

PI: Faris, Justin D.**PI's E-mail: farisj@fargo.ars.usda.gov****Project ID: FY06-FA-087****FY05 ARS Agreement #: NA****Research Area: HGG****Duration of Award: 1 Year****Project Title: Analysis of FHB Resistance QTL Derived from *Triticum dicoccoides*.****PROJECT 1 ABSTRACT**

(1 Page Limit)

Fusarium head blight (FHB) is one of the most devastating diseases of wheat and durum. Type II resistance has been identified in several accessions of *Triticum dicoccoides*, a wild tetraploid relative, which readily hybridizes with durum wheat. The resistant accessions of *T. dicoccoides* were used to create disomic chromosome substitution lines in the Langdon durum background (LDN-DIC). Screening of the substitution lines for FHB resistance indicated that chromosomes 3A and 6B from accession Israel A (IsA) and chromosome 7A from PI478742 contain resistance factors. The FHB resistance QTL on 3A was identified by others and continues to be a subject of investigation by the PI's of this proposal and other researchers. The QTL on 6B was identified by the PI's of this proposal. We also identified a putative QTL on chromosome 7A, but confirmation is needed. The specific objectives of this research are:

1. **Confirm the putative FHB-resistance QTL on chromosome 7A derived from *T. dicoccoides* accession PI478742**
2. **Genotype F₂ progeny derived from the cross between LDN-DIC 3A (IsA) and LDN-DIC-6B (IsA) for the putative QTLs on 3AS and 6BS, and screen plants for reaction to FHB to evaluate allelic combinations and utility of the markers for marker-assisted selection**

For the first objective, we will conduct a third FHB inoculation experiment in the greenhouse to confirm the QTL on chromosome 7A derived from *T. dicoccoides* PI478742. The second objective will involve the genotyping of F₂ plants derived from the cross between LDN-DIC 3A (IsA) and LDN-DIC 6B (IsA) for regions possessing FHB resistance QTLs. Plants of each of the four possible homozygous genotypic classes will be tested for reaction to FHB in multiple greenhouse experiments. We expect that the effects of the 3A and 6B QTLs will be additive and that plants possessing resistance alleles at both QTLs will be significantly more resistant than the other three classes. This work will allow us to evaluate the feasibility and utility of the markers underlying these QTLs for MAS, and we will gain an understanding of the relationship of these two QTLs including their additive, dominance, and epistatic effects with one another. The long term goal is to identify highly resistant progeny possessing both resistance QTL, which will be crossed with lines possessing the chromosome 7A QTL, for the development of FHB resistant durum germplasm.