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**ARS Agreement #:** *New*

**Research Category:** BAR-CP

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**Project Title:** Determining FHB Susceptibility in Barley Cultivars in the Western US.

## PROJECT 2 ABSTRACT

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FHB damage in spring barley continues to increase in southern and eastern Idaho. In 2015, malt barley was rejected at the elevator for having high levels of DON. Minimal levels were found in 2016 and 2017, however inoculum continues to build in corn residues as corn production increases in the state. The majority of the barley varieties that are available to growers in the area are susceptible to FHB. Growers need information on FHB susceptibility of the varieties that currently are being grown and those newly released. Breeders need information on advanced lines and breeding material to release selections with reduced vulnerability to FHB damage and DON accumulation.

Screening in 2014 through 2017 has allowed us to rank currently grown barley lines for relative FHB susceptibility. However, the majority of the varieties in production are susceptible and remain vulnerable under the highly conducive environment that occurs under irrigated production. Continuing the screening project will allow us to characterize new releases of barley and give us the ability to identify higher levels of resistance within breeding populations and advanced lines.

A screening nursery has been developed with an irrigation system to meet the irrigation needs of the crop and provide appropriate moisture to facilitate disease development. Inoculation with *Fusarium graminearum* (*Fg*) colonized corn spawn resulted in excellent development of disease in spring wheat. However, barley was also inoculated with a spore suspension of *Fg* macroconidia, resulting in excellent symptom expression. The addition of misting equipment with the double inoculation of macroconidia has resulted in good infection and the ability to screen for differential reactions to FHB. Appropriate development of inoculum and timing of inoculation will allow identification of susceptible barley cultivars and the development of resistance in breeding material. Reduction of FHB, FDK and DON in the harvested grain must start with selection of appropriate varieties that also meet the need of the industry for yield and end-use quality. This nursery allows us to do that by calculating the Fusarium disease index and testing harvested material for DON in conjunction with the USWBSI supported DON testing at the University of Minnesota.