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:	59-0790-4-124
USDA-ARS Agreement Title:	Development of Fusarium Head Blight Resistant Wheat Varieties - Cornell.
FY06 ARS Award Amount:	$ 34,423

USWBSI Individual Project(s)

USWBSI Research Area*	Project Title	ARS Award Amount
VDUN	Fusarium Head Blight Resistant Soft White Winter Wheat Variety Development for the Northeastern US.	$ 34,423
	Total Award Amount	**$ 34,423**

June 29,2007

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: *Fusarium Head Blight Resistant Soft White Winter Wheat Variety Development for the Northeastern US.*

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

Our field evaluation methods have proven to be reliable for the past 3 years so that the problem of low infections has been solved. The next problem was the enormous labor requirement for evaluation. I consulted with several other people at the FHB conference last winter to try to resolve this bottleneck in our system. On the recommendation of other FHB collaborators, we have altered the method of evaluation this season allowing us to reduce the labor requirement. The revised scoring system is similar to the method recommended on the USWBSI web site and seems to be fairly reliable but not quite as accurate as total counts on 1 meter rows. Last year we modified a protocol that we had previously used to select single plants in early generations to improve the reliability of identifying resistant genotypes. Those were planted in single rows this year for evaluation. We started with 91 symptomless plants in the field in 2006. Those were threshed and 39 showed clean seed and were planted separately in headrows. Those were evaluate in 2007 and 19 were classified as resistant. Estimates of realized heritability will be averaged over the next couple of years. Lodging was not a problem this year with the reduced plant density compared to last year. Other diseases such as Septoria Glume Blotch were not a problem this year. For 2008, we are going to attempt mass inoculation of our main breeding nursery to eliminate susceptible genotypes before yield evaluation.

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:
A new variety, NY88046-8138 has been approved for release and will be named Jensen. Foundation seed was planted last fall for certified seed sales this year. This variety has excellent resistance to fusarium head blight and preharvest sprouting, the two main problems in this growing region. We also have approval for release of CaledoniaReselect-L which also shows excellent resistance to FHB. This variety has not been named but Breeder's seed will be planted this fall. These are our first FHB resistant soft white winter wheat varieties and represent an important milestone for the northeast wheat growing region.

Impact:
The impact of these two varieties is enormous for the white wheat industry as there has been a drastic shift in acreage from white to red wheat. This has created a severe shortage of white wheat in this region and forced processors to import white wheat from Canada. Accumulators are paying a premium to farmers for delivery of white wheat.

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?

For the first time, a soft white winter wheat variety is available to farmers in the northeastern wheat growing region. White wheat varieties have lagged behind red wheats because there are only 2 white wheat breeders and many red wheat breeders. This release may prevent white wheat from disappearing from this region all together.

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.

Presentations:
6/7 – Aurora, NY
Small grains management field day
"A New Soft White Winter Wheat with Fusarium Head Blight Resistance for New York"

7/5 – Ithaca, NY
Seed grower's field day
"Cornell Wheat Breeding and a New Soft White Winter Wheat with Fusarium Head Blight Resistance for New York"

Cornell Wheat Breeding Project: Developing Improved Soft White Winter Wheat for the Northeastern U.S. – Kellogg's, Battlecreek MI – February 26

No publications that have a journal format citation.