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Project Title: Coordinated Phenotypes of Soft Wheat Germplasm for the Midwest

PROJECT 3 ABSTRACT

(1 Page Limit)

Strong FHB resistance must be combined with high-yield to impact the Eastern US wheat industry. Each year the six breeding programs in Northern Winter Wheat group generate breeding lines that are in the advanced stages of development. Due to low to moderate heritability of FHB resistance multi-location testing is needed to determine the FHB resistance of these lines, as well as their yield, quality, agronomic value, and resistance to other diseases. The breeders in this CP use a series of nine coordinated nurseries to achieve this objective. Five of our programs (Table 1) also conducts an Official Variety Trial (OVT) of the cultivars that are available to their growers. We will screen the entries in all these tests for FHB resistance. Collectively, over 400 unique advanced breeding lines and released cultivars are evaluated for FHB resistance in these trials. This screening encompasses nearly all genotypes that are currently available to growers as well as much of what may be available to them in the next three to five years.

Our specific objectives are 1) Phenotype advanced breeding lines that are candidates for release: 2) place FHB and other agronomic, disease resistance, and quality data in a database: 3) report on purification and seed increase of the best lines.

The coordinated testing of advanced lines in the various uniform trials and OVTs plus the data summaries for lines that are candidates for release is an efficient method to determine the FHB resistance of nearly all germplasm that is currently released, or likely to be released in the near future. We anticipate that all data from the trials of breeding lines will be placed in the T3 database. The lack of a single coordinator for the OVTs limits our ability to place this data in a database, though that data is made available to growers via state extension personnel, websites, and publications as well as the USWBSI Scab Smart website. Each breeder in this coordinated project has breeding lines with improved levels of FHB resistance and other traits that warrant their release. The purification and seed increase of these lines is funded by non-USWBSI sources. We propose to summarize the information that supports the release of the advanced lines and to make that information available to all breeders and extension personnel when appropriate