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Project Title: Development of FHB-Resistant Wheat Cultivars for the Midsouth.

PROJECT 1 ABSTRACT

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The Arkansas Wheat Breeding Programs is working to incorporate FHB resistance from diverse and reasonably-adapted sources into adapted lines with high yield potential and resistance to other important diseases and is collaborating with other breeding programs in the southern region to evaluate breeding lines and mapping populations for FHB resistance and other important traits. Advanced breeding lines that combine the qualities of a variety and moderate to high levels of FHB resistance continue to be identified at an increasing rate within the Arkansas Wheat Breeding Program. In 2013-2014, 50% of breeding lines selected for advanced yield testing had a severity rating of less than 30% under extremely high disease pressure at two misted inoculated locations. Not only were these lines resistant to FHB, but they also had strong yield potential, test weight and resistance to other diseases common to Arkansas. AR05094-4-1 (*TerralTV8450/Beretta*), which was highly resistant in 2012-2013, continued to perform well and was entered into the entered into the 2014-2015 Uniform Eastern Soft Red Winter Wheat Nursery. AR00343-5-1 *(AR97052/Roane)* has consistently shown moderate resistance to FHB over 4+ seasons of evaluation and is currently in foundation seed production and target for release this summer. We continue to evaluate new sources of resistance, in particular lines which have been developed through the "Developing Doubled Haploids to Expedite Variety Development in SRWW" program that have 3+ known QTL/genes for resistance to SCAB. We have evaluated double haploids from Maryland, North Carolina, Virginia and Louisiana and have used this material for advancement and in our crossing program. We are also currently working on developing and improving our in house marker assisted selection pipeline in order to select for known QTL/genes more efficiently. This success is a direct result of cooperation and integration of the Wheat Breeding (PI-Mason) and Wheat Pathology (Co-PI Milus, now retired) programs along with continued support and cooperation between the members of the United States Wheat and Barley Scab Initiative. Future work will focus on releasing identified lines as varieties and a more targeted focus on introgression and pyramiding of genes and quantitative trait loci for FHB resistance for continued development of resistant germplasm and cultivars.