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FY04 ARS Agreement #: 59-0790-0-F076

Research Area: GIE

Duration of Award: 1 Year

Project Title: Novel FHB Resistance Sources in Bread Wheat from International Genetic Resources.

PROJECT 1 ABSTRACT

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Objective:

Overall goals are identify and validate new sources of FHB resistance, diversifying the current resistance gene pool utilized by the USWBSI community to facilitate the utilization of resistant germplasm. In this project we aim to target the acquisition of potentially novel sources of resistance from global hotspots through our wide-spread contacts. This will allow us to identify globally stable resistance, and will contribute to our understanding of the underlying mechanisms of resistance. Germplasm will be evaluated first at several FHB hot spot locations in Mexico, and then globally through CIMMYT's International Wheat Improvement Network (including CIMMYT-Turkey) with USWBSI reference cultivars included. This will ensure that materials are exposed to a number of *Fusarium graminearum* isolates, including those found in the US.

Approach:

Systematic run first screening by CIMMYT FHB initiative among relevant entries of primary gene pool in CIMMYT gene bank (largest global collection of wheat and wheat relatives), the core set of wheat accession for Generation Challenge Program composite wheat collection with GIS information, and advanced improved lines in CIMMYT breeding programs for novel resistance in bread wheat. Promoting germplasm exchanges and introduction of highly resistant bread wheat germplasm from international programs' via CIMMYT's international network under a Material Transfer Agreement (MTA) in compliance with the new International Treaty on Plant Genetic Resources for Food and Agriculture. Evaluate germplasm at multi-sites of FHB hotspots in Mexico and globally through the CIMMYT International Wheat Improvement Network with reference cultivars from USWBSI, and US testing sites to identify highly resistant bread wheat germplasm to several *Fusarium graminearum* isolates including US ones. Genetic characterization with DNA markers for haplo-type diversity and allelic variation of several candidate genes expected for FHB resistance to identify newly acquired resistant sources, besides classical genetic analysis.