Fungicides: What to Expect

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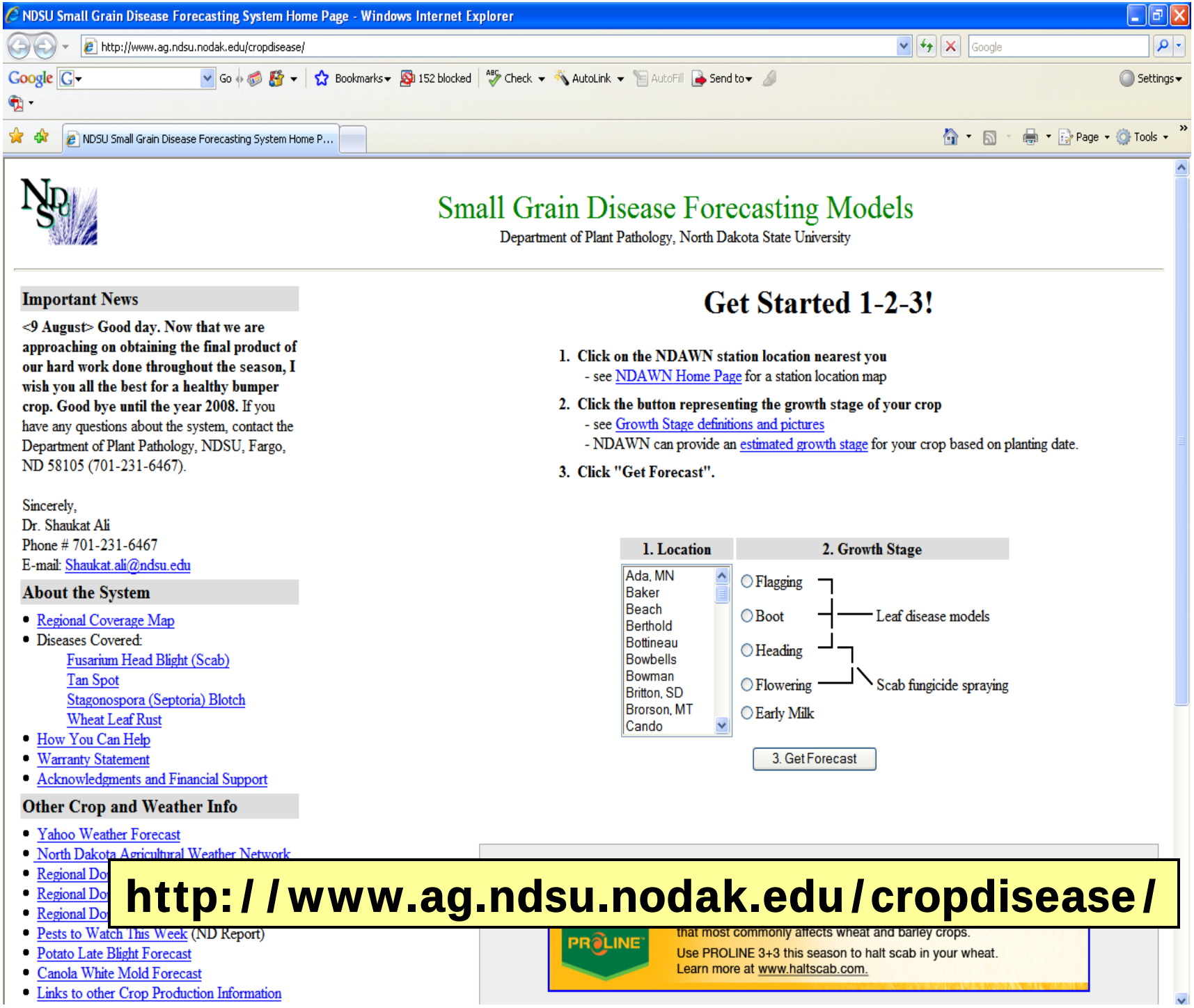
When do fungicides pay?

