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Project ID: FY10-SW-006

FY10 ARS Agreement #: 59-0206-9-082

Research Category: VDHR-SWW

Duration of Award: 1 Year

Project Title: Development of FHB-resistant Wheat Cultivars for the Midsouth.

PROJECT 3 ABSTRACT

(1 Page Limit)

Wheat varieties with resistance to FHB are an important component for reducing yield and quality losses associated with FHB. However, FHB resistance needs to be combined with other traits such as yield, milling and baking quality, and resistance to other diseases. A major part of this project focuses on combining adequate resistance to FHB with other beneficial traits that will encourage growers to plant resistant varieties. To provide breeders with new sources of FHB resistance in adapted backgrounds and with resistance to other important diseases, lines from the germplasm enhancement program have been selected for agronomic traits and for resistance to FHB and contemporary races of leaf rust, stripe rust, and Septoria tritici blotch. The wheat breeding program at Louisiana State University has collaborated closely with this project, and this collaboration has been mutually beneficial. Markers for resistance genes *FHB1*, *FHB2*, and *FHB3* will be used to select and pyramid these genes as appropriate for particular populations and lines. To assist southern breeders with developing FHB-resistant varieties, this project will evaluate entries in the Uniform Southern FHB Nursery for type I resistance, a combination of types I and II resistance, and grain DON level in the greenhouse and for FHB severity, percentage of scabby kernels, and mycotoxin level in inoculated, irrigated field nurseries at two locations. Advanced lines from the Arkansas and Louisiana breeding programs developed for resistance to FHB also are included in these field nurseries. To provide clientele with FHB resistance ratings for local varieties, this project will evaluate 20 of the most commonly grown varieties in Arkansas for FHB resistance (severity, scabby kernels, and mycotoxins) in the field at two locations and report the results on the University of Arkansas Cooperative Extension Service website. A graduate student will conduct research to identify lines with tolerance to FHB, that is, the ability to yield well in the presence of head blight and to identify lines with resistance to kernel infection. These are two hypothesized types of resistance to FHB for which there is little or no information. Being able to identify lines with these components would facilitate incorporating these types of resistance into cultivars. Progress made in this project will benefit the entire soft red winter wheat region.