USDA-ARS/
U.S. Wheat and Barley Scab Initiative
FY06 Final Performance Report (approx. May 06 – April 07)
July 16, 2007

Cover Page

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Fiscal Year:	2006
USDA-ARS Agreement ID:	59-0790-4-127
USDA-ARS Agreement Title:	Accelerating the Development of FHB-Resistant Soft Red Winter Wheat Varieties.
FY06 ARS Award Amount:	$ 61,196

USWBSI Individual Project(s)

USWBSI Research Area*	Project Title	ARS Award Amount
VDUN	Accelerating the Development of FHB-Resistant Soft Red Winter Wheat Varieties.	$ 61,196
	Total Award Amount	**$ 61,196**

July 16, 2007
Principal Investigator Date

* CBCC – Chemical, Biological & Cultural Control
EEDF – Etiology, Epidemiology & Disease Forecasting
FSTU – Food Safety, Toxicology, & Utilization of Mycotoxin-contaminated Grain
GET – Genetic Engineering & Transformation
HGR – Host Genetics Resources
HGG – Host Genetics & Genomics
PGG – Pathogen Genetics & Genomics
VDUN – Variety Development & Uniform Nurseries

Project 1: *Accelerating the Development of FHB-Resistant Soft Red Winter Wheat Varieties.*

1. What major problem or issue is being resolved and how are you resolving it?

The problem we are addressing is the lack of FHB resistance in soft red winter wheat varieties adapted to Kentucky. Most varieties grown in our region are susceptible to FHB; thus, Kentucky wheat producers and end users are at risk for severe economic losses as a result of head scab epidemics.

This breeding process involves every year: 1) evaluating germplasm and breeding lines as parents for FHB resistance; 2) incorporating known resistance into crosses with elite, high yielding lines and cultivars, and 3) evaluating resistance in the progeny of the crosses. We are also evaluating F_2 and F_3 populations in inoculated nurseries so that only resistant segregates are brought forward and developed into lines that can be evaluated for the usual array of traits at multiple locations. We have approximately 300 single seed descent lines that have been genotyped as homozygous for the Sumai 3 resistance by the USDA-ARS genotyping lab in Raleigh, NC.

Field evaluation is carried out at two locations: Lexington, under mist irrigation with inoculum provided by the scabby corn method, and at Princeton in a non-irrigated nursery with a combination of conidial spray and scabby corn as inoculum sources.

2. List the most important accomplishment and its impact (how is it being used?). Complete all three sections (repeat sections for each major accomplishment):

Accomplishment: Approximately 300 single seed descent lines genotyped as homozygous for the Sumai 3 resistance were planted in yield tests for the first time during the period covered by this grant.

Impact: This will have a big impact on our breeding program; tracking the resistance genes with markers will accelerate the delivery of resistant lines to the variety release track. It will also allow us to combine the Sumai 3 resistance with native resistance.

As a result of that accomplishment, what does your particular clientele, the scientific community, and agriculture as a whole have now that they didn't have before?

Breeders will have additional germplasm and parental lines to use in crosses for the development of scab resistant germplasm and varieties.

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.

Mundell, N. and D. Van Sanford. 2006. Evaluation of Fusarium Head Blight Resistance in Soft Red Winter Wheat. In: Canty, S.., A. Clark, and D. Van Sanford (Eds.), Proceedings from the 2006 National Fusarium Head Blight Forum; 2006 Dec 10-12; Research Triangle Park, NC. Lexington, KY: University of Kentucky. p. 113

Van Sanford, D. A. 2007. Head scab update. Presented at the North American Wheat Worker's Workshop, Saskatoon, Saskatchewan, CANADA, March 12-14