

**USDA-ARS/
U.S. Wheat and Barley Scab Initiative
FY06 Final Performance Report (approx. May 06 – April 07)
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Cover Page

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USDA-ARS Agreement Title:	Fungicide Efficacy Evaluations for Managing Scab in Louisiana Wheat.
FY06 ARS Award Amount:	\$ 15,060

USWBSI Individual Project(s)

USWBSI Research Area*	Project Title	ARS Award Amount
CBCC	Fungicide Efficacy Evaluations for Managing Scab in Louisiana Wheat.	\$ 15,060
	Total Award Amount	\$ 15,060

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
PGG – Pathogen Genetics & Genomics
VDUN – Variety Development & Uniform Nurseries

Project 1: *Fungicide Efficacy Evaluations for Managing Scab in Louisiana Wheat.*

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

Fusarium Head Blight (FHB), *Fusarium graminearum*, is a major concern for wheat producers in the United States. Periods of high humidity and moderate temperatures during flowering are common along the Louisiana Gulf Coast which provides favorable conditions for FHB development. Furthermore, increased use of minimum tillage practices in corn and wheat production systems have the potential to increase the threat of this disease in the state. This disease is managed in part by using genetic resistance and fungicides. However, no commercially available fungicides are highly effective against *F. graminearum*; therefore, a multi-state screening effort is ongoing to identify viable chemistries efficacious against this pathogen.

The objective of this project is to evaluate fungicides for the management of FHB in Louisiana. Fungicides were evaluated in LSU AgCenter small field plot tests at the Macon Ridge Research Station (northeast) and the Rice Research Station (southwest). Each location represents a unique environment (e.g. weather, soil type). Disease pressure was enhanced by distributing *F. graminearum* colonized corn (0.5 gm/0.09 m²) into plots prior to flowering. A misting system was also utilized to provide conditions favorable for disease development at the Macon Ridge Research Station.

Ten treatments were evaluated in two tests at the Macon Ridge location in 2006-07: 1. non-treated, 2. Folicur 3.6F @ 4.0 fl. oz/A, 3. Prosaro (1:1 ratio of prothioconazole: tebuconazole) @ 6.5 fl oz/A, 4. & 5. Caramba 0.75SL @ 10.0 and 8.0 fl oz/A, 6. & 7. Folicur 3.6F @ 4.0 fl oz/A + Topsin M 70WSP @ 0.5 lb/A and Folicur 3.6F @ 4.0 fl oz/A + Topsin M 4.5F @ 8.0 fl oz/A, 8. & 9. Topgard 1.04SC @ 10.0 & 14.0 fl. oz./A, and 10. Tilt 3.6EC 4.0 fl oz./A, and Proline 5.0 fl oz/A. Ten treatments were evaluated in two tests at the Rice Research Station near Crowley, LA: 1. non-treated, 2. Tilt 3.6EC @ 4.0 fl oz/A, 3. Folicur 3.6F @ 4.0 fl. oz, 4. Prosaro (1:1 ratio of prothioconazole: tebuconazole) @ 6.5 fl oz, 5. Stratego 2.08EC @ 10.0 fl oz/A, 6. Quadris 2.08SC @ 8.0 fl oz/A, 7. Dithane DF @ 2 lb/A, 8. Quilt 1.67SC @ 14.0 fl oz, 9. Folicur 3.6F @ 4.0 fl oz/A + Topsin M 4.5F @ 8.0 fl oz/A, and 10. Headline 2.08EC at 8.0 fl oz/A.

All fungicide treatments in all tests were applied at flowering using a handheld CO₂ charged spray boom delivering 17 GPA at 40 psi. Disease incidence and severity was assessed in accordance with the USWBSI Uniform Fungicide Test materials and methods. Disease assessment data and grain quality measurements were compared using appropriate statistical procedures.

Scab epidemics developed in one test at the Macon Ridge location and at the Rice Research Station location. Yields were not reported from the Macon Ridge location due to stand problems.

Macon Ridge Research Station: Relative to the non-treated (13.3%), incidence was lowest in wheat treated with Prosaro (4.0%); however this wasn't reflected in the scab index (1.2). Severity did not differ among treatments and ranged from 14.1% (non-treated) to 5.5% (Folicur). Scab index ratings (0.5) were lower in wheat treated with the tank mix of Folicur

and Topsin M compared to the non-treated (2.4). These data were similar to data collected in tests from previous years.

Rice Research Station: In the first test, scab incidence ranged from 13.4% (Prosaro) to 23.2% (non-treated). All fungicide treatments, except Dithane, had less scab incidence than the non-treated. Severity was highest in the non-treated (5.15%) and lowest in wheat treated with Quilt (3.65%). Scab was less severe than the non-treated in wheat treated with Quilt and Prosaro.

In the second test, scab incidence was less in the fungicide-treated wheat (except Dithane) compared to the non-treated (10.0%). Severity was less than the non-treated (3.25%) in wheat treated with Prosaro (1.55%), Stratego (1.80%), and Folicur + Topsin M (1.85%).

**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: Efficacious fungicides are needed to manage scab. This collaborative research is attempting to identify fungicides effective for managing scab in wheat. Coordinating uniform tests throughout land grant universities in the U.S. will help expedite the identification of effective fungicides and application techniques for managing this disease. Currently, results from these studies have identified several candidate fungicides that appear to be more efficacious than commercially available products. This data is needed to secure a section 3 label for use in commercial wheat.

Impact: The discovery of effective fungicides and incorporation into wheat production systems will reduce the threat from scab and increase the quality of the U.S. crop. New fungicides efficacious against scab are being identified.

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 research has identified several candidate fungicides that may be used to manage scab. This data will be added to an existing data to support decisions concerning the use of fungicides in wheat for managing scab. In addition, the results from these studies are necessary for obtaining an EPA approved commercial fungicide label (section 3).

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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.

None