment: 5 sites

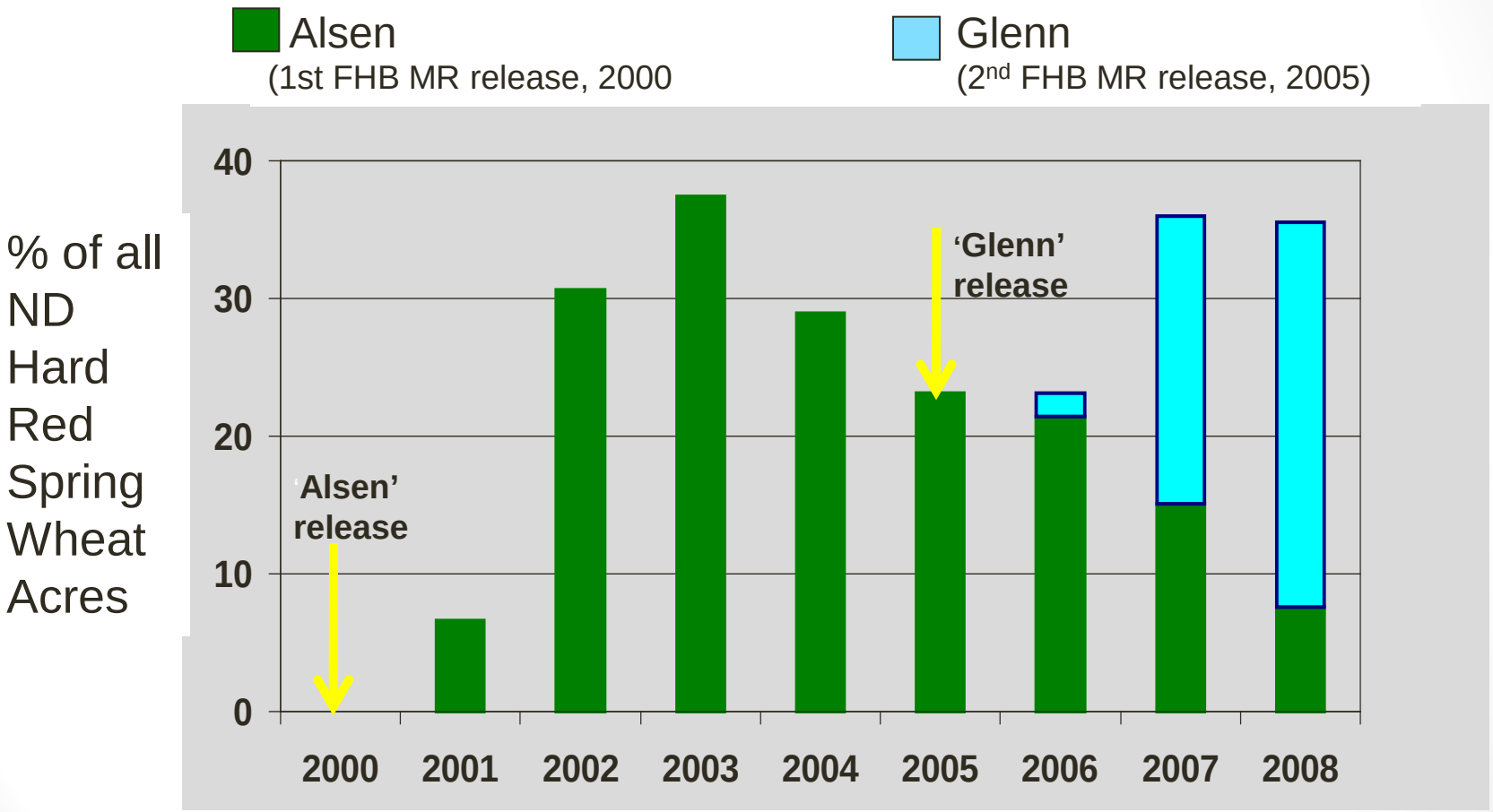


ND Adoption of Best Variety Available: Acreage, NE District: 1993 vs 1995



Variety Development In ND*

FHB MR Hard Red Spring Wheat Cultivars



*FHB resistance breeding and disease screening efforts supported by funding from US Wheat Barley Scab Initiative

Fungicides

- Benomyl (Benlate) and Mancozebs: only registered products available that could be applied at flowering
- Expensive: relative to wheat price at time and generally had to be applied 2x
- Discontent with their use:
  - sparked multi-state effort in region to evaluate fungicides

