PI: Mark Sorrells **PI's E-mail: mes12@cornell.edu**

Project ID: FY14-NW-010 **ARS Agreement #: 59-0206-4-007**

Research Category: **VDHR-NWW** **Duration of Award: 1 Year**

Project Title: Implementing Genomic Selection for FHB Resistance in Soft Winter Wheat (SWW) Adapted to the Corn Belt.

PROJECT 4 ABSTRACT

(1 Page Limit)

Genomic selection (GS) is a new technology that uses marker selection to select nearly all the genes that affect FHB resistance, including those with small effects. Genomic selection uses a training population of lines that is phenotyped and genotyped. A prediction model is built using the phenotypic and genotypic data from the training population. That model can then be used to predict the value of other genotyped individuals that are related to the training population even without phenotyping those individuals.

Objectives:
1. To implement GS for FHB resistance in soft winter wheat by completing two cycles of GS.
2. Initiate evaluation of the effectiveness of GS.

Over the past three years we have phenotyped a training population of 649 lines. This includes 600 RILs (100 from each of six breeding programs, each phenotyped at the breeder's location only) and 49 checks (phenotyped by all six breeders at all locations and years). We have planted the best lines from the training population and have made crosses among them. The F2 seed was planted in October and vernalized. They were genotyped using genotyping by sequencing and prediction models were used to select the genotypes with the highest breeding values. The selected plants are currently being crossed to generate the population for the next cycle. All plants were selfed to produce F2:3 for comparison with selected genotypes. This will be repeated for another cycle and evaluated in the 2015-16 FHB nursery.