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

Cover Page

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Year:	**FY2000**
Grant Number:	**59-0790-9-074**
Grant Title:	**Fusarium Head Blight Research**
Amount Granted:	**$304,511.00**

Project

Program Area	Objective	Requested Amount
Information Technology	To provide facilitation and network information to all scab research projects and make information available to public.	$199,304.00
Variety Development & Uniform Nurseries	To enhance variety development of scab resistant varieties.	$77,433.00
	Requested Total	$276,737.00[1]

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Principal Investigator Date

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

Project 1: To provide facilitation and network information to all scab research projects and make information available to public.

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

   Scab affects the industries and people involved in virtually every stage of the production, processing, and distribution systems of five market classes of wheat and barley across the U.S. The Networking and Facilitation Office (N&FO) was established in 1999 to minimize the barriers to the U.S. Wheat & Barley Scab Initiative's success arising from the administrative burdens and communication challenges that are involved in working with over 72 researchers across 22 states. The N&FO is addressing this problem by 1) helping scientists and all interested parties, who in the past may have problems communicating with each other, to learn from each other by facilitating communications and communication system development; 2) identifying and implementing an internet-based communication and collaboration mechanisms; and 3) acting as a center of accountability and a rapid clearing house of scab-related information. The NF&O also provides administrative support to the various committees and associated conferences associated with the Initiative, including annual resolution of a comprehensive national research plan and budget.

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

   The third and fourth issues of the "Scab Newsletter" have been published, and a fifth is in production. The call for pre-proposals for the FY2001 research plan has gone out, and annual progress reports for the FY2000 projects have been collected and being forwarded to USDA-ARS. Planning for the 2000 National Scab Forum is well underway. A research symposium held at the American Society of Agronomy meetings in November of 1999. Four papers from that symposium will be published in the Crop Science Journal in early 2001. A part-time web designer has been recently hired to update and upgrade the website at WWW.SCABUSA.ORG. A consultant has done a full analysis and design of the web-accessible database that will enable management and access to all USWBSI documents. The N&FO organized two Steering Committee meetings, and four Executive Committee meeting (conference calls). A workshop for the Epidemiology and Disease Management research area was funded with resources from this office, as well as a visit to CIMMYT in Mexico for a tour of the FHB screening nurseries by members of the Executive Committee, and scientists working in the areas of Germplasm Introduction and Enhancement, and Variety Development and Uniform Nurseries.

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

   N/A

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

Coordination of the symposium, Genetic Solutions to Fusarium Head Blight in Wheat and Barley: Challenges, Opportunities, and Imperatives, held at the 1999 Annual Meeting of the American Society of Agronomy, 1999 National Fusarium Head Blight Forum, establishment of a half-time web designer position that will re-design and then maintain the Initiative's website, and the continued facilitation of communication and dissemination of information related to the USWBSI, within the Initiative itself, as well as with other interested parties.

Project 2: To enhance variety development of scab resistant varieties.

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

  FHB rendered the 1996 Michigan soft white winter wheat (SWWW)crop unusable by the processing industry. To date, no SWWW varieties are available that express resistance to this disease. Resolution of this deficiency is being addressed through a combined greenhouse and field breeding program employing conventional techniques of hybridization and selection. To that end, we are enhancing our capacity to screen for FHB reaction, and increasing the relative contribution and diversity of FHB resistant parents in our breeding crosses. More precisely, 30 resistance resources were introduced into our breeding program. Most of these materials are new improved germplasm from China, such as highly-resistant W14, CJ 9306, CJ 9311; high yielding and scab resistant CJ 9403, CJ 9815, CJ 9807, CJ 8809, TFSL 037; white-grained SH 19089, Shaan 85-2, CJ 9602; and so on. W14, CJ 9807, CJ 9804, TFSL 037, CJ 9306, CJ 9815, CJ 9602, CJ 9403 and SH 19089 were used resistant parents to cross with US winter wheat varieties. We have also refined our single floret incoculation greenhouse based screening system. Field screening of all advanced yield trial materials is also supported with these funds.

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

We believe our accomplishments are on track with the objectives of our proposal.

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

N/A

- What were the most significant accomplishments this past year?

  - Introduction of alternative sources of FHB resistance,
  - Refinement and full implementation of the greenhouse screening system,
  - 65 crosses were made in the greenhouse during this crop season. 25 were made to transfer the resistance from Chinese germplasm into local winter varieties. 16 resistant to resistant were made to accumulate the resistance genes. 2 susceptible cultivars were crossed to each of 12 resistant genotypes for a genetic study.
  - Early generation materials in the field and greenhouse breeding programs were advanced.

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.

Ward, R. et al. Michigan State Wheat Variety Trial Results. July, 2000. Distributed through extention offices and published in the August 30 issue of the Michigan Farm Bureau's Michigan Farm News. [FHB data included]

Ward, Richard and Tracy Sayler. 2000. U.S. Wheat and Barley Scab Initiative: An Unprecedented University, Government and Industry Collaboration Focused on Accelerated Research of a Serious Cereal Disease Problem. International Wheat Scab Symposium, Suzhou, China.

Lewis, Janet, Richard Ward, and L. Patrick Hart. 2000. Sites of Action of Type II Resistance to FHB in Wheat: Ning 7840 Retards Spread of F. graminearum within Rachis. Int'l. Wheat Scab Symposium, Suzhou and Nanjing, China.

Van Sanford, David, J. Anderson, K. Campbell, J. Costa, P. Cregan, C. Griffey, P. Hayes, and R. Ward. 2000. Discovery and Deployment of Molecular Markers Linked to FHB Resistance: An Integrated System for Wheat and Barley. Crop Science (accepted).