

# Advances in the Development and Application of Prediction Models for FHB and DON

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# Presentation Outline

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- Progress in model development
- Advances in model application

# Model Development

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- Working with cooperators to gather new observations
- Data cleaning and quality assessment
- Evaluating the performance of current models
- Developing and testing the new models for potential application

# Resources for Modeling

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- Data set represents
  - 15 states
  - Time period range of 1982 – 2009
  - 527 cases
    - location, year, cultivar, anthesis date, residue level
    - Integrated management trials a rich source of data





# Model Application

## Current FHB Prediction models

Wheat market class	Model variables	Accuracy (%)	Sensitivity (%)	Specificity (%)
Spring	RH + Resistance	78	86	69
Winter	Temp/RH combination	72	78	68

n=116

# Model Application


**Fusarium Head Blight Risk Assessment Tool 2010**


0
24
48
72

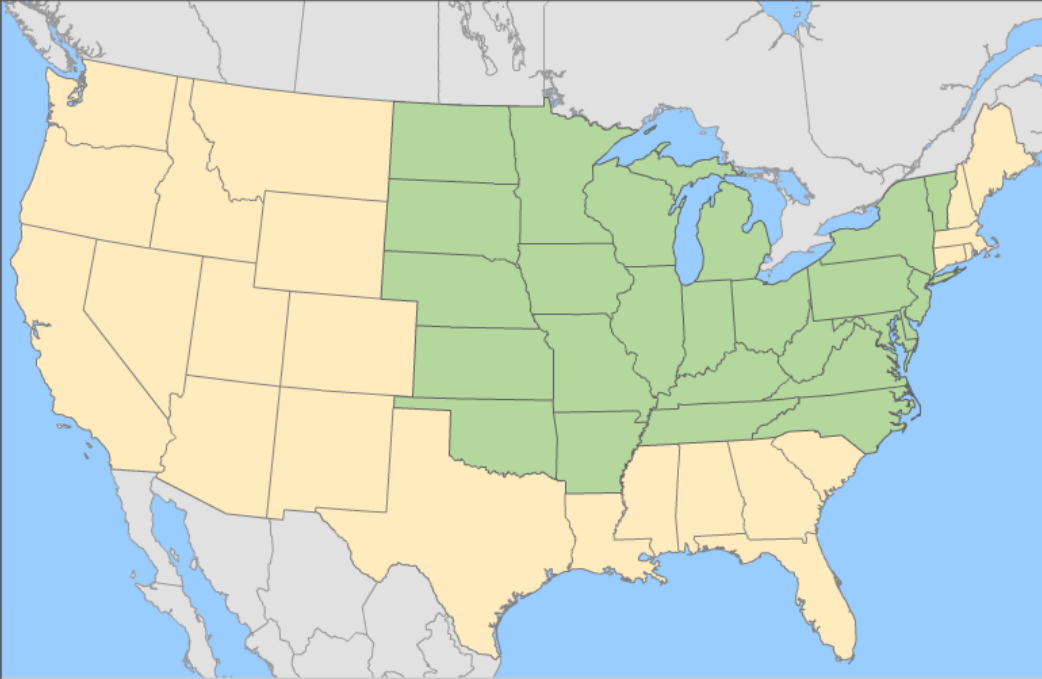
?

**▲ Assessment Date**

	S	M	T	W	T	F	S
	4	5	6	7	8	9	10
	11	12	13	14	15	16	17
APR	18	19	20	21	22	23	24
	25	26	27	28	29	30	1
MAY	2	3	4	5	6	7	8
	9	10	11	12	13	14	15
	16	17	18	19	20	21	22
	23	24	25	26	27	28	29
	30	31	1	2	3	4	5
JUN	6	7	8	9	10	11	12
	13	14	15	16	17	18	19
	20	21	22	23	24	25	26
	27	28	29	30	1	2	3
	4	5	6	7	8	9	10

