

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

Cover Page

PI:	Mark Sorrells
Institution:	Cornell University
Address:	Department of Plant Breeding 252 Emerson Hall Ithaca, NY 14853
E-mail:	mes12@cornell.edu
Phone:	607-255-1665
Fax:	607-255-6683
Fiscal Year:	2007
USDA-ARS Agreement ID:	59-0790-4-124
USDA-ARS Agreement Title:	Development of Fusarium Head Blight Resistant Wheat Varieties - Cornell.
FY07 ARS Award Amount:	\$ 35,600

USWBSI Individual Project(s)

USWBSI Research Area *	Project Title	ARS Adjusted Award Amount
VDUN	Fusarium Head Blight Resistant Soft White Wheat Variety Development for the Northeastern US.	\$35,600
	Total Award Amount	\$ 35,600


7-11-08

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

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

Field evaluation methods continue to improve and have generated useful results for the past 4 years thus eliminating the problem of low infections. In addition, the evaluation protocol was an issue, which we resolved by consulting with other collaborators. 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 the total counts on 1 meter rows that we used previously. We also continued to refine a protocol for selecting single plants in early generations. We can now reliably identify resistant genotypes about 40-50% of the time based on two years of evaluation of the progeny of those single plants. In two independent experiments, 38 and 48% of the putative resistant single plants were resistant when evaluated in replicated 1 meter rows.

Lodging and diseases were not a problem this year. We evaluated a mass inoculation method for nurseries that could not be placed under the mist irrigation. Infection rates were much lower but we could still identify susceptible genotypes. For 2009, we are going to continue with this mass inoculation of our main breeding nursery to eliminate susceptible genotypes before yield evaluation.

In our marker assisted selection program we added the screening of our recurrent parents for the 5AS resistance gene and found that nearly all were polymorphic with our two sources OH02-12678 and OH02-12686. These have been crossed to all of our recurrent parents, including E0028, NY03179-10, NY0180-10, NY03179-12, Jensen, P25W41, CalResel-L. We have also crossed our two Caledonia derived FHB lines to E0028 and CalResel-L. These will all be advanced again in our winter greenhouse.

**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:

Jensen soft white winter wheat went into production this past year. It is moderately resistant to fusarium head blight and preharvest sprouting, the two main problems in this growing region. CaledoniaReselect-L which also shows excellent resistance to FHB was approved for release and foundation seed production began this year. These are the first FHB resistant soft white winter wheat varieties in the northeastern region and represent an important milestone for our growers.

Impact:

The importance of these white wheat varieties is enormous for this growing region. White wheat is a very important raw material for the whole grain products produced by companies in this region. In recent years there has been a shift in acreage from white to red wheat thus creating a severe shortage. Buyers have been offering a premium for farmers who grow a quality crop 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?:

The resistance in these varieties is non-Chinese which can be combined with Chinese sources to increase resistance to FHB. These two new varieties provide northeastern farmers a choice of white wheat varieties with high yield, and good agronomic traits that will produce a more reliable crop. We anticipate that this will help to stabilize white wheat production in this region.

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:

6/5 – Aurora, NY

Small grains management field day

“Jensen Soft White Winter Wheat with Fusarium Head Blight Resistance for New York”

6/19 – WSMI radio interview

Varieties and resources for farmers growing wheat who want to avoid head scab.

7/8 – Ithaca, NY

Seed grower's field day

“Cornell Wheat Breeding Program and Jensen Soft White Winter Wheat with Fusarium Head Blight Resistance for New York”

No publications that have a journal format citation.