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PROJECT 1 ABSTRACT

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The **overall project goal** is to promote collaboration between North American barley breeding programs to advance and distribute elite barley germplasm with resistance to Fusarium head blight.

Project Objectives;

1) Coordinate the exchange and distribution of advanced FHB resistant barley germplasm between NABSEN collaborators to expedite the development of resistant barley varieties.
2) Establish and evaluate NABSEN nurseries at two North Dakota locations.
3) Coordinate the screening of western US barley germplasm.

Breeding efforts to develop adapted barley varieties with genetic resistance to FHB and DON accumulation have made steady progress. To maintain this trajectory, it is important to continue the North American Barley Scab Evaluation Nurseries (NABSEN). One limiting factor in the development of adapted barley varieties with improved type I resistance and lower DON accumulation is availability of FHB nurseries across a range of environments with sufficient disease. 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 **expected outcomes** of this screening effort are robust evaluation of lines from breeding programs in the upper Midwestern US and Canada. This project will coordinate the NABSEN, as well as establish misted irrigated nurseries at the Fargo and Langdon, ND locations. In addition, we will provide data on FHB severity and DON accumulation for western breeding program materials. The NABSEN has made it possible for Midwestern breeding programs to evaluate their elite materials for over a decade and will continue accomplish these project goals within the proposed time period. There is currently a need to include western adapted breeding lines into the established Midwestern nurseries in order to utilize screening expertise to expedite the process of determining the levels of resistance and/or susceptibility in the western breeding material which will also be accomplished following the proposed timeline. This will provide breeders with important knowledge of the native FHB resistance in their adapted germplasm and the expedited ability to make decisions on crosses to characterize and deploy these resistance genes/QTL. Continuing the coordinated NABSEN effort will provide breeders access to robust FHB phenotyping, resistant germplasm, and that can be correlated with the extensive genotyping data available on T3 which will assist breeders in moving FHB resistant QTL into their elite lines which is of mutual interest to stakeholders and end users that need a secure supply of domestic barley.