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PROJECT 1 ABSTRACT

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The development of barley varieties with lower DON accumulation is limited by the availability of novel and effective resistance sources in the primary barley germplasm pool. This research project is focused on the mapping and characterization of a new source of DON accumulation resistance in a Turkish two-rowed line designated CGN00483. The USWBSI funded the screening of 1550 landraces collected from several countries located in the centers of diversity of *Hordeum* that were not represented in other germplasm collections. These barley accessions from the Dutch Centre for Genetic Resources were assessed for resistance to FHB and DON accumulation and a two-rowed accession collected in Turkey designated CGN00483 was identified as having good DON accumulation resistance consistently showing lower DON levels than Conlon the two-rowed DON accumulation resistant control. Over four years of testing the average DON levels were consistently low as compared to Conlon. Thus, a CGN00483 X Harrington cross was made in the greenhouse in 2013 and the population was advanced to the F_7 generation representing a RIL population consisting 170 F_7 individuals. The population was tested for DON accumulation at the F_4 generation in the 2014 FHB field nurseries at two locations, Fargo and Langdon, and showed continuous segregation. We will test these populations over the next two years in the field at three locations, acquire DON accumulation data and perform the genotyping of the population using at least 384 SNPs from several PCR-GBS panels that we have developed for Ion Torrent sequencing technology. QTL analyses will be performed to identify DON accumulation QTL and associated markers. CGN00483 will be crossed with Conlon and ND-Genesis and a backcrossing and MAS scheme will be utilized to introduce the QTL into the elite two-rowed backgrounds.