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Project ID: FY08-MC-022

FY07 ARS Agreement #: 59-0790-4-114

Research Category: MGMT

Duration of Award: 1 Year

Project Title: Greenhouse Studies of Environmental Influences on DON Production in Wheat.

PROJECT 1 ABSTRACT

(1 Page Limit)

Deoxynivalenol (DON) accumulation in wheat has been shown to be positively correlated with visible scab (McMullen, et al. 1993; Stack, et al. 1995). However, correlations between disease severity and DON levels are not always high (McMullen, et al, 1994; Paul, et al., 2005), and DON accumulation has been reported in asymptomatic winter wheat (Cowger and Sutton, 2005), raising questions about how time of infection, environmental conditions, or genetics influence DON production. Field studies with soft white winter wheat cultivars currently are examining the effects of cultivar, moisture levels, and timing of infection on DON accumulation (Cowger, 2005; Nita, et al., 2005). NDSU greenhouse studies with spring wheat indicated that single post-anthesis (Feekes 10.54) inoculations with *Fusarium graminearum* did not result in appreciable visible symptoms of FHB, but DON levels were not measured in these studies (Jordahl, et al., 2003).

A study to determine factors affecting DON production in greenhouse spring wheat was supported by the USWBSI; funding was received in May 2007. A greenhouse proposal was submitted because environmental factors can be more easily controlled than in the field. The research from this funding was initiated at NDSU in Sept. 2007, with plantings of Glenn spring wheat, a commercially grown cultivar possessing Sumai-3 germplasm, plantings of Trooper, an FHB susceptible spring wheat, and plantings of a moderately resistant and a susceptible durum. The project currently requesting support will continue with the 2007-2008 greenhouse study and will make minor adjustments to methods and objectives, if indicated by the 2007-2008 greenhouse season. In addition, DON derivative data and DON levels will be determined, as other NDSU greenhouse studies have looked at affects of timing of infection on 3ADON and 15ADON levels.

Data from this research has several implications. If late infections and prolonged moisture increase risk of DON in certain grain classes or cultivars, this information may be used: 1) to incorporate weather predictions into current FHB or DON forecasting models for spring and durum wheat; 2) to prompt further evaluation of post-flowering fungicide efficacy and provide justification to EPA for shortened pre-harvest intervals (PHI); and 3) to assist breeders in incorporating DON resistance into their germplasm.