

**U.S. Wheat and Barley Scab Initiative
 FY02 Final Performance Report (approx. May 02 – April 03)
 July 15, 2003**

Cover Page

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Year:	FY2002 (approx. May 02– April 03)
Grant Number:	NA
Grant Title:	Fusarium Head Blight Research
FY02 ARS Award Amount:	\$ 28,585

Project

Program Area	Project Title	USWBSI Recommended Amount
GIE	Transfer of Fusarium head blight resistance from wild relatives into durum wheat.	\$29,300
	Total Amount Recommended	\$29,300

 Principal Investigator

 Date

Project 1: Transfer of Fusarium head blight resistance from wild relatives into durum wheat.

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

The lack of Fusarium head blight (FHB) resistance in current durum cultivars is a major problem. Wild relatives of wheat offer an excellent source of FHB resistance. Diploid wheatgrass, *Lophopyrum elongatum* ($2n = 2x = 14$; EE genome), is a particularly good source of resistance. By crossing durum cultivars (Langdon and Lloyd) with this wheatgrass and through a series of backcrosses, we have transferred grass chromatin into the durum genome. However, in many cases the alien integrations are not stable, which poses a big challenge.

We are using Langdon disomic 5D(5B) substitution as the female parent to promote high homoeologous pairing (i.e., pairing between wheat and grass chromosomes) and hence alien chromatin transfer into the durum genome.

We are also exploring other wild grasses such as *Thinopyrum bessarabicum* ($2n = 2x = 14$; JJ genome) as a source of FHB resistance.

What were the most significant accomplishments?

We have produced fertile hybrid derivatives between durum cultivars and *L. elongatum*. Some of these derivatives have a high degree of scab resistance and hold some promise. We have also produced some monosomic additions of grass chromosomes, two disomic additions, and also some hybrid derivatives with three grass chromosomes. Some of these hybrid derivatives have low FHB infection (7% to 21%) and appear promising. However, we do not yet have meiotically stable scab-resistant durum germplasm.

Hybrids between durum and *Th. bessarabicum* have also been produced. We are now raising backcross progeny and are studying them further.

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.

Jauhar, P.P. 2002. Transferring FHB resistance from wild relatives into durum wheat: Prospects and problems. Workshop on Fusarium Head Blight Resistance in Wheat. University of Minnesota, St. Paul, MN, September 12-13.

Jauhar, P.P. and T. S. Peterson. 2002. Alien addition lines of durum wheat: Prospects for breeding for scab resistance. Agron. Abstracts, American Society of Agronomy, Madison, Wisconsin. November 2002.

Jauhar, P. P. 2003. Chromosome engineering for scab resistance in durum wheat. XIX International Congress of Genetics, Melbourne, Australia. July 2003.

Jauhar, P. P. 2003. Cytogenetics and crop improvement: Chromosome engineering. *Encyclopedia of Applied Plant Science*. Academic Press, London. (In press)