U.S. Wheat and Barley Scab Initiative

Annual Progress Report
September 15, 1999

Cover Page

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Project

Program Area	Objective	Requested Amount
Biotechnology	Isolate spike-specific promoters from Bowman barley and near-isogenic morphological marker lines.	$50,000
	Requested Total	$50,000[1]

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Principle Investigator Date

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

Project 1: Isolate spike-specific promoters from Bowman barley and near-isogenic morphological marker lines.

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

Barley transformation has the potential to help combat Fusarium head blight by introducing anti-fungal and anti-toxin genes. Promoters currently in use for barley transformation give transgene expression in all plant tissue throughout development, which is not an efficient use of plant resources. This project will isolate spike-specific promoters to target gene expression to the spike tissues that are attacked by Fusarium head blight. RNA differential display technology will be used to identify genes that are expressed in spike tissues of Bowman and ten near-isogenic lines with morphological changes in spike tissues. Regulatory regions, i.e. promoters, of these genes will be identified by DNA sequencing. Candidate spike-specific promoters will be inserted into marker gene constructs and tested for transgene expression patterns. Differential display comparisons will included Bowman spike tissue vs. non-spike tissue, expressing vs. non-expressing tissue of the morphological marker lines, and morphological line tissue expressing the trait vs. the comparable normal tissue in Bowman.

2. Please provide a comparison of the actual accomplishments with the objectives established.

The project is on schedule for accomplishing the objectives with approximately ½ year of research completed. A Research Specialist was hired in July 1999 to conduct this project. She has collected specific plant tissues from Bowman and each morphological line and has extracted RNA from multiple plants for each trait. These samples are being kept separate to help reduce the number of false positives obtained from the differential display reactions. Separate RNA extractions from Bowman have been done on leaves, stems, nodes, and the lemma, pericarp, and rachis. RNA samples are being tested for their quality and yield at this time and differential display reactions will begin within the next few weeks.

3. What were the reasons established objectives were not met? If applicable.

Not applicable.

4. What were the most significant accomplishments this past year?

Appropriate personnel were hired to conduct this research project. RNA samples were successfully extracted from multiple plants expressing each of the 10 morphological traits and from the corresponding normal tissue from Bowman barley.

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 at this time.