

Project Abstract

Project Title:	Fusarium Head Blight Resistance for Montana Spring Wheat	
Principal Investigator:	Jason P. Cook	Montana State University
Co-Investigator:	Frankie Crutcher	Montana State University

The goal of this project is to publicly release Fusarium Head Blight (FHB) resistant spring wheat varieties adapted to Montana's dryland and irrigated production areas. We are accomplishing this goal by increasing the frequency of FHB resistant alleles in the Montana State University (MSU) public spring wheat-breeding program. Primary sources of FHB resistance are from lines entered into the Hard Red Spring Wheat Uniform Regional Nursery (HRSWURN). Additionally, we are using genetic markers to introduce and track the *Fhb1* and *Fhb5A* resistance alleles in several of our advanced experimental lines. Once experimental lines enter our statewide yield trials, they are screened in our inoculated mist irrigated FHB screening nursery located at the Eastern Agricultural Research Center in Sidney, MT. Screening our lines in FHB screening nurseries is critical to the success of this project.

Research Objectives:

- 1.) Integrate FHB resistance alleles from FHB resistant spring wheat germplasm into MSU's spring wheat breeding program using both conventional and marker assisted selection (MAS) breeding methods to increase FHB resistant allele frequencies in Montana's spring wheat breeding program. From the winter of 2022 to spring of 2024, we will make crosses and advance the populations to the F6 generation. Derived lines will then be advanced using field selection and MAS in successive growing seasons.
- 2.) Phenotype Montana adapted spring wheat experimental lines for FHB resistance in an inoculated mist irrigated FHB screening nursery during the 2022 and 2023 growing season. Experimental lines found to have FHB resistance will be considered for public release.

Deployment of FHB resistant spring wheat varieties adapted to Montana will help protect Montana's spring wheat grain producers and end-users from FHB infections and unacceptable deoxynivalenol (DON) levels that would prevent the sale of FHB infected spring wheat.