

# Best Management Practices for Scab, Wheat Streak Mosaic Virus, High Plains Virus



Andrew Friskop

NDSU Cereal Extension Plant Pathologist

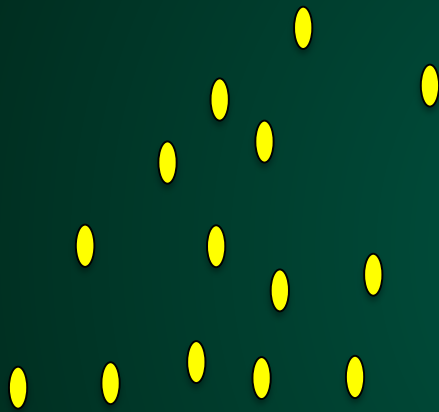
# Pathogen (Causal Agent)

- *Fusarium graminearum*
- FHB on spring wheat, winter wheat, durum, barley, rye, and oat
- Also causes root rots, corn stalk rots and corn ear rots





- \*Persistent Moisture
- \*High humidity
- \*75-85°F
- \**Before and during heading*



Cereal Crop Residue – wheat, barley, corn, oat







- 
1. Yield Losses
  2. Lower Test Weights
  3. DON

# Management of FHB and DON



# Best Management Practices

- Crop rotation
- Tillage (if appropriate)
- Multiple planting dates
- Variety Selection
- Fungicides



# Management with Less Susceptible Varieties



## HRSW

Variety	FHB Rating
SY Soren	M
SY Ingmar	M
Elgin-ND	M
Barlow	M
Glenn	MR
Faller	M
Linkert	M
WB Mayville	S
Rollag	MR
SY Valda	MR

## Durum

Variety	FHB Rating
Divide	M
Carpio	M
Alkabo	MS
Joppa	M
Tioga	MS
Lebsock	MS
Mountrail	S

## HRWW

Variety	FHB Rating
Jerry	S
Decade	S
WB Matlock	MS
SY Wolf	MS
Wesley	S
Emerson	MR

# Should I Spray



# SMALL GRAIN DISEASE FORECASTING MODEL



NDSU > Small Grain Disease Forecasting Model

## Small Grain Disease Forecasting Model

[Small Grain Diseases Explained](#)

[Other Crops and Weather Information](#)

[Small Grain Disease Forecasting Model](#)

[Department of Plant Pathology](#)

### Thanks to:



NDSU thanks [Bayer CropScience](#) for providing financial support for the maintenance and operation of this Web site. NDSU, by policy, neither endorses nor recommends use of specific commercial products

## Small Grain Disease Forecasting Model



The NDSU Small Grains Disease Forecasting Model assists producers in estimating the possibility of disease in their crops and provides information for making. This is done in conjunction with NDAWN weather station locations within North Dakota and sections of western Minnesota and eastern Montana.

# FUSARIUM HEAD BLIGHT Prediction Center



- Introduction
- Model Basics
- User Guide
- Fusarium
- Developers
- Login

**ND Commentary** *last update 2015-06-17 Andrew Friskop.*

According to the model, the areas with the highest level of scab risk continue to be in south central to southwestern ND. A few more pockets of elevated scab risk are apparent on the eastern side of the state as well. Areas south of I-94 received a steady rain yesterday, which will likely increase scab risk in the small grains. Also, the dew point temperatures have been relatively high resulting in prolonged moisture periods (dew) in the morning. The combination of these factors and with rain in the forecast could elevate scab risk throughout the state.

