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PROJECT 1 ABSTRACT

(1 Page Limit)

Research into biological controls is needed to provide additional tools for the management of Fusarium head blight (FHB) in wheat and barley. This project will focus on a bacterial biocontrol agent, *Lysobacter enzymogenes* strain C3, but will also involve other biocontrol agents of FHB as well. One objective is to determine the efficacy of C3 and other biocontrol agents for control of FHB control in wheat field experiments located in multiple states. The agents will be evaluated with respects to field disease severity and incidence, yield of wheat seed, and concentrations of the mycotoxin deoxynivalenol in seed. In addition, the biocontrol agents will be investigated as to their ability to establish at sites of pathogen entry on wheat heads using microscopy methods. Furthermore, population levels of applied biocontrol agents on treated wheat heads will be monitored over the flowering period time to determine their ability to survive under field conditions. Another objective of this study is evaluate biocontrol efficacy of C3 on four cultivars of spring wheat that differ in resistance to FHB. This experiment will seek confirmation that host genotype can affect biocontrol efficacy. A third objective in this project is to determine if induced systemic resistance is involved in biocontrol of FHB by C3 and other agents. This will be accomplished by applying the organisms to leaves and select spikelets and then assessing disease development on spikelets that are spatially separated from the treatment sites. This project will contribute to the rapid development of control measures for FHB by providing information on C3 and other FHB biocontrol agents regarding their ability to control *Fusarium graminearum* across multiple environments, their capacity to deposit and establish at critical sites of pathogen entry, and their mechanisms of action.