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Project ID: FY16-HW-002

ARS Agreement #: N/A

Research Category: HWW-CP

Duration of Award: 1 Year

Project Title: Single Kernel NIR Sorting Technology for Enhancing Scab Resistance and Grain Quality.

PROJECT 1 ABSTRACT

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Rapid, objective, and economical methods are needed to determine scab and DON in samples. Sorting technology is needed to select kernels with specific traits such as no DON, no scab, high protein, high hardness, etc. Rapid single kernel assessment and sorting technology will help the breeding community rapidly and objectively evaluate lines for scab severity and DON levels.

Our single kernel sorting technology will continue to be optimized to improve scab determinations and improve DON accuracy measurements. This will be done through statistical analyses and calibration techniques and by using the information from our basic research studies on NIR absorption bands related to DON and scab damage. We will concentrate also on measuring DON in asymptomatic kernels and scab in kernels with no visible scab. We will also develop NIRS techniques to evaluate different FHB resistant types in wheat germplasm. Research will also be conducted to develop rapid methods to determine DON levels in bulk wheat samples to prescreen samples from scab nursery trials and other experiments that usually contain high DON levels.

We will provide cooperators with free scab and DON determinations, evaluation of germplasm for resistant types such as FHB resistance to toxin accumulation and sort kernels for specific traits as requested.