

V(A). Planned Program (Summary)

Program # 17

1. Name of the Planned Program

Fusarium head blight of wheat

V(B). Program Knowledge Area(s)

1. Program Knowledge Areas and Percentage

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
212	Pathogens and Nematodes Affecting Plants	100%		100%	
Total		100%		100%	

V(C). Planned Program (Inputs)

1. Actual amount of professional FTE/SYs expended this Program

Year: 2010	Extension		Research	
	1862	1890	1862	1890
Plan	1.5	0.0	2.0	0.0
Actual	1.5	0.0	2.0	0.0

2. Actual dollars expended in this Program (includes Carryover Funds from previous years)

Extension		Research	
Smith-Lever 3b & 3c	1890 Extension	Hatch	Evans-Allen
48000	0	75400	0
1862 Matching	1890 Matching	1862 Matching	1890 Matching
72000	0	113000	0
1862 All Other	1890 All Other	1862 All Other	1890 All Other
0	0	0	0

V(D). Planned Program (Activity)

1. Brief description of the Activity

- Research on fungicidal- and bio-control and application technology
- Field surveys on disease severity and losses to disease
- Develop resource material
- Provide presentations and workshops
- Translate scientific materials into lay materials

2. Brief description of the target audience

- Wheat and barley producers
- Crop consultants and ag advisors
- Research Extension Centers
- Extension personnel
- Agribusiness and agrifinance personnel
- Government agency personnel

V(E). Planned Program (Outputs)

1. Standard output measures

2010	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Plan	6000	15000	0	0
Actual	10000	15000	0	0

2. Number of Patent Applications Submitted (Standard Research Output)

Patent Applications Submitted

Year: 2010
 Plan: 0
 Actual: 0

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

2010	Extension	Research	Total
Plan	1	1	
Actual	1	1	2

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- {No Data Entered}

V(G). State Defined Outcomes

V. State Defined Outcomes Table of Content

O. No.	OUTCOME NAME
1	Percent of acres planted to resistant varieties
2	Percent of acres treated with fungicides
3	Economic losses to disease (\$)
4	Number of individuals demonstrating increased knowledge and skills
5	Number of individuals implementing recommended action or practice
6	Estimated dollar value of adopted best management practices (\$)
7	Stable export market unaffected by quality issues (\$)
8	Number of consultants and producers trained on the use of two new tools for 2010: ScabSmart and FHB Alerts.

Outcome #1

1. Outcome Measures

Percent of acres planted to resistant varieties

Not Reporting on this Outcome Measure

Outcome #2

1. Outcome Measures

Percent of acres treated with fungicides

Not Reporting on this Outcome Measure

Outcome #3

1. Outcome Measures

Economic losses to disease (\$)

Not Reporting on this Outcome Measure

Outcome #4

1. Outcome Measures

Number of individuals demonstrating increased knowledge and skills

Not Reporting on this Outcome Measure

Outcome #5

1. Outcome Measures

Number of individuals implementing recommended action or practice

Not Reporting on this Outcome Measure

Outcome #6

1. Outcome Measures

Estimated dollar value of adopted best management practices (\$)

Not Reporting on this Outcome Measure

Outcome #7

1. Outcome Measures

Stable export market unaffected by quality issues (\$)

Not Reporting on this Outcome Measure

Outcome #8

1. Outcome Measures

Number of consultants and producers trained on the use of two new tools for 2010: ScabSmart and FHB Alerts.

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	{No Data Entered}	1000

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

North Dakota consultants and wheat producers need to access decision tools to optimize their management decisions of Fusarium head blight (FHB = scab). ND wheat producers have suffered severe yield and quality losses from a fungal disease called Fusarium head blight (FHB = scab). On the 9 million acres of spring wheat, durum wheat and winter wheat grown in the state, approximately 1/3 of the acreage is at risk every year from this disease, in areas with higher rainfall and more saturated soils. Significant research and extension efforts have sought management solutions for this disease, and today, producers have more resistant varieties available, better fungicides for reducing the disease and its associated toxin, and have a disease

forecasting system available to identify the risk of the disease during the critical growth stages of the crop.

What has been done

In 2010, Extension made available a new website on scab management, called ScabSmart, www.scabsmart.org, an internet site about scab management developed at NDSU with funding from the US Wheat and Barley Scab Initiative, which provides updated and straight forward information on best varieties for resistance, fungicide efficacy, crop rotations, and disease forecasting. In 2010, we also made FHB alerts available, to be "pushed" to emails or smartphones. These FHB alerts provided short messages at times and locations of critical risks of infection as determined by the FHB forecasting model. If infection risk was high, wheat producers could react by applying efficacious fungicides to reduce the disease and the toxin.

Results

ND wheat producers used the information provided on ScabSmart, FHB alerts, and also from information provided through traditional means, such as the NDSU Crop and Pest Report, county ag alerts, and the AgDakota listserv. They responded when FHB risks were high during the susceptible growth stage of wheat, flowering. The most efficacious fungicides were applied to 1.2 million acres because of forecast risks. Average wheat yield response was 15% or between 7.5 and 10 bu/acre of yield was protected from loss. If 9 bu/acre is used as the average yield increase and using a conservative price of \$7/bu, the gross return was \$63/acre and the net return was \$40/acre on 1.2 million acres. The total net return in North Dakota was \$48 million, based on yield response alone. Additional protection of the food quality was achieved with reductions of vomitoxin to safe levels in harvested wheat grain.

4. Associated Knowledge Areas

KA Code	Knowledge Area
212	Pathogens and Nematodes Affecting Plants

V(H). Planned Program (External Factors)

External factors which affected outcomes

- Economy

Brief Explanation

High prices of wheat and lower prices of fungicide also made fungicide protection against FHB more economical.

V(I). Planned Program (Evaluation Studies and Data Collection)

1. Evaluation Studies Planned

- During (during program)

Evaluation Results

An analysis of hits on the ScabSmart web site indicated about 1000 ND producers using site, and the number of sign-ups for FHB alerts indicated ND residents had the highest number of participants across US. Three NDSU faculty, Drs. G. McKee, J. Ransom, and M. McMullen, also surveyed ND producers on their reasons or determinants of adoption of scab management techniques. Results were presented at the 2010 US Wheat and Barley Scab Initiative National Forum in December, 2010. The largest percentage (35.3%) of farmers used three techniques, variety resistance, fungicides, and crop rotations.

Key Items of Evaluation