

FY20 USWBSI Project Abstract

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Project ID: FY20-DU-010

ARS Agreement #: *New*

Research Category: DUR-CP

Duration of Award: 1 Year

Project Title: Developing FHB Resistant Durum Wheat Varieties for Montana

PROJECT 1 ABSTRACT

(1 Page Limit)

The goal of our project is to create durum genotypes for U.S. durum growers that have enhanced Fusarium head blight (FHB) resistance. Our focus is on developing durum varieties adapted to MT and North Dakota with our primary field tests being done in MT. In collaboration with Dr. Xiwen Cai of NDSU we have obtained experimental durum lines that contain non-Fhb1 and Fhb1 derived sources of FHB resistance integrated from hexaploid wheat. There are 14 lines with improved FHB resistance that will be planted in the Montana FHB screening nursery which has been established at the MSU Eastern Agricultural Research Center (EARC, Sidney, MT) under the supervision of Dr. Frankie Crutcher. EARC employees will plant three replicates of two-row plots, maintain plots using weed control and fertilizer, and inoculate the plots three weeks prior to heading using corn spawn infested with five isolates of *Fusarium graminearum*. After inoculation, field plots will be subjected to two weeks of overhead mist irrigation every evening for two hours to facilitate infection at flowering. Post-harvest, seed from all plots will be assessed for the percent of Fusarium damaged kernels (FDK) and a subsample will be sent to NDSU to determine deoxynivalenol (DON) levels.

We are also planning to intercross genotypes with good FHB resistance and low DON levels to allow pyramiding of best FHB resistance alleles. We expect to identify lines from both the experimental NDSU material and our own advanced breeding lines that have reduced FHB infection and DON levels that are lower than currently grown varieties. We will select the most resistant lines and intercross them to try and pyramid the resistance loci. The first new crosses will be made in our greenhouse cycle beginning either September 2020 or January 2021. Any resultant low FHB/DON varieties will be released and made available to Montana and North Dakota growers and used as parents for further breeding.