

**USDA-ARS / USWBSI  
FY04 Final Performance Report  
July 15, 2005**

**Cover Page**

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<b>Year:</b>	<b>FY2004 (approx. May 04 – April 05)</b>
<b>FY04 ARS Agreement ID:</b>	<b>59-0790-4-126</b>
<b>FY04 ARS Agreement Title:</b>	<b>Integrated Project - Ground and Aerial Application of Fungicides for Improved FHB Control.</b>
<b>FY04 ARS Award Amount:</b>	<b>\$ 9,756</b>

**USWBSI Individual Project(s)**

<b>USWBSI Research Area*</b>	<b>Project Title</b>	<b>ARS Adjusted Award Amount</b>
CBC	Integrated Project - Ground and Aerial Application of Fungicides for Improved FHB Control.	\$ 9,756
	<b>Total ARS Award Amount</b>	<b>\$ 9,756</b>

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Principal Investigator

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Date

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\* 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: *Integrated Project - Ground and Aerial Application of Fungicides for Improved FHB Control.***

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

The seven variables that significantly influence fungicide efficacy are: application timing, AI selection, “post application” weather, target plant, application rate, deposition efficiency, and coverage uniformity. Currently US growers trying to control FHB on wheat have only one fungicide available and it is on EUP label (“Emergency Use Permit”). Folicure is Bayer product and its application timing and maximum rate is specified by the EUP. A second experimental chemistry named JAU by Bayer is in the field testing, a label for a blended JAU / Folicure product is anticipated in one to two years. Growers can select the variety of wheat or barley but they have no control of the weather. Thus the application technology researcher is left with two variables to optimize: deposition efficiency and coverage uniformity.

Deposition efficiency and coverage uniformity are affected by spray volume, drop size, and the methodology of droplet transport. North Dakota research documented that replacing one vertically mounted flat fan nozzle with two half flow rate, flat fan nozzles aimed forward and backward 60° from vertical improves efficacy. 2004 field studies extensively tested the effects of varying spray volumes and drop sizes for both aerial and ground application. Nearly all the sprayed plots were significantly better than the checks, but due to low disease pressure resulting from below average summer temperature none of the application variables had a significant effect.

**2. What were the most significant accomplishments?**

Recent North Dakota field studies have shown a direct and significant relationship between dose and efficacy but even two times the maximum rate does not produce 100% control. Therefore any rate reductions are not recommended.

2004 ground application deposition studies showed that the deposition on the grain heads increased as the nozzles are angled from zero to 60° from vertical and that two nozzles angled forward and backward was better than all nozzles angled forward. Preliminary 2004 results indicate that the local systemic activity of both Folicure and JAU was enough to overcome any differences in coverage uniformity between the several different application technologies tested.

The grower must be concerned about more than FHB control. Significant increase in yields and test weight are frequently affected but the fungicides control of other leaf diseases. FHB efficacy must be measured by DON measurement. Even if it was possible it would be a mistake to only target the grain heads with AI for FHB control. An economically sound spraying methodology must have both an AI and application equipment that target the whole plant and disease complex.

**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.**

- no publications
- Presentation at Int'l Wheat Symposium Dec 2004
- One article in preparation - Spray Deposition on Wheat Heads