**1. Choose a State**  
 State:

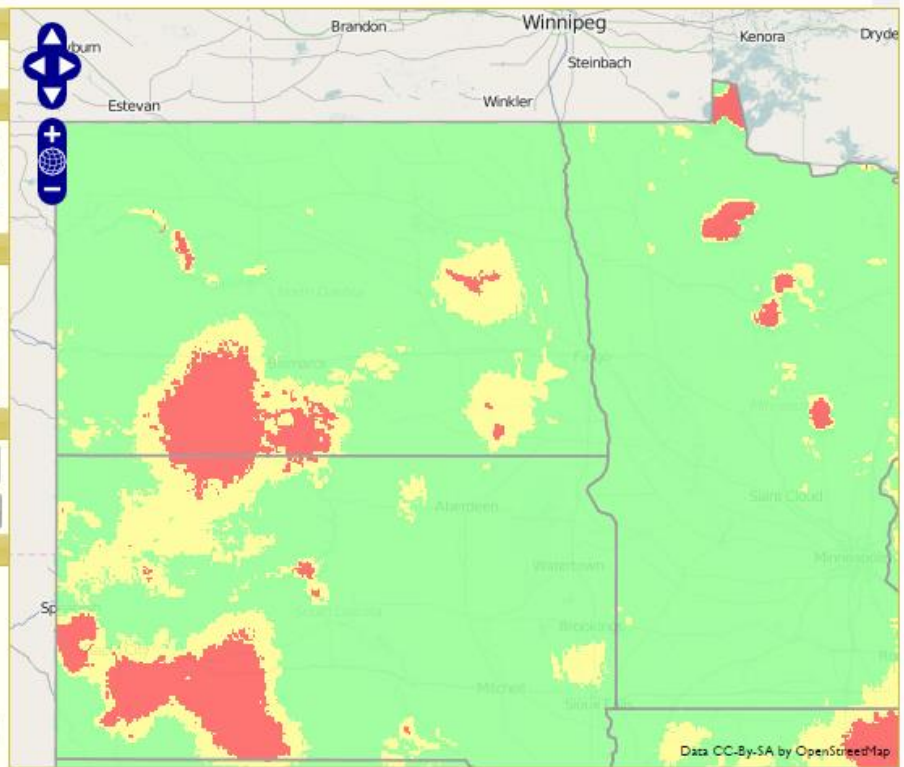
**2. Choose a Model**  
 Wheat:   ?  
 Susceptibility:    
[Link to Spring Wheat Variety Information](#)

**3. Weather Forecast Mode**  
 Forecast (hrs):      
 Assessment Date:

**Advanced: Save Model and Location**  
 Name:    
 Saved Locs:

**Legend**  
**Blight Risk**  
 High  
 Medium  
 Low  
 No Data  
**Weather Stations**  
 FAA  
 AgNet  
 Inactive (for model)