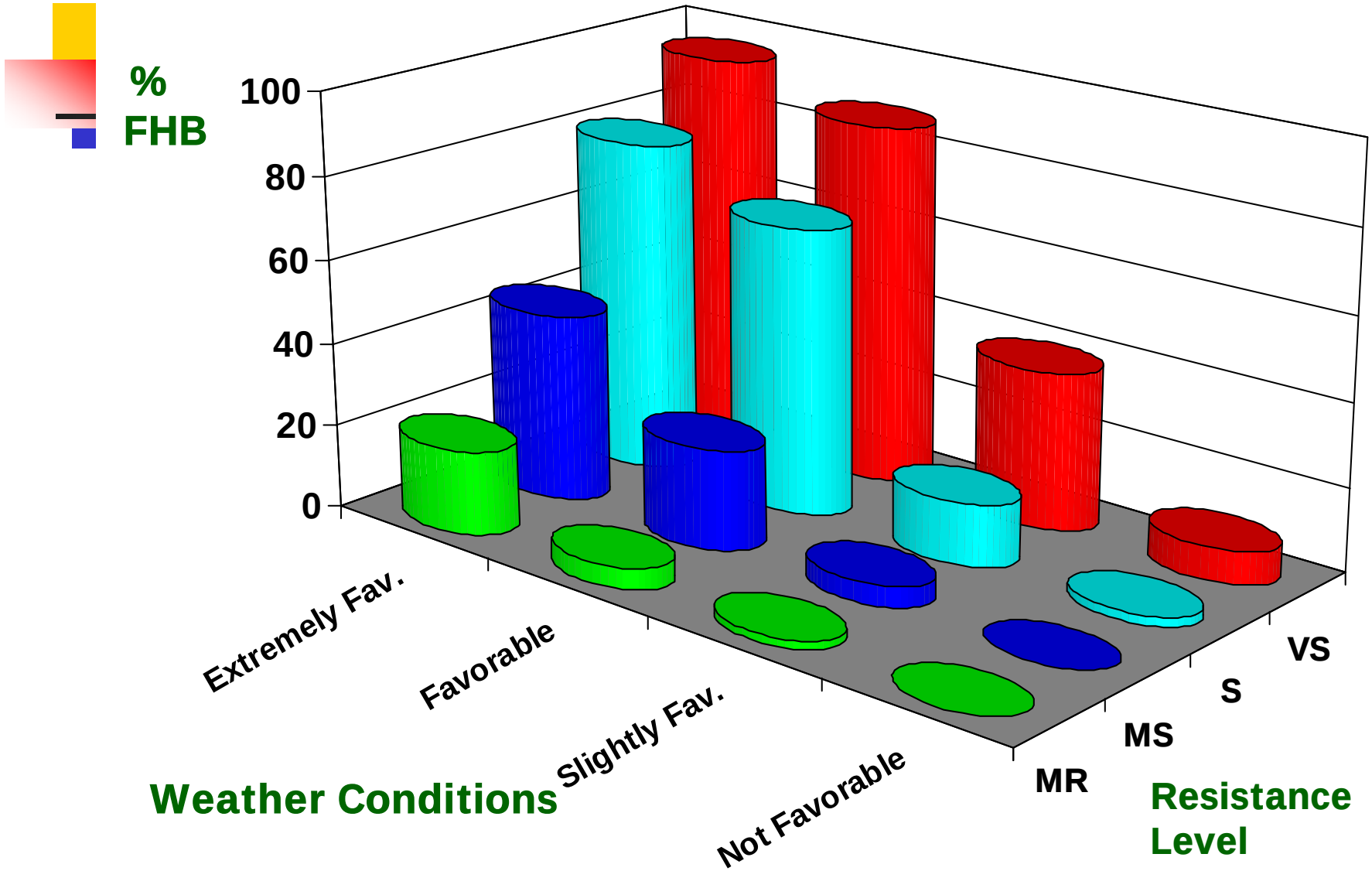
- Maintaining a high yield potential
- Need to be applied prior to the onset of disease
  - Once disease is present it’s to late
- Environmental conditions
  - Disease forecasting models


NDSU Small Grain Disease Forecasting System Home Page - Windows Internet Explorer
http://www.ag.ndsu.nodak.edu/cropdisease/
Small Grain Disease Forecasting Models
Department of Plant Pathology, North Dakota State University
Important News
<9 August> Good day. Now that we are approaching on obtaining the final product of our hard work done throughout the season, I wish you all the best for a healthy bumper crop. Good bye until the year 2008. If you have any questions about the system, contact the Department of Plant Pathology, NDSU, Fargo, ND 58105 (701-231-6467).
Sincerely,
Dr. Shaukat Ali
Phone # 701-231-6467
E-mail: Shaukat.ali@ndsu.edu
About the System
Regional Coverage Map
Diseases Covered:
Fusarium Head Blight (Scab)
Tan Spot
Stagonospora (Septoria) Blotch
Wheat Leaf Rust
How You Can Help
Warranty Statement
Acknowledgments and Financial Support
Other Crop and Weather Info
Yahoo Weather Forecast
North Dakota Agricultural Weather Network
Pests to Watch This Week (ND Report)
Potato Late Blight Forecast
Canola White Mold Forecast
Links to other Crop Production Information
Get Started 1-2-3!
1. Click on the NDAWN station location nearest you
- see NDAWN Home Page for a station location map
2. Click the button representing the growth stage of your crop
- see Growth Stage definitions and pictures
- NDAWN can provide an estimated growth stage for your crop based on planting date.
3. Click "Get Forecast".
1. Location
Ada, MN
Baker
Beach
Berthold
Bottineau
Bowbells
Bowman
Britton, SD
Brorson, MT
Cando
2. Growth Stage
Flagging
Boot
Heading
Flowering
Early Milk
Leaf disease models
Scab fungicide spraying
3. Get Forecast
PROLINE
that most commonly affects wheat and barley crops.
Use PROLINE 3+3 this season to halt scab in your wheat.
Learn more at www.haltscab.com.
http://www.ag.ndsu.nodak.edu/cropdisease/

When do fungicides pay?