Fungicide Testing

- ’94-’97: Multi-state projects to identify most effective fungicides
- 1995: ND, SD, MN request Sec. 18 for Tilt to be applied at flowering
- 1996: Europeans identify tebuconazole (Folicur) as an effective product
- 1997: ND and MN requested Crisis Exemption for Folicur

Working Together, Sharing Results: Breeding Nurseries, Fungicide Trials

Establishment of USWBSI

- By 1997, evident that disease wasn't re-occurring in one region or grain class (large outbreaks in soft red winter wheat, as well as another severe outbreak in our region)
- Sustained funding for research on FHB was difficult to obtain

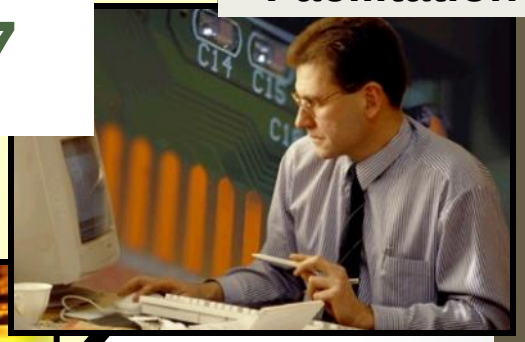
Spring Grain Region Became Integrally Part of USWBSI - 1997

