

**U.S. Wheat and Barley Scab Initiative
 FY01 Final Performance Report (approx. May 01 – April 02)
 July 15, 2002**

Cover Page

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Year:	FY2001 (approx. May 01 – April 02)
Grant Number:	59-0790-9-057
Grant Title:	Fusarium Head Blight Research
FY01 ARS Award Amount:	\$ 77,975

Project

Program Area	Project Title	Requested Amount
Variety/Uniform	Improvement of Soft Winter Wheat for Resistance to Fusarium Head Blight	\$ 80,100
	Total Amount Requested	\$ 80,100

Principal Investigator

Date

Project 1: Improvement of Soft Winter Wheat for Resistance to Fusarium Head Blight

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

Soft winter wheat cultivars that are adapted to Indiana and eastern United States are susceptible to Fusarium head blight (FHB) or wheat scab, caused by the fungus *Fusarium graminearum*. FHB has become frequent and severe during the last 15 years, coinciding with the widespread adoption of reduced soil tillage for soil conservation. In seasons with favorable weather conditions for development of the disease, significant production and wheat grain quality losses have occurred. Wheat germplasm lines and/or cultivars from other parts of the world that have effective resistance to Fusarium have been identified. Thus, research to transfer Fusarium resistance to improved cultivars adapted to Indiana and surrounding regions will have a significant impact on control of this disease and is being supported by this grant.

2. What were the most significant accomplishments?

Breeding. FHB resistance of several wheat germplasm lines that is partially effective, none have complete resistance, has been transferred into lines that are partially adapted and that have resistance to other important diseases in Indiana and surrounding regions. Certain of these first cycle breeding lines have been crossed and the resulting hybrid plants were crossed to improved, adapted lines to produce segregating populations that should include plants having FHB resistance of multiple source lines and that are more adapted than the FHB source lines. Initial screening for FHB resistance and other important plant traits has been accomplished. A breeding scheme, involving field and greenhouse testing, to achieve two generations per year with selection in winter wheat has been developed to reduce the number of years required for the process of breeding for cultivars having effective FHB resistance.

Genetics. The FHB resistant cultivar, Ning 894037, has the previously reported resistance QTL on chromosome 3BS and a resistance QTL with smaller effect on chromosome 6B. Wheat cultivar Alondra has a FHB resistance QTL on chromosome 2D. Wheat cultivar Fundulea 201R has one FHB resistance QTL on chromosome 1B and one FHB resistance QTL on chromosome 3A, both conditioning large resistance effects. The FHB resistance QTL on 3BS between SSR markers Xgwm493 and Xgwm533 in several wheat lines developed in China, likely originated from the Chinese line Taiwanxiaomai and not from the Italian line Funo. FHB resistance QTLs in wheat lines of Chinese origin, like Sumai 3, appear to be different than FHB resistance QTLs in wheat lines of European origin, like Fundulea 201R.

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.

Bourdoncle W and HW Ohm. 2001. Genetic analysis of Fusarium head blight resistance in wheat line Huapei 57-2. p. 228. *In* Proceedings, 2001 National Fusarium Head Blight Forum, SM Canty, J Lewis, L Siler, and RW Ward (*eds*).

Ohm HW. 2001. Variety development and uniform nurseries: winter wheat research progress. p. 269. *In* Proceedings, 2001 National Fusarium Head Blight Forum. SM Canty, J Lewis, L Siler, and RW Ward (*eds*).

Shen X and H Ohm. 2001. QTL of FHB resistance in wheat line Ning 894037. p. 272. *In* Proceedings, 2001 National Fusarium Head Blight Forum. SM Canty, J Lewis, L Siler, and RW Ward (*eds*).