

PI: Kolb, Frederic

PI's E-mail: f-kolb@uiuc.edu

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Project Title: Mapping FHB QTL in an IL97-1828 x Clark Derived RIL Population.

PROJECT 3 ABSTRACT

(1 Page Limit)

Our objective in this research project is to identify molecular markers associated with genes for Fusarium head blight (FHB) resistance in a source that does not trace back to a Chinese source of FHB resistance. The FHB resistant parent in this population, IL97-1828, has a very high level of FHB resistance. IL97-1828 has good plant type, good resistance to initial infection by the fungus, resistance to spread of the fungus in the head, low percentage of Fusarium damaged kernels (FDK) and low deoxynivalenol (DON) levels. Deoxynivalenol is a toxic produced by the fungus. Clark, the FHB susceptible parent, is an early, winter hardy, short, adapted soft red winter wheat variety. The population includes 283 lines. The FHB resistance of all of the lines in this population will be determined in field nurseries at Urbana, IL in the 2009 and 2010 field seasons and at Wooster, OH in the 2010 field season (in cooperation with Clay Sneller). A misted, inoculated FHB field nursery will be used for evaluation of the lines at