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

PROJECT 2 ABSTRACT
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The best hope for growers to overcome Fusarium Head Blight (FHB) is through resistant varieties. However resistant varieties are useless if they are too costly in terms of yield reduction. This project focuses on development of wheat varieties that are not only FHB-resistant but also contain the necessary attributes to make them competitive with other varieties on the market. Parents for crossing will be genotyped for markers linked to FHB resistance genes, and subsequent segregating populations will be enriched using MAS.

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.