

PI: Jamie Sherman

PI's E-mail: jsherman@montana.edu

Project ID: FY16-BA-002

ARS Agreement #: 59-0206-5-003

Research Category: BAR-CP

Duration of Award: 1 Year

Project Title: Fusarium Head Blight Resistance for Montana Barley.

PROJECT 1 ABSTRACT

(1 Page Limit)

Fusarium Head Blight (FHB) has been reported in Montana especially in irrigated environments where corn is part of the rotation. Resistance to FHB has not been a breeding goal of the Montana program. FHB has been reported to cause economic loss due to decreased yield, and increased production costs due to fungicides and other management practices. The fungus also produces a toxin that can result in lower prices and outright rejection of the sale. Although FHB is not a regular problem in Montana, increased corn acres, no-till, increased irrigation and a changing environment could lead to epidemics. One important tool for growers are lines with increased resistance for FHB. Recent screening indicates a lack of resistance to FHB in barley varieties currently grown in Montana and therefore necessitate increased breeding effort. The primary objective of this grant is to improve Montana lines for Fusarium head blight resistance. We began this process in the spring of 2015 by crossing lines of known resistance from other programs into Montana lines. We grew F1s in the field during the summer and inbred for two generations in the greenhouse over the winter. F4 heads were split so that half the seed from a head is planted in FHB location for selection. The remainder planted in Bozeman for increase so resistant lines might be moved forward. We will continue to make crosses in the spring focusing on newly identified resistant lines. 90 Montana lines were screened for resistance in 2015 and over 200 in 2016. Promising lines will continue to be used as parents in future crossing blocks.

An important issue for Montana is that at the present time we do not have enough disease pressure in most locations to make selections. However, FHB caused damage in 2016 in eastern MT and in the Yellowstone river valley where irrigation is available, corn rotations have increased, and tillage has decreased. A co-PI, Frankie Crutcher at EARC in Sydney, will plant trials in locations with FHB, providing locations for cooperative evaluation of breeding lines. She will also use locally identified isolates to infect trials. An advantage of Montana screening is material will be exposed to isolates causing infection in the region. Robert Brueggeman of NDSU and Juliet Marshall of UI agreed to screen breeding lines from Montana and Schwarz agreed to screen Montana lines for the mycotoxin DON. We have also developed the ability to screen for DON at MSU to increase the number of data points. All data will be downloaded into Datafarm database, a part of the barley T3 database.

Outputs/Linkages: The ultimate goal will be improved FHB resistance in Montana lines. Resistant lines will be released and growers will be made aware of their availability and useful characteristics.