

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

Cover Page

PI:	Yang Yen
Institution:	South Dakota State University
Address:	Dept. of Biology/Microbiology 249C NPB, Box 2140D Brookings, SD 57007
Email:	Yang_Yen@sdsstate.edu
Phone:	605-688-4567
Fax:	605-688-5624
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Grant Number:	59-0790-1-078
Grant Title:	Fusarium Head Blight Research
FY01 ARS Award Amount:	\$ 9,735

Project

Program Area	Project Title	Requested Amount
Variety/Uniform	Implementation of Marker-assisted Selection in the Scab Breeding and Germplasm Enhancement Programs in South Dakota	\$ 56,100
	Total Amount Requested	\$ 56,100

Yang Yen
Principal Investigator

July 2, 2002
Date

Project 1: Implementation of Marker-assisted Selection in the Scab Breeding and Germplasm Enhancement Programs in South Dakota

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

The goal of this project is to implement marker-assisted selection (MAS) in the SDSU spring and winter wheat breeding programs and the USWBSI spring wheat germplasm program. To reach our goal, we are adopting useful markers from other programs while incorporating new marker selection into our breeding routine.

2. What were the most significant accomplishments?

As the first step toward our goal, we have screened 78 elite breeding materials from SD spring wheat breeding program and 87 elite selections from USWBSI spring wheat germplasm program for SSR markers with primer sets *gwm533*, *gwm493* and *gwm389*. Sumai 3 and Wheaton were used as the controls. The results showed that 38 of the 78 elite breeding lines screened have the *Qfhs.ndsu-3BS-gwm493* marker identified by Anderson et al (2001) but only five also have the *Qfhs.ndsu-3BS-gwm533* marker. Of the 87 elite germplasm selections screened, 27 lines have the *Qfhs.ndsu-3BS-Xgwm493* markers; 31 lines have the *Qfhs.ndsu-3BS-Xgwm533* marker; and 26 lines have the *Qfhs.ndsu-3BS-Xgwm389* marker. The *Xgwm533-120bp*, the *Xgwm493-140bp* and the *Xgwm493-160-bp* markers observed in our elite breeding lines were also observed among the elite germplasm selections. In addition, new markers *Xgwm389-130bp*, *Xdwm533-300bp* and *Xgwm533-165bp* were also observed among the selections.

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.

Zhu, L.-C., J.C. Rudd and Y. Yen. (2001) Applying simple sequence repeat (SSR) markers in screening *Fusarium* head blight resistant parents. *Proc. SD Acad. Sci.* 76: 21-24.

Zhu, L., J.C. Rudd and Y. Yen. 2001. Applying simple sequence repeat (SSR) marker in screening *Fusarium* head blight resistant parents. *In: 2001 National Fusarium Head Blight Forum Proceedings*, Erlanger, KY, Decem. 8-10, 2001, page 292.

Weng, Y., X. Zhang, Y. Yen and Y. Jin. 2001. Characterization of *Fusarium* head blight resistant germplasm with SSR markers linked to FHB resistance in Sumai 3. *In: 2001 National Fusarium Head Blight Forum Proceedings*, Erlanger, KY, Decem. 8-10, 2001, page 212-215.