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**Duration of Award: 1 Year**

**Project Title: To Enhance Variety Development of Scab Resistant Varieties.**

PROJECT 2 ABSTRACT  
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The long-term goals of this project are to: 1. develop elite winter wheat varieties that are resistant to Fusarium head blight (FHB, scab) using conventional breeding (**part of the Scab Initiative's effort on plant breeding and variety development**), 2. determine the level of FHB and need for FHB resistant varieties in dryland and irrigated wheat production, and 3. to screen experimental lines in hard winter wheat regional nurseries to identify the level of FHB resistance within the existing elite winter germplasm of the Great Plains (**part of the Scab Initiative's effort on plant breeding and variety development and also part of the germplasm introduction and enhancement efforts**). The specific objectives in our conventional breeding and variety development effort are: A) collect FHB resistant germplasm (done in conjunction with Dr. A. McKendry of the FHB germplasm efforts and with Eastern European wheat lines), B) incorporate the resistant germplasm (including our new transgenic sources---**part of the FHB biotechnology effort**) into hard winter wheat germplasm (white and red) by crossing, and C) using a modified bulk breeding or backcrossing method to advance the germplasm to elite line status. The specific objective of our screening experimental lines in hard winter wheat regional nurseries is to screen the elite hard winter wheat lines in the Regional Germplasm Observation Nursery (RGON). This nursery contains approximately 300 lines and represents the totality of the publicly and privately developed elite germplasm in the hard winter wheat growing region, so this nursery is the key focal point for accessing and evaluating germplasm. In 2002-2003 we will continue to make crosses to new sources of FHB tolerance and have numerous bulks that should be segregating for FHB tolerance mainly derived from the soft wheat lines identified as having some FHB tolerance. In addition, we have 1000 headrows (2.5% of all head row rows that are planted) that should segregate for FHB tolerance that will be evaluated for agronomic performances and selected for advancement to the FHB field screening nursery. We have made 27 crosses involving transgenic parents and intend to make additional crosses and segregating populations to determine their transmission, genetic stability, and efficacy of our transgenes. In our field screen, we will evaluate approximately 1000 lines from our breeding program and the Great Plains winter wheat breeding efforts.