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

Project Title: Targeting Fusarium-infested Crop Residues in the Control of Fusarium Head Blight.

PROJECT 1 ABSTRACT

(1 Page Limit)

Reduced tillage practices have been adopted worldwide in agriculture. The implementation of conservation tillage, leaving crop residues at the soil surface following the harvest of crops is essential to protect vulnerable soils, however these practices have contributed directly to the upsurge of Fusarium head blight (FHB) of wheat and barley. While researchers have made significant progress in the identification and incorporation of genetic resistance, and in the identification and delivery of effective fungicides to cereal crops, FHB remains a recalcitrant problem. It would seem that we cannot reduce the threat of future FHB epidemics without addressing the underlying origin of the problem – *Fusarium*-infested crop residues.
Given the limitations of current agricultural practices we are challenged to find ways to reduce the inoculum potential of *Fusarium*-infested residues without removing them from the soil surface.

This proposal seeks to examine our ability to reduce the inoculum potential of residues by aiding residue decomposition and targeting biocontrol to the pathogen on residues. The experiment will utilize a relatively new piece of equipment (a mower/shredder attachment for a combine) for harvesting corn. This shredder attachment chops residue finely and is being rapidly adopted by corn growers in areas where no-till and/or Bt-corn are produced.

Three field experiments (examining the residues of corn, wheat, and barley, respectively) are proposed. Each experiment will examine both the fine chopping of *Fusarium*-infested crop residues and biological control agents (BCAs: *Trichoderma*, *Streptomyces*, or *Bacillis*), fungicides (prothioconazole) and bentonite clay applications to the residues. Applications of BCAs and fungicides will be made in either the fall or spring. We anticipate that the finely chopping will accelerate the rate of residue decomposition and that in combination with BCAs that the survival/inoculum production capacity of *Fusarium* in the residues will be diminished. Negatively impacting the survival of *F. graminearum* (*G. zeae*) will reduce inoculum production and thus the potential of disease development and DON production in subsequent wheat or barley crops.

The proposal meets the current goals of the USWBSI Chemical, Biological and Cultural Control Research Area (CBCC-RA) by examining strategies including tillage practices and biological control inputs to aid in the development of integrated disease management. The findings of this research have the potential to impact our understanding of FHB and our ability to reduce; i) the severity and frequency of epidemics and ii) the accumulation of DON in grain - the overall goals of the USWBSI.

This proposal is one of three (PIs - Dill-Macky, Stein and Yuen) to be conducted in a cooperative manner.