USDA-ARS/
U.S. Wheat and Barley Scab Initiative
FY05 Final Performance Report (approx. May 05 – April 06)
July 14, 2006

Cover Page

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Fiscal Year:	**2005**
FY05 ARS Agreement ID:	**59-0790-4-133**
Agreement Title:	**Uniform Fungicide Trial for Scab on Wheat in Illinois.**
FY05 ARS Award Amount:	**$ 8,780**

USWBSI Individual Project(s)

USWBSI Research Area*	Project Title	ARS Adjusted Award Amount
CBC	Uniform Fungicide Trial for Scab on Wheat in Illinois.	$ 8,780
	Total Award Amount	**$ 8,780**

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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

FY05 (approx. May 05 – April 06) FY05 Final Performance Report
PI: Adee, Eric
ARS Agreement #: 59-0790-4-133

Project 1: *Uniform Fungicide Trial for Scab on Wheat in Illinois.*

1. What major problem or issue is being resolved and how are you resolving it?
Head scab on wheat has caused severe losses in yield and grain quality in Illinois. Fungicides have the potential to be one of the best options for control of scab (Fusarium head blight, FHB), but many fungicides are not affective or are not labeled for application time necessary for control of scab. The goal of this study is to test the efficacy of new or recently labeled fungicides and biological control agents in controlling head scab on wheat and their resulting effect on yield and quality of wheat. A small reduction in the toxin level (DON) produced by the fungus means a great deal to the millers who process the grain. Conducting uniform fungicide trials will give farmers valuable information for management of scab as well as contributing to data applicable across all the Midwestern wheat growing regions. These trials were conducted at Carbondale, Monmouth and Urbana, IL.

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:
Weather conditions were not favorable for FHB development to adequately test the effectiveness of the products. The percent incidence of FHB was 0, 0.5 and 6.0 with no fungicides at the three locations the study was conducted. The study at Carbondale had the highest incidence of FHB, though there were no differences between the check and the fungicide treatments for FHB severity, incidence, index, grain yield, test weight, or level of DON (Table 1). At Monmouth, there was a very low level of FHB, with no differences between the treatments and control for any of the measurements on FHB. However, foliar diseases were covering over 60% of the top two leaves on the control at late milk (Feekes 11.1). All fungicides reduced the severity of leaf disease from the control, though there wasn't a significant increase in yield over the control, probably due to the late onset on the diseases. At Urbana, irrigation was unsuccessfully used to promote the development of scab, with no symptoms or signs of scab and very little foliar disease according to Dr. Dean Malvick There were no differences in yield between the treatments including the check at Urbana (Pr>F = 0.93, data not shown). These results have been presented through Extension activities and can aid companies in developing products and farmers in selecting fungicides that will be effective in controlling scab.

Table 1: Uniform FBH Fungicide Trial, Carbondale, IL, 2005

Fungicide Treatment[z]	*FHB Incidence (%)*[y]	*FHB Severity (%)*[x]	*FHB Index*[w]	*Yield (bu/ac)*	*DON*[v] *(ppm)*
Untreated check	*6.0*	*11.0*	*0.75*	*59.1*	*0.050*
Folicur 432SC 4.0 fl oz	*1.8*	*10.5*	*0.50*	*59.5*	*0.000*
Prosaro 6.5 fl oz	*2.5*	*13.3*	*0.75*	*59.7*	*0.025*
Caramba 13.5 fl oz	*4.8*	*16.0*	*0.75*	*59.5*	*0.000*
Caramba 10.0 fl oz	*9.0*	*24.8*	*2.00*	*59.1*	*0.075*
Punch 6 fl oz	*4.05*	*13.3*	*1.25*	*59.7*	*0.100*
Punch 8 fl oz	*1.0*	*2.8*	*0.00*	*59.5*	*0.025*
LSD (P=0.05)	*NS*	*NS*	*1.32*	*NS*	*NS*

Table 2: Uniform FBH Fungicide Trial, Monmouth, IL, 2005

Fungicide Treatment[z]	*FHB Incidence (%)*[y]	*FHB Severity (%)*[x]	*FHB Index*[w]	*Yield (bu/ac)*	*Leaf Disease (%)*[u]
Untreated check	*0.5*	*6.0*	*0.06*	*77.0*	*61.8*
Folicur 432SC 4.0 fl oz	*0.3*	*1.8*	*0.02*	*74.9*	*28.0*
Prosaro 6.5 fl oz	*0.3*	*1.8*	*0.02*	*80.5*	*23.3*
Caramba 13.5 fl oz	*0.3*	*1.8*	*0.02*	*80.6*	*25.6*
Caramba 10.0 fl oz	*0.3*	*3.6*	*0.04*	*78.9*	*25.6*
Punch 6 fl oz	*0.3*	*1.8*	*0.02*	*74.7*	*32.8*
Punch 8 fl oz	*0.0*	*0.0*	*0.00*	*77.3*	*32.8*
Tilt 4 fl oz	*0.0*	*0.0*	*0.00*	*77.4*	*23.3*
Quadris 9.2 fl oz	*0.5*	*3.9*	*0.04*	*78.1*	*20.9*
Headline 6 oz @ Feekes 8 - 9	*0.0*	*0.0*	*0.00*	*80.2*	*32.8*
Headline 6 oz @ Feekes 8 – 9 + Caramba 13.5 fl oz @ Feekes 10.51	*0.8*	*4.1*	*0.59*	*82.2*	*23.3*
LSD (P=0.05)	*NS*	*NS*	*NS*	*5.5*	*13.4*

[z]*Fungicides were applied at the early flowering stage (Feekes 10.51) with 0.125% Induce..*
[y]*Incidence is the percent of heads with symptoms of FHB.*
xSeverity is percent of florets with FHB in the infected heads.
[w]*Disease index is FHB incidence x severity.*
[v]*Deoxynivalenol*
[u]*Percent foliar disease symptoms on flag and penultimate leaves, wheat at late milk(Feekes 11.1).*

Impact:

Foliar fungicides will have little impact on yield of wheat if the environmental conditions are not favorable for the development of fungal diseases attacking the head and leaves before early grainfill.

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?:

Data from these studies show that there was relatively little benefit in applying fungicides to wheat in Illinois in 2005. Utilizing disease prediction models that include weather data, variety characteristics, cropping history and growth stage can greatly benefit growers when determining if fungicide applications are economically viable.

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.

Adee, E.A., 2006 Wheat Management Workshop, Kankakee County, February 2, 2006.