

**U.S. Wheat and Barley Scab Initiative
Annual Progress Report
September 18, 2000**

Cover Page

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Year:	FY2000
Grant Number:	59-0790-0-062
Grant Title:	Fusarium Head Blight Research
Amount Granted:	\$43,078.00

Project

Program Area	Objective	Requested Amount
Variety Development & Uniform Nurseries	Develop high yielding, high quality, hard red or white winter wheat cultivars adapted for Kansas with improved resistance to scab.	\$43,078.00
	Requested Total	\$43,078.00

Principal Investigator

Date

Project 1: Develop high yielding, high quality, hard red or white winter wheat cultivars adapted for Kansas with improved resistance to scab.

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

Serious Fusarium head blight (scab) epidemics have occurred in Kansas in 1982, 1990, 1993, and 1995 with most of the losses occurring in the eastern quarter of the state. Since 1980, wheat acreage in the eastern quarter of Kansas has declined by two thirds mostly due to farmer aversion to the risk of scab. Scab also has the potential to become more prevalent in central Kansas due to decreasing tillage and increasing cultivation of corn, the main reservoir for inoculum. The best long-term solution to the problem is to produce winter wheat cultivars that have high levels of resistance to scab. Until involvement in the USDA Scab Initiative, there was virtually no effort for identifying sources of resistance in Kansas breeding programs. The Initiative has resulted in the development of greenhouse and field screening nurseries that provided accurate ratings for current cultivars in Kansas, advanced breeding lines, and participation in the Regional Scab Nursery. Respectively, these nurseries allowed dissemination of information to growers on the reaction of current commercial cultivars, selection for scab resistance in breeding lines, and identification of additional sources of resistance from other breeding efforts in the region.

2. Please provide a comparison of the actual accomplishments with the objectives established.

Because of the scab screening efforts, a new column for reaction to Head Scab has been added to the popular extension publication *Wheat Variety Disease and Insect Ratings* for the 2000 issue. For the first time, this will allow producers in Kansas to use the reaction to scab to help select cultivars for planting. Additionally two commercial cultivars in Kansas (Hondo and Heyne) were identified as having good levels of resistance (3 and 4 on the 1-9 scale where 1=immune and 9=highly susceptible). These cultivars had an average of 7 and 9% scab, respectively compared with over 50% in susceptible cultivars. Similarly, the advanced breeding line KS96HW115 (released in August, 2000 as Lakin) was given a rating of 4 on the 1-9 scale. Therefore, there is scab resistance already present in cultivars adapted to Kansas that can potentially be used in the development of future cultivars.

3. What were the reasons established objectives were not met? If applicable.

The objective to develop scab resistant cultivars for Kansas has just begun. It normally takes about 10 years to produce a cultivar from initial crosses until release. Even though three Kansas cultivars have been identified with good levels of resistance, five of the six most popular commercial cultivars (Jagger, 2137, TAM 107, Ike, and 2163), representing 70% of the seeded acreage, are susceptible. Clearly, a long-term effort in providing resistance-screening nurseries is needed to help breeders select and release cultivars that have acceptable resistance to scab.

4. What were the most significant accomplishments this past year?

1. Implementation of field and greenhouse scab screening techniques to allow accurate evaluation of wheat germplasm. 2. Assessment of 20 common Kansas cultivars for reaction to scab and dissemination of the results to producers. 3. Identification of three newly developed cultivars adapted to

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Kansas that have good levels of resistance. 4. Involvement of breeders and geneticists in having their advanced breeding lines evaluated for reaction to scab.

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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.

1. Bowden, R. L. and Brooks, H. L. 2000. Wheat Variety Disease and Insect Ratings 2000. Kansas State University Agricultural Experiment Station and Cooperative Extension Service bulletin #MF-991, 4 pp.

2. Davis, M. A., Bowden, R. L., and Bockus, W. W. 2000. Reaction of selected winter wheat accessions to Fusarium head blight, 1999. *Biological and Cultural Tests* 15:132.

3. Bockus, W. W. 2000. Fusarium head blight nurseries. Demonstration of field plots to participants of the Western Coordinating Committee WCC-97 (*Cereal Diseases*) annual meeting at Manhattan, KS.

4. Bockus, W. W. 2000. Fusarium head blight. Radio talk for the *Agriculture Today* program on KKSU, AM 580 radio station.