Epidemiology & Crop Management

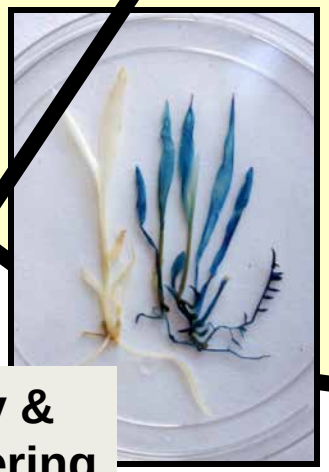
Fungicide Technology

Germplasm Acquisition & Evaluation

Networking & Facilitation



Food Safety & Toxicology



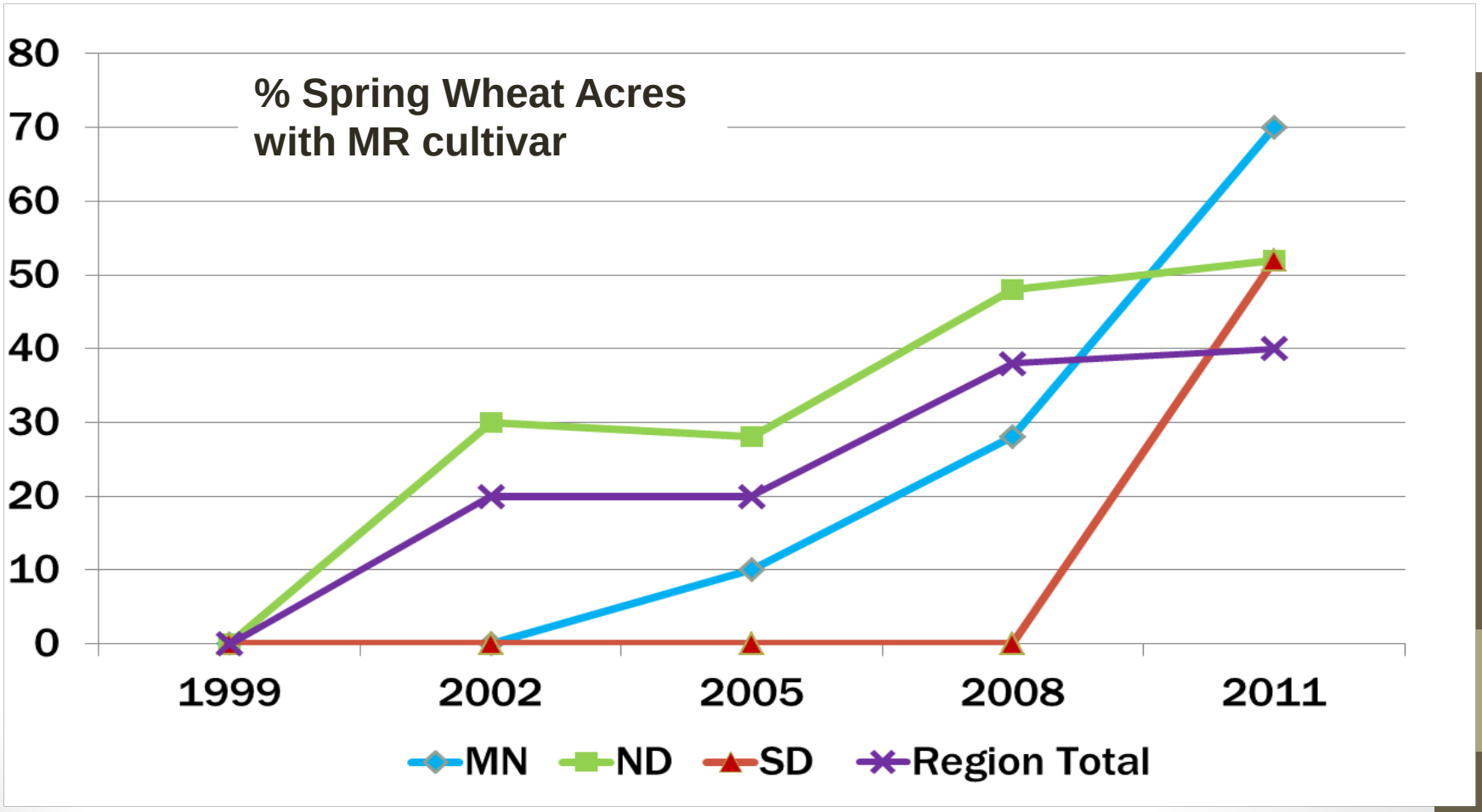
Biotechnology & Genetic Engineering

Current Spring Grain Successes

- Continued variety improvement, sharing of nursery results, germplasm
- Grower adoption of varieties
- Grower adoption of fungicides and recommended application techniques
- Adoption of US FHB forecasting model
- Development of MN, ND and SD forecasting web interfaces
- Use of Scab Smart, FHB Alerts

Continued Good Adoption of MR Varieties

% Wheat Acres In Northern Great Plains Seeded to Cultivars with MR Rating For FHB *(from J. Anderson, K. Glover, and M. Mergoum, 2011 USWBSI Scab Forum Proc.)*



Information on Varieties Grown

- Data collected by State Ag. Statistics Reporting Service
  (ex. ND field office of USDA National Ag. Stats. Ser.)

- Funding from Commodity Groups and State Experiment Stations
  (ex: ND Wheat Commission and NDSU Ag. Exp. Station)

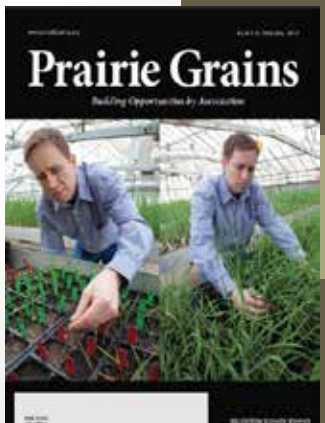
Why Adoption of MR Varieties?

- MR Varieties grown today have good quality and yield
- Small Grains, and especially wheat classes, are extremely important to all 3 state's economies

Why Adoption of MR Varieties?

- For the 10 million+ acres -
- ~ 60 unique, named varieties available/yr
- Of these, ~10-12 varieties grown on 80% of acres
- Disease response stated in consistent manner in variety trial bulletins, Scab Smart

