Project Abstract

Project Title:	Expediting Development of Wheat with Improved FHB Resistance for the Coastal Plain	
Principal Investigator:	Richard Boyles	Clemson University

This project will develop SRW wheat cultivars and cultivar development resources to respectively mitigate short- and long-term threats of FHB epidemics in the Atlantic Coastal Plain and greater southeastern US. This project is designed to support all three VHDR-SWW CP research priorities.

Objectives

1. Coordinate phenotype screening of FHB resistance for advanced breeding lines.
   Expected outcomes: Accurate data for FHB index, FDK, and DON from a misted nursery on >700 advanced breeding lines and FHB index ratings on >2,800 developmental lines for effective selection. Data for SC Official Variety Trial will be uploaded to ScabSmart.
2. Participate in genetic screening to facilitate genomic and marker-assisted selection.
   Expected outcomes: Genomic estimated breeding values for all Clemson preliminary wheat lines (*n*=570) will be generated to support final decisions for line advancement. Haplotype marker data will be produced by the Eastern Regional Small Grains Genotyping Laboratory on 21 SC lines within elite nurseries to dictate and subsequently justify cultivar release. Genotype data in conjunction with new trait data will be recycled into the SunGrains training population to increase accuracy and robustness of genomic prediction.
3. Initiate advanced generation intercrossing for stacking native FHB resistance QTL.
   Expected outcomes: F_1 and F_1-derived seed from an 8-way intercross population will be made available to VHDR-SWW breeders after annual crossing is completed. Recombinants containing eight founder lines in its pedigree will an assortment of the 11 known FHB resistance QTL among native SRW wheat sources.

Expediting development of high-yielding, FHB resistant wheat cultivars will benefit wheat growers in the Atlantic Coastal Plain. Increasing the number of commercially available FHB resistant cultivars will increase wheat acreage planted to resistant cultivars and thus improve SRW wheat production and quality in the region. More healthy wheat in the marketplace benefits end-users and consumers.