

0203-KI-079 Development of markers lined to FHB resistance in durum wheat.

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Grant #: 59-0790-9-048; \$31,500; 1 Year

Research Area: BIO

PROJECT ABSTRACT

(1 Page Limit)

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. Once resistance genes are identified, transfer into adapted wheat germplasm remains a lengthy and difficult task because undesirable traits generally accompany the transfer. Markers linked to resistance genes can accelerate selection, germplasm development and time to variety release. We will use traditional marker technologies (RFLP, AFLP and microsatellites) in addition to the information on wheat ESTs being generated by the NSF funded wheat genomic project to identify and develop "breeder friendly" markers to improve germplasm development and reduce time to variety release. The specific objectives of this project are to:

- 1) **identify markers closely linked to FHB resistance loci in durum wheat;**
- 2) **develop a PCR-based marker system for screening large durum breeding populations segregating for FHB; and**
- 3) **demonstrate the utility of these markers in populations developed by various breeding programs.**

We have identified a major QTL in durum lines derived from *T. dicoccoides* chromosome 3A substitution line. The markers linked to this locus explain 55% of the genetic variation relating to FHB resistance. Additionally, markers identified from Suami3 are being developed for deployment in the selection of backcross derived durum varieties. We plan to validate and determine the feasibility of using these markers in selecting durum lines carrying Suami3 resistance QTL. The durum lines developed from Wangshuibai lag behind that of other sources and rely on costly and inaccurate phenotypic selection. This method is specially time consuming in derivation by the backcross method. We plan to develop markers linked to resistance QTL from Wangshuibai to aid speed the process of selection. Markers may represent the only mean by which the resistance QTL from *T. dicoccoides*, Sumai3, Wangshuibai and other possible sources of resistance can eventually be combined in a single variety, the ultimate objective of this project.