Project Abstract

Project Title:	**Developing Scab Resistant and Low DON Winter Barley Varieties for the Great Plains**	
Principal Investigator:	**Katherine Frels**	**Board of Regents, Univ of Nebraska, Univ of Nebraska-Lincoln**
Co-Investigator:	**Stephen Wegulo**	**Board of Regents, Univ of Nebraska, Univ of Nebraska-Lincoln**

Our goal for this project is to develop winter barley cultivars that are resistant to Fusarium head blight and accumulate less DON for Nebraska and surrounding states. Interest in growing feed, food, and malt-use barley is growing in the Midwest, and improved scab resistance is key to delivering high quality grain. Our three objectives include:

1. *Increase phenotypic screening of UNL barley germplasm for FHB resistance and DON accumulation.* The UNL barley breeding program is relatively new to FHB phenotyping, and we must expand our knowledge on the level of resistance in our germplasm. We will continue to expand the phenotyping of our elite and advanced breeding nurseries in our inoculated FHB nursery, submit lines to regional trials, and plant and inoculate trials such as the Winter NABSEN and Winter Malting Barley trial in our nursery.

2. *Develop new FHB resistant barley germplasm and develop mapping populations for the University of Nebraska barley program.* To increase the frequency of UNL barley cultivars that are resistant to FHB, we must increase the proportion of lines in our program that carry some native level of resistance. We will develop new collaborations with regional breeding programs that have successfully developed FHB resistance and utilize a designed crossing block to combine Nebraska winter barley genotypes with moderate native resistance with FHB resistant donors from both winter and spring barley breeding programs. In addition, we will develop new doubled haploid populations in conjunction with the BAR-CP and Dr. Pat Hayes, Oregon State University.

3. *Improve selection of germplasm with increased FHB resistance and reduced DON accumulation*. We will test the accuracy of pedigree-based genomic prediction for FHB incidence, severity, and DON accumulation in winter barley. Pedigree-based genomic prediction will compensate for the lack of available DNA marker data in the UNL barley program.