 **Assessment Available**  
click on state to zoom in

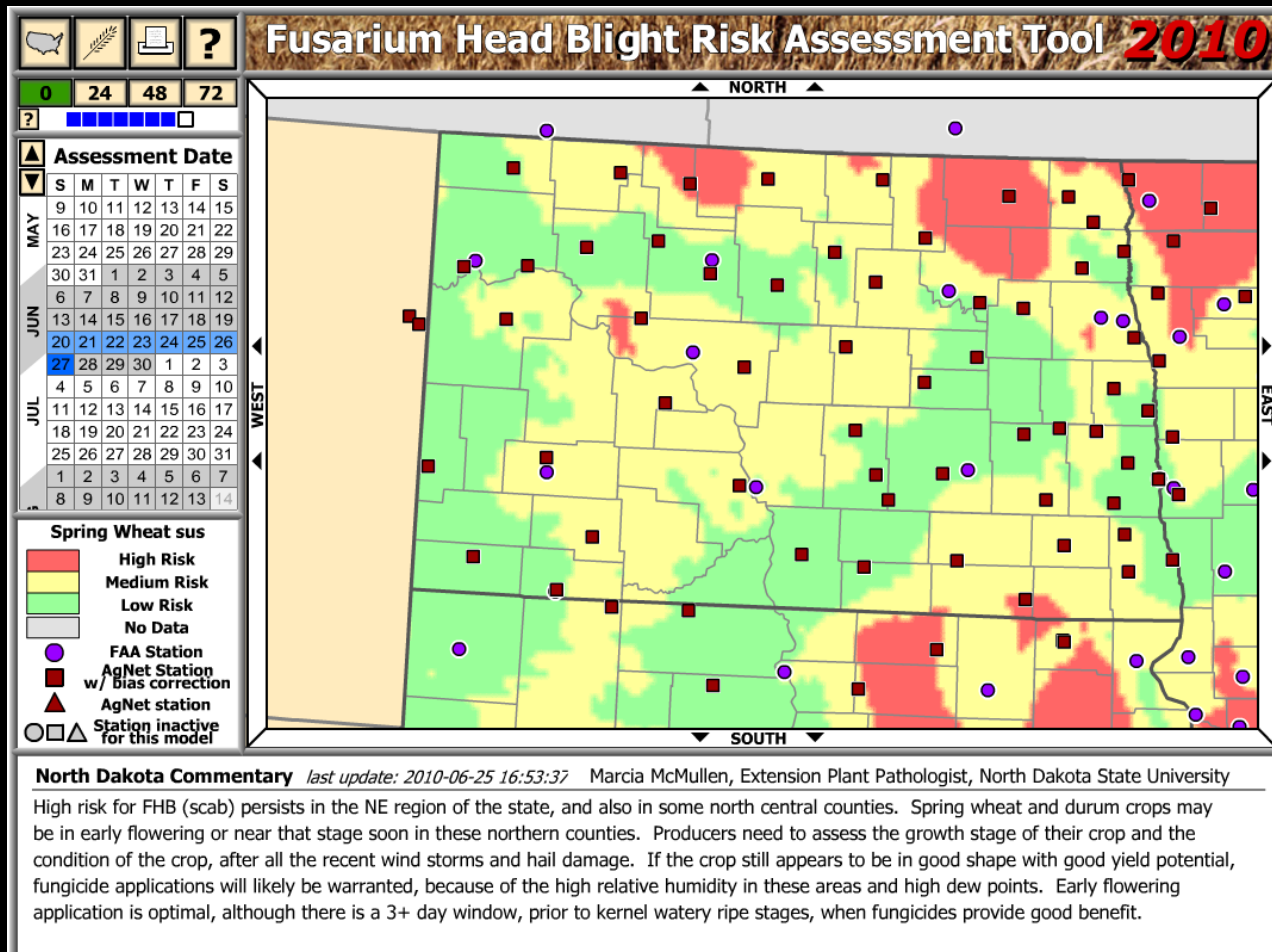
 **No Assessment Available**



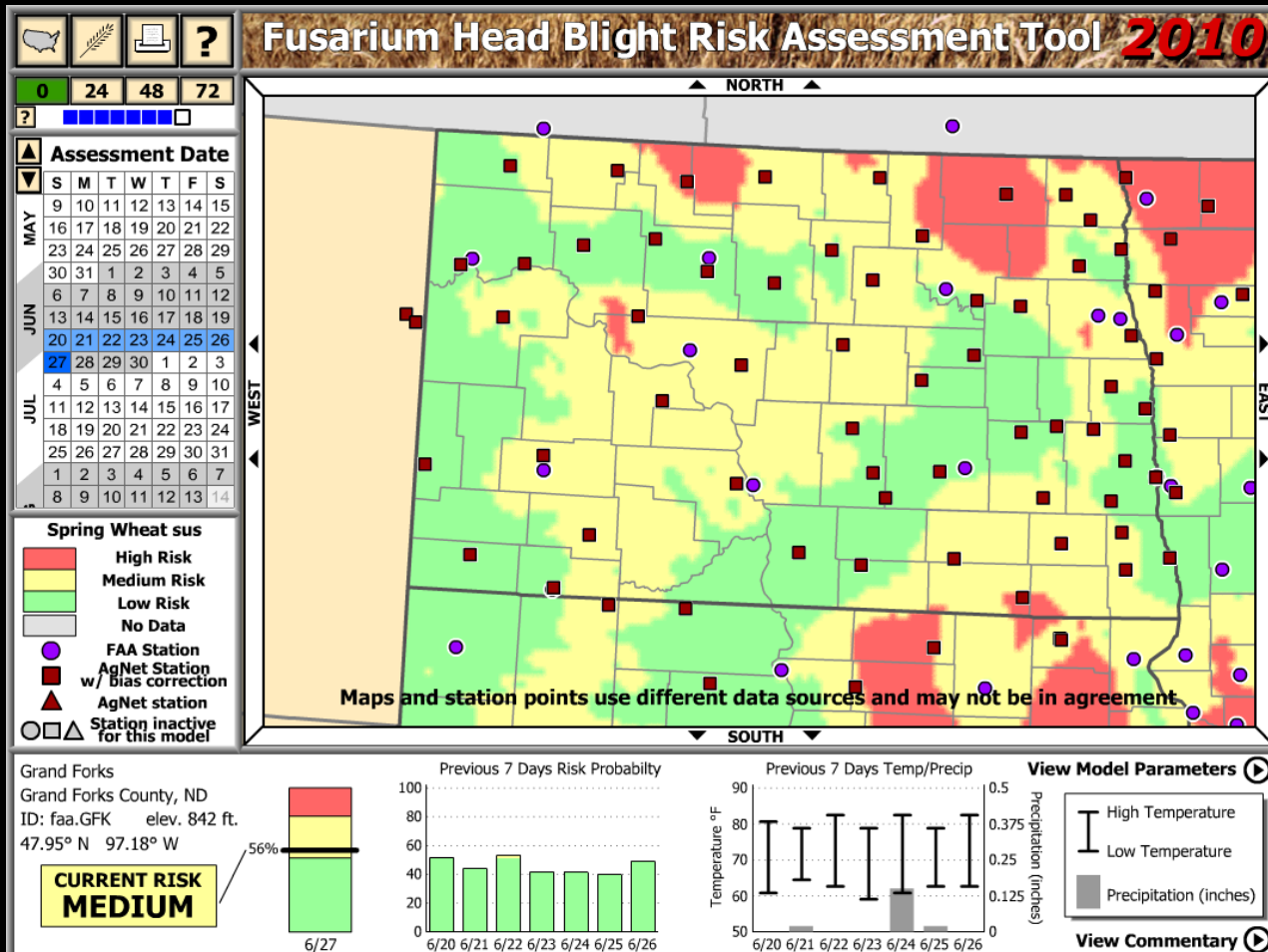
**National Commentary** *last update: 2010-04-19 10:23:56*

Welcome to the 2010 version of the wheat scab prediction tools. This tool provides daily estimates regarding the risk of the wheat disease known as "scab" or "Fusarium head blight". Wheat is most vulnerable to this disease during anthesis and early stages of grain development, and weather preceding these stages for growth strongly influences the risk of disease. Wheat in North Carolina, Arkansas, and Oklahoma will likely enter the critical stages of growth soon. The current predictions for these states indicate a low risk of disease.

