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

Cover Page

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Year:	**FY2000**
Grant Number:	
Grant Title:	**Fusarium Head Blight Research**
Amount Granted:	**$210,000.00**

Project

Program Area	Objective	Requested Amount
Biotechnology	Develop wheat microsatellite markers and associated information databases.	$263,225.00
	Requested Total	$263,225.00[1]

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Principle Investigator Date

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

Year:2000
PI: Perry Cregan, Rick Ward, and Bikram Gill
Grant:

Project 1: Develop wheat microsatellite markers and associated information databases.

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

Wheat breeders do not have unfettered access to DNA markers that can be effectively used in the discovery of and selection for genes that control Fusarium resistance in wheat. As a result, wheat breeding programs with the goal of producing agronomically superior cultivars with acceptable grain quality make relatively little use of existing RFLP markers. To solve this problem we are developing microsatellite DNA markers that are more polymorphic and less laborious to use than RFLPs. New microsatellite markers will be placed on the wheat genome map in the ITMI mapping population and by physical mapping with aneuploid stocks. In order to pre-enable application of this technology, markers representing each of the 84 virtual ½ arm map bins (4 per chromosome) will be used to characterize both scab resistant lines (e.g. Sumai 3, Niing7840 and W14) as well as a panel of 36 or more breeder-identified breeding parents.

2. Comparison of actual accomplishments with the objectives established.

Development of 250 new microsatellite markers during the period 2/1/2000 through 1/30/2001: During the first granting period (FY99) 42 microsatellites were developed. In the second granting period, 99 new microsatellites have been developed to date.

Mapping of markers: Mapping of polymorphic microsatellites is progressing at MSU and loci are being positioned via physical mapping using aneuploid stocks (KSU) with results as follows:

Numbers of BARC/BARCM microsatellites on wheat chromosomes			
Chromosome	**A**	**B**	**D**
1	4	3	
2	4	5	3
3	4	5	3
4	2		1
5	2	7	1
6	1	6	6
7	6	5	7

Characterization of scab resistant sources and breeding parents: MSU will request nominations for lines to include in the allele state database from USWBSI wheat breeders during the fall of 2000. Genotyping of that set will be done once the majority of microsatellite markers are mapped.

3. Reasons that established objective were not met.

Development of 250 new microsatellite markers: This project was expanded in its second year (FY00), and full funding was not available until May 2000. We are therefore in the 4th month of first year of the full-scope project. Our proposal anticipated the possibility of a high level of duplicate clones in the microsatellite enriched libraries purchased from Genetic Identification Services, Inc. (GIS). A high level of duplicate clones was found even in the second and third sets of libraries made by GIS. In the past two months we have reverted to the construction and screening of non-enriched libraries and now have a large set of microsatellite containing clones. We still anticipate developing at least the promised 250 new markers during the granting period.

4. What were the most significant accomplishments this past year? Dr. J. A. Anderson submitted a manuscript to *Theoretical and Applied Genetics* reporting two new microsatellite loci developed by this project that flanked a scab resistance QTL on chromosome 3BS.