- Environmental conditions
  - Disease forecasting models
- Wheat type (spring, durum, etc.)
- Variety and disease resistance
  - R or MR
  - S
  - VS

Interaction of Weather and Cultivar Resistance Level to Cause Fusarium Head Blight



When do fungicides pay?

- Commodity price?
  - Fungicide application $12/acre
    - Wheat $3.00 bu need 4 bu/A increase in yield to break even
    - Durum $6.00 bu need 2 bu/A increase in yield to break even
- Quality factors
  - Test weight, damage kernels, DON reduction

Fungicide Use in Wheat

- Timing
- Disease in question
- Fungicide Selection

Fungicide Timing

- 1) Early
  - 4 to 5 leaf stage
    - Early tiller development

Early Fungicide Application

- Primarily Tan Spot

  "Save the tillers"

- 4 to 5 leaf stage – tank mix with herbicides
- 1/2 rate of the fungicide is used

Early Fungicide Application

- Primarily Tan Spot

  "Save the tillers"

- Research indicates that all fungicides perform similar at this application stage
  - Bumper, Tilt, PropiMax, Headline, Quilt, Stratego...

5 leaf fungicide applications. 2007

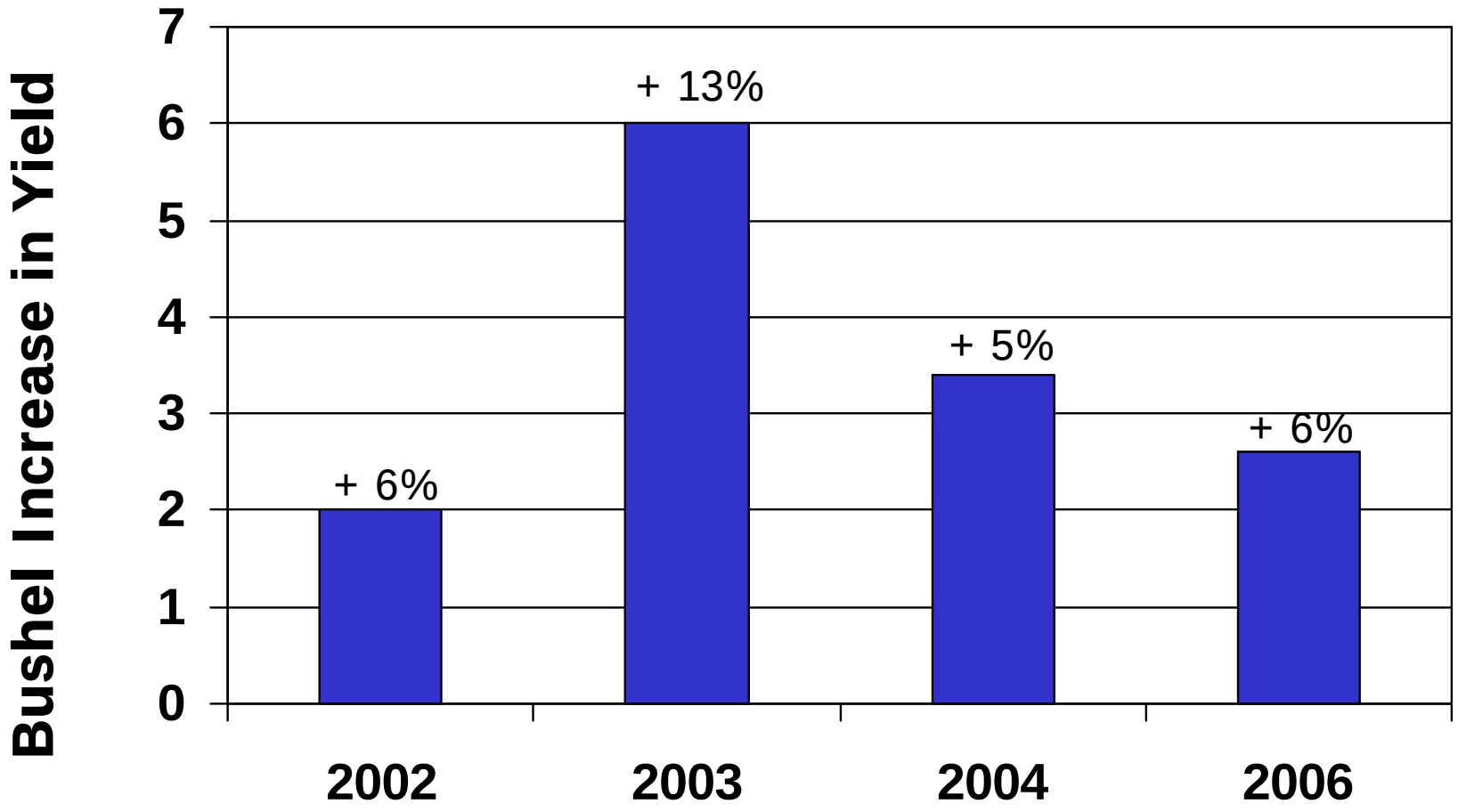
Winter Wheat (Roseglen/Berthold)

