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PROJECT ABSTRACT

(1 Page Limit)

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 400 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 2001, only 3 lines in the RGON showed a high level (<10%) of tolerance. In the three Nebraska nurseries approximately 1% of the lines had promise for FHB tolerance (<10%). Using a more relaxed level of FHB tolerance (<20%), only the FHB screening nursery had 20% of the lines be considered tolerant. This low frequency of tolerance may be due to escapes, hence further testing and refinement of our screen is necessary. Having a FHB field screen was a tremendous addition to our efforts in 2001 and with further refinement should allow us to reliably test our breeding lines, our transgenic lines, and regional elite lines effectively in the field.