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:	**59-0790-9-039**
FY03 ARS Agreement Title:	**Fusarium Head Blight Uniform Fungicide Trial in Maryland.**
FY03 ARS Award Amount:	**$ 7,805**

USWBSI Individual Project(s)

USWBSI Research Area*	Project Title	ARS Adjusted Award Amount
CBC	Fusarium Head Blight Uniform Fungicide Trial in Maryland.	$ 7,805
	Total Amount Recommended	**$ 7,805**

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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: ***Fusarium Head Blight Uniform Fungicide Trial in Maryland.***

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

The primary problem is that there are still no individually effective tools for the management of a Fusarium Head Blight outbreak for the mid-Atlantic region. Registered fungicides are not adequate. There are only a few cultivars of soft red winter wheat purported to be have some resistance. However these are only slightly better than susceptible cultivars and are inadequate in a severe epidemic. Furthermore, production practices that increase the risk of FHB outbreaks are becoming more popular. Experimental and off-label applications of fungicides have been shown on occasion to provide some efficacy but parameters for their application need to be investigated to determine if adequate levels of control can be achieved consistently. Field trials examining registered and experimental fungicides and biocontrol agents, and application timing are being conducted to determine if fungicidal controls can be implemented.

2. What were the most significant accomplishments?

The fungicide efficacy experiment was conducted at the Beltsville facility of the University of Maryland Central Maryland Research and Education Center on a Sassafras sandy loam soil (pH 6.6, OM 1.9%). All foliar fungicide treatments were applied with a CO_2 sprayer equipped with 8001 flat fan nozzles arranged with double swivel adaptors to carry three sets of two nozzles 20 in. apart. Adaptors were adjusted so that one nozzle of each pair would point forward and the other backward 30° from the horizontal. All treatments were applied in 20 gal/A at 40 psi. Treatments were applied when 15 to 25% of the wheat was in anthesis on 29 May. All plots except for an uninoculated control received a broadcast application of 14 oz (precolonized dry wt) *Gibberella zeae* infested corn kernels approximately 6 weeks prior to anthesis. The site was mist irrigated daily for 45 min just prior to sunset for two weeks after anthesis on days without natural precipitation. Head blighting was assessed on a sample of 50 heads collected from each plot at soft dough on 16 Jun. Plots were combine harvested on 15 Jul 2003 and a seed sample was retained for determination of scab damaged kernels, 1000 kernel weight and deoxynivalenol (DON) content. DON analysis was conducted by Dr. P. Hart's laboratory at Michigan State University.

Spring temperatures were somewhat below optimum for Fusarium head blight (FHB), but above normal rainfall made conditions generally conducive. FHB was moderately severe. Powdery mildew (*Blumeria graminis*) was insignificant due to cultivar resistance. Glumes were not visibly symptomatic of Stagonospora blotch (*Stagonospora nodorum*) 18 days after anthesis when head blight was assessed. However, frequent rainfall encouraged Stagonospora blotch development during grain ripening. Only plots not treated with a foliar fungicide displayed Stagonospora blotch symptoms at harvest. Although believed to be a negligible effect due to cultivar resistance and late development, the differential between treated and untreated plots for test weight, yield, 1000 kernel weight and damaged kernels could be the result of Stagonospora blotch and Fusarium head blight damage rather than due to Fusarium head blight alone. Folicur 3.6F is the current head blight fungicide standard by virtue of prior performance among U.S. EPA registered products (3e and 18C registrations). The best treatment was the tank mix of JAU6476 and Folicur. It was statistically better ($P<0.05$) than Folicur alone for all measures except head severity and field disease severity. The treatment with V-10116 at the 8 fl oz rate also performed very well but did not reduce the percentage of Fusarium damaged kernels or the mycotoxin, DON. No phytotoxicity symptoms were observed.

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.

Grybauskas, A.P., and S.F. Wallace. 2004. Fusarium head blight management of soft red winter wheat with fungicides in Maryland, 2003. Fungicide and Nematicide Tests (online) 59: CF017. The American Phytopathological Society, St. Paul, MN. (http://www.apsnet.org/online/FNtests/)

Grybauskas, A.P. 2004. Small grain disease research in Maryland. Contributed paper at NJ-Del-Mar-Va-PA Plant Pathologists association annual meeting, Newark, DE.

2/25/04 Extension presentation - Disease Management Roundtable – Carroll County Winter Wednesday Series. Westminster, MD.

2/11/04 Soybean Rust and Wheat Scab, Presentation at the 2004 Maryland Crop Improvement Annual meeting, Easton, MD.