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Research Category: PBG

Duration of Award: 1 Year

Project Title: Determinants of Aggressiveness in *Fusarium graminearum*

PROJECT 1 ABSTRACT

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The ability of different *F. graminearum* isolates to cause disease varies dramatically. Little is known about factors (other than DON) involved in pathogen aggressiveness. Better development of resistance depends on a better understanding of the factors that allow *F. graminearum* to cause disease. The goal of this project is to identify genes that modulate the aggressiveness of *F. graminearum* to wheat. We will identify them by phenotyping and genotyping a population of *F. graminearum*. Our objective is to identify genes that control the aggressiveness of *F. graminearum*. To achieve this, we will conduct greenhouse aggressiveness assays with a population of isolates collected from wheat lines with different levels of resistance. These isolates will be genotyped using a whole-genome re-sequencing approach. Multiple population genetic analysis will be conducted to identify genes that are under selection.

Our expected outcome is the confirmation of the involvement of candidate fungal genes in the aggressiveness of *F. graminearum*. Phenotyping, DNA extractions, and sequencing will be completed in the first year of the project. Data analysis and reporting will be completed during the second year of the project. This research will identify the genetic determinants of aggressiveness in *F. graminearum*. With our results, we will be able to generate more informed recommendations for cultural practices to manage FHB. Identification of gene variants involved in aggressiveness along with the evaluation of the effect of wheat resistance levels on the pathogen will allow predictions on the durability of resistance to *F. graminearum*.