# Model Application



# Model Application





# How Effectively Are We Communicating?

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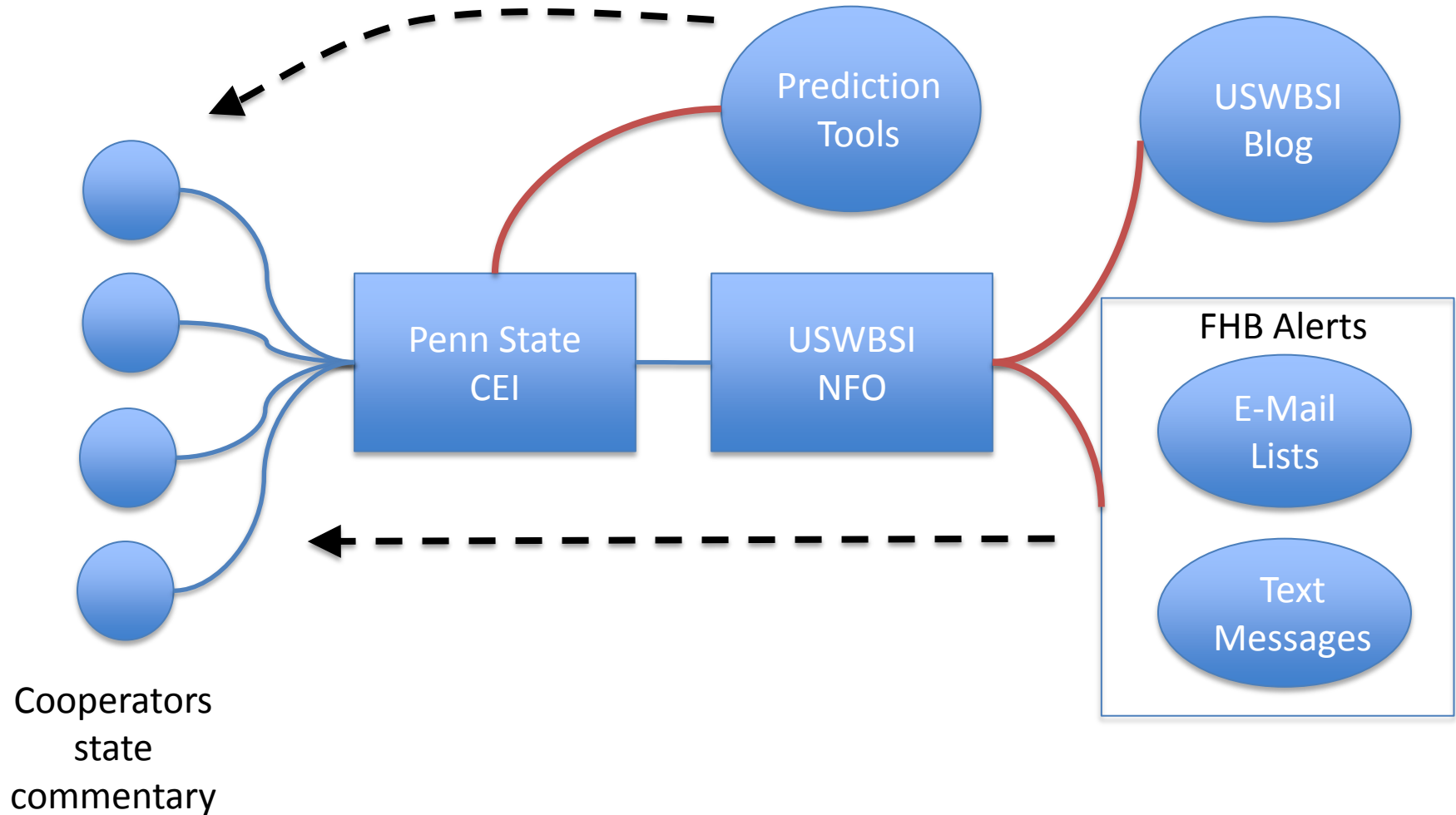
- Concerns emerge at 2009 FHB Forum
  - Some stakeholders were not getting the information they needed
  - Evaluate our cooperative efforts to communicate
- Ad-hoc committee appointed
  - Nashville meeting, March 29, 2010

# Committee Recommendations

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- Capitalize on emerging technologies to “push” the information out to stakeholders
- Energize the effort to develop state commentaries
- Develop a central location to organize information

# Advent of the “FHB Alert”



# Cooperator Activity

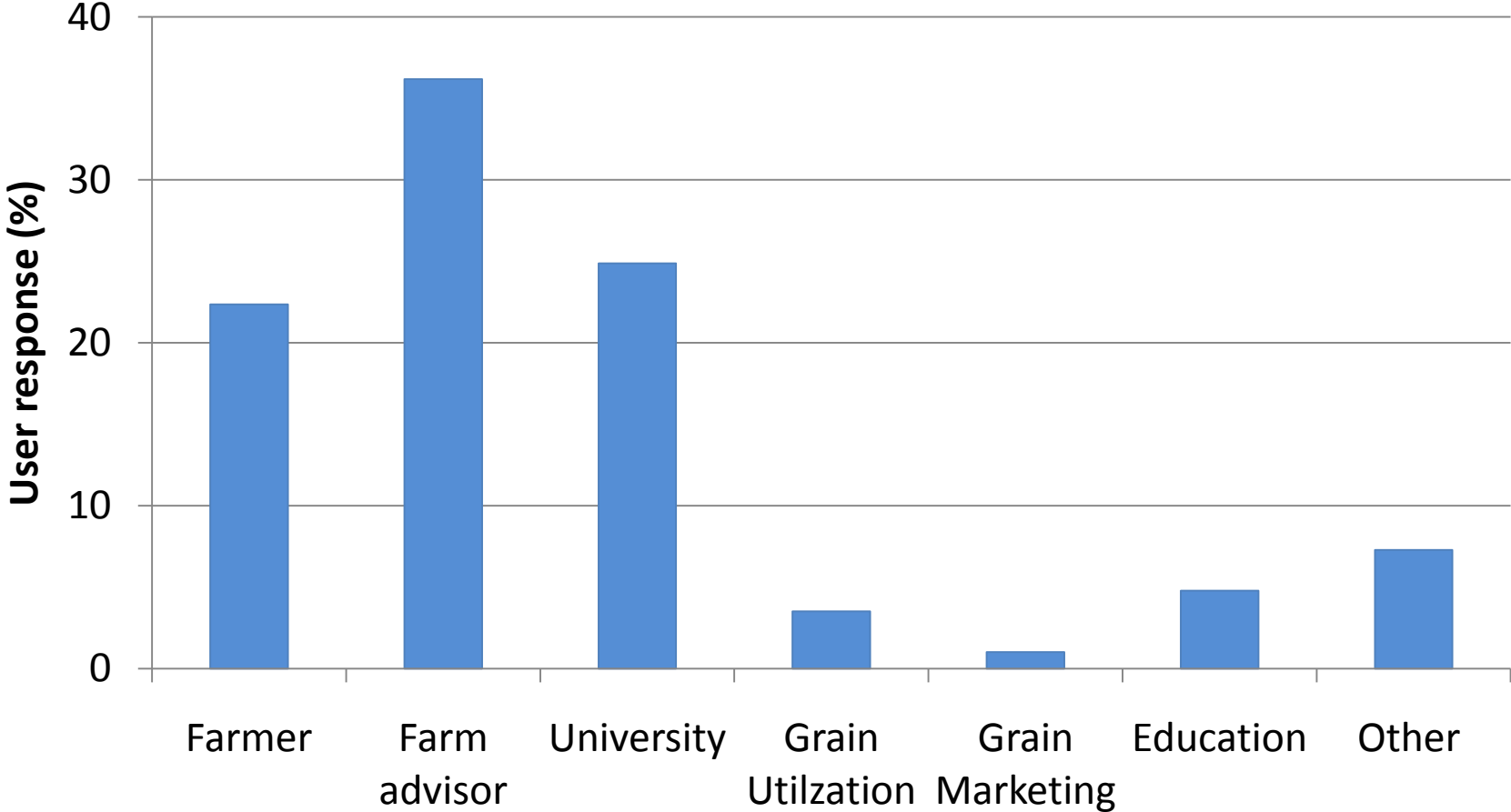
	2009	2010
States participating	21	20
Commentaries submitted	90	132
States with 5 or more commentaries	8	13