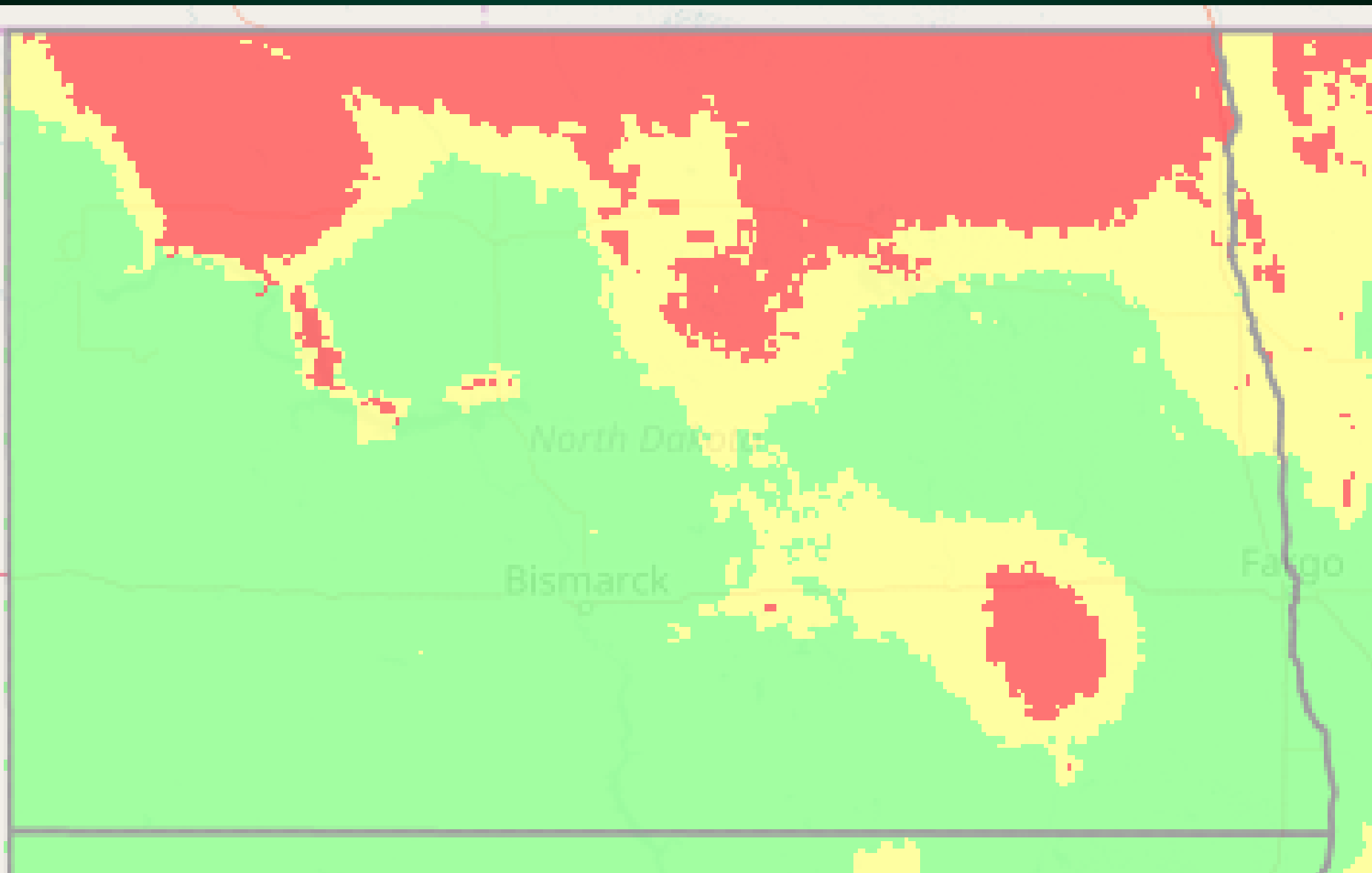
Risk Map Opacity



Disclaimer



July 12, 2016



# Fungicide Choice



# Fungicide Choice – FRAC 3 (Triazoles)

Pierce et al. 2008

## Mean Percent Reduction

<u>Fungicide</u>	<u>FHB Severity</u>	<u>DON</u>
Prosaro	52%	42%
Caramba	50%	45%
Proline	48%	43%
Folicur, generics	40%	23%
Tilt, generics	32%	12%

