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

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Fiscal Year:	2007
USDA-ARS Agreement ID:	59-0790-4-108
USDA-ARS Agreement Title:	Enhancement of Scab Resistant Wheat Cultivars Adapted to the Southeast.
FY07 ARS Award Amount:	$ 32,257

USWBSI Individual Project(s)

USWBSI Research Area*	Project Title	ARS Adjusted Award Amount
VDUN	Enhancement of Scab Resistant Wheat Cultivars Adapted to the Southeast.	$32,257
	Total Award Amount	**$ 32,257**

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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: *Enhancement of Scab Resistant Wheat Cultivars Adapted to the Southeast.*

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

Fusarium head blight (FHB) epidemics have occurred in Georgia and the Southeast that resulted in marketing difficulty of grain due to high DON concentrations. Presently, scab resistant cultivars with resistance to other diseases such as leaf rust and stripe rust are not available in adequate numbers. The goal is to enhance soft red winter wheat cultivars with Fusarium head blight resistance and improved yield potential for commercial use in the lower Southeastern United States. The objectives are to identify, incorporate, and pyramid resistance to FHB in elite lines and to marker-assisted selection to pyramid FHB resistance. Both native and exotic sources of scab resistance are being identified and incorporated into elite lines. Marker Assisted Selection is also being employed to accelerate the development of adapted FHB resistant cultivars by the assistance in the selections within populations containing 3BS and 5AS. Wheat breeding lines from the southern uniform scab nurseries are being evaluated for resistance and adaptation under field conditions in the Southeast**.**

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:

Scab resistant cultivars that have combined resistance to leaf and stripe rust have been lacking in the Southeast. Several wheat germplasm from both native and exotic sources with FHB resistance have been transferred into elite lines that are adapted to the Southeast. Breeding lines have been identified with native scab resistance that is equal to or better than Ernie. These lines are being increase with the intention for release. MAS with SSR markers were used to accelerate the development of scab resistance from 3BS and 5AS into elite lines. Advanced lines from GA 031307DH and GA031454DH (derivative of Sumai 3), VA02W-713 (Ning7840 / PIO2691 // Roane), INW 0411, and Truman were further selected for field evaluation.

Impact:

Wheat lines from diverse origin with moderate FHB resistance are available that are adapted to the Southeast. The breeding line, GA 991109-6E8 (Ernie derived) has been identified with good native scab resistance and is being increased for possible release. Two other lines, GA981621-5E34 and GA991371-6E13 have been identified in the Uniform Southern FHB nurseries with moderate Type II resistance. Both native and exotic sources of scab resistance are also being incorporated into adapted lines with good agronomic performance.

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?:

Cultivars and elite lines with moderate resistance to Fusarium head blight and adapted to the southeast will be available for producers. Millers should be able to obtain grain with acceptable quality.

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.

Jerry Johnson, Zhenbang Chen, James Buck, and Mingli Wang. 2007. Introduction of Fusarium Head Blight (FHB) Resistance into Soft Red Winter Wheat AGS2000. National FHB Forum, Kansas City, KS

J.W. Johnson, L. Miranda, and Z. Chen. 2007. Wheat Coordinated Agricultural Project (CAP). Small Grain and Soybean Expo, Statesboro, GA.