# User Survey 2010

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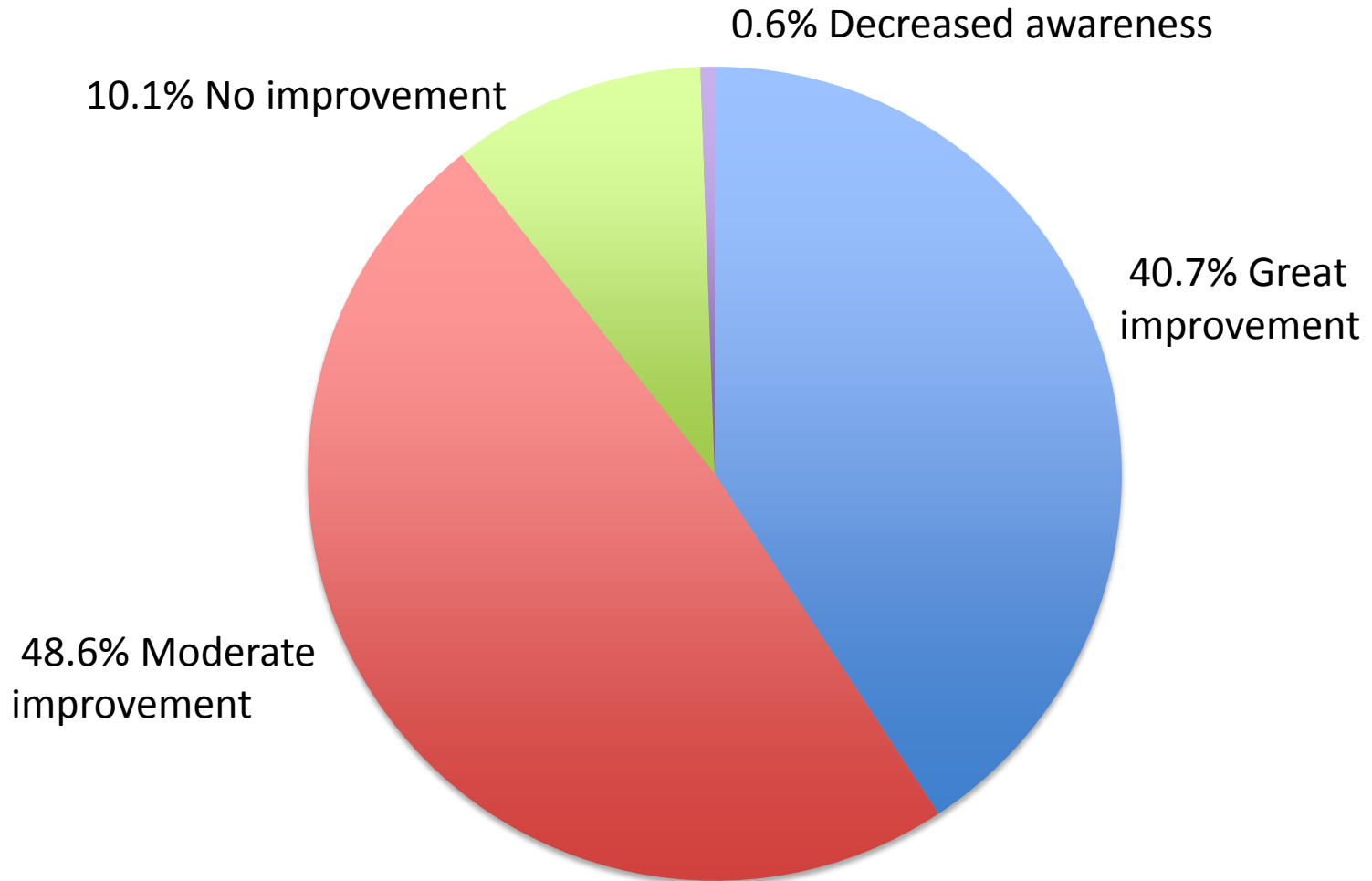
- Evaluation of FHB Alert and web-tools
- Sent to FHB Alert subscribers
- Distributed via extension e-mail lists and electronic newsletters
- 356 participants, representing 20 states

