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Project Title: Screening Advanced Breeding Lines for Scab Resistance Region Uniform Nurseries.

PROJECT 4 ABSTRACT

The objective of this project is to screen elite barley germplasm for resistance to *Fusarium* head blight (FHB) in uniform screening nurseries in North Dakota, Minnesota, China, Canada and Mexico. A mist irrigated uniform FHB screening nursery, known as the North American Barley Scab Evaluation Nursery (NABSEN) or its predecessor, has been grown at two sites in Minnesota and two sites in North Dakota the past 13 growing seasons. In 2000 three dryland nursery sites were added to compliment the mist-irrigated sites, in 2002 sites in Canada and a Busch Ag site in ND were added, and in 2003 and 2004, sites at the CIMMYT/ICARDA trials in Mexico were added. In 2005/06 an irrigated and inoculated site was established in Hangzhou China. The China site has been the most consistent and valuable of our screening nurseries and has add significantly to the data collected on NABSEN. Mist-irrigated nurseries that are inoculated with *Fusarium graminearum* are used so that data can be collected in years when environmental conditions are not conducive for natural infection. When conducive conditions exist, naturally mist irrigated nurseries ensure a range of disease pressures are experienced. Un-inoculated dryland nurseries are grown so that lines can be grown under conditions similar to those experienced by producers in that year and environment. At all sites the nursery includes breeding lines with putative FHB resistance from the four Upper Midwest barley-breeding programs, the Canadian breeding program and the CIMMYT/ICARDA breeding program, and includes susceptible and resistant checks. *Fusarium* head blight severity and deoxynivalenol (DON) accumulation are determined for each entry, and each entry is replicated at least twice per location. Results from the NABSEN nursery are circulated to all participants and barley researchers who desire them and a summary of results at each site is printed and distributed at the annual USWBSI meeting in December and will be uploaded to the web.