**PI: Steve Harrison** **PI's E-mail: sharrison@agctr.lsu.edu**

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**Project Title: Developing Doubled Haploids to Expedite Variety Development in SRWW.**

## PROJECT 2 ABSTRACT

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One of the main objectives of the VDHR research area is to increase the efficiency of coordinated project breeding programs in developing and releasing FHB-resistant varieties. Doubled haploids (DH) shorten variety development time in fall-sown small grains by approximately four years.

Wheat DH production requires a large investment in laboratory equipment, greenhouse space, and expert personnel. This approach has been successfully used in the Southern Winter Wheat region through the efforts of the breeding program at NCSU (Murphy) that distributed over 500 DH lines since 2010 involving crosses with native resistance soft red winter wheat parents such as Bess and Neuse, and lines containing Fhb1 in current variety backgrounds.

We plan to expand the use of this technique for the whole Southern Winter Wheat region by the coordinated development of four breeding populations through DH production followed by collaborative phenotyping across the region once the DH lines are developed and seed is being increased for testing. This proposal fits into the overall Coordinated Project because it will quickly provide inbred breeding lines having several diverse FHB resistance genes (exotic and native) to five breeding programs for testing in the Southern Winter Wheat (SWW) region.

The LSU program will create a doubled haploid population from the cross: LA05145D-21/MD08-26-H2-7-12-21. LA05145D-21 has 'Jamestown' as a resistance source and had been tested for FHB resistance and yield, disease resistance, and agronomic traits. The MD line has the genes: *Fhb1*, 5AS, 2DL, so this cross combines at least four resistance sources in a good agronomic background.