\*Often observe greater reductions in durum and HRSW

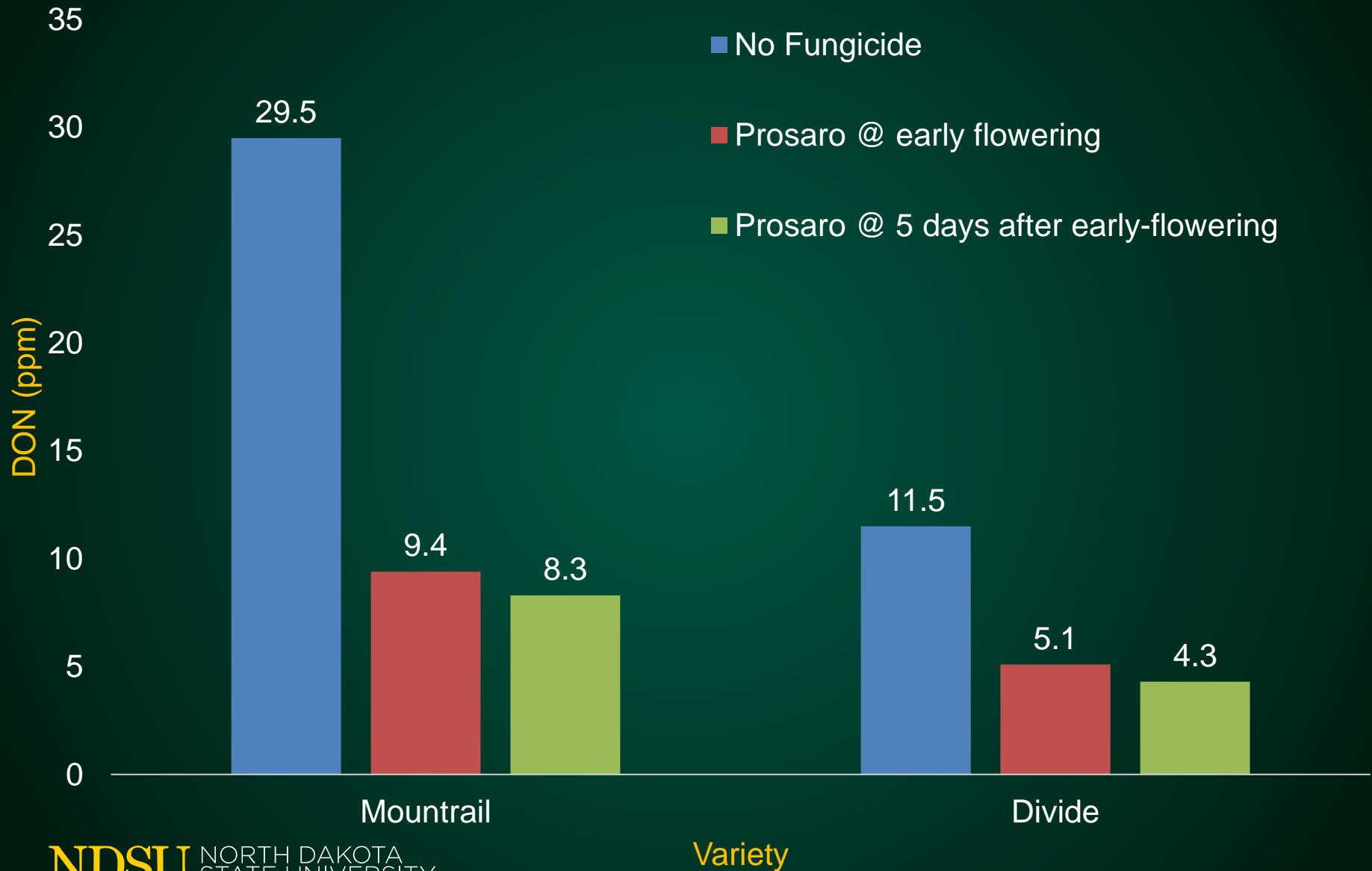
# Fungicide Timing



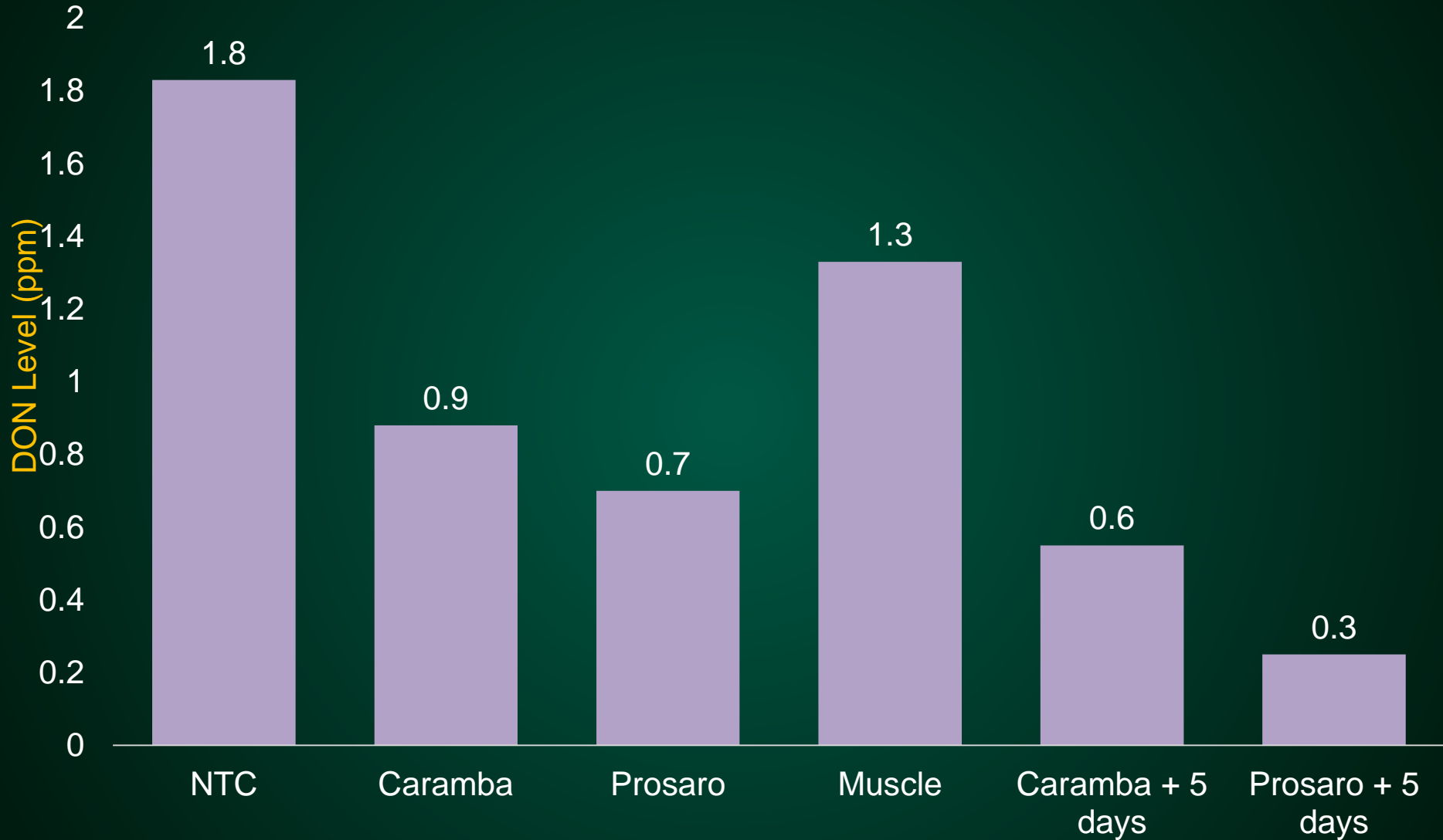




# Durum – FHB Trial – 14-15 Langdon



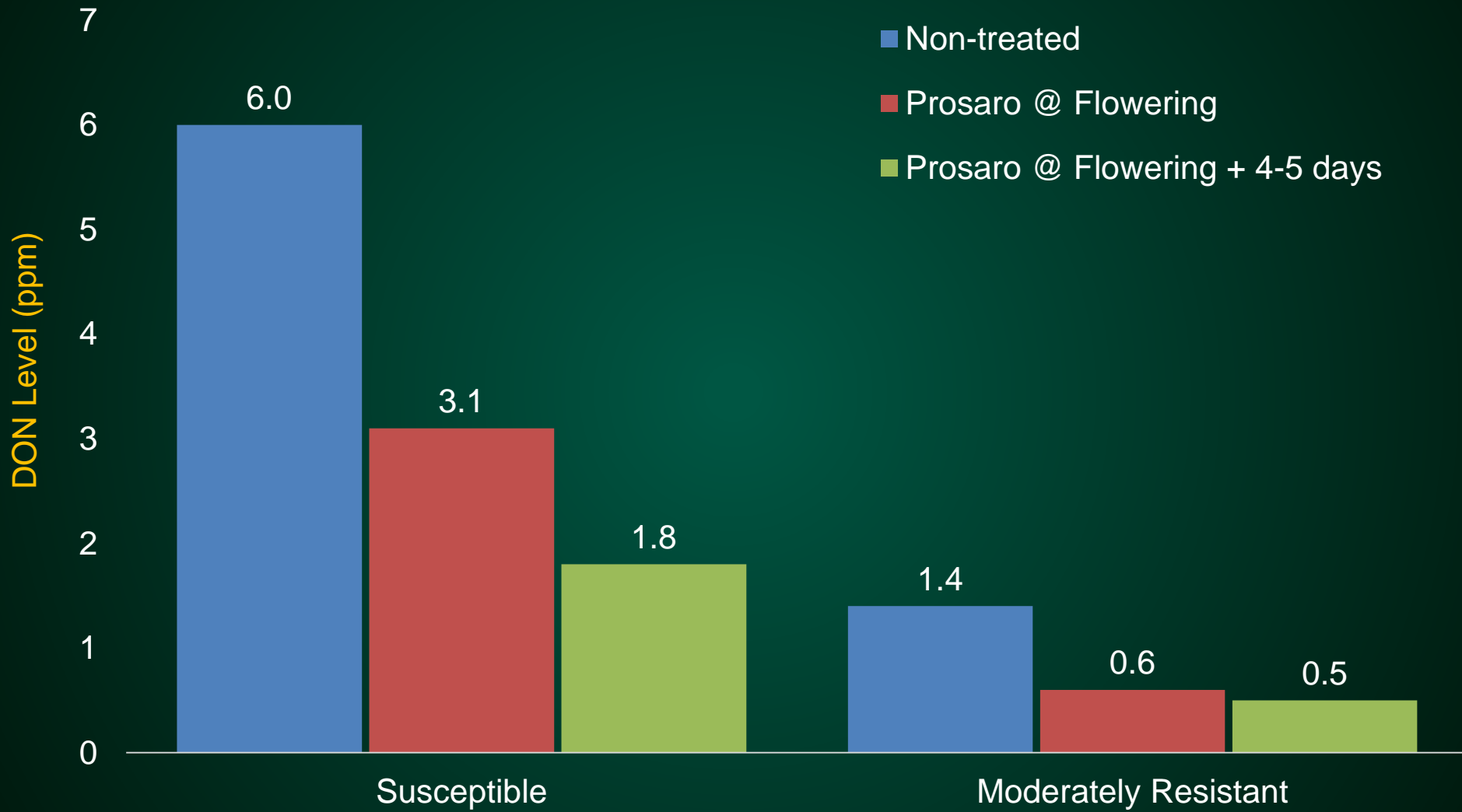
# FHB – Fungicide Timing - Barley





# Integrated Management

# HRSW – Integrated Management

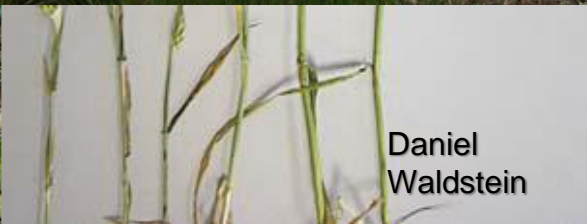


# Wheat Streak Mosaic Virus and High Plains Virus

- Vectored by wheat curl mite (tiny, wingless)
- Symptoms
  - Yellowing, stunting, white heads
  - Yellow streaks parallel to veins
- Appear first on edge of field or in patches next to volunteers
- Multiple grass species are hosts



