USDA-ARS / USWBSI
FY04 Final Performance Report
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Cover Page

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Year:	**FY2004** (approx. May 04 – April 05)
FY04 ARS Agreement ID:	**59-0790-4-104**
FY04 ARS Agreement Title:	**Development of FHB Resistant Wheat Genotypes Adapted to the Gulf Coast.**
FY04 ARS Award Amount:	**$ 30,411**

USWBSI Individual Project(s)

USWBSI Research Area*	Project Title	ARS Adjusted Award Amount
VDUN	Development of FHB Resistant Wheat Genotypes Adapted to the Gulf Coast.	$ 30,411
	Total ARS Award Amount	**$ 30,411**

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Principal Investigator Date

* BIO – Biotechnology
CBC – Chemical & Biological Control
EDM – Epidemiology & Disease Management
FSTU – Food Safety, Toxicology, & Utilization
GIE – Germplasm Introduction & Enhancement
VDUN – Variety Development & Uniform Nurseries

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?

FHB is common in the rice growing region of Louisiana and occurs statewide in some years. Head scab was severe in wheat variety trials at the LSU AgCenter Rice Research Station in 2005, was common in grower fields in that region of the state, and occurred in some fields across the state. Wheat from the Gulf Coast enters major export markets through Mississippi River elevators so it is important that wheat grown in the region is not contaminated with Fusarium-related toxins. The Gulf Coast is a unique wheat-growing region that is not suitable for most wheat varieties due to low vernalization and high disease pressure. The LSU AgCenter wheat breeding program serves as an important source of adapted wheat varieties for this region and this research should lead to development of FHB resistant varieties specifically adapted to that region. The overall objective of this project is to accelerate development of wheat varieties and germplasm adapted to the Gulf Coast that are resistant to Fusarium Head Blight (FHB). These 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. What were the most significant accomplishments?

Significant progress was made in development of FHB resistant varieties and germplasm for the Gulf Coast. FHB research plots were planted at Baton Rouge (south), Crowley (rice region), and Winnsboro (north) Louisiana. Corn-based inoculum was used at all three locations and a mist system was set up at Baton Rouge and Winnsboro. Material evaluated for 2004-05 included: 1) FHB material from CIMMYT-USWBSI, 2) two regional FHB nurseries, yield trials of 51 advanced LSUAC breeding lines with FHB resistant parentage, 2600 advanced headrows, and numerous populations developed as part of the USBWSI-funded breeding program. All entries in the Louisiana statewide wheat performance trials were also screened for reaction to FHB at two locations.

Five LA advanced lines were entered in the 05USFHBN coordinated by NC State. LSU04FHB1 in the 2004 USFHBN had a scab index of 19, 6th lowest of 41 entries. Results for the 2004-05 season are incomplete but initial results show LA97407D-17-4 (Mason*2/Catbird90) had the second-lowest scab index in NC.

F4 and F5 headrows with FHB resistant parentage were evaluated for resistance to stripe and leaf rust, and for agronomic adaptation at Baton Rouge. Selected lines were harvested and will be evaluated using MAS in the fall of 2005 and in inoculated screening nurseries and replicated yield trials in the spring of 2006. Individual heads of F3 populations from backcrosses with FHB resistance sources were selected for agronomic adaptation and will be tested as F4 headrows in 2005. Sources of resistance include parents with major genes (ND2928, Futai8944, CIMMYT FHB lines) and adapted lines that have show some level of resistance probably not associated with Sumai-3 major genes. Forty F2 populations with FHB resistance sources in their parentage were selected and harvested at Baton Rouge. Many of these populations included FHB resistance sources developed by Gene Milus using ‘Mason’ as an adapted background. Twenty-two F1 crosses and backcrosses were produced at Baton Rouge. Most of these had resistance sources from the USFHBN including VA01-W476 and AR857-1.

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 you 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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