Project Abstract

Project Title:	Developing FHB resistant winter durum to increase crop diversity in US Great Plains	
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Durum wheat has a niche market and is used in the preparation of a range of food products including bread, couscous, and most importantly pasta. The ability to grow winter durum in northern and central great plains not only will provide diversity and higher yields to growers but also provide a fall cover, utilize fall moisture, prevent soil erosion, and overall impact soil health and climate. The susceptibility of durum to FHB could be a stumbling block in the successful production of winter durum in this region. The overall goal of the project is to develop and release winter durum cultivars with good winter hardiness and FHB resistance. We recently initiated breeding winter durum genotypes that would be adapted to northern and central great plains and have several lines in $F_{3:5}$ stage now.

The specific objectives of this proposal are 1) Evaluate winter durum germplasm and lines in preliminary/advanced yield trials for FHB resistance and advance superior lines for variety development; (2) introgress FHB resistance into elite winter durum adapted to the US Great Plains. These objectives will be addressed through 1) screening of parental lines (16-20) and newly developed early breeding lines (60-100) and germplasm in a mist-irrigated and inoculated FHB field nursery to identify materials with FHB resistance and use them as parents in our crossing block; 2) use of DON testing results to select advanced lines with low DON and us them as parental lines; 3) genotype parents and segregating progenies (F_1, BC_1F_1, and BC_2F_2) to perform a marker-assisted selection for Fhb1/5AL QTL; 4) selected breeding lines will be screened in the greenhouse/ a mist-irrigated and inoculated FHB field nursery to advance the lines with enhanced FHB resistance. The expected outcome of the project will be the development of FHB resistant/tolerant lines and eventually lead to the release of winter durum varieties with FHB resistance/tolerance providing growers an opportunity to diversify rotation and use fall moisture and build soil health. A lower DON content in the durum supply will benefit the milling and pasta industry, and consumers will benefit from safe durum products.