

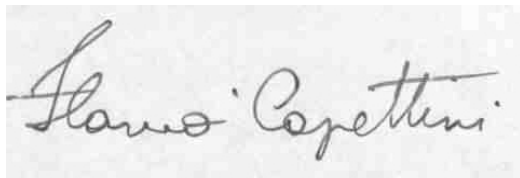
**USDA-ARS/  
U.S. Wheat and Barley Scab Initiative  
FY07 Final Performance Report (approx. May 07 – April 08)  
July 15, 2008**

**Cover Page**

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<b>Fiscal Year:</b>	2007
<b>USDA-ARS Agreement ID:</b>	59-0790-5-F092
<b>USDA-ARS Agreement Title:</b>	ICARDA/CIMMYT FHB Barley Enhancement.
<b>FY07 ARS Award Amount:</b>	\$ 27,805

**USWBSI Individual Project(s)**

<b>USWBSI Research Area*</b>	<b>Project Title</b>	<b>ARS Adjusted Award Amount</b>
HGR	International Barley Germplasm and Information Exchange through ICARDA/CIMMYT.	\$27,805
	<b>Total Award Amount</b>	<b>\$ 27,805</b>



July 7, 2008

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:** *International Barley Germplasm and Information Exchange through ICARDA/CIMMYT.*

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

The primary problems that we are working to resolve are the need for search and identification of new sources of FHB resistance in barley which will diversify the current resistance gene pool (with emphasis in 6-row types), and the need for facilitation of distribution of such resistant germplasm identified. We are meeting these needs through the following approaches:

- Screening new FHB resistant barley germplasm through extensive systematic screening activities of the barley genetic resources available at the ICARDA gene bank and making that available to the programs cooperating with the USWBSI.
- Introducing ('highly') resistant barley germplasm from international programs and promoting germplasm exchanges, especially 6-row types, through the ICARDA gene bank and ICARDA & CIMMYT international network that otherwise maybe inaccessible to US researchers .
- Providing agronomically suitable FHB resistant barley germplasm to US collaborators through pre-breeding activities using major USA cultivars.
- Testing USA barley germplasm at CIMMYT-El Batán field station and/or through the ICARDA International Barley Improvement Network.
- Testing preliminary resistant germplasm identified through other projects searching for novel sources of resistance in order to determine the GxE interaction of such sources.

**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:**

During the summer a wide screening nursery was established at El Batán, México, with artificial misting and inoculation. Disease levels reached satisfactory severity levels allowing selection of resistant genotypes. The major accomplishment was the identification of new putative sources of FHB resistance from materials that were screened, especially entries from the ICARDA Gene Bank that were never tested before (Table 1). Genotypes tested the year before has been advanced for further testing to confirm resistance. Entries from the program selected in 2006 were distributed to US breeding programs (North Dakota State University, The University of Minnesota, Busch Agricultural Resources, Inc.) and Canada (Agriculture Canada at Brandon, Manitoba). Three nurseries that were deployed were the EGS2007: 282 entries, NABSEN 2007: 8 entries contributed to the nursery, and China Nursery 2007: 100 entries. Genotypes with at least 2 seasons of selection were the ones tested in the China Nursery. Germplasm with superior resistance is being used in crosses within the breeding program. Genotypes showing unusual brightness were identified in China within the entries of BARI and ICARDA. Seed samples of those exceptional entries were distributed by BARI to interested breeders during the Barley CP meeting in Minnesota.

**Table 1.** Number of nurseries and entries screened at El Batán, México during 2007 and number of putative resistant entries selected for further testing.

<b>Name</b>	<b>Origin</b>	<b>Entries</b>	<b>Selected</b>
<b>MV-06</b>			
<b>New Germplasm</b>			
ICARDA 2006	ICARDA Gene Bank	1170	352
Bulgaria	Bulgaria	5	3
<b>Germplasm Introduced from Other Programs</b>			
Alberta 2007	CANADA BMZY-07 F.	145	40
BARI 2007	BARI	266	74
Brandon 2007	Canada	100	28
BARI 2006	USA	232	135
NABSEN 07	USA	108	4
<b>Germplasm from the Breeding Program</b>			
Preliminar FHB 07	Breeding Program	337	120
EGS 2007	Breeding Program	235	131
China 2007	Breeding Program	110	110
F10CEBADASCX	Breeding Program	8	7
Alberta Best	Canada	7	6
Palestina	ICARDA Gene Bank	3	1
ICARDA 2006	ICARDA Gene Bank (Sel.)	580	152
Eritrea/Ethiopia	ICARDA Recolection	141	87
BARI Sel	Obregón	500	135
<b>Total</b>		<b>3947</b>	<b>1385</b>

**Impact:**

**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 scientific community is basically obtaining:

1. Putative resistance sources from ICARDA gene bank that was not available before.
2. Advanced lines originated from the ICARDA/CIMMYT breeding program with enhanced FHB resistance as well as resistance to several other important diseases in an acceptable agronomic background, many of them in a US-germplasm based lines.

**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.**

Capettini Flavio, Stefania Grando, Les Wright, Linnea Skoglund. 2008. Contribution of ICARDA to Improve Fusarium Head Blight Tolerance in Barley – 20 Years of International Collaboration. The 10th International Barley Genetics Symposium, Alexandria, Egypt, 5-10 April 2008.

Capettini, Flavio, Mario Cattáneo, Silvia Germán, Luz Gómez Pando, Euclides Minella, Sergio Pieroni, Miguel Rivadeneira, Mauro Zamora. 2007. Barley enhancement in Latin America in the last 20 years: a story of success. *In* Promaco PTY LTD. 13<sup>th</sup> Australian Barley Technical Symposium. Fremantle, Western Australia. 26-29 August 2007. pp. 25-37.