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ARS Agreement #: 59-0206-4-041

Research Category: VDHR-SPR

Duration of Award: 1 Year

Project Title: Developing FHB Resistant Wheat Cultivars for Idaho and the Western US.

PROJECT 1 ABSTRACT

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This project addresses a disease of importance nationally and internationally which is likely to become an increasing problem for growers in Idaho and some areas in Pacific Northwest (PNW) because of the increasing corn production, reduced tillage, and changing climate. Currently, most virtually grown cultivars in Idaho and PNW are susceptible to FHB and often produced high levels of DON toxin. Developing FHB resistance in Idaho and PNW wheat cultivars will reduce or eliminate future costs of disease control using fungicides, and help growers and industry reduce yield and quality losses when epidemic occurs. Accelerated breeding for FHB resistance includes using novel resistant sources, advanced sequencing technology, molecular marker-assisted selection, and high throughput phenotyping.

The overall goal of this project is to develop FHB resistant spring cultivars that have high grain yield and good end-use quality and resistance to predominant diseases and insects. The specific objectives are: 1) Increase and document acreage planted for UI Stone, FHB tolerant soft white spring wheat cultivar; 2) Assess FHB resistance for breeding materials in local scab nursery and via molecular marker assisted selection (MAS); 3) Validate QTL identified from PNW association mapping panel and collect data for training population of future genomic selection; 4) Develop and release new spring wheat cultivars pyramided *Fhb1* with resistance genes to stripe rust, stem rust, cereal cyst nematodes, Hessian Fly, and end-use quality via MAS and field testing in local disease nurseries.

All information and data being produced from this project will be presented at local field days, grower schools, Western Wheat Workers meeting, the FHB forum, professional meetings, and published in breeding program webpages and various peer-reviewed and refereed journals. FHB resistance data derived from the association panel will be uploaded to T3 database and shared with the USWBSI. Newly identified PNW wheat genotypes with FHB resistance will be released as cultivars and/or germplasm and provided to breeders for use as parents in their programs.

The PI has over 15 years working experiences on FHB research, including pathogen isolation, running disease nurseries, developing resistant cultivar and germplasm, and mapping QTL for FHB resistance.