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FY06 ARS Agreement #: NA

Research Area: PGG

Duration of Award: 1 Year

Project Title: **Identifying Fungal Genes and Plant Factors Involved in DON Production.**

PROJECT 1 ABSTRACT

(1 Page Limit)

Fusarium head blight (FHB) caused by *Fusarium graminearum* is an important disease of wheat and barley. In addition to yield losses, infected grains are reduced in grain quality and contaminated with mycotoxins. In addition to factors reducing the impact of FHB, novel methods for reduction of toxin accumulation in grain are desirable. In previous studies, we have found that no DON production or accumulation is detectable in wheat infected with *F. graminearum* mutants for the genes *Tri6* and *Tri10*. Disease symptoms typically associated with DON in wheat, such as blighting, spread within the head and tissue bleaching are not observed in these mutants. **The objective of this project is to characterize candidate genes involved in DON production in infested wheat.** Gene expression profiles of *F. graminearum* in wheat infected with wild type, as well as *Tri6* and *Tri10* mutants have been compared and several novel, differentially regulated genes, potentially involved in toxin accumulation *in planta*, have been identified. Gene deletion analysis will allow us to identify novel genes that may mediate critical steps in DON biosynthesis and/or accumulation *in planta*. The objectives of this proposal are relevant to the FY07 Research Priorities of the U.S. Wheat and Barley Scab Initiative, Pathogen Genetics and Genomics (PGG) research area, namely: 1) Identify and characterize genes that control important pathogen traits and 2) Identify and characterize important pathogen gene and protein expression profiles, regulatory networks, and developmental or metabolic pathways. The genome-wide effect of *Tri6* and *Tri10* transcription factors in trichothecene biosynthesis will be further characterized.