# Who is using the information?

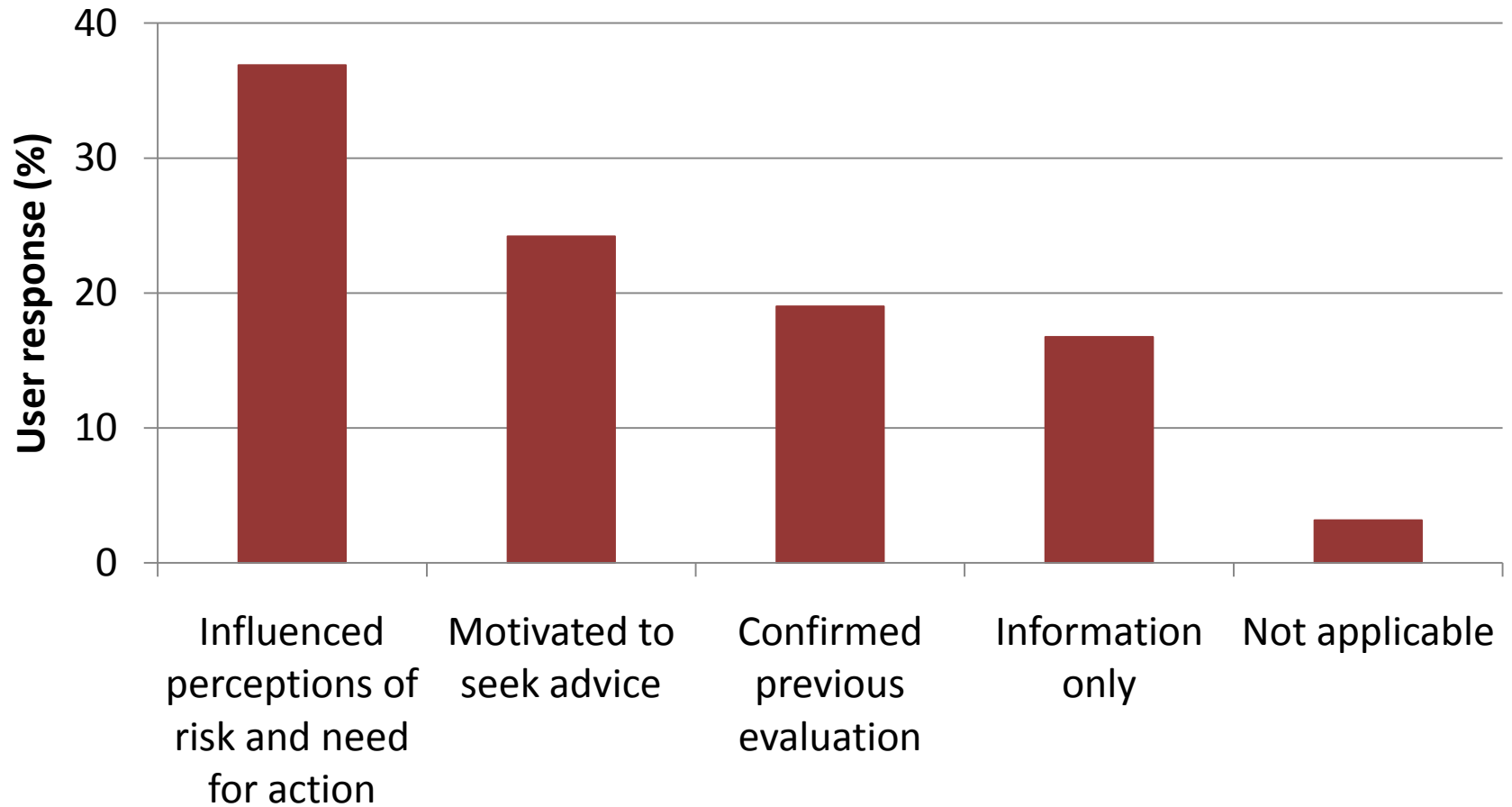


n=356

# How did the information influence awareness of the FHB risk?



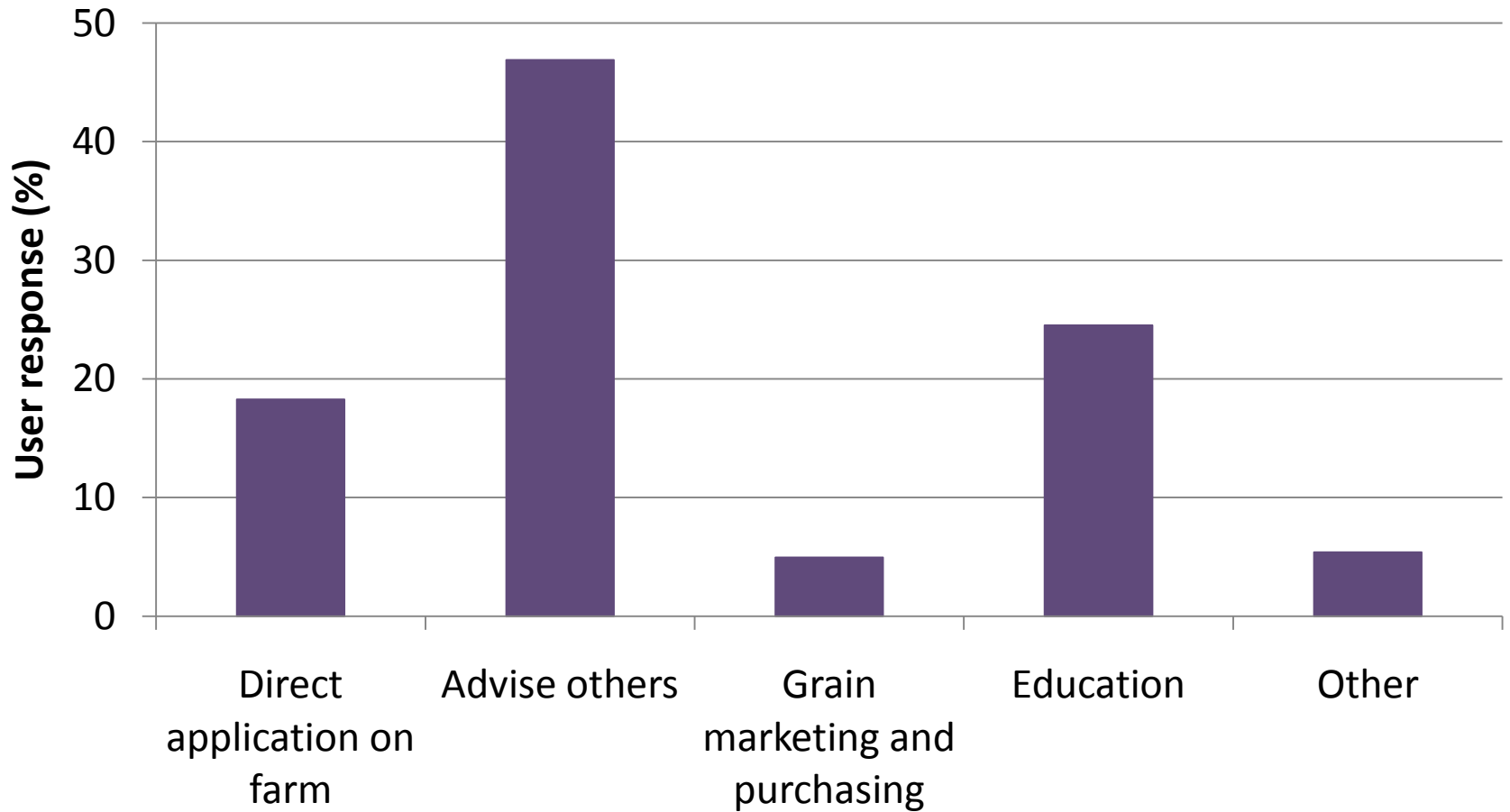
# How did the information influence actions?



