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Project ID: FY09-SH-010 **FY09 ARS Agreement #: 59-0790-8-060**

Research Category: **GDER** **Duration of Award: 1 Year**

Project Title: Targeting Host Defense Mechanism for Enhancing FHB Resistance in Wheat.

PROJECT 1 ABSTRACT

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The long-term goal of this collaborative project is to enhance Fusarium head blight (FHB) resistance in wheat. With previous support from the USWBSI we have utilized *Arabidopsis thaliana* to identify plant genes that are involved in plant defense and susceptibility to *F. graminearum*. In addition, we have identified microbial elicitors that enhance resistance against FHB. We propose to utilize these genes/factors to genetically engineer FHB resistance in wheat. Three strategies will be utilized: (i) The ectopic expression of defense regulatory genes, (ii) reducing the level of host susceptibility factors, and (iii) targeting non-host resistance mechanism.

The specific objectives are:

1. Characterize FHB resistance and mycotoxin accumulation in At*PAD4* and At*WRKY18* expressing wheat.
2. Utilize RNAi to develop transgenic wheat with reduced expression of 9-LOX genes.
3. Target non-host resistance mechanism in wheat for enhancing FHB resistance.

Objective 1 and 2 are continuation of the currently funded USWBSI project. During FY2010 FHB resistance and toxin accumulation will be evaluated in the transgenic lines that have been identified and additional lines that are developed. For objectives 3, during FY2010 recombinant constructs will be generated and plant transformation initiated to express these genes in transgenic wheat.

Our ongoing and proposed projects are relevant to the GDER initiative of USWBSI, by promoting the development of effective FHB resistance through transgenic strategies. Our approach and the genes/mechanisms being targeted complement the activity of other USWBSI sponsored projects.