U.S. Wheat and Barley Scab Initiative
FY00 Final Performance Report (approx. May 00 – April 01)
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Cover Page

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Year:	**FY2000 (approx. May 00 – April 01)**
Grant Number:	**59-0790-9-031**
Grant Title:	**Fusarium Head Blight Research**
2000 ARS Award Amount:	**$53,659**

Project

Program Area	Project Title	Requested Amount
Epidemiology & Disease Management	Investigate inoculum potential of crop residues.	$55,000.00
	Requested Total	$55,000.00[1]

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Principal Investigator Date

[1] Note: The Requested Total and the Award Amount are not equal.

Project 1: Investigate inoculum potential of crop residues.

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

This project addressed the management of *Fusarium* infested residues. Inoculum of Fusarium head blight originates from host residues including wheat, barley, corn, and other grasses. Changes in cropping practices that leave more residue on the soil surface, specifically reduced tillage, have contributed to the increase of Fusarium head blight (FHB or scab) in recent years. This project examined; residue cover, residue decomposition rates, the associated survival and inoculum production of *Fusarium* from residues, the relative importance of residue components in contributing to inoculum loads, the impact of post-planting burning of the residue on residue cover, the survival of Fusarium in burned residues, and the establishment of crops following post-planting burning operations. The outcomes of this project will aid in the development of cultural, chemical, and biological control practices directed at the control of *Fusarium* inoculum originating from in-field crop residues.
A study established in Crookston MN has examined residues of wheat, barley, and corn from 1999 and 2000 crops in the 2001 field season. Samples collected from these plots are being used to evaluate the residue decomposition rates and colonization by *F. graminearum*. These data will likely confirm this projects earlier findings that *F. graminearum* survivals at least two years in association with host crop residues. Experimental plots were established in St Paul, Ulen, Crookston, and Humboldt MN to examine the impact of post-planting burning on *Fusarium*. Cereal residues were burned either after harvest in fall 2000 or following planting of wheat or barley in spring 2001 following a wheat crop. Residues were collected from burned and control (unburned) treatments. Burning reduced the residue, determined by number of nodes recovered, by 50-70% in comparison to control plots. No detrimental effect of burning was observed on stand establishment in plots burned up to 5 days after planting. The duration of the burn did not appear to affect seedling emergence, as burns of ca. 15, 30, and 60 sec/m^2 resulted in similar rates of seedling emergence. Recovery of *F. graminearum* was significantly ($P>0.01$) reduced in burned wheat residues in comparison to control treatments. *F. graminearum* was recovered from 26% and 23% of residue pieces (nodes and crowns) collected in control plots and from 6% and 1% of wheat residue pieces collected following a burn treatment, in 2000 and 2001, respectively. Recovery of *F. culmorum*, *F.avanaceum*, *F. sporotrichioides*, and *Cochliobolus sativus* also followed the same pattern.

2. What were the most significant accomplishments?

Data show that crop residues provide a source of inoculum of *F. graminearum* for at least two years. Preliminary data show that burning can reduce the residue of cereals left after harvest and reduce the inoculum potential of pathogens present in residues. Residue burning does not effect seedling emergence. The judicious burning of cereal residues may assist in the management of FHB.

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.

Dill-Macky, R. and Salas, B. 2001. Effect of burning wheat and barley residues on survival of *Fusarium graminearum* and *Cochliobolus sativus*. Phytopathology: 91:S23.

Pereyra, S.A., Dill-Macky, R., and Sims, A.L. 2000. Survival and inoculum potential of *Fusarium graminearum* on wheat residue. Phytopathology: 90:S60.

Pereyra, S.A., Dill-Macky, R., and Sims, A.L. 1999. Survival and inoculum potential of *Fusarium graminearum* in wheat residues. In: Proceedings of the 1999 National Fusarium Head Blight Forum, Sioux Falls SD, December 5-7, 1999, p. 96-98.

Dill-Macky, R. 1999. Residue Management and Fusarium head blight of wheat. In: Proceedings of the Canadian Workshop on Fusarium Head Blight, Winnipeg Manitoba, CANADA, November 28-30, 1999, p. 76-78.

Pereyra, S.A., Dill-Macky R., and Sims, A.L. 1999. Survival and inoculum potential of *Fusarium graminearum* in wheat residues. Phytopathology: 89:S60.