Treatment	Yield Bu/A
Untreated	54.1
Fungicide 5 lf	58.0 (+ 7%)

Spring Wheat (Minot)

Treatment	Yield Bu/A
Untreated	36.9
Fungicide 5 lf	38.4 (+ 4.1%)

5 Leaf HRS / Durum Wheat Fungicide Studies
NCREC, Minot



Fungicide Timing

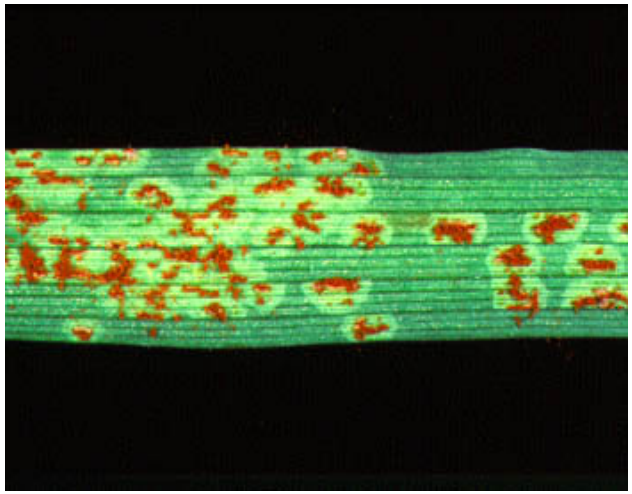
- 1) Early
  - Wheat on wheat consistent 3+ bu/A response
  - Wheat on rotation ground not as consistent 0 – 3 bu/A return

Fungicide Timing

- 1) Early
  - 4 to 5 leaf stage
    - Early tiller development
- 2) Flag leaf timing
  - Main concern leaf rust