# Wheat Streak Mosaic Virus



Daniel  
Waldstein

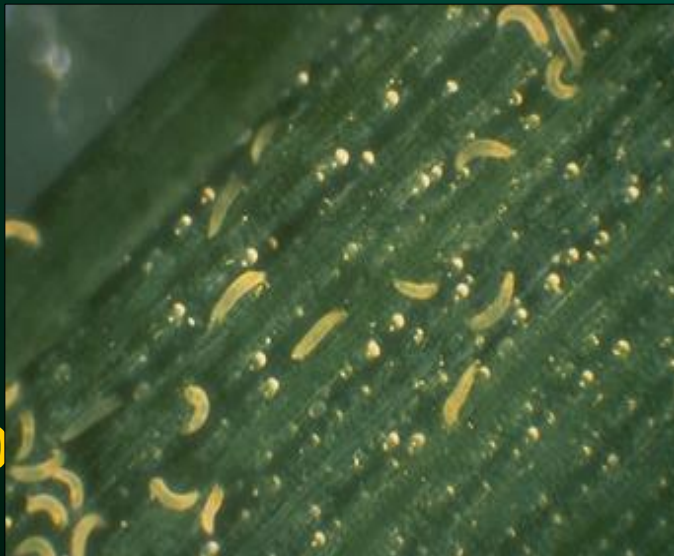


Photo: R. Ashley



# Wheat Curl Mite

- Life cycle is 10 days
- 75-85 F favorable for mite reproduction
- Can only survive about 8 hours with no food or water
- Acquisition time: 15 minutes



