Project Abstract

Project Title:	**Fusarium head blight resistance for Montana barley**	
Principal Investigator:	**Frankie Crutcher**	**Montana State University**
Co-Investigator:	**Jamie Sherman**	**Montana State University**

For the last several years, grain has been rejected in different regions of Montana due to high levels of deoxynivalenol (DON) caused by Fusarium head blight (FHB). We propose to continue breeding efforts to reduce the losses caused by FHB in barley as well as understand how the *Fusarium* species complex affects barley production in the state. Our project has four objectives. 1) Continue crossing resistant material from other programs and identified in this program into lines adapted to Montana; field screen resulting progeny in different environments. Crosses for FHB resistance are made each year, material is inbred to F4 generation, and tested in hill plots at EARC. Material that performs well after two years will be submitted to the ND trials. Material showing consistent performance will be submitted to other locations for further FHB screening and agronomics. Resistant lines with good agronomics will be used as resistant parents in the crossing block. 2) Continue to pyramid resistant lines and screen for resistance in the field for future genotype mapping. Our goal is to create populations with transgressive segregation for FHB resistance. Once such a population is identified it will be genotyped and used in a mapping study. We have about 20 families resulting from crosses of resistant lines. Lines with transgressive segregation will be crossed to pyramid more genes. 3) Phenotype resistance in four 2-row NAM families in the field. Our goal is to map FHB resistance observed in four NAM families previously indicated to be resistant. 4) Collect and identify *Fusarium* species in the Montana FHB disease complex. *Fusarium* communities collected in 2019 are currently being identified to determine the diversity of these species within barley growing regions of the state. Additional isolates will be collected in 2022 if disease is present. *F. graminearum* from these collections will be evaluated for the ability to cause disease on resistant varieties and chemotype. Barley producers in Montana will benefit from this work through the release of new resistant varieties adapted to multiple regions within the state that have also been tested against all FHB community members found in the FHB disease complex. Any resistant varieties developed through this work will be deposited in T3/barley.