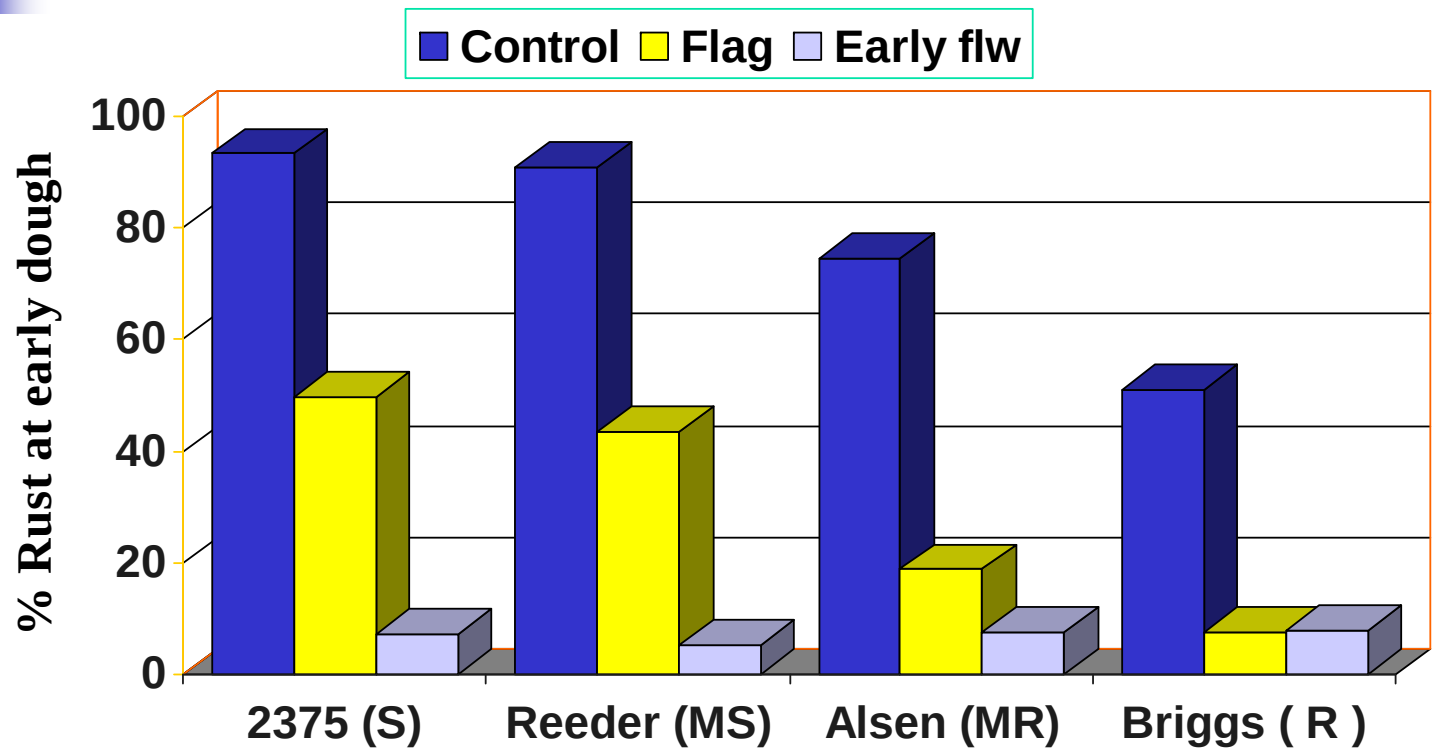
Small Grains

- Flag Leaf
  - Full rate for– long residual
  - 7 days earlier than a flowering (10.51) application



  - Can we wait until heading/flowering to get both leaf disease and scab control

Leaf Rust Control: Impact of fungicide on rust in varieties of different susceptibility. Folicur @ 4.0 fl oz/acre



NDSU Carrington Research Extension Center, 2004

Fungicide Timing

- 1) Early
  - 4 to 5 leaf stage
    - Early tiller development
- 2) Flag leaf timing
  - Main concern leaf rust
- 3) Early Flowering
  - Fusarium Head Blight / Scab

- Scab
  - Wheat (10.51) Early Flower (Better early than late)

  - Barley (10.5) Must be headed!

Spraying For Scab

- 1998-2006 Folicur (generics) Section 18
- Summary on Folicur: what to expect?
  - Variety susceptibility very important
  - 15 to 20% yield response common
  - 50% reduction of scab
  - Can reduce DON by 33 to 50%
  - 1 ½ to 2 lb increase in test weight common

Spraying for Scab

- 2007
  - Section 18 for Folicur and generics ($4-7/A)
  - Proline registered – best scab control/DON reduction, weak on rust
    - Proline 3+3: Proline + Folicur ($12-15/A)
    - Prosaro: Proline/Folicur premix 2008 label?

Spraying for Scab

- Proline 3+3 (Proline + Folicur), what to expect
  - 15 to 20% yield response common
  - 50 -80% reduction of scab
  - Can reduce DON by 50 - 75%
  - 2 to 4 lb increase in test weight common

WINTER WHEAT

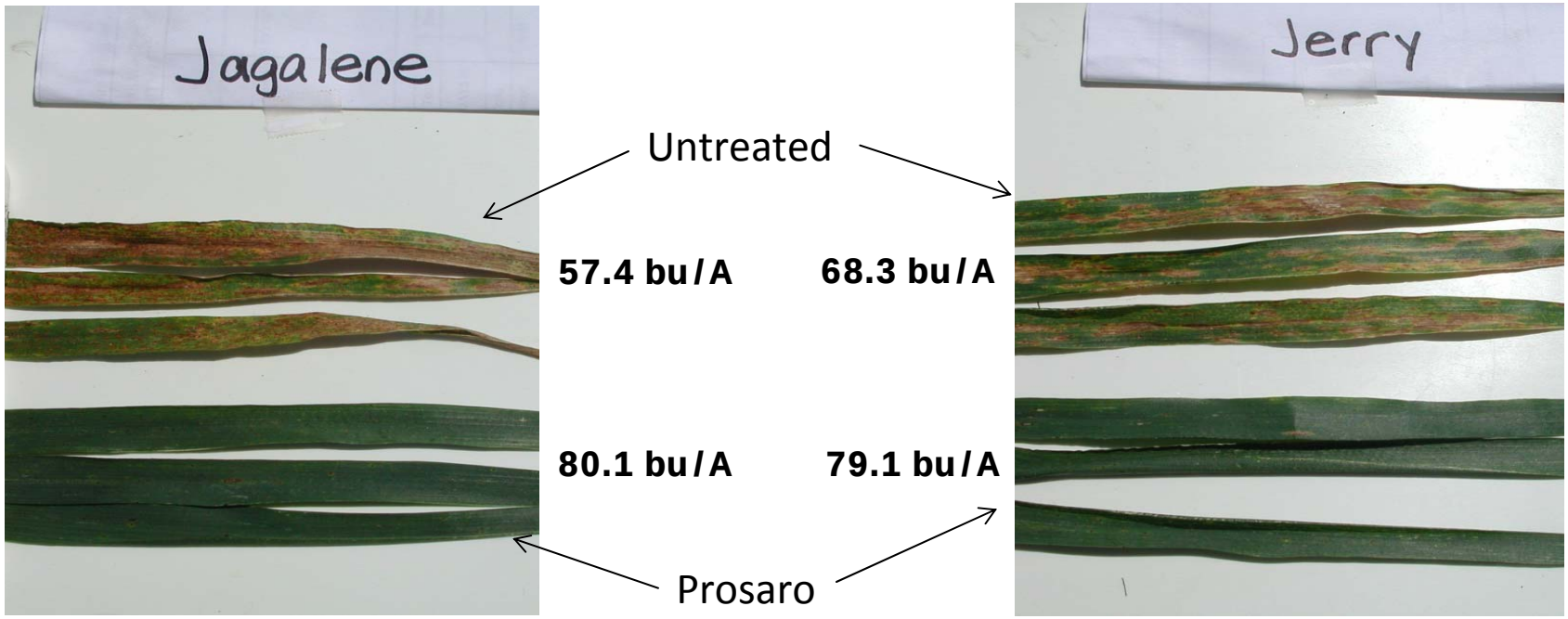
- Primarily concerned about leaf disease
  - Is the variety susceptible to leaf rust?
- In most years, winter wheat development (flowering period) is a head of a major scab threat

