

0203-KI-080 Development of markers linked to FHB resistance in hexaploid wheat.

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PROJECT ABSTRACT

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The extensive economic damage caused by Fusarium head blight (FHB) or scab to the North Dakota durum and wheat producers is well recognized. The most cost-effective way of reducing losses from this devastating disease is through the development of genetic resistance in the host plant. Analysis of North Dakota hard red spring (HRS) wheat lines carrying Sumai3 derived FHB resistance, their susceptible parental and sister lines indicated the presence of two QTL regions significantly associated with resistance. The discovery of a region on chromosome 3B was expected based on previously published results. However, the discovery of a region on chromosome 7B was unexpected. Moreover, populations of 388 F6 derived lines from crosses of Wangshuibai to ND674 (adapted HRS line) and reciprocal cross have been developed. Majority of these lines have been evaluated for FHB resistance in both greenhouse and field over 4 seasons. The resistant lines from this population are even more resistant than the lines derived from Sumai3. Preliminary marker analyses for chromosome 3B and 7B regions have proven negative. The need for additional investigation of FHB resistance in the above material is evident. Thus, the specific objectives of this project are:

- 1) **study the effect and interaction of major FHB resistance QTL;**
- 2) **analyze recombinant inbred populations derived from Wangshuibai, a Chinese source for FHB resistance, for the presence of Sumai3 QTL; and**
- 3) **identify additional QTL in Wangshuibai populations.**

Specifically, we would like to confirm the QTL on chromosome 7B and study its interaction with the region on 3B. We would also like to perform a more detailed analysis of Wangshuibai recombinant inbred line population for it holds great promise as a new source of FHB resistance gene(s). Our ultimate goal is to develop markers that are closely linked to resistance loci and that are easily applicable to breeding programs by PCR methods. The markers developed by this project could greatly reduce costs associated with breeding for FHB, and will be utilized by the durum, hard red spring wheat and hard white wheat breeding programs at NDSU.