n=356

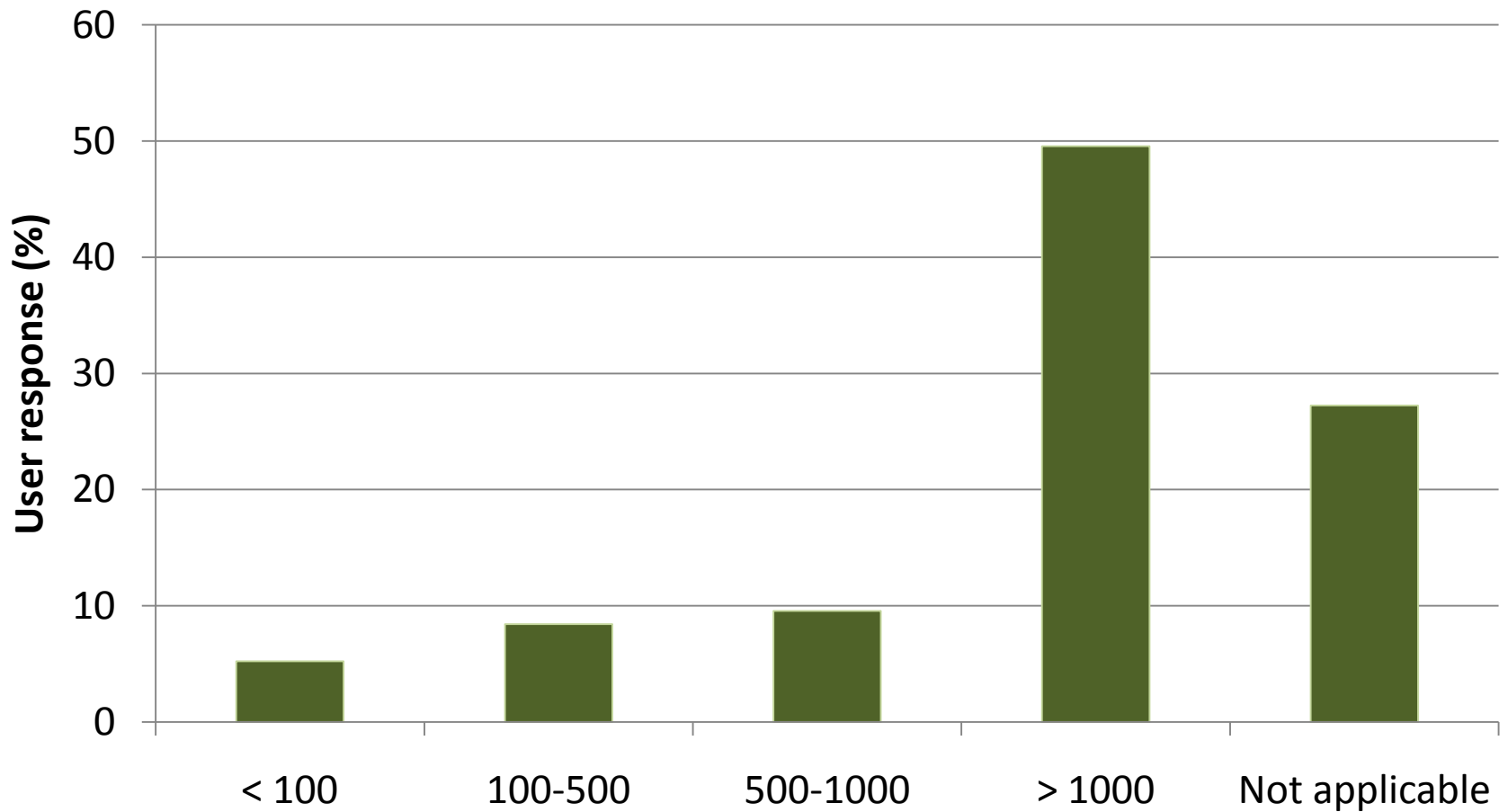


# How was this information used?



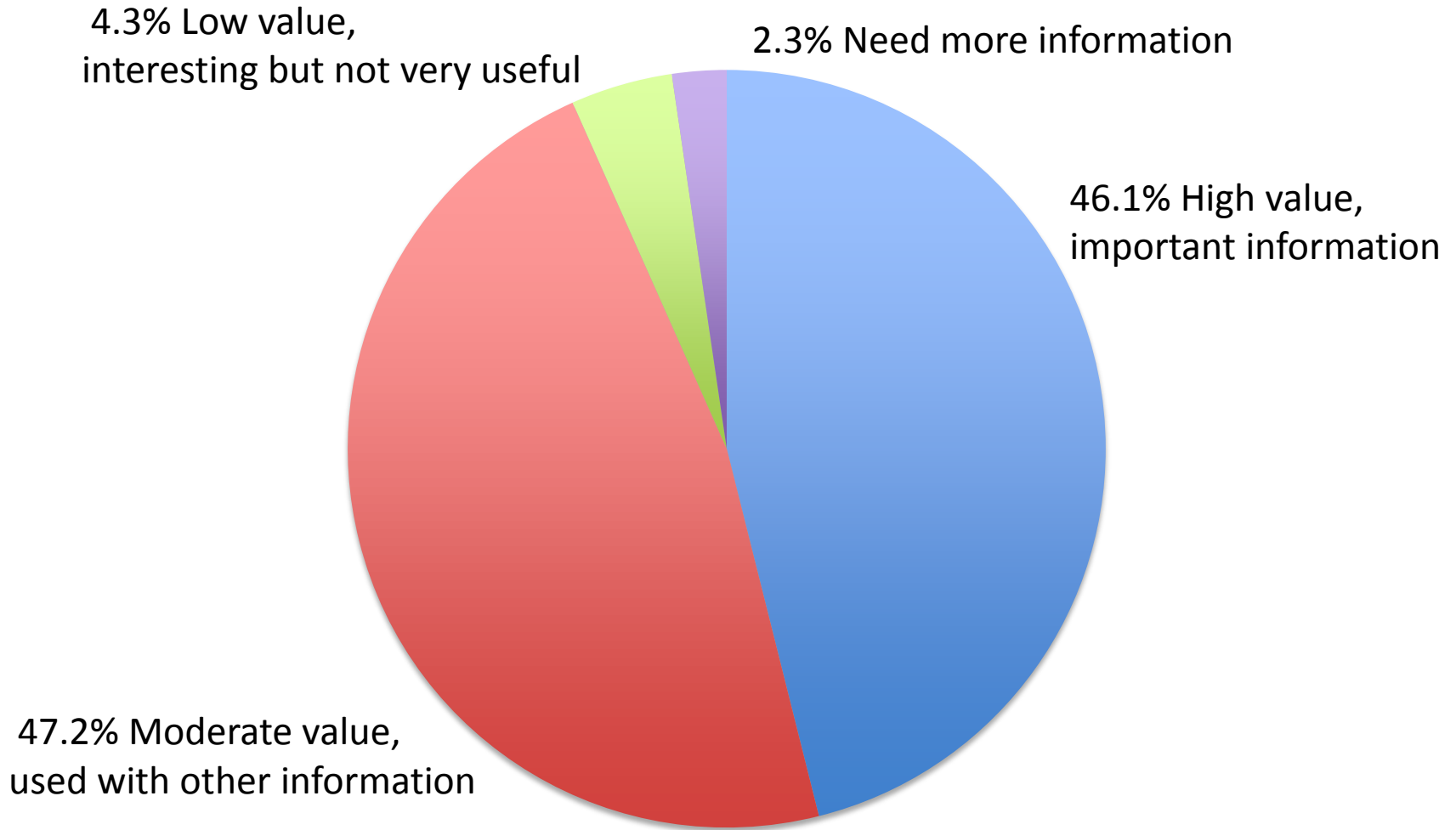
n=356

# How many acres were influenced by each user?



n=356

# What is the value of the information?



# We Need Your Help!

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- Cooperators working together to evaluate and communicate the risk of disease
- Promoting the use of the FHB Alert System

# Access to the FHB Alerts

Via the USWBSI webpage: [www.scabusa.org](http://www.scabusa.org)

The image shows a screenshot of the USWBSI website homepage. The main header features the text "US Wheat and Barley Scab Initiative" over a background image of wheat. Below the header is a navigation bar with links: HOME, Research Categories, Annual Meetings, Research Info/Tools, Grower/Industry Tools, and Publications. On the left side, there is a sidebar menu with sections: "About USWBSI" (Mission, What's Scab?, Annual Research Plan, Committees, Browse Funding Data, News Center, Contact Us), "USWBSI Services" (FHB Listserv, Calendar of Events, What's New?, FHB-related Links, Site Info/Submit Feedback), and "Application Menu" (Application Overview, Discussion Board, Scab Blog, Photo Library). Below the menu is a login section with fields for "Username:" and "Password:", a "Remember me" checkbox, and a "User Login" button. At the bottom of the sidebar is a "Search" field. The main content area is titled "WHAT'S HOT!" and features several articles and links, including "2010 National Fusarium Head Blight Forum" (Updated: 11/11/10) with sub-links for General Information, Online-Registration, Forum Schedule/Program, and Hotel Reservations; "Plant Scientists Fight Hunger Through Genetics" (Posted: 10/21/10); "Fusarium Focus: Fall 2010 Newsletter" (Posted: 09/28/10); "On-line Article: Fusarium Head Blight in 2010: An Overview" (Posted: 09/15/10); and "FY11 Request for Pre-Proposals (RFP) Closed". A red circle highlights the "Sign up for FHB Alerts" link in the "Attention Growers: Important Tools for FHB" section. Other links in this section include Scab Smart, FHB 2010 Risk Assessment Tool, FHB Prediction Center (Wheat), Links to Regional FHB Management Sites, and Grain Sampling for DON Analysis. At the bottom of the page, there are links for "USWBSI's Action Plan" (Updated: 06/01/09), "DON Testing Information including Sample Submission Instructions.", "FHB Bibliography Database" (Maintained by USDA-ARS-CDL), "US Wheat, Barley and Durum Variety Scab Resistance Data" (Interactive Map), and "Protocols, Tips and Tricks".

