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PROJECT 2 ABSTRACT

(1 Page Limit)

Barley breeding efforts focused on developing adapted malting varieties with acceptable resistance to FHB and DON accumulation over the past two decades has resulted in significant progress and is now providing lines with increased resistance. To enhance the trajectory towards genetic resistance to FHB it is essential to continue the North American Barley Scab Evaluation Nurseries (NABSEN). The FHB nurseries coordinated under the NABSEN provide the breeding programs with a range of year sites with sufficient levels of disease to expedite the evaluation of their materials which is necessary for robust evaluation when trying to improved type I resistance and lower DON accumulation. The NABSEN has consistently established sufficient levels of infection across a wide range of environments including Crookston and St. Paul, MN, Osnabrock, Fargo and Langdon, ND, and Brandon, MB Canada. The coordinated screening efforts evaluate advanced breeding lines with putative FHB resistance from four barley breeding programs in the upper Midwest US and two breeding programs in Canada. This project coordinates the NABSEN, establishes misted irrigated nurseries at the Fargo and Langdon, ND locations, and coordinates the evaluation of western breeding materials. The determination of *Fusarium* head blight severity and deoxynivalenol (DON) accumulation for each entry replicated at least twice per location allows for the robust and timely evaluation of material coming out of multiple breeding programs. The NABSEN has made it possible for Midwestern breeding programs to evaluate their elite materials and make head to head comparisons of lines from different programs containing distinct genetic resistances and now there is a need to include western adapted breeding lines. Utilizing the screening expertise gained by the Midwestern pathologists and breeders will expedite the process of determining the levels of resistance and/or susceptibility in the western breeding material providing breeders with baseline knowledge of the native FHB resistance in their adapted germplasm. This has become necessary as FHB moves west with corn production. Continuing the coordinated NABSEN effort will allow breeders in all FHB prone regions to simultaneously evaluate their lines with those from other programs and give western breeders a jumpstart in breeding for FHB resistance. The access to robust FHB phenotyping, resistant germplasm and genotype data of the NABSEN lines will assist breeders in moving FHB resistant QTL into their elite lines.