

**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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<b>Year:</b>	<b>FY2001 (approx. May 01 – April 02)</b>
<b>Grant Number:</b>	<b>N/A</b>
<b>Grant Title:</b>	<b>Fusarium Head Blight Research</b>
<b>FY01 ARS Award Amount:</b>	<b>\$ 28,230</b>

**Project**

<b>Program Area</b>	<b>Project Title</b>	<b>Requested Amount</b>
Biotech	Molecular mapping of Fusarium head blight resistance genes in tetraploid wheat.	\$ 37,525
	<b>Total Amount Requested</b>	<b>\$ 37,525</b>

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 Principal Investigator

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 Date

**Project 1: Molecular mapping of Fusarium head blight resistance genes in tetraploid wheat.**

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

Fusarium head blight (FHB) is one of the most devastating diseases of wheat. Resistant sources of hexaploid bread wheat have been identified and are currently being employed in breeding programs, but development of resistant tetraploid durum wheat has met with less success. Resistance has been identified in *Triticum dicoccoides*, a wild tetraploid relative, which readily hybridizes with durum wheat. A resistant accession of *T. dicoccoides* was used to create disomic chromosome substitution lines in the Langdon durum background. Screening of the substitution lines for FHB resistance indicated that chromosomes 5B and 7A contain resistance factors. Using Langdon and the 5B and 7A substitution lines as parents, recombinant inbred chromosome line (RICL) mapping populations will be produced. The populations will be subjected to FHB inoculations and genetic maps of chromosomes 5B and 7A will be generated using molecular markers such as RFLPs, AFLPs, and microsatellites. Quantitative trait loci (QTL) analysis will be performed to identify genomic regions associated with resistance. Putative QTLs will be further targeted to identify markers tightly linked to them. The most informative markers will be converted to user-friendly PCR-based markers and freely distributed to interested breeders and geneticists. The diagnostic markers should expedite the introgression of *T. dicoccoides*-derived resistance genes into elite durum lines using marker-assisted selection. Combining the FHB resistance genes identified from this project along with genes identified by others from different sources should lead to a highly resistant durum cultivar.

## 2. What were the most significant accomplishments?

It is essential to construct immortal segregating populations for mapping of complex quantitative traits such as resistance to Fusarium head blight. Recombinant inbred lines are selfed to homozygosity and thus can be used for unlimited numbers of replicated experiments. Toward this goal, we performed initial crosses between Langdon and Langdon-*T. dicoccoides* 5B chromosome substitution, and between Langdon and Langdon-*T. dicoccoides* 7A chromosome substitution during FY01. We then proceeded to advance about 200 lines of each population to the F3 generation by single seed decent. Thus, within FY01 we were able to advance the two populations approximately half way to completion.

FY01 (approx. May 01 – April 02)

FY01 Final Performance Report

PI: Faris, Justin D.

Grant: N/A

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.

None.