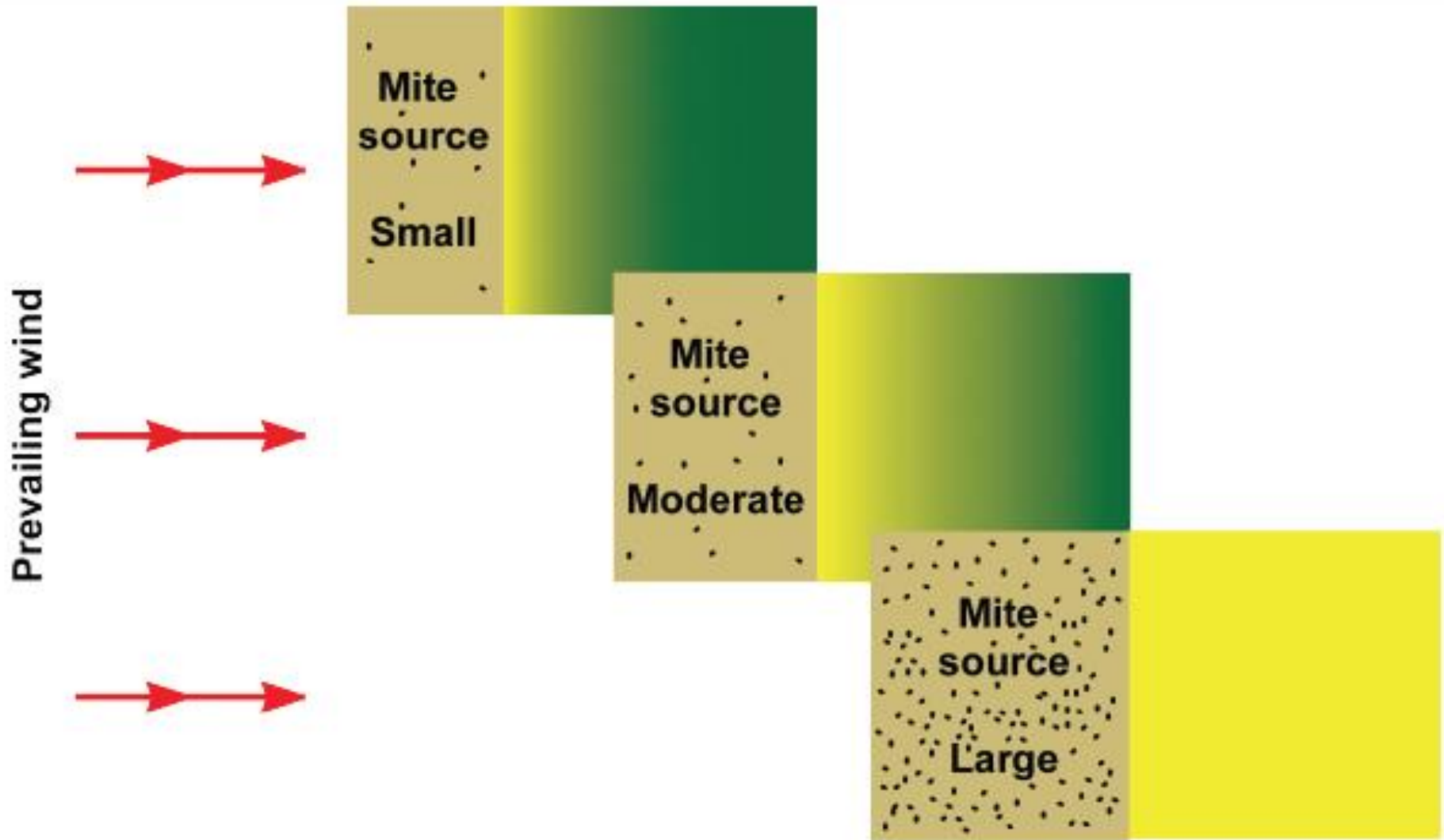
ND

Kansas State  
University



NDSU Electron Microscopy Lab

# Mite Movement





# Crop Hosts

+++ = Highly Susceptible; ++ = Moderately Susceptible; + = Slightly Susceptible; - = Resistant

Crop	Wheat Curl Mite Susceptibility	Wheat Streak Mosaic Virus Susceptibility	High Plains Virus Susceptibility
Wheat	+++	+++	++
Corn	+	-	-
Rye	++	+	+
Oats	+	+	+
Barley	++	+	+
Sorghum	+	+	-
Foxtail Millet	+	+	-
Proso Millet	-	+	-
Pear Millet	+		

# Weed Hosts

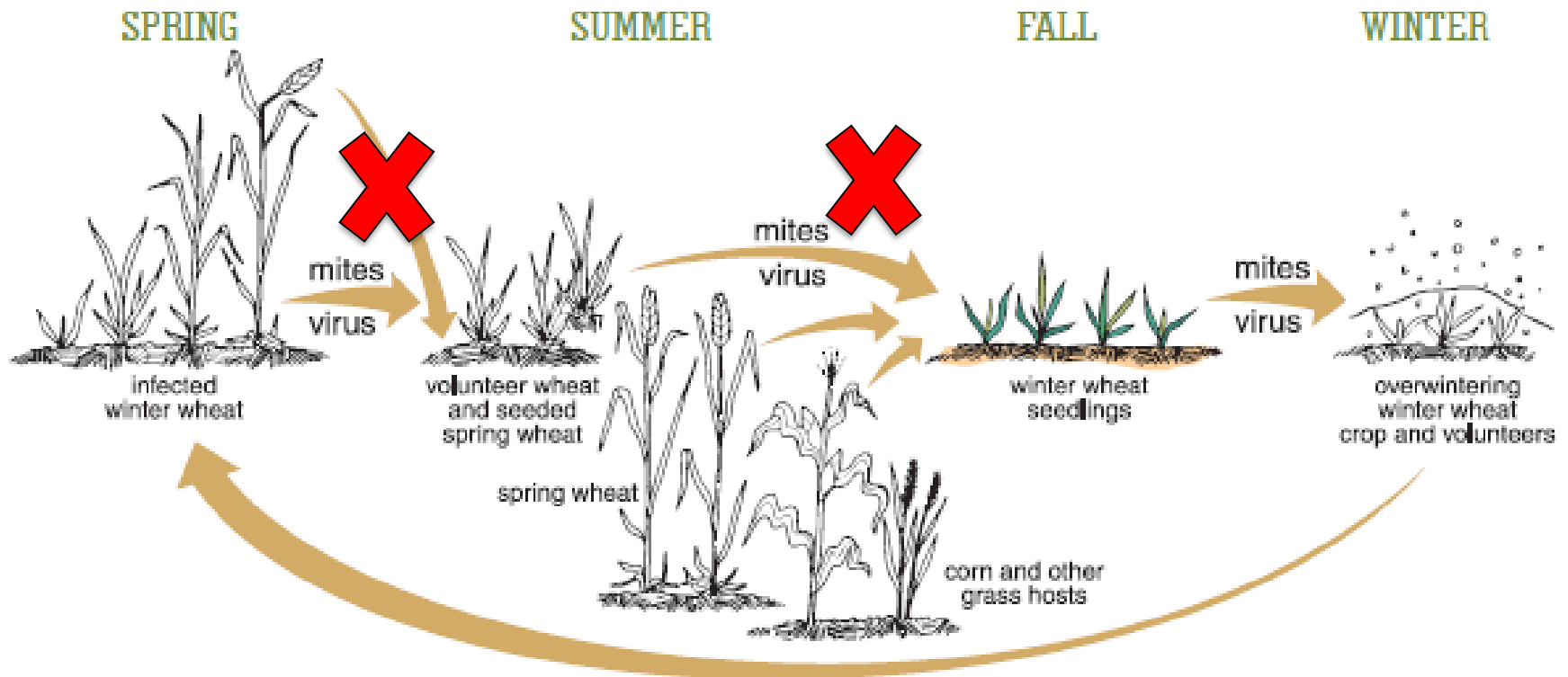
+++ = Highly Susceptible; ++ = Moderately Susceptible; + = Slightly Susceptible; - = Resistant

