

0203-HA-114 Development of FHB Resistant Wheat Genotypes Adapted to the Gulf Coast.

PI: Harrison, Stephen; E-mail: sharrison@agctr.lsu.edu

Louisiana State University Agricultural Center, Louisiana Agricultural Experiment Station, Baton Rouge, LA 70803-2110

Grant #: 59-0790-9-040; \$20,512; 1 Year

Research Area: VDUN

PROJECT ABSTRACT

(1 Page Limit)

Fusarium Head Blight (FHB), or Scab, caused by *Fusarium graminearum* and related fungi, has become a major concern to U.S. wheat producers. FHB produces mycotoxins that threaten the integrity of the U.S. food supply and greatly reduce the value of the harvested crop. Conditions favorable for FHB development are common along the Gulf coast with rainfall averaging 100 to 150 cm/yr across Louisiana and wheat frequently following corn and grain sorghum in reduced tillage production practices. Most wheat production along the Gulf Coast enters the export market through large grain elevators along the Mississippi River. These elevators process 1/4th of the total US wheat crop. There is a need for development of FHB resistant varieties adapted to this region, as well as evaluation of resistance levels and FHB levels in current varieties.

The overall objectives of the project are to accelerate development of wheat varieties and germplasm adapted to the Gulf Coast that are resistant to FHB and to screen available cultivars for FHB reaction. The Gulf Coast is a unique wheat-growing region that is not suitable for most wheat varieties due to low vernalization and high disease pressure. Objectives will be accomplished by: (1) Participating in the Uniform Southern Soft Red Winter Wheat FHB nursery and screening entries in statewide variety trials; (2) Initiating a recurrent selection program based on MS₃ male sterility and conventional crossing; and (3) Incorporating FHB resistant lines into the LAES breeding program using a modified pedigree selection system, and (4) Releasing locally adapted FHB resistant varieties to southern seedmen. The project involves cooperation of pathologists and breeders. The FHB regional nurseries will be evaluated in north and south Louisiana under controlled field conditions with inoculation and mist systems. A RCBD with three reps will be grown at each location. Advanced breeding lines from CIMMYT/INIA and regional nurseries, with FHB resistance, will be incorporated into the wheat crossing program. The breeding effort will evaluate headrows and advanced lines, representing multiple populations containing sources of FHB resistance. F₂ and F₃ populations will be selected under controlled conditions conducive to FHB development. All screening will be conducted under a mist system and inoculated with a corn-based inoculum. These populations were developed by the LAES or by Dr. Gene Milus of the Univ. of Arkansas, and have been selected in Louisiana for adaptation and resistance to other diseases. The headrows will be evaluated in the field at Baton Rouge. Advanced breeding lines will be evaluated as 3-row headrow plots at both locations and also in replicated yield trials at Baton Rouge. Additional crosses will be made to incorporate new resistance sources. The project will cooperate extensively with Dr. Gene Milus, pathologist at the University of Arkansas, to evaluate populations