# Acknowledgements

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## Model development team

Pierce Paul  
Larry Madden  
Katelyn Willyerd  
Denis Shah  
Adam Sparks

## Model Application

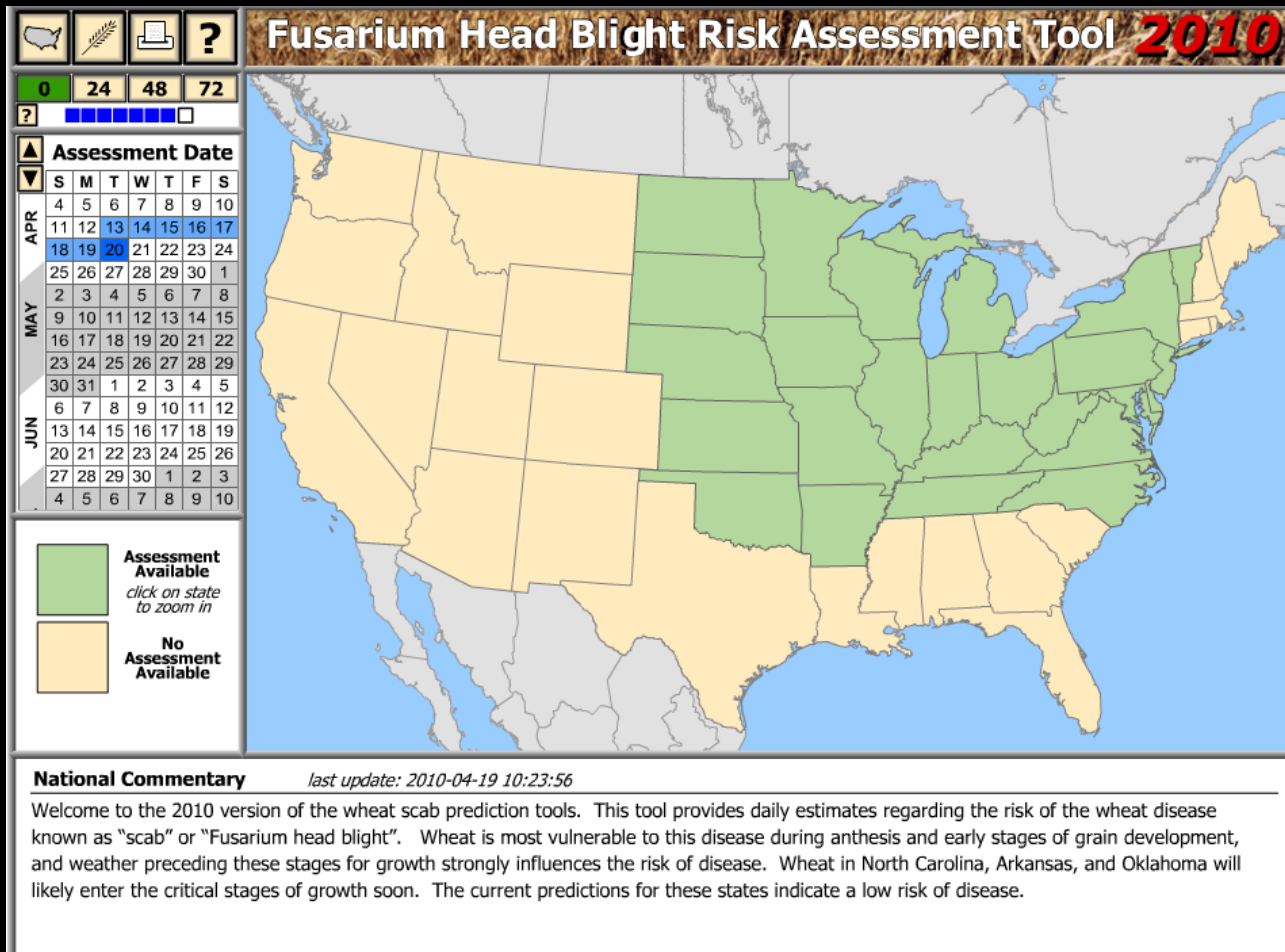
Paul Knight  
Doug Miller  
Steve Crawford  
Sonja Miller  
Tiffany Wisniewski

## Cooperators in 25 states that contribute data and commentary

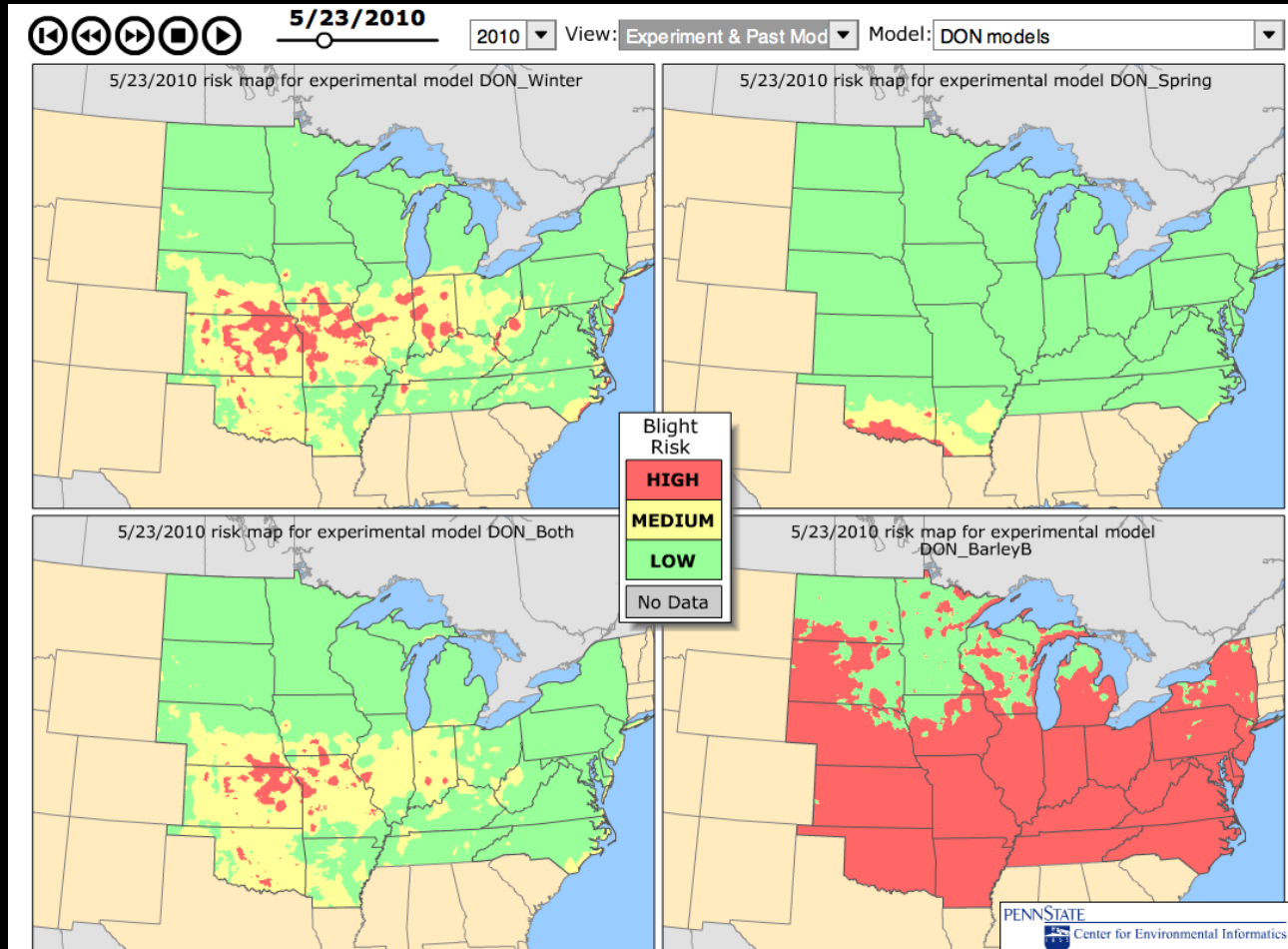
### USWBSI NFO

Dave Van Sanford  
Sue Canty  
Dave Hane

# Plans for Expansion in 2011



# Platform for testing new models





# Model Application

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- Maintain flow of weather data
  - National weather service (NWS)
    - Base of RTMA
    - Hourly reporting stations (FAA)
  - Independent weather networks
    - 15 states