

FY19 USWBSI Project Abstract

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Project ID: FY18-NW-011

ARS Agreement #: 59-0206-6-003

Research Category: VDHR-NWW

Duration of Award: 1 Year

Project Title: Development of Scab Resistant Wheat Varieties for Michigan and the Great Lakes Region

PROJECT 1 ABSTRACT

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Michigan State University Wheat Breeding and Genetics aims to develop soft winter wheat varieties and germplasm with high levels of resistance to Fusarium Head Blight that are adapted to Michigan and the Great Lakes region. Disease promoting conditions are present annually in Michigan placing the entire wheat value chain at risk. Through the proposed work, resistant varieties will be made available to Michigan wheat and Michigan milling industry will be supplied with a more consistent supply of high quality grain. The development of FHB-resistant varieties will help support a critical part of the Michigan agricultural economy.

To accomplish the goal of developing FHB-resistant wheat varieties and germplasm, the following objectives will be completed:

1. Two crossing cycles will be completed annually to develop 500 to 600 populations per year focused on FHB resistance. Populations will be produced that segregate for both FHB resistance and important agronomic traits.
2. A total of 1100 preliminary and advanced yield trial entries will be evaluated in an irrigated disease nursery. Lines will be identified that have optimum combinations of FHB resistance and yield potential.
3. Marker-assisted selection will be performed for QTL known to be present in the pedigrees of lines in yield testing. This will identify genotypes carrying known resistance QTL from Chinese and native sources. Resistant genotypes carrying selectable QTL are cycled into the crossing program.
4. Resistant germplasm will be disseminated through regional FHB nurseries. This will ensure that work completed by MSU-WBG will have regional impact in support USWBI objectives.
5. Data on FHB resistance in soft winter wheat varieties will be generated and communicated to Michigan wheat growers and agribusiness. Contrasting resistant varieties with high-risk susceptible varieties will enable growers to make informed planting decisions and increase the acreage planted to resistant varieties.