USDA-ARS / USWBSI
FY03 Final Performance Report (approx. May 03 – April 04)
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Cover Page

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Year:	**FY2003 (approx. May 03 – April 04)**
FY03 ARS Agreement ID:	**59-0790-0-064**
FY03 ARS Agreement Title:	**Developing new SRWW germplasm with resistance to scab.**
FY03 ARS Award Amount:	**$ 11,707**

USWBSI Individual Project(s)

USWBSI Research Area*	Project Title	ARS Adjusted Award Amount
VDUN	Developing New SRWW Germplasm with Resistance to Scab.	$ 11,707
	Total Amount Recommended	**$ 11,707**

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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: ***Developing New SRWW Germplasm with Resistance to Scab.***

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

Major problem is the rapid and effective incorporation of resistance to scab from exotic sources into adapted soft red winter wheat (SRWW) germplasm. The approach is to use backcrossing, three-way crossing into adapted wheat lines and varieties as well as marker-assisted selection (MAS) by incorporation of the Sumai 3 allele and other exotic alleles into the Maryland breeding program. Early-generation material is being screened at the USDA in Manhattan (Kansas). Segregating populations developed from the crosses described above are being screened under field conditions by using corn infested with Fusarium that is spread in the spring. Conditions favorable for disease development were aided with daily misting before and during wheat flowering.

2. What were the most significant accomplishments?

Seventy wheat early segregating populations were advanced for scab screening. Progenies of segregating populations were screened under field conditions, which were very favorable for scab development. Lines with sound grain were advanced for further testing in 2003/2004.

Field screening of advanced lines and varieties of wheat was conducted in 2003. The 2002/2003 wheat growing season presented very favorable environmental conditions for the development of a scab (*Fusarium graminearum*) epidemic in Maryland. Rainy, drizzly conditions predominated during the spring of 2003. These conditions led to a high level of scab incidence on Maryland's Eastern shore, the largest wheat growing area in Maryland. The official winter wheat state variety test was grown under field conditions in Queenstown (MD) and the level of scab incidence, percentage of tombstones, and DON (Deoxynivalenol) were assessed. Forty genotypes were tested and the incidence of the disease was fairly uniform across the nursery. There were significant genotypic differences. The genotypes Vigoro Tribute, USG3350, Catoctin, McCormick, Coyote, USG3430, MV5-46, Neuse, 25R37, and Patton showed moderate levels of resistance to scab with low percentage of tombstones and low DON levels. On the other hand, the genotypes Southern States 522, Century II, GA931470E62, Coker 9835 and Florida 304 had very high levels of tombstones and DON. This ranking was consistent with other evaluations of resistance of currently grown soft red winter wheat cultivars. It is important to continue to screen currently grown cultivars of soft red winter wheat for even moderate scab resistance because this can be useful for future breeding as well as for immediate use by wheat growers.

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.

Scab Screening Of Soft Red Winter Wheat Genotypes In Maryland. Costa, J.M., Cooper, A., and Sikora, T. 2003. 2003 National Fusarium Head Blight Forum. Minneapolis, Minnesota.