

**USDA-ARS/
U.S. Wheat and Barley Scab Initiative
FY06 Final Performance Report (approx. May 06 – April 07)
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Cover Page

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USDA-ARS Agreement Title:	Development of FHB Resistant Wheat Genotypes Adapted to the Gulf Coast.
FY06 ARS Award Amount:	\$ 29,642

USWBSI Individual Project(s)

USWBSI Research Area *	Project Title	ARS Award Amount
VDUN	Development of FHB Resistant Wheat Genotypes Adapted to the Gulf Coast.	\$ 29,642
	Total Award Amount	\$ 29,642

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

(Form – FPR06)

Project 1: *Development of FHB Resistant Wheat Genotypes Adapted to the Gulf Coast.*

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

This project is developing wheat varieties adapted to the Gulf Coast that are resistant to Fusarium Head Blight (FHB), and evaluating FHB reaction of available varieties. The climate and disease spectrum of Louisiana are unique and prevent most varieties developed outside of the Deep South from being successfully produced. Therefore it is important that the LSU AgCenter wheat breeding program release high-yielding scab-resistant varieties. A recent survey of Louisiana FHB populations found that strains from the region were quite unique and 78% were NIV producers. Since NIV is more toxic than DON it is important to develop resistant varieties to prevent movement of NIV contaminated grain into the Mississippi River export elevators. Scab occurs occasionally across Louisiana and frequently in the rice region of southwest Louisiana. Objectives will be accomplished by: (1) Participating in regional screening nurseries, (2) Initiating a recurrent selection program, and (3) Crossing adapted soft wheat lines and varieties with genotypes having resistance to FHB

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:

The wheat breeding program continued to make excellent progress towards development of locally-adapted varieties with resistance to FHB in 2006. Wheat breeding lines with FHB resistant parentage were grown a replicated yield trial and in non-replicated observation plots at Baton Rouge. The same lines were evaluated for FHB resistance at three locations in misted, inoculated nurseries. Seventeen lines were identified from these trials that appear to have good yield and agronomic characteristics coupled with resistance to FHB. These 17 lines also contain major QTLs for resistance based on marker tests conducted by the USDA Regional Genotyping Lab at Raleigh. They will be advanced and increased for regional testing. Forty-eight crosses were made using diverse, adapted sources of FHB resistance to develop new populations as part of the variety development effort. Numerous headrows and segregating populations were advanced through the breeding program. The misted, inoculated fields were also used to screen available varieties and advanced breeding lines for FHB reaction, including: the statewide wheat variety trial; the Gulf-Atlantic Wheat Nursery, LSU Wheat Prelims-A, B, and C, and the regional Uniform Southern Fusarium Headblight Nursery.

Impact:

This program is primarily focused on the development of productive varieties with good disease-resistance that are adapted to the Gulf Coast region. The LSUAC wheat breeding program has released four varieties since 2002 and accounted for a large proportion of wheat production in Louisiana during 2007. There are no FHB-resistant varieties currently grown in Louisiana. The development of FHB resistant varieties will positively impact wheat production economics and should allow growers in the distressed rice producing region of southwest Louisiana where FHB is a significant problem to expand wheat production.

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?

Louisiana growers will soon have available varieties that are locally adapted and are resistant to Fusarium headlight. There are few cropping options for the rice region and scab-resistant wheat would provide an economically viable option.

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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.

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