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**Project ID: FY10-HW-006**

**FY09 ARS Agreement #: 59-0790-6-065**

**Research Category: HWW-CP**

**Duration of Award: 1 Year**

**Project Title: Verification of the Value of Genetic Resistance and Fungicides on the Control of FHB in Winter Wheat in North Dakota.**

### **PROJECT 1 ABSTRACT**

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Once genetic resistance has been developed or identified in a cultivar, it must be widely tested to determine if it is adapted, yields well and has other characteristics that farmers desire. The purpose of this project is to evaluate, in a farm-like setting, advanced lines or recently released varieties with improved FHB resistance for yield, yield stability, FHB resistance and farmer acceptance in North Dakota. Furthermore, since the application of fungicides for FHB and other diseases is a common practice in eastern ND where FHB is most problematic, this research will evaluate the impact of fungicides on these advanced lines and recently released varieties to verify the value of a fungicide application and to determine the importance of an integrated approach to FHB control. The integration of resistant varieties and fungicides may provide the desired level of FHB control, particularly in years of high disease pressure. This project will provide farmers with the opportunity to observe new materials in a field setting. Experiments will be established in two locations in eastern ND that will include at least twenty varieties/advanced lines. These varieties/lines will consist of currently popular varieties, those that have been recently released and promising new lines being developed with FHB resistance by the winter wheat - CP. These genotypes will be grown, with and without fungicide applied at flowering. Experiments will be arranged as a split plot, with fungicide application as a whole plot and genotypes as subplots and will be established in fields that were previously cropped to spring wheat, barley or corn so that inoculum levels of FHB will be relatively high, but not unlike conditions found in farmers fields. Data will be taken on FHB incidence and severity, yield and DON levels, winter survival and other basic quality attributes. Field days will be arranged at these locations to allow farmers to observe the performance of these materials and the impact of fungicides on FHB and the control of other diseases. Data from these experiments will also be summarized and presented in extension meetings during the winter months, when winter wheat production is discussed. In order to ensure sufficient disease development in future years, a misting systems will be developed in 2010 that will accommodate the trial described above at Prosper as well as other materials, like the Quad-state nursery and other materials that will developed by breeders in the region. In the absence of a breeder in North Dakota, the Quad-state trial will be screened for FHB resistance during the summer of 2010. Important outputs of this work will include: Information on local adaptation of new varieties and promising lines and their resistance to FHB; information on the effectiveness of fungicides on the control of FHB and other diseases and the profitability of their use; information on the value of an integrated approach to FHB control; farmers will be able to observe the value of new genetics and fungicides on FHB control; and a misting system that will accommodate winter wheat screening work in future years.