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**Project ID: FY09-MC-037**

**FY09 ARS Agreement #: 59-0206-9-064**

**Research Category: MGMT**

**Duration of Award: 1 Year**

**Project Title: Greenhouse Studies of DON in Wheat as Influenced by Environment and F.g. Isolate.**

### **PROJECT 1 ABSTRACT**

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ND greenhouse studies evaluating the effect of inoculation timing and duration of moisture in 2007 indicated that multiple inoculations on hard red spring wheat and durum wheat increased DON, but spring wheat and durum wheat reacted differently to times of inoculation. Durum wheat has a broader window of vulnerability to infection than does the spring wheat. Results also indicated that DON derivatives were rare and only associated with very high DON levels. North Dakota greenhouse studies in 2008 indicated that increased durations of moisture at late growth stage inoculations had larger impacts on durum infection than in hard red spring wheat. North Dakota studies also indicated that cultivar resistance interacted with post-flowering moisture duration. Recent studies have been looking at impact of the DON genotype of the inoculation isolate on infection results.

**Overall project goal:** to continue to gather data on differential effects of moisture duration, growth stage at inoculation, and Fusarium isolate on FHB and DON development in susceptible and moderately resistant hard red spring wheat and durum cultivars, in controlled greenhouse inoculation experiments.

**Project Objective:** 1) test 4 inoculation timings, 3 moisture duration regimens, and two to three *F. graminearum* isolates on two grain classes and two cultivars of each grain class to determine effects on FHB, DON, and DON derivatives. To determine if there are interactions between grain class or susceptibility of cultivar and moisture duration, growth stage and/or isolate.

**Expected Outcome:** The results will increase the data base for verification of 2008 and 2009 results and provide direction for future studies on isolate choice and possible management and breeding evaluation schemes to address late season infections and how they may differ between the two grain classes studied

**The proposed project addresses the following priority area of the Management Research Area:** Develop a full understanding of specific environmental and biological factors influencing infection and toxin accumulation that can be used to develop the next generation of disease forecasting and DON risk assessment systems.