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Project Title: Mapping and Validating FHB Resistance QTL in Barley.

PROJECT 2 ABSTRACT

(1 Page Limit)

We are conducting research to enhance our understanding of resistance to Fusarium head blight (FHB) in barley and develop molecular marker tools to exploit resistance genes from diverse sources of resistance. We are engaged in mapping and validating two quantitative trait loci (QTL) for FHB that were identified in the Chevron mapping population. Each region is linked with other traits that are undesirable for breeding six-rowed malting barley (late heading and high grain protein). We have developed recombinant near isogenic lines to attempt to separate undesirable alleles from resistance alleles at these loci. We have developed large segregating populations for each region from crosses between an NIL and the recurrent parent. We will generate a high resolution map of the QTL regions that will be useful for MAS and future map-based cloning efforts. We have initiated research to use association genetics in breeding germplasm to identify novel FHB QTL. This research will leverage resources developed by the USDA-CSREES Barley CAP. In this funding period, we will conduct association mapping using a set of 384 breeding lines from four breeding programs evaluated for FHB at 4-5 locations in 2008. We will also continue to collect FHB and DON data from an additional set of 384 lines in 2009. Information on genetics of resistance and markers linked to resistance QTL that are identified in the course of this research will be valuable for managing multiple disease resistance genes in barley breeding programs through the use of marker assisted selection.