WINTER WHEAT

- 2007: Rust detected in early June on susceptible varieties in north central, ND
  - About a month earlier than normal (same in 2005)
- Leaf disease pressure was severe
- The threat of scab became a discussion point

Winter Wheat Variety by Fungicide Berthold, ND. 2007

Flag leaves of Jagalene and Jerry winter wheat on June 29, 2007



Winter Wheat Variety by Fungicide Trials
Berthold, Roseglen, ND. 2007

Berthold
(avg. of 10 varieties)

Treatment	Yield Bu/A	TW Lb/bu
Untreated	62.1	61.6
Prosaro	77.1	62.9

Roseglen
(avg. of 10 varieties)

Treatment	Yield Bu/A	TW Lb/bu
Untreated	43.8	55.0
Prosaro	60.4	57.5

Winter Wheat Variety by Fungicide Trials Minot, ND. 2005 - 2006

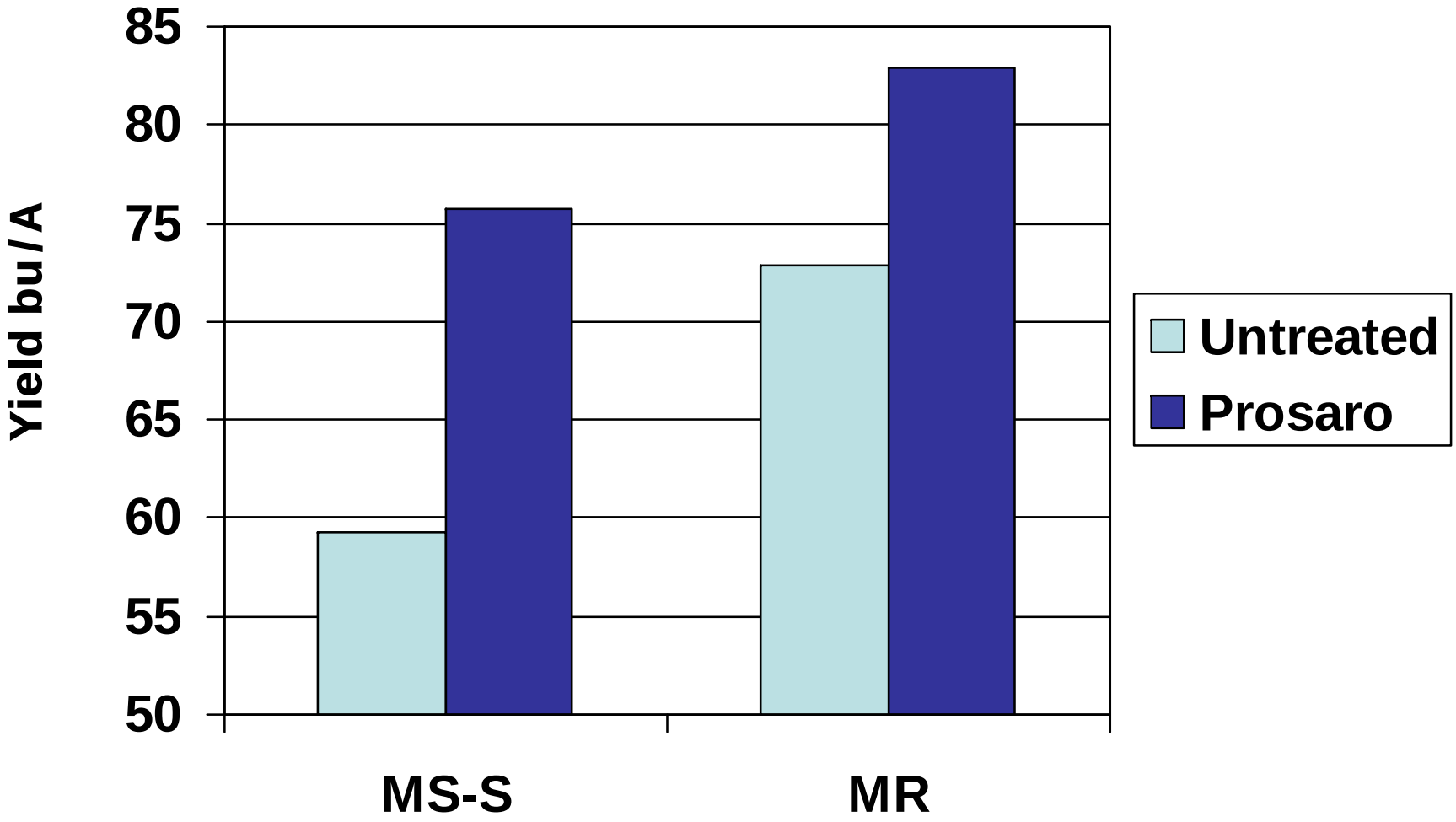
2006
(avg. of 8 varieties)

