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**Project ID: FH08-HA-135**

**FY08 ARS Agreement #: 59-0790-8-069**

**Research Category: BAR-CP/MGMT**

**Duration of Award: 1 Year**

**Project Title: Grower Demonstration of Integration of Genetics and Fungicide Application.**

### **PROJECT 1 ABSTRACT**

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One of the changes to the principle objectives of the USWBSI in 2008 is to develop greater communication between the research community and the stakeholders. Stakeholders include consumers, grain brewers and millers, crop consultants and producers. This project was initiated to provide greater communication through an annual field demonstration and presentation at winter meeting that identifies the benefits of improved genetics on barley, fungicide timing and operating the sprayer using specific recommended spray application technology parameters. This study will compare 'Tradition' to 'ND20448' barley. Tradition is a malt type barley cultivar that was planted on the greatest number of barley acres in North Dakota in the past year. 'ND20448' is an NDSU line being considered for replacement of 'Tradition'. One of 'ND20448' unique qualities is that it has been shown to accumulate 1/3 less deoxynivalenol (DON) in the seed than 'Tradition' and other 6-row type cultivars. Fungicide applications will be made with a tractor mounted sprayer traveling 6 mph to simulate travel speed in the lower end of the range used by growers and commercial applicators. The sprayer will be operated with recommended parameters; nozzles delivering 300-350 micron droplets from orifices oriented forward to the direction of travel and angled 30° downward from horizontal. This sprayer configuration will be compared to an orifice oriented vertically, which is typical of a configuration used to spray herbicides for weed control. Prosaro fungicide, a formulation of a 50:50 blend of tebuconazole and prothioconazole, will be applied at three growth stages. Prosaro is a Bayer CropScience product expected to receive a federal registration in 2008. The barley growth stages will include booting (Feekes 10.3), heading (Feekes 10.5) and watery milk ( $\approx$ Feekes 10.54) to contrast applying treatments early, recommended, and late, respectively. Assessment will be made by including a dye with the fungicide solution and removing by washing with a 95% ethyl alcohol a sample of heads collected immediately after the fungicide application and quantifying with the use of a photospectrometer. Plots will be harvested with a plot combine and differences determined by measuring yield, test weight, plump, and DON accumulation in the seed. Separation of means will be determined with analysis of variance and Fisher's protected lsd.

The results of the study will be communicated through the USWBSI annual forum, through a field day demonstration targeting growers, other researchers, and grower consultants, through a written report on the NDSU Langdon Research Extension Center web site and through meetings.