U.S. Wheat and Barley Scab Initiative
FY02 Preliminary Final Performance Report (approx. May 02 – April 03)
July 15, 2003

Cover Page

PI:	**Dennis TeKrony**
Institution:	**University of Kentucky**
Address:	**Department of Agronomy** **N-106K Ag. Science Bldg. North** **Lexington, KY 40546-0091**
E-mail:	**dtekrony@ca.uky.edu**
Phone:	**606-257-3878**
Fax:	**606-257-7874**
Year:	**FY2002 (approx. May 02 – April 03)**
Grant Number:	**59-0790-1-075**
Grant Title:	**Fusarium Head Blight Research**
FY02 ARS Award Amount:	**$ 14,634**

Project

Program Area	Project Title	USWBSI Recommended Amount
EDM	Fusarium graminearum and DON levels in single seeds following greenhouse point inoculation.	$15,000
	Total Amount Recommended	**$15,000**

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Principal Investigator Date

Project 1: Fusarium graminearum and DON levels in single seeds following greenhouse point inoculation.

1. What major problem or issue is being resolved and how are you resolving it?

The single floret inoculation system is commonly used to screen wheat cultivars and germ plasm for FHB Type II resistance in the greenhouse by a visual rating of the spread of fungal hyphae in the spike and spikelets. Evaluation of this system in our laboratory across a wide range of germ plasm has shown that the visual ratings of spikelet infection are poorly associated with the *Fusaraium graminearum* (Schwabe) infection occurring in the seed, rachis and other floral components the same spikelets. The objective of this research was to use the single floret inoculation system to relate visual ratings of spikelet infection in the greenhouse to *F. graminearum* infection and deoxynivalenol levels in seeds of adjoining florets in all individual spikelets on each infected spike. The movement of fungal hyphae and DON into the various components of the spike was evaluated following point inoculation (PI) of a floret at a middle location of the spike for two susceptible (P 2555 and VA 96W-326) and three resistant (P 25R18, Roane, Coker 9474) cultivars.

2. What were the most significant accomplishments?

This preliminary investigation of movement of F. graminearum and DON into seeds following point inoculation of a middle spikelet in the greenhouse supports early studies in our laboratory regarding the fungal and DON movement in the spike. Although high levels of spikelet infection occurred in the susceptible cultivars in the greenhouse, the fungal movement in the spike occurred primarily in two ways; localization around the PI and movement down the spike from the PI. Thus, severity of greenhouse infection overestimated F. graminearum seed infection and DON presence in susceptible cultivars and underestimated fungal infection and DON in resistant cultivars. There was a close relationship between the presence of F. graminearum in seed from the right floret with the presence of DON in seed from the left floret in both susceptible and resistant cultivars. Although DON was present in seed of resistant cultivars the levels were much lower than susceptible cultivars and often did not exceed 1 PPM.

Include below a list of the publications, presentations, peer-reviewed articles, and non-peer reviewed articles written about your work that resulted from all of the projects included in the grant. Please reference each item using an accepted journal format. If you need more space, continue the list on the next page.

Dennis TeKrony, David Van Sanford, Cheryl Edge, Marcy Rucker and Yanhong Dong. 2002. **Fusarium graminearum and DON in single seeds following greenhouse point inoculation. Poster presentation,** National Fusarium Head Blight Forum, Erlanger, KY.

Argyris, Jason. 2002. "Effect of Fusarium graminearum infection on wheat seed quality" Master of Science Thesis, University of Kentucky, Lexington, KY

Argyris, Jason, David Van Sanford and Dennis TeKrony. 2003. Fusarium graminearum infection during wheat seed development and its effect on seed quality. Crop Science (In Press).