PI: Dill-Macky, Ruth **PI's E-mail: ruthdm@umn.edu**

Project ID: FY07-DI-097 **FY06 ARS Agreement #: 59-0790-4-096**

Research Area: **EEDF** **Duration of Award: 1 Year**

Project Title: Factors Influencing the Accumulation of DON in Fusarium-Infected Wheat.

PROJECT 2 ABSTRACT

(1 Page Limit)

Few studies have closely examined the development of Fusarium head blight (FHB) and deoxynivalenol (DON) accumulation in relation to the resistance of wheat cultivars, the relative aggressiveness of *F. graminearum* isolates, and the competence and ability of *F. graminearum* isolates to produce DON, or the impact of environmental conditions, especially moisture on the accumulation of DON in Fusarium-infested wheat.

This project aims to improve our knowledge of the development of Fusarium head blight and the accumulation of DON in wheat. Specifically this project aims to examine; i) the effect of environmental conditions, principally moisture between anthesis and harvest, on the development of FHB and the accumulation of DON in wheat; ii) the impact of host genetic resistance on the development of FHB and the accumulation of DON in wheat; and iii) the effect of pathogen aggressiveness (defined as the ability of a *F. graminearum* isolate to produce FHB symptoms on greenhouse inoculated wheat plants) and pathogen toxin production capacity (determined by the ability of a *F. graminearum* isolate to produce DON and in sterile-grain culture) on the development of FHB and the accumulation of DON in wheat.

An understanding of the factors effecting the accumulation of DON in *Fusarium*-infected wheat can be used to refine disease development and/or DON accumulation models used in forecasting and disease risk assessment systems. The findings of the project should also help us understand why there are discrepancies between; a) visual evaluations of FHB made in the field prior to head senescence, b) post harvest visual assessment of FHB damage to grain (VSK or FDK), and c) the DON content of harvested grain. These discrepancies are frequently observed in both dryland and mist-irrigated germplasm screening nurseries and in commercial fields where apparently sound grain is found to contain significant levels of Fusarium produced mycotoxins, especially DON. Understanding the impact of different host resistance genes on DON accumulation is of value in establishing the value of specific host resistance genes or gene combinations. An understanding of the impact of the variability within the pathogen population for aggressiveness and DON toxin production will shed light on the threat posed by shifts in the pathogen population with respect to aggressiveness and/or the spectrum and quantities of mycotoxins produced.