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**ARS Agreement #: New-5yr**

**Research Category: MGMT**

**Duration of Award: 1 Year**

**Project Title: Effects of Local Corn Debris Management on FHB and DON Levels (Year Two)**

## **PROJECT 2 ABSTRACT**

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This research project will provide realistic estimates of DON reduction resulting from corn debris management (i.e., moldboard plowing) in commercial-scale wheat fields planted following grain corn harvest in Illinois, Kentucky, Michigan, Missouri, Nebraska, New York, and Vermont. USWBSI investigators, using microplots in rotated wheat fields, demonstrated that spores from within-field corn debris as well as airborne spores in the atmospheric background population of *Gibberella zeae* contribute to head infection. But strikingly, DON level differed significantly between corn debris and no debris microplots in only one location (Bath, NY) out of twenty-one winter wheat environments over five states in 2009 and 2010, overwhelming evidence that atmospheric background inoculum is a strong contributor to infection even when corn debris is present in a wheat field. Small area sources of debris, however, may result in an underestimation of the contribution of a larger field of corn debris to DON contamination. Our experimental objective is to quantify reductions in head infection, FHB, and DON that result from within-field corn debris management under commercial scale wheat production. Following corn harvest, replicated wide (60 ft) strips will be subject to moldboard plowing or left unplowed prior to sowing wheat over the entire field with a no-till drill. Wheat in each strip will be monitored for FHB and sampled for laboratory quantification of head infection and DON. Our results will identify the range of FHB/DON reductions to be expected from tillage or other direct debris management techniques in single fields of wheat within corn production regions. Preliminary results from year one of this project demonstrate no significant effect of tillage treatment on DON level in four environments and small, but significant, increases in toxin in the no-till compared to tilled strips in two locations. Our research addresses Goal #3, to develop a full understanding of specific factors influencing infection and toxin accumulation that can be used to develop the next generation of scab and DON risk assessment measures. We will translate our findings into regionally appropriate recommendations for debris management as a component of integrated management. We will extend our results to stakeholders in our individual states and regions as well as nationally. A specific goal of this project is to create an informative new section on 'Debris Management' for the ScabSmart website.