

**PI:** Senay Simsek

**PI's E-mail:** senay.simsek@ndsu.edu

**Project ID:** FY20-SI-026

**ARS Agreement #:** *New (NCE for FY20 for 59-0206-7-155)*

**Research Category:** PBG

**Duration of Award:** 1 Year

**Project Title:** Identification of Compounds in Wheat Bran that Inhibit the Growth of *F. graminearum*

## PROJECT 2 ABSTRACT

(1 Page Limit)

Control of Fusarium Head Blight (FHB) and the pathogen's production of tricothecene mycotoxins is a challenge to small grains producers in United States, and other parts of the world. FHB is the cause of significant economic impact in terms of yield quality losses, and the presence of tricothecenes, such as deoxynivalenol are a food safety issue. In turn, this is a food security issue, as otherwise acceptable lots of grain can be rendered unfit. Although some progress has been made with fungicides and the development of some disease resistance, FHB remains a significant problem. One challenge to finding resistance is that there is currently limited understanding of the biochemical responses of the host plant. Our group had previously developed a laboratory scale screening test for FHB susceptibility using a wheat bran/agar culture. When methanolic extracts of wheat bran from Glenn cultivar (resistant variety of FHB) were added to Samson (less resistant), *F. graminearum* growth was inhibited due to oxygenated fatty acid. To further explore this methodology, we are proposing to quantify the other secondary metabolites that are produced in response to Fusarium and/or show inhibitory activity towards the pathogen and mycotoxin production. These could potentially include phenolic acids, lignans, carotenoids, tocopherols, as well as, oxygenated fatty acids. The goal is to ultimately identify which compounds are responsible for inhibition. This information may lead to better understanding of the possible mechanisms involved in resistance, and also the identification of possible control agents that could be used in the field or food processing.