Host	Wheat Curl Mite Susceptibility	Wheat Streak Mosaic Virus Susceptibility	High Plains Virus Susceptibility
Jointed Goatgrass	+	+	
Downy Brome	+	+	-
Japanese Brome	-	+	-
Sandbur	+	+	
Crabgrass	+	+	-
Barnyardgrass	+	++	-
Canada wildrye	+	-	
Stinkgrass	+	++	-
Witchgrass	+	++	-
Green Foxtail	+	++	-
Yellow Foxtail	+	-	+

Adapted from Wegulo, et al.

# Management – Break Green Bridge

2-week window between destruction of volunteers and planting





# Manage Volunteers

Herbicide

Tillage (if appropriate)





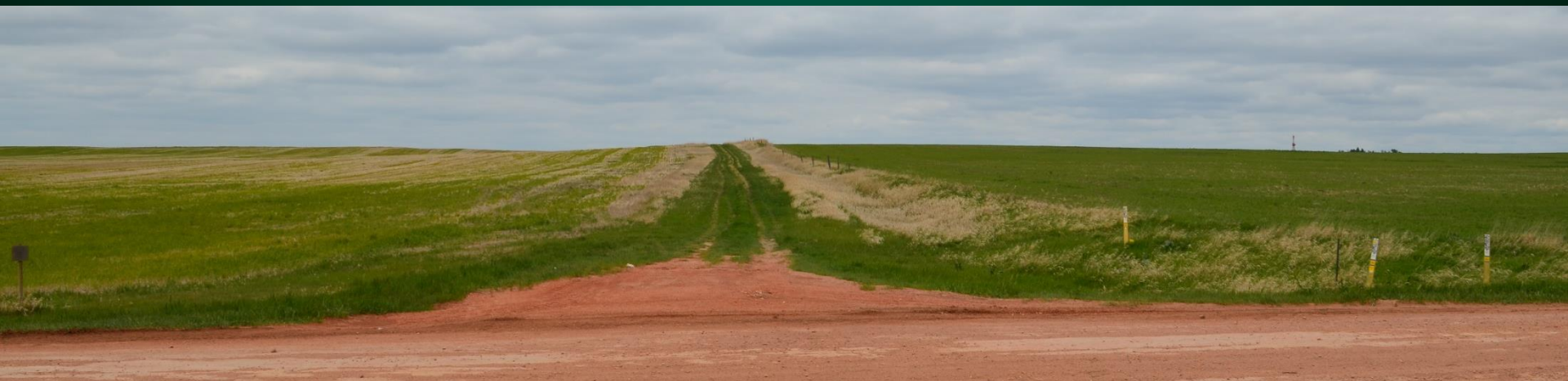
# Seeding Date

## Spring Wheat

- Seed early to avoid warm temperatures

## Winter Wheat

- Northern ND – September 1-15
- Southern ND – September 16-30



# WSMV – Winter Wheat Seeding Date

Seeded September 2

Seeded September 20



Roger Ashley



# WSMV – Winter Wheat Seeding Date

Seeded September 2

# WSMV – Winter Wheat Seeding Date

Seeded September 20

A wide-angle photograph of a green field, likely winter wheat, under a cloudy sky. In the foreground, there is a dirt road. Several yellow markers are visible in the field, indicating a specific area of interest. The text "Seeded September 20" is overlaid on the image.

# Spring Risk Factors

- Seeding wheat late near an infected source (winter wheat field, volunteers, etc)
- Warm weather experienced early in the growing season favoring mite activity



# Other WSMV and HPV Questions

- Can I spray an insecticide or miticide?
  - Not effective for managing mites.
- Are there any resistant varieties?
  - To our knowledge, no varieties available in ND have WSMV, HPV or wheat curl mite resistance.

A wide-angle photograph of a lush green agricultural field, likely a crop field, stretching to a flat horizon. The sky is a clear, vibrant blue with scattered, light-colored clouds. The word "Questions" is overlaid in the center of the image in a bold, yellow, sans-serif font.

# Questions