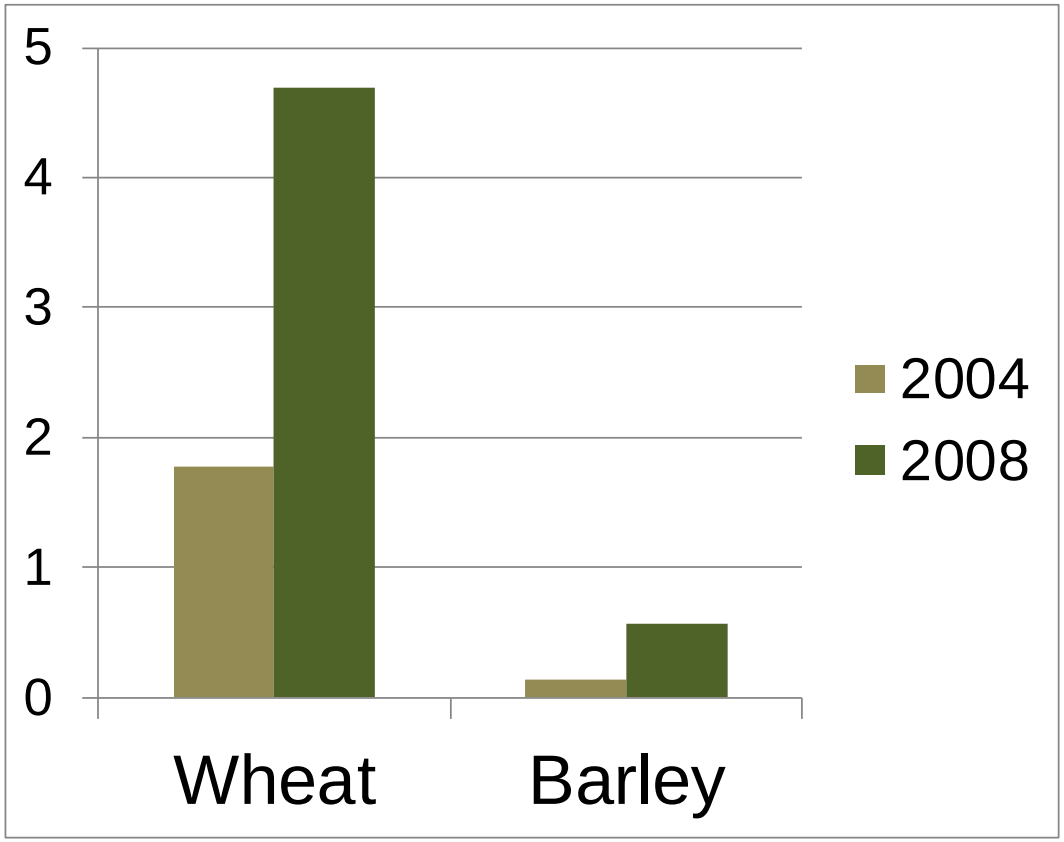
In addition to each state's extension bulletins, *Prairie Grains* magazine (sponsored by 3 state's commodity groups) publishes all the state variety trial ratings and yields each year



Why Adoption of Fungicides?

- Multiple trials over multiple locations & years showed economic results in most years
- Growers duplicated results on-farm
- Repeated epidemics or outbreaks made growers quick to adopt successful strategies

Million Acres Treated with Foliar Fungicide Products - ND



- More than doubled in 4 years;
- Increases likely due to:
  - **Wetter year, more disease**
  - **Improved prices for commodities**
  - **Use of newer fungicides (Proline and Folicur available)**

Source: Pesticide Use Surveys based on 2004 and 2008 Growing seasons; New Survey being done on 2012 Season

Mr. Tim Brakke of Aneta, ND 2006

AGWEEK
MARKETS • NEWS • POLICY • PROGRAMS
VOLUME 21, NUMBER 35 / Monday, April 10, 2006 Newsstand price — $1

COVER STORY

Prepared for scab

▶ Tim Brakke of Aneta, N.D., says that for him the key to effective fungicide spraying is simply expecting to spray and planning early, rather than hoping he won't have to and scrambling at the end.

■It's better for growers to be ready to battle and not need to fight than to be caught unprepared

ANETA, N.D. — Some farmers plan not to spray for scab in wheat, and then scramble at the end.

Others, like Tim Brakke of Aneta, N.D., make scab fighting a central part of their small grain planning — everything from variety selection to budgeting.

While Brakke is loathe to say that his scab-fighting methods are somehow better than others, some of the experts hold the Aneta farmer up as an example of how it should be done.

"I always have the hope that I don't have to spray, but I always plan for it," Brakke (pronounced BROCK-ee) says.

Brakke happened to have friends who work for the advertising agency that represents Bayer CropScience, the maker of Folicur fungicide. For a stipend, the agency recently asked Brakke to talk to area ag journalists about how he plans for scab control.

Joel Ransom, a North Dakota State University extension cereals agronomist, was there, too, as well as Sheena Johnson, communications specialist for the

■ PREPARED: Page 30

▲ Farmer Tim Brakke (right) of Aneta, N.D., and hired men, including Eddie Vig (from left) and Rodney Frederick, say the spreading out varietal maturity dates for wheat as well as advance planning on fungicide spraying have helped make their scab fight more effective and manageable.

Stories and photos by Mikkel Pates, Agweek staff writer

Surprising shifts

■Region's growers to plant more soybeans, less wheat and corn

FARGO, N.D. — The U.S. Department of Agriculture's prospective plantings report shows that farmers are going for less corn and more soybeans and sugar beets in 2006.

