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Project Title: Increase Capacity of Two Coordinated FHB Nurseries for Spring Wheat

PROJECT 4 ABSTRACT

(1 Page Limit)

Field phenotyping of wheat materials for FHB resistance is an essential part of effort to identify FHB resistant sources, map QTL for FHB resistance, and develop FHB resistant cultivars and germplasm. In the past years, we have established two FHB nurseries for spring wheat, one located at Prosper, ND, which is mainly used to screen spring wheat breeding lines of NDSU spring wheat breeding program (Dr. Andrew Green) and the other located on NDSU campus at Fargo, ND, which has been used to evaluate introgression wheat lines and mapping populations from multiple research groups (Dr. Xiwen Cai, Dr. Steven Xu, and Dr. Shaobin Zhong). However, only a limited number of wheat materials could be included for FHB evaluation at the Fargo nursery due to limited capacity of the nursery and lack of enough funding to manage larger field plots. Furthermore, one location for FHB screening may not provide good quality data due to unpredicted weather and environmental conditions, and thus establishing additional nursery is important to ensure the success of FHB screening every year. Langdon, ND, is an excellent location for FHB screening because the weather conditions are conducive for FHB development. Our overall goal is to increase the capacity and efficiency of FHB screening nurseries for the spring wheat CP. Therefore, the specific objective of this proposal is to expand the Fargo nursery and establish a new nursery at Langdon location to accommodate more advanced breeding lines, mapping populations, and introgression germplasm from NDSU spring wheat breeding program (Dr. Andrew Green) and other researchers (Dr. Xiwen Cai, Dr. Steven Xu, and Dr. Shaobin Zhong) working in the spring wheat CP. Field plots will be increased, water pipelines will be expanded, and overhead misting systems will be upgraded at the Fargo location. Similar size of disease nursery will be established at the Langdon location with the same inoculation method and misting system set up. Wheat entries will be submitted by the PI and co-PIs and planted in the two nurseries in the summer growing season. FHB data will be collected in early August by each of the research groups. The proposed research project addresses the following research priorities for FY20-21 in VDHR: 1. Increase acreage planted with varieties with improved FHB resistance to reduce DON in the US grain supply. 2. Increase efficiency of coordinated project breeding programs to develop and release FHB resistant varieties.