

PI: Jorge Dubcovsky

PI's E-mail: jdubcovsky@ucdavis.edu

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Project Title: Preparing Barley for FHB in California

PROJECT 1 ABSTRACT

(1 Page Limit)

California has been an FHB-free refuge in the US, but recent trends suggest this may not continue. Rare occurrences of FHB have been identified in California in past years, and increasing occurrences are possible as FHB continues to spread through the intermountain west, the climate becomes more unpredictable, new regions are growing barley, and the acreage of small grains under center pivot irrigation in rotation with maize increases. Development of California barley varieties with FHB-resistance will prepare us for an increase in FHB incidence and will facilitate germplasm exchange between other US spring barley breeding programs that are under greater threat.

Until recently the level of FHB susceptibility in the UC barley germplasm was unknown. In collaboration with Dr. Ruth Dill-Macky, a preliminary trial of 100 lines from the UC barley breeding program were screened in an inoculated scab nursery in MN in the spring of 2019. Results from the first year identified several lines with very low average FHB severity and DON levels that also have excellent malting quality and agronomic characteristics. One of these lines has been used extensively in our breeding program and the identification of markers linked to these sources of FHB resistance can be immediately used in our program.

We propose to continue screening lines in the MN scab nursery and to use UC lines with the best resistance to FHB, in addition to varieties with known resistance identified in prior USWBSI projects, as parents for new populations, including a double haploid population. We also propose to genotype all the lines screened in the scab nursery, additional lines from the program, and the double haploid population. This will help us to identify QTL or genomic regions of interest and select the best lines for further screening over the next two years. In addition, several sites throughout California will be explored as options for screening of natural FHB occurrence.