USDA-ARS/
U.S. Wheat and Barley Scab Initiative
FY07 Final Performance Report (approx. May 07 – April 08)
July 15, 2008

Cover Page

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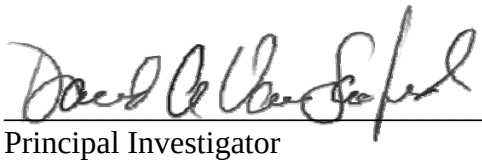
Fiscal Year:	2007
USDA-ARS Agreement ID:	59-0790-4-127
USDA-ARS Agreement Title:	Accelerating the Development of FHB-Resistant Soft Red Winter Wheat Varieties.
FY07 ARS Award Amount:	$ 50,598

USWBSI Individual Project(s)

USWBSI Research Area*	Project Title	ARS Adjusted Award Amount
IIR	Accelerating the Development of FHB-Resistant Soft Red Winter Wheat Varieties.	$50,598
	Total Award Amount	**$ 50,598**



7-14-08

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
IIR – Integrated/Interdisciplinary Research
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 need for 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: 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 evaluate early generation 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.

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 150 single seed descent lines homozygous for *Fhb*1 resistance were planted in replicated yield tests at multiple locations for the first time during the period covered by this grant.

Impact: This will have a big impact on our breeding program; the presence of *Fhb*1 in backgrounds with additional native resistance QTL moves us towards the goal of eliminating very susceptible material from our breeding program and establishing a baseline level of nothing less than moderately resistant.

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. The combination of *Fhb*1 and native resistance QTL will be especially useful.

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.

Agostinelli, A. A. Clark and D. Van Sanford. 2007. Air Separation and Digital Photo Analysis as Novel Methods to Measure the Percentage of Fusarium Damaged Kernels. In: Canty, S.., A. Clark, D. Ellis and D. Van Sanford (Eds.), Proceedings from the 2007 National Fusarium Head Blight Forum; 2007 Dec 2-4; Kansas City, MO. Lexington, KY: University of Kentucky. p. 161.

Mundell, N. and D. Van Sanford. 2007. Evaluation of FHB Profiles of Advanced Wheat Breeding Lines Treated with a Fungicide. In: Canty, S.., A. Clark, D. Ellis and D. Van Sanford (Eds.), Proceedings from the 2007 National Fusarium Head Blight Forum; 2007 Dec 2-4; Kansas City, MO. Lexington, KY: University of Kentucky. p. 212.

Invited Talks:

Van Sanford, D. A. 2008. The USWBSI: Status Report. 2008 Wheat Quality Council Annual Meeting. Kansas City, MO. February 19-21, 2008.