

PI: Juliet Marshall

PI's E-mail: jmarshall@uidaho.edu

Project ID: FY16-MA-036

ARS Agreement #: 59-0206-4-040

Research Category: EC-HQ

Duration of Award: 1 Year

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

PROJECT 1 ABSTRACT

(1 Page Limit)

FHB damage in spring grain continues to increase in southern and eastern Idaho. In 2015, fields of both wheat and barley showed signs of the disease and many spring wheat fields tested at >5 ppm DON, even after appropriate treatments with fungicides. The majority of the grain varieties that are available to growers in the area are susceptible to FHB, especially the hard white spring wheat and durum varieties. A few varieties of hard red spring wheat have some level of resistance associated with the presence of the *Fhb1* gene. Soft white spring wheat and barley have shown the lowest vulnerability to FHB infection in the field, but high levels of DON are being reported even in soft white spring wheat. 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 and 2015 has allowed us to rank currently grown wheat and 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 wheat and 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. In 2015, barley was also inoculated with a spore suspension of *Fg* macroconidia, resulting in excellent symptom expression. Appropriate development of inoculum and timing of inoculation will allow identification of susceptible wheat and barley 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.