The National Agricultural Statistics Service cautions that the March 1 survey data may not take into account weather and other conditions between now and planting. The actual plantings data is collected in June and reported June 9.

According to the report, U.S. spring wheat acreage will be down 1 percent from 2005; durum, down 34 percent — the lowest since 1961. Winter wheat plantings for 2006 are up 2 percent from 2005, unchanged from an earlier report.

Oat acres are expected 2 percent up from last year, while barley is pegged to be down 5 percent, the lowest on record.

■ REPORT: See Page 31

2010 Survey Results*, MN and ND Wheat Growers – Integrated Management of FHB

- Grow resistant varieties 81%
- Use good crop rotation 76%
- Apply recommended fungicide 68%
- Spray when weather FHB conducive 30%
- Spray when crop consultant says 10%

Most used an integrated approach of a combination of methods listed above

* Source: J. Ransom, G. McKee, M. McMullen, 2010 USWBSI Forum Proceedings

Future Needs

- Further delineation of best management strategies for each grain class as discussed at this meeting
- Clear and consistent message needed on variety response, fungicide use, etc.
- Simplify access to variety response info.
- Look at new ways to get information out
  - You tube videos
  - Advertise value of FHB Alerts
  - Social media

Future Needs

- Need to have to have interest and success in absence of crisis (how do you get people's attention?)
- Can't let weather, price, and crop acreage fluctuations be the driving factors in decisions – look long term
- Form alliances that address multiple farmer concerns – even in absence of FHB

Cartoon from Fargo Moorhead Forum Newspaper, 1991

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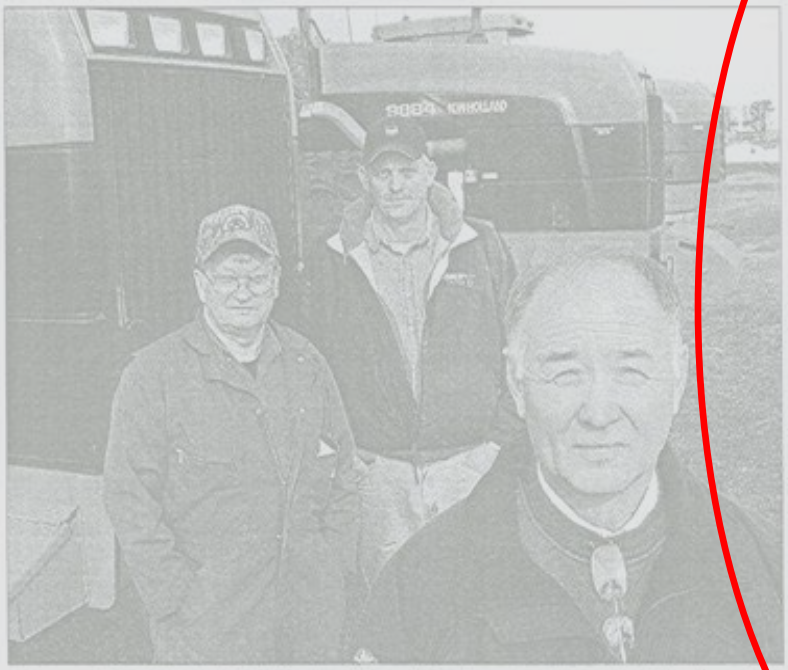

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Future Needs

- Form alliances that address multiple farmer concerns and foster continuous dialogue and trust
- Example: New Research Partnership just formed, Nov. 2012, Fergus Falls, MN
  Discussion among ND and MN commodity groups, farmers, consultants, research & extension, and administration

Partnerships for the Future

Prairie Ag Research Leadership Program

MN Wheat & MN Soybean Councils:

"Will allocate significant amounts of check-off dollars toward supporting partnerships among growers, researchers, educators and industry partners (to support small plot research and coordinated on-farm research)"

- Similar partnership dialogue in ND

Possible Outcome

Establish on-going communication and performance system on **multiple** crops at local level

Increases utilization of research results

Success of USWBSI model:
A Unified Effort to Fight an Enemy of Wheat and Barley: Fusarium Head Blight. Plant Disease 96:1712-1728.


Thank You!
Acknowledgements
Progress through cooperative efforts: Land Grant Universities, US Wheat and Barley Scab Initiative, ARS, Commodity Organizations, and Private Industry