USDA-ARS/
U.S. Wheat and Barley Scab Initiative
FY10 Final Performance Report
July 15, 2011

Cover Page

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Fiscal Year:	FY10
USDA-ARS Agreement ID:	59-0790-7-077
USDA-ARS Agreement Title:	Enhanced Tools for the Deployment of Fusarium Head Blight Prediction Models.
FY10 USDA-ARS Award Amount:	$ 37,254

USWBSI Individual Project(s)

USWBSI Research Category*	Project Title	ARS Award Amount
MGMT	Deployment of Models Predicting the Risk of Disease Epidemics and DON.	$ 37,254
	Total ARS Award Amount	**$ 37,254**

Paul G Knight July 8, 2011
Principal Investigator Date

*MGMT – FHB Management
FSTU – Food Safety, Toxicology, & Utilization of Mycotoxin-contaminated Grain
GDER – Gene Discovery & Engineering Resistance
PBG – Pathogen Biology & Genetics
BAR-CP – Barley Coordinated Project
DUR-CP – Durum Coordinated Project
HWW-CP – Hard Winter Wheat Coordinated Project
VDHR – Variety Development & Uniform Nurseries – Sub categories are below:
SPR – Spring Wheat Region
NWW – Northern Soft Winter Wheat Region
SWW – Southern Soft Red Winter Wheat Region

Project 1: *Deployment of Models Predicting the Risk of Disease Epidemics and DON.*

1. What major problem or issue is being resolved relevant to Fusarium head blight (scab) and how are you resolving it?

The assessment of the risk of scab for the entire wheat and barley planting region east of the Rockies for the growing season is being predicted based on the research of plant pathologist (Erick DeWolf and colleagues) and the known relationship to atmospheric conditions (Temperature and Moisture [both rainfall and dew point]).

The innovative component of this prediction system includes the use of several models (winter vs spring wheat, experimental, etc.), dense resolution gridded atmospheric data (5km horizontal resolution) and an increasing number of agricultural weather networks (19 of 28 states) used to bias correct the gridded data for a more accurate assessment of the risk along with a 3 day forecast..

The user interface includes a survey which gathers user feedback on the utility of the prediction system and also displays expert commentary.

2. List the most important accomplishment and its impact (i.e. how is it being used)to minimize the threat of Fusarium head blight or to reduce mycotoxins. Complete both sections (repeat sections for each major accomplishment):

Accomplishment:

The primary accomplishment is a daily real-time assessment of Fusarium head blight and DON across the wheat/barley growing regions of the nation beginning in early April and continuing into mid-August. Growers can make scientifically sound decisions based on the guidance provided and also receive notices of expert commentaries for their region/state.

Impact:

A better informed growing community that uses amelioration for scab in the most responsible way while increasing the productivity of their farms.

Include below a list of the publications, presentations, peer-reviewed articles, and non-peer reviewed articles written about your work that resulted from all of the projects included in the grant. Please reference each item using an accepted journal format. If you need more space, continue the list on the next page.

1. Haran, M., Bhat, K., Molineros, J. and De Wolf, E. 2010. Estimating the risk of crop epidemics from coincident spatiotemporal processes. Journal of Agricultural, Biological
2. and Environmental Statistics 15:158-175.

3. De Wolf, E. 2010. Integrating genetic resistance and fungicide for Fusarium head blight management. Hard Red Winter Wheat Workers Workshop, 2010. March 7-9, Lincoln, NE.

4. De Wolf, E., Shah, D., Paul, P., Madden, L., Willyerd, K., Knight, P., and Miller, D. 2010. Advances in the development and application of prediction models for FHB and DON. In: S. Canty, A. Clark, A. Anderson-Scully, D. Ellis, and D. Van Sanford (Eds.), Proceedings fo the National Fusarium Head Blight Forum; 2010 Dec 7-9; Milwaukee, WI. Lexington, KY: University of Kentucky. P. 79.

5. De Wolf, E. 2010. Prediction models for Fusarium head blight in the U.S. University of Manitoba, Plant Science Department Seminar Series. Winnipeg, MB Canada, Oct. 29, 2010.

6. Hane, D. S., Canty, S., De Wolf, E., Crawford, S., and Van Sanford, D. 2010. The U.S. Wheat and Barley Scab Initative's FHB alert system. In: S. Canty, A. Clark, A. Anderson-Scully, D. Ellis, and D. Van Sanford (Eds.), Proceedings of the National Fusarium Head Blight Forum; 2010 Dec 7-9; Milwaukee, WI. Lexington, KY: University of Kentucky. P. 177.