

**USDA-ARS / USWBSI
FY04 Final Performance Report
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Cover Page

PI:	Martin A. Draper
Institution:	South Dakota State University
Address:	Plant Science Department Box 2108 - PSB 113 Brookings, SD 57007-1090
E-mail:	draper.martin@ces.sdstate.edu
Phone:	605-688-5157
Fax:	605-688-4024
Year:	FY2004 (approx. May 04 – April 05)
FY04 ARS Agreement ID:	59-0790-4-097
FY04 ARS Agreement Title:	Field Studies on Chemical and Biological Control of Fusarium Head Blight in South Dakota.
FY04 ARS Award Amount:	\$ 11,707

USWBSI Individual Project(s)

USWBSI Research Area*	Project Title	ARS Adjusted Award Amount
CBC	Field Studies on Chemical and Biological Control of Fusarium Head Blight in South Dakota.	\$ 11,707
	Total ARS Award Amount	\$ 11,707

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: *Field Studies on Chemical and Biological Control of Fusarium Head Blight in South Dakota.*

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

Fusarium head blight can only be managed by a combination of cultural and chemical means. In many cases, producers have to compromise on cultural approaches at disease management and become reliant on chemical control. Fusarium head blight is an erratic problem in SD, but was locally severe in 2004. Late disease development led to moderate to high levels of disease with very high levels of mycotoxin (DON). The availability of tebuconazole (Folicur and Orius), via Section 18, has become widely accepted among growers and has become a common production input in some parts of the state. More effective fungicides or application methods are needed to provide better disease control and improving the profit margin of producers. Awareness of FHB risk has been elevated and is a significant consideration in grower decisions.

We have continued to screen products through the uniform fungicide trial, participated in the “mini”-uniform biological trial, screened SDSU biological products in the field for Dr. Bruce Bleakley, and tested droplet patterns from aerial applicators using standard nozzle configurations.

2. What were the most significant accomplishments?

Very low levels of FHB developed at two of the three study locations. Nonetheless late (symptomless) infection resulted in measurable levels of DON. Under mist irrigation conditions at the third location, the most severe disease occurred. Due to prolonged tillering and asynchronous flowering, disease suppression was less than historical levels. The best treatments provided only up to about 25% less FHB disease than the untreated.

Treatments containing prothioconazole (JAU 6576) and metconazole (Caramba) suppressed scab incidence numerically more than tebuconazole (Folicur). Mixes of tebuconazole and prothioconazole show promise for optimizing control of leaf diseases while suppressing FHB.

In the misted trial site, no biological control agents (BCAs) reduced disease or DON levels significantly below the untreated. Folicur was superior to the biological under these conditions.

A graduate student on the project continues to study on application technology and droplet deposition. Preliminary data suggests head morphology associated with specific varieties has a significant role in penetration of fungicide to the rachis.

Accomplishment: The products available (chemical and biological) are inadequate for controlling Fusarium head blight in the wheat and barley crop. Products have been selected and made available to producers for use on the wheat and barley crop in South Dakota.

Impact: The products made available on EPA FIFRA Section 18 exceptions have been well accepted by producers and, where used, are providing the level of protection expected.

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?

There is now a chemical control that can be relied on in high disease risk areas of the state to reduced the impact of the disease and reduce the economic burden on the producer

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 your grant. Please reference each item using an accepted journal format. If you need more space, continue the list on the next page.

Research Reports

Draper, M.A., K.R. Ruden, K.D. Glover, S.M. Schilling, D.S. Wittmeier, and G. Lammers. 2004. 2004 uniform fungicide performance trials for the suppression of Fusarium head blight in South Dakota. International Symposium on Fusarium Head Blight. December 11-15, 2004, Orlando, FL., Proceedings p 296.

Draper, M.A., B. Bleakley, K.R. Ruden, K.D. Glover, S.M. Schilling, D.S. Wittmeier, S.M. Schilling, and G. Lammers. 2004. 2004 uniform fungicide performance trials for the suppression of Fusarium head blight in South Dakota. International Symposium on Fusarium Head Blight. December 11-15, 2004, Orlando, FL., Proceedings p 297.

D. Hershman and M. Draper. 2004. Analysis of 2004 uniform wheat fungicide trials across locations and wheat classes. International Symposium on Fusarium Head Blight. December 11-15, 2004, Orlando, FL., Proceedings p 318.

B.E. Ruden, M.A. Draper, K.R. Ruden, D.S. Wittmeier and S.M. Thompson. 2004. Fungicide spray deposition on heads form various nozzle configurations. International Symposium on Fusarium Head Blight. December 11-15, 2004, Orlando, FL., Proceedings p 368.

G.Y. Yuen, B.H. Bleakley, M.A. Draper, C.C. Yoachim, E.A. Milus, K.R. Ruden, and L. E. Sweets. 2004. Results of the 2004 Standardized evaluation of biological control agents for the control of Fusarium head blight. International Symposium on Fusarium Head Blight. December 11-15, 2004, Orlando, FL., Proceedings p 380.

Presentations

M.A. Draper. 2004. Plant diseases and the changing fungicide scene. SD Commercial Pesticide Applicators Training. January 21 - February 2, 2005, Aberdeen, Watertown, Brookings, Pierre, Mitchell, Yankton and Sioux Falls, SD.

M.A. Draper. 2003. Wheat disease management in South Dakota, 2004. AgHorizons Conference, December 7, 2004, Pierre, SD.