Treatment	Yield Bu/A	TW Lb/bu
Untreated	52.0	61.4
Folicur	53.2	61.6

2005
(avg. of 4 varieties)

Treatment	Yield Bu/A	TW Lb/bu
Untreated	47.8	54.6
Headline (flag)	67.7	59.2

Winter Wheat Variety Response to Prosaro
MS-S: rust susceptible, MR: mod resistant
Berthold, ND. 2007



Winter Wheat Variety Response to Prosaro
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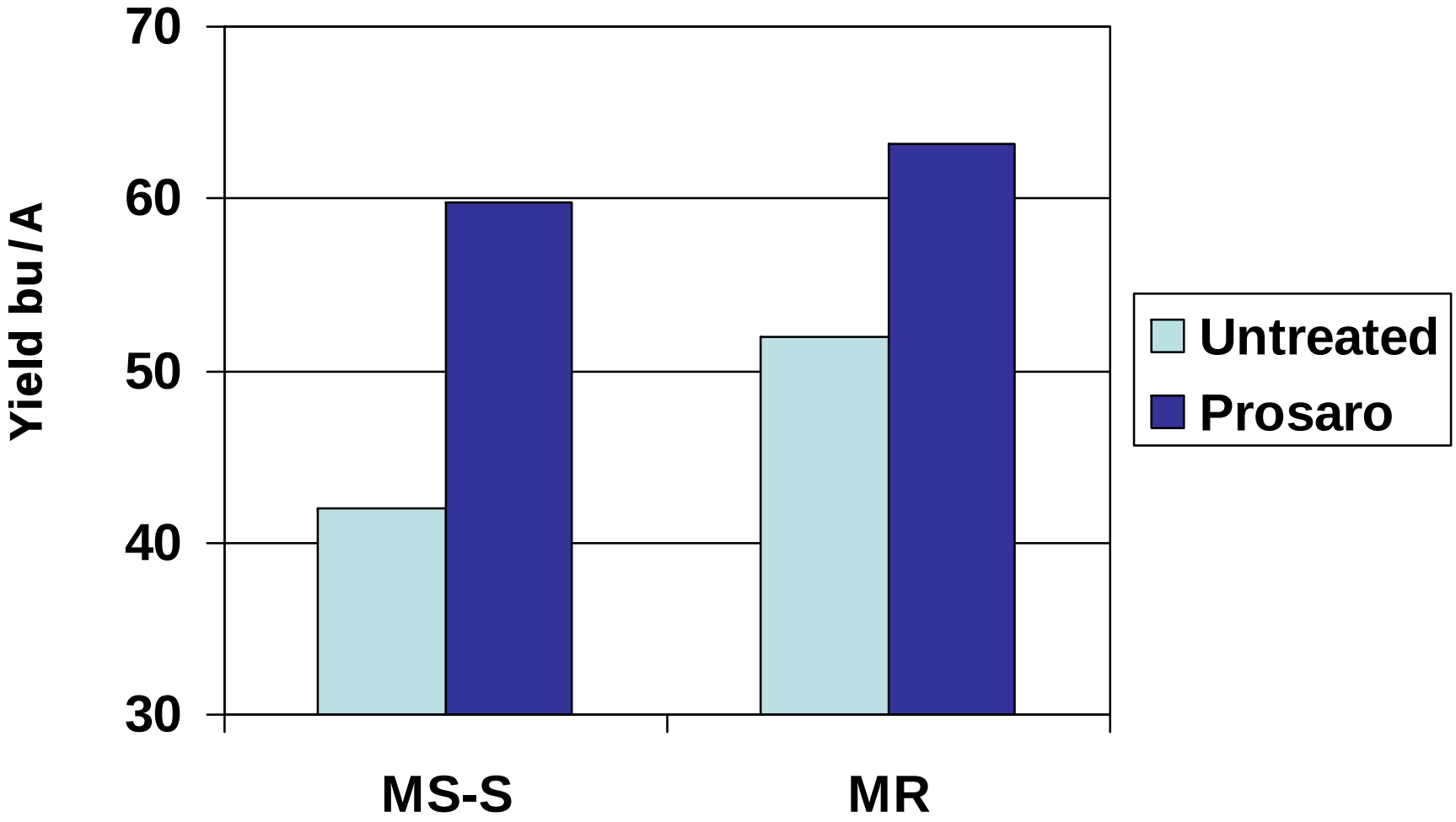

