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Project ID: 0304-CA-104

Research Area: GIE

Project Title: Enhancing resistance to Fusarium head blight in wheat using alien species.

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PROJECT 2 ABSTRACT

(1 Page Limit)

Fusarium head blight (FHB) has caused significant economic losses for wheat and barley production in the United States and threatened the safety of wheat and barley grains for human and animal consumption. Effective measures need to be developed to control FHB. Host resistance has been the most practical and effective means to combat the disease. However, lack of effective resistance sources to FHB has hindered the development of cultivars highly resistant to the disease. Extensive efforts have been made to identify sources of FHB resistance within common wheat (*Triticum aestivum* L.) and durum wheat (*T. turgidum* L.). Relatively little research has been done to identify novel sources of FHB resistance from wild relatives of wheat and utilize the resistance to develop wheat cultivars within the U.S. Wheat and Barley Scab Initiative. The ultimate goal of this research project is to transfer alien chromatin conferring resistance to FHB into wheat genomes via chromosome manipulation to develop durum and wheat germplasm with novel resistance genes to FHB. The specific objectives of this project are to:

- 1) identify novel sources of resistance to FHB from the wheat-alien species derivatives that are currently available;
- 2) characterize alien chromatin conferring resistance to FHB in the wheat-alien species derivatives.

This project will evaluate FHB resistance of the wheat-alien species lines currently available and identify alien chromatin conferring resistance to FHB. The wheat-alien species derivatives will be screened for resistance to FHB in the greenhouse. Resistant lines will be characterized cytogenetically. The conventional and molecular cytogenetic techniques, such as C-banding and fluorescence *in situ* hybridization (FISH), will be used to manipulate both wheat and alien chromatin. Accomplishment of this project will allow both common wheat and durum wheat to gain novel FHB resistance genes. Pyramiding of the resistance genes identified from wild species with the resistance currently existing in wheat will enhance FHB resistance of wheat and make the resistance of wheat to FHB more durable.