U.S. Wheat and Barley Scab Initiative  
FY00 Final Performance Report (approx. May 00 – April 01)  
July 30, 2001  

Cover Page

<table>
<thead>
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<tbody>
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<tr>
<td>Year:</td>
<td>FY2000 (approx. May 00 – April 01)</td>
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<tr>
<td>Grant Number:</td>
<td>59-0790-0-060</td>
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<tr>
<td>Grant Title:</td>
<td>Fusarium Head Blight Research</td>
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<tr>
<td>2000 ARS Award Amount:</td>
<td>$34,146</td>
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Project

<table>
<thead>
<tr>
<th>Program Area</th>
<th>Project Title</th>
<th>Requested Amount</th>
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<tbody>
<tr>
<td>Biotechnology</td>
<td>Create molecular maps of wheat genes imparting resistance to scab infection and deoxynivalenol (DON) accumulation.</td>
<td>$45,700.00</td>
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Requested Total | $45,700.00¹

¹ Note: The Requested Total and the Award Amount are not equal.

Principal Investigator                   Date

(Form – FPR00)
Project 1: Create molecular maps of wheat genes imparting resistance to scab infection and deoxynivalenol (DON) accumulation.

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

Effective utilization of scab resistance resources relies on understanding inheritance of wheat resistance to scab and to DON accumulation in wheat grain. Because of complexity of wheat resistance to scab infection and DON, conclusions from classical research are controversial. Molecular mapping of QTL provides an efficient tool for solving the complicated problem. We constructed a well spaced molecular linkage map with AFLP and some microsatellite markers to characterize QTL for Type II scab resistance and low DON, and to dissect genetic effects of these QTL by testing the mapping population for scab resistance and DON accumulation under field and greenhouse conditions. The results will provide useful information on inheritance of the wheat resistance to the complicated disease and also speed up breeding process by providing breeders with selectable markers for breeding wheat cultivars with low DON and high levels of scab resistance.

2. What were the most significant accomplishments?

   a. Through AFLP mapping, we concluded that three QTL in Ning 7840 controlled Type II scab resistance. One QTL with a major effect located on chromosome 3BS by SSR markers and other two demonstrated minor effect on scab resistance.
   b. One major QTL for low DON as evaluated by spray inoculation under greenhouse conditions has been mapped on cv. Ning 7840, and DON levels in infected seeds of 133 F11 RILs from two field experiments have been analyzed for further mapping of low DON under field infection conditions.
   c. The AFLP map derived from Ning 7840/Clark population is being further saturated with PstI-AFLP, RGA and SSR markers.
   d. One AFLP marker has been converted into STS marker, and further validation of the marker is underway.
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.

**Papers Published or Submitted**


**Meeting Presentations**


**Invited Presentations**

1. QTL for scab resistance and DON accumulation in wheat. Sept. 6, 2000. Invited seminar of Dept of Entomology and Plant Pathology, OSU.