

Project Abstract

Project Title:	Developing FHB resistant barley cultivars for California	
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The project goals are to characterize resistance to FHB in the University of California (UC) barley germplasm, to identify any novel sources of resistance and to develop barley varieties with improved FHB resistance. In order to achieve these goals, our objectives are to:

Screen UC barley germplasm in an FHB nursery and throughout CA

Approach: Material from the UC barley breeding program will be evaluated yearly in an FHB screening nursery in order to identify resistant material that can be advanced or used as a source of resistance. A range of susceptible germplasm will be planted in sentinel plots in three CA locations to determine possible screening sites. **Expected Outcome:** We expect to identify material adapted to our environment that exhibits consistent FHB resistance and can be released as varieties or used as a source of FHB resistance in our breeding programs.

Genotyping and MAS for improved selection

Approach: We have genotyped several hundred lines from the breeding program from previous USWBSI funding. We will continue to use and update these data yearly in order to predict FHB resistant material or identify genomic regions of interest in our material. We will also use marker assisted selection (MAS) for favorable alleles influencing malting quality in our germplasm in order to combine improved malting quality and FHB resistance. **Expected Outcomes:** The genotyping data of our FHB phenotyped materials will help us to run GWAS studies, predict the location of FHB QTLs and predict the value of the lines to advance to the next generations.

Develop CA adapted varieties with increased resistance to FHB and DON.

Approach: We have started to develop populations with known resistant material and UC varieties or most promising elite lines. However, this material is not very well adapted to our environment. As we gain more insight into resistance of UC germplasm we will focus on incorporating the most resistant of these into our breeding programs. An elite AMBA approved malting line, planned for release in 2022 as "UC-Gallagher" showed some of the best FHB resistance in our preliminary screening and also contains the favorable alleles for malting quality traits. We will continue to use this parental line to develop new material with known FHB resistant varieties. **Expected Outcome:** Release of material that has improved FHB resistance, superior malting quality and agronomics.