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Project Title: Mycotoxin Potential and Aggressiveness of FHB Pathogens used for USWBSI Research.

PROJECT 2 ABSTRACT

(1 Page Limit)

USWBSI investigators often rely on a 'favorite' set of strains of FHB pathogens for their field and greenhouse trials, yet little is known about the mycotoxin potential and aggressiveness of these strains. Knowledge of the aggressiveness and mycotoxin potential of FHB pathogens used in USWBSI research may assist in selecting appropriate strains for field and greenhouse experiments and may help explain observed variations in FHB and/or DON among field and greenhouse trials. In this two-year USWBSI project, we propose to provide a unique strain testing service for 18 USWBSI researchers from 10 institutions located in nine states. All of these investigators currently participate in USWBSI Variety Development and Host Resistance (VHDR) research, and all of them have provided a letter of interest for the proposed work. It appears that only one of these investigators (Dr. Dill-Macky) is involved with limited screening of strains used for USWBSI research; others have indicated the importance of such services and their interest in providing strains for testing if the project is funded. We propose to collect strains that have been used (or are currently being used) in inoculations of field and/or greenhouse trials to support USWBSI VHDR research. We will: (1) measure the aggressiveness of individual strains on a series of susceptible and moderately-resistant cultivars of wheat and barley, (2) determine the relative concentrations of trichothecene mycotoxins (e.g., DON, 3ADON, 15ADON, and NIV) produced by these strains following a series of controlled inoculations, and (3) identify individual strains to the level of species, based on both biological (e.g., production of sexual structures in culture) and phylogenetic (e.g., comparison of DNA sequences from portions of three genes) species recognition. The specific objective of the proposed research is to characterize the mycotoxin potential and aggressiveness of FHB pathogens used for USWBSI VHDR research. The project directly addresses the FY10 PBG priority to 'characterize genetic variation in the pathogen population with regard to aggressiveness toward plants and mycotoxin potential'. We will screen strains representing nearly a decade of FHB research in the U.S. Information on the mycotoxin potential and aggressiveness of FHB pathogens is essential to 'develop new strategies for reducing the impact of FHB and associated mycotoxin contamination in barley and wheat', an FY10 PBG priority.