PI: Kevin P. Smith
PI's E-mail: smith376@umn.edu

Project ID: 0506-SM-125
FY04 ARS Agreement #: 59-0790-4-120
Research Area: VDUN
Duration of Award: 1 Year

Project Title: Accelerated Development of Fusarium Resistant Barley Varieties.

PROJECT 2 ABSTRACT
(1 Page Limit)

Fusarium Head Blight (FHB) or scab, caused by the fungus *Fusarium graminearum*, has emerged as the major factor limiting barley production in the Midwestern United States. The primary goals of this project are to enhance our understating of the biology/genetics of resistance to Fusarium head blight (FHB) in barley, develop and evaluate methodologies that improve our ability to screen and select for resistance, and release FHB resistant malting barley varieties. To accomplish these goals, we propose a series of field and greenhouse experiments and variety trials. These trials will enable us to identify resistant lines that will be used as parents in advanced cycle crosses to develop resistant varieties, or be evaluated in advanced disease, yield and quality trials as new resistant variety candidates. In addition to breeding activities, we will investigate the relationships among disease severity, grain protein, accumulation of DON in grain, days to anthesis, spike morphology and maturity. We will evaluate populations derived from crosses among resistant and susceptible varieties that segregate for some or all of these other traits. We will employ marker assisted selection in early generation (F2 or F3) populations using markers linked to QTL regions that have been mapped and validated in the Chevron, Frederickson, Atahualpa, and Hor211 sources of resistance. We will continue to collect spectral data using a FOSS 6500 NIRS instrument to develop a calibration for use in estimating DON concentrations in whole grain samples. These activities should contribute directly to the development of FHB resistant barley varieties and enhance our understanding of resistance to FHB. Both of these outcomes are necessary to integrate FHB resistant varieties as part of an overall strategy for disease management.