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Project Title: Fusarium Head Blight Resistance for Montana Barley

PROJECT 1 ABSTRACT

(1 Page Limit)

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). To address this problem, we propose to continue breeding efforts for the advancement of Montana adapted FHB resistant barley varieties. We will continue to make crosses of barley lines that have shown resistance with high performing Montana varieties and field screen the resulting progeny in different environments (Objective 1). Progeny from new crosses along with progeny developed from 2015-2017, the 2-row NAM population, and progeny from pyramiding multiple forms of resistance will be screened at the MSU Eastern Ag Research Center, which has sufficient field space to evaluate a large number of barley lines (Objectives 2 and 3). Promising progeny will be sent to North Dakota for additional screening. This should improve the likelihood of identifying resistance and developing cultivars adapted to local weather and cultivation practices. This screening will involve the collection and use of *Fusarium graminearum* isolates from Montana barley fields (Objective 4). Preliminary results have shown that FHB communities in Montana differ to those found in other states most likely due to the rotation and cultivation practices unique to the region. This includes rotations with pulses and sugar beets, both of which are potential hosts of *F. graminearum* and other species of *Fusarium* involved in the FHB disease complex. Thus, an in-depth population analysis of the FHB complex is needed to determine the effect of rotations and the potential impact on the barley industry. Stakeholders will benefit from this work through the development of resistant barley varieties and a better understanding of how rotations affect disease development in relation to FHB.