Effect of wheat class on yield and protein, mean of 20 varieties from two adjacent trials, Ransom County, 2007

	No Fungicide		Prosaro @ Flowering	
Wheat Class	*Yield*	*Protein*	*Yield*	*Protein*
Spring wheat	57.0	15.5	61.0	15.5
Winter wheat	57.9	13.4	78.5	13.7

Spraying for Scab

- 2008: Folicur (generics) Sect. 18 doesn't look good as of today
  - = no Prosaro or Proline/Folicur 3+3
- Proline: still the best option

2001 Uniform Durum Wheat Fungicide Data, ND

Garrison, ND

Treatment	DON ppm	Yield Bu/A	Twt Lbs/ Bu
Untreated	3.6	46	58.3
Folicur	2.4	53	59.5
AMS (Proline)	1.0	55	60.9

Durum fungicide results across 3 ND locations and 3 durum cultivars, 2001*

(NDSU data from K. McKay, B. Schatz and J. Lukach)

Treatment**	%FHB FS	DON ppm***	% Lf Dis.	Yld bu/a	Twt lbs/bu
Untreated	30.1	9.7	58.5	38.6	53.3
Folicur 4 fl oz	9.8	6.3	35.1	51.9	55.5
AMS21619 5.7 fl oz (Proline)	5.7	1.8	14.0	60.1	58.4
LSD P=0.05	10.5	NS	23.7	8.5	2.0

Uniform Wheat Fungicide Results, ND 2003

across 4 locations (Fargo, Carrington, Langdon, Minot) and 2 Wheat Classes*

Trt & Rate/A	Leaf Dis %	FHB FS %	DON ppm	Yield Bu/A	Twt Lbs/bu
Untreated	48	8.6	2.7	60	59.5
Folicur 4 fl oz	14	3.7	1.5	70	61.0
JAU 5 fl oz (Proline)	11	2.6	0.9	70	61.0
JAU (Proline) + Folicur	10	2.7	0.7	73	61.2
*Spring wheat and durums at 3 locations each					

2005 Uniform HRSW Fungicide Data, ND

Averaged across Carrington (Reeder), Fargo (Reeder) and Langdon (Grandin)

Treatment* and rate/acre	FHB FS %	DON** ppm	Yield Bu/A	% Yield Incr.	Twt Lbs/ Bu
Untreated	20.9	9.0	36.8	----	56.8
Folicur 4 fl oz	10.3	6.1	47.1	28.0	57.9
Prosaro 6.5 fl oz	8.4	4.8	51.1	38.9	58.7

Durum Variety by Fungicide Trials
Minot, Willow City, ND. 2007

Minot, ND. 2007

Variety	Yield Bu/A	
	Untreated	Prosaro
Divide	37.7	39.1 (+4%)
Grenora	36.0	39.4 (+9%)
Lebsock	34.5	37.0 (+7%)
Monroe	32.5	36.2 (+11%)
AVERAGE	35.2	37.9 (+7%)

Spring Wheat Variety by Fungicide Trial Lisbon, ND. 2007

Lisbon, ND. 2007

Variety	Yield Bu/A	
	Untreated	Prosaro
Glenn	62.5	64.5 (+3%)
Alsen	45.9	54.1 (+18%)
Freyr	50.4	58.5 (+16%)
Steele-ND	61.6	65.7 (+7%)
Howard	65.3	65.7 (+1%)
Faller	66.6	68.3 (+3%)

Fungicide Summary

- Fungicides can pay
  - Environmental conditions, disease (scab, rust, etc.) variety response, commodity price
- Sect. 18 for Folicur (generics) important for 2008 even though we have Proline