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Project ID: FY08-DA-012 **FY07 ARS Agreement #: 59-0790-6-057**

Research Category: **BAR-CP/GDER** **Duration of Award: 1 Year**

Project Title: Transformation and Field Testing of Transgenic Barley Lines.

PROJECT 1 ABSTRACT

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The proposed project is a continuation of the work initiated in FY06 to enhance resistance of barley to *Fusarium graminearum* by over-expressing the anti-fungal gene *gastrodianin* from *Gastrodia elata*. We have developed ten fertile transgenic plants incorporating the coding region of *gastrodianin*. Expression is targeted to the spike tissue using a tissue-specific *Lem2* promoter isolated from Morex barley. Plants that set sufficient seeds will be used for studies in the FY08 and FY09 grant period. Golden Promise is not a good variety for scoring *Fusarium* head blight (FHB) resistance because the head does not come out of the boot completely. Thus, for field testing, transgenic Golden Promise expressing *gastrodianin* will be backcrossed to an adapted barley variety. The objectives for this proposal are: 1) backcross transgenic Golden Promise barley expressing *gastrodianin* to Conlon in FY08, and 2) conduct field tests of transgenic Conlon barley in FY09. The project will address the USWBSI Gene Discovery & Engineering Resistance (GDER) goal of developing effective FHB resistance through transgenic strategies.*usarium* infection and early stages of growth and spread.