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Project Title: Screening and Developing Wheat Germplasm with Resistance to Scab.

PROJECT 1 ABSTRACT

(1 Page Limit)

Scab of wheat is a disease that has recently increased in wheat grown in the U.S. mid-Atlantic. Scab or head blight is caused by fungi of the genus *Fusarium*. Scab reduces grain yield, decreases grain quality, and can produce toxins that are a potential health threat when the infected wheat is used for food. Alleles of resistance to scab exist in current soft red winter wheat cultivars, therefore screening of advanced lines of breeding programs may allow identification of lines with tolerance to scab. The **first objective** of this project is to screen elite lines in the Maryland breeding program for resistance to scab as well as screen the Uniform Eastern and Uniform Southern Scab nurseries. This is a practical way to identify potential cultivars with tolerance to scab before their release. The **second objective** of this project is as part of the breeding program to specifically develop soft red winter wheat germplasm *adapted* to the mid-Atlantic region with increased resistance to scab derived from non-traditional sources as well as pyramiding scab resistance from adapted genotypes. These two objectives support the overall goal of enhancing the resistance to scab of new wheat cultivars in the mid-Atlantic region. Special screening nurseries will be artificially inoculated and resistance to scab will be evaluated. Molecular marker assisted selection will also be utilized to accelerate and improve the efficiency of selection (genotyping will be carried out at the USDA genotyping center at Raleigh, NC). This proposed research is relevant to the U.S. Wheat and Barley Scab Initiative because publicly available germplasm developed from this project will be useful in the development of cultivars with enhanced resistance to scab for the mid-Atlantic region of the U.S.