

PI: Harrison, Stephen**PI's E-mail: sharrison@agctr.lsu.edu****Project ID: FY07-HA-081****FY06 ARS Agreement #: 59-0790-4-104****Research Area: VDUN****Duration of Award: 1 Year****Project Title: Development of FHB Resistant Wheat Genotypes Adapted to the Gulf Coast.****PROJECT 1 ABSTRACT**

(1 Page Limit)

Fusarium Head Blight has become a major concern to U.S. wheat producers and conditions favorable for FHB development are common along the Gulf Coast. There is evidence that this region contains *Fusarium* populations that produce toxins other than DON. Objectives of this research are to: 1) to participate in the USFHBN regional nursery and provide data to breeders on the reaction of these advanced lines to FHB in order to facilitate the development of resistant varieties, 2) to incorporate FHB resistance into the LAES germplasm using a modified pedigree selection system coupled with MAS, and to 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. The proposed research addresses 2007 VDUN research priorities: 1) breeding and release of FHB-resistant wheat varieties and germplasm that are adapted to FHB-threatened states, 2) multi-location validation of FHB resistance through participation in the Uniform Southern Soft Red Winter FHB Nursery (USFHBN) nursery, and 3) providing growers with accurate FHB ratings of current varieties. The overall goal of the project is to accelerate development of FHB resistant wheat varieties and germplasm that are adapted to the unique environment of the Gulf Coast, a region not suitable for most wheat varieties due to low vernalization and high disease pressure. The project involves cooperation of pathologists and breeders across multiple institutions. The FHB regional nursery will be evaluated in northeast and south central Louisiana under controlled field conditions with corn-based inoculation and timed misting; and in the scab-prone rice region of southwest Louisiana without inoculation. Three replications of 'headrows' in a RCBD will be grown at each location. Advanced LA breeding lines from all preliminary and advanced yield trials, the 51 entries in the 2007 LA statewide variety trials, and potential parental lines from other sources will be included along with the USFHBN. Selected lines will be incorporated into the wheat crossing program. A replicated yield trial and a non-replicated observation trial will be conducted at Baton Rouge and Winnsboro for advanced lines derived from FHB-specific crosses. These lines will be concurrently evaluated in a misted-inoculated trail at Baton Rouge and Winnsboro; and at Crowley, for scab resistance. All lines in these trials and those in other PYTs with appropriate pedigrees will be subjected to MAS to detect the presence of 3BS and 5AS QTL. Segregating populations will be planted as strips with widely-spaced plants and will be inoculated with scabby corn. Individual plants will be selected for resistance to FHB, lead and stripe rust, and agronomic adaptation. FHB resistant lines selected from the USFHBN will be crossed to adapted lines that have high yield and good resistance to leaf and stripe rust. Two-way F1 plants with a FHB resistant parent will be topcrossed with elite LA lines in the greenhouse to set up F1 population enrichment via MAS next fall. The project will cooperate extensively with Dr. Gene Milus, pathologist at the University of Arkansas, with the SUNGRAINS breeders, and with other scientists.