

Project Abstract

Project Title:	Evaluation and development of FHB resistant germplasm for enhancing barley production	
USWBSI Project ID:	FY24-BA-002	
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Project Summary

FHB and DON contamination of barley and wheat has emerged as a problem in the Intermountain West. This situation is expected to persist, and FHB will continue affecting barley production in Idaho and surrounding states. Our previous experiments identified some useful FHB resistance resources from the Aberdeen barley materials and other groups, however, it is still challenging to use these resources as the interactions between barley and the FHB fungus can be affected by multiple factors and there is no available molecular source to assist FHB selection. The barley program in Aberdeen develops large number of breeding lines every year. Determining their FHB resistance status and DON accumulation capacity requires putting each line in an artificially misted FHB nursery and follow the traditional selection process, which is lengthy and labor intensive. Genomic prediction models are proven to increase rates of genetic improvement and reduce the length of the selection process. Supported by previous USWBSI grants, we have assembled a training population representing the Aberdeen barley breeding program's foundation population and evaluated its FHB resistance in multiple locations/years.

The long-term goals of this project are to: 1) develop FHB resistance/tolerance germplasm and 2) conduct genome-wide association study and genomic selection for improving barley FHB breeding efficiency.

Project Objectives: 1) Characterize FHB resistance and DON accumulation in elite barley germplasm; 2) incorporate a genomic selection approach for FHB resistance and low DON accumulation; 3) develop elite barley lines with FHB resistance, low DON accumulation and good agronomic performance.

Expected Outcomes: 1) develop 1-2 elite barley germplasm with lower DON accumulation; 2) understand the genetic basis of FHB resistance in Aberdeen barley materials; 3) Identify 1-2 molecular markers that may be used to assist FHB selection.

