

PI: Richard W. Ward

PI's E-mail: wardri@msu.edu

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Project Title: Mapping of FHB resistance QTL carried by 'CJ 9306'.

PROJECT 2 ABSTRACT

(1 Page Limit)

Lack of elite germplasm sources of resistance and insufficient understanding of their inheritance resulted in the slow progress in plant breeding for FHB resistance in wheat. So far, only limited sources of potent host plant resistance to FHB have been genetically investigated. New germplasm lines W14, CJ 9306, CJ 9403 and etc developed by Dr. Guo-Liang Jiang through multiple-parent crossing and recurrent selection combined with modified pedigree methods possess a high level of resistance and desired agronomic traits. Preliminary experimental results indicated that the mode of inheritance and resistance genes or gene combinations in these lines might be different from the reported sources such as Sumai 3, Ning 7840 etc. Therefore, we plan to conduct classical and molecular genetic investigations on these new sources for FHB resistance (focusing on Type II resistance).

The goals and supporting objectives of the proposed project are: **(1) to further investigate on the inheritance mode and gene effects of FHB resistance in these new lines; (2) to map QTLs for the resistance and identify the associated DNA markers in CJ 9306 and CJ 9403; (3) to analyze the correlation between the resistance and agronomic traits at classical and molecular levels.**

The proposed research is based on the fact that we have created all the required experimental materials, including F1, F2, F3 and backcross generations of several R × S crosses and recombinant inbred populations from the crosses Veery/CJ 9306 and Veery/CJ 9403. At the same time, we have accumulated extensive experience in QTL mapping, especially with SSR markers. The expected results include: (1) The mode of inheritance as qualitative-quantitative trait, adequate genetic model and gene effects/interactions for FHB resistance in the new highly resistant lines CJ 9306 and CJ 9403 would be clearly and scientifically elaborated; (2) One or several new markers different from the reported ones would be detected; (3) Desired gene combinations and relationships between FHB resistance and other traits would be revealed at both classical and molecular levels.

In the area “Germplasm Introduction and Enhancement” of USWBSI, genetic analysis of newly identified and/or acquired sources of resistance, especially genetic studies on germplasm with a high level of resistance that may have novel resistance genes or gene combinations, are given a higher priority. We believe that, therefore, the proposed project is of great importance and significance for realization of the goals of USWBSI.