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Research Area: **VDUN** **Duration of Award: 1 Year**

Project Title: Accelerating the Development of FHB-Resistant Soft Red Winter Wheat Varieties.

PROJECT 1 ABSTRACT

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The overall goal of this project is to release FHB-resistant SRW wheat varieties to reduce economic risk for farmers whose crop is at risk for FHB infection, for millers and bakers who can tolerate only very low levels of mycotoxin, and for consumers who depend on a safe food supply. In two of the past three crop seasons, the Kentucky wheat industry has been very hard hit by FHB. Millers have had difficulty sourcing low toxin grain from Kentucky, and farmers have been severely discounted.

To meet this overall goal, we have identified several specific objectives: (1) accurately characterize resistance in existing cultivars and advanced breeding lines by evaluating them under a range of disease pressures; (2) carry out phenotypic selection among and within populations segregating for the Sumai 3 type of FHB resistance and other quantitative sources of resistance; (3) accelerate the deployment of the 3BS QTL in new wheat varieties. The plans to accomplish the project goals are to: 1) conduct extensive field screening at two locations in Kentucky; cultivars, advanced breeding lines and early generation populations will be screened in a misted nursery at Lexington, KY, and in non-irrigated bagged hill plots at Princeton, KY; 2) select resistant lines, families and individual plants on the basis of scab symptoms in chaff and seed; 3) genotype selected breeding lines, 3-way F_1 individuals, and F2:3 families with respect to markers linked to Sumai 3 resistance QTL, then advance individuals homozygous or heterozygous for the Sumai-3 type of alleles.

The relevance of this project to the U.S. Wheat and Barley Scab Initiative is that breeding FHB-resistant wheat varieties offers the maximum likelihood of success in our effort to minimize the threat of FHB to farmers, millers, bakers and consumers of wheat.