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**Project ID: FY16-BA-010**

**ARS Agreement #: 59-0206-6-004**

**Research Category: BAR-CP**

**Duration of Award: 1 Year**

**Project Title: Investigating the Basis of Resistance to Scab in Barley.**

### **PROJECT 1 ABSTRACT**

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Our overall project goal is to better define the mechanism of a resistance response that we have observed that is specific to trichomes and silica cells in two row barley, but only very infrequently in six-row barley, and appears to halt ingress of *F. graminearum* into the palea.

Our Objectives are:

1. Determine whether the resistance response we have documented in barley trichomes/silica cells is correlated with cessation of fungal penetration.
2. Characterize the resistance response in two- and six-row barley lines to determine if the response differs between these classes of barley. Use progeny of a two- and six-row barley cross to determine segregation pattern of resistance and barley type.
3. Determine if known barley powdery mildew pathogenesis-related genes MLO and ROR2 alter the observed resistance response associated with barley trichomes/silica cells.

Expected outcomes: Upon completion of this project, we expect to know to what degree this resistance response stops fungal ingress, if the resistance response is linked to or encoded by genes distinguishing six- and two- row barley, and whether the response is associated with known powdery mildew resistance genes MLO and ROR2.

Plans to accomplish projects: All of the techniques used in the proposed work have been previously worked out and we have access to the barley lines we need for the project.

Statement of Mutual Interest: Should we accomplish the proposed work, we will have the information to move forward with a novel scab resistance mechanism, possibly identifying markers to use towards incorporating it into other lines of barley.