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Project Title: Development of FHB Resistant Wheat Genotypes Adapted to the Gulf Coast.

PROJECT 1 ABSTRACT

(1 Page Limit)

The LSU AgCenter wheat breeding develops varieties that are marketed commercially and are widely grown across the Gulf Coast and Mississippi Delta regions. The most economical and effective means to prevent grower's losses due to Fusarium Headblight epidemics, and avoid export market contamination from FHB, is to develop and release high-yielding FHB-resistant varieties for the region. Our goal is to accelerate development of FHB resistant wheat varieties adapted to the unique environment of the Gulf Coast. Objectives of the LSU AgCenter wheat breeding program, Fusarium Headblight project are: 1) to evaluate varieties and advanced breeding lines in regional nurseries to determine FHB reaction and potential in the region, 2) to incorporate FHB resistance into the LAES germplasm and develop and release FHB resistant varieties for the Gulf Coast region, and 3) to evaluate entries tested in the statewide variety trials for reaction to FHB so that growers have that information when choosing varieties.

Uniform regional nurseries, the statewide variety trials, and LSUAC breeding lines will be evaluated at three locations under controlled field conditions to determine the level of FHB resistance in each line. The amount of scab that occurs, kernel shriveling, and toxin content will be recorded for each line/variety. Tissue samples will be collected for DNA extraction to test for the presence of major genes conferring resistance to scab.

Lines showing good scab resistance along with adaptation and other traits of importance will be incorporated into the wheat crossing program. Crosses to incorporate FHB resistance are made in the greenhouse and field each year. Early-generation populations are planted as strips with widely-spaced plants and will be inoculated with scabby corn to facilitate selection of resistant plants. Individual plants will be selected for agronomic adaptation and resistance to FHB, leaf and stripe rust. FHB resistant lines selected from the USFHBN will be crossed to adapted lines that have high yield and good resistance to leaf and stripe in order to develop FHB resistant varieties that are adapted, broadly disease resistant, and have high yield and test weight.

Four breeding lines that have shown good FHB resistance and agronomic performance will be increased for entry in statewide variety trials during 2009. Numerous early-generation populations and headrows will be evaluated for agronomic adaptation and disease resistance in Baton Rouge and Winnsboro, including the populations listed below.