

PI: Stephen M. Neate

PI's E-mail: stephen.neate@ndsu.nodak.edu

Project ID: 0506-NE-124

FY04 ARS Agreement #: 59-0790-3-083

Research Area: VDUN

Duration of Award: 1 Year

Project Title: Screening Barley Lines for Scab Resistance in Uniform Nurseries.

PROJECT 4 ABSTRACT

(1 Page Limit)

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, Canada, Mexico and China. A mist irrigated uniform FHB screening nursery, known as the North American Barley Scab Evaluation Nursery (NABSEN), has been grown at two sites in Minnesota and two sites in North Dakota the past nine 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. It is proposed in 2005 to also sow the trial in an irrigated and inoculated experiment in Hangzhou China. The China site has been the most consistent and valuable in our other screening programs and will 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. Uninoculated dryland nurseries are grown so that lines can be grown under conditions similar to those experienced by producers. The expanded 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 barley researchers who desire them. Results are in the form of a report that is also posted on the web and a presentation at the annual U.S. Wheat & Barley Scab Initiative meeting.