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FY09 ARS Agreement #: 59-0206-9-059

Research Category: VDHR-NWW

Duration of Award: 1 Year

Project Title: Coordinated Evaluation and Utilization of Marker Assisted Selection.

PROJECT 2 ABSTRACT

(1 Page Limit)

The objectives of this project are to 1) evaluate the effectiveness of use of FHB-resistance genes in the NWW breeding programs through marker assisted selection (MAS); 2) quantify the effects of these genes in reducing FHB and DON toxin; and 3) measure their impact on other key traits such as yield and milling and baking quality. Approximately 700-1000 partially inbred lines (RIL) from crosses with an array of parents homozygous for the resistance alleles at Fhb1, the most important FHB gene and other genes that have been planted in breeding nurseries in KY, MO, IN, IL, MI, OH and NY. These lines will be genotyped at Fhb1 and other resistance gene loci during the spring and summer of 2010 at the USDA-ARS *Eastern Regional Small Grains* Genotyping Lab, Raleigh, NC. This material will be concurrently tested for FHB traits, and in some cases yield and other agronomic traits in the individual Co-PI's scab and yield nurseries. Based on genotypic and phenotypic data, a number of pairs of sister lines, homozygous for resistance and susceptibility alleles at each QTL will be identified in each breeding program. Seed of these lines will be distributed to Co-PIs for planting in the fall 2010 and FHB phenotyping, yield testing and milling and baking quality analysis. Outputs will include information on the effect of genetic background on gene expression, sharing of lines to use as parents, and possible identification of lines worthy of joint germplasm and/or cultivar release.