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PROJECT 1 ABSTRACT

(1 Page Limit)

The overall goal of this project is to mitigate the adverse effect of FHB in soft red winter wheat region by developing high yielding and superior quality varieties that are resistant to FHB disease. To achieve that goal, we will conduct genetic studies and breeding activities. FHB screening activities (field and greenhouse) will result in identification of resistant and moderately resistant lines. These lines will be used in breeding crosses and germplasm exchange. The loci identified during genetic mapping studies can be converted to breeder's friendly markers, to facilitate selection of superior progeny. A collection of 432 Purdue-bred lines, derived from 123 unique crosses made between 1986 and 2010 will be used for genome-wide association studies (GWAS). This germplasm was genotyped using genotyping-by-sequencing (GBS) technique. The output will be identification of loci that control resistance to FHB. Purdue lags behind in the development of genome-wide predictive breeding strategies. We will phenotype the collection of 432 Purdue-bred lines for FHB resistance and agronomic traits for two years. To begin developing predictive breeding pipeline, we will evaluate the prediction accuracy of a genome-wide prediction approach for FHB resistance and other agronomic traits such as grain yield. The proposed research will contribute to education and research skills of graduate students and postdoc in our program. The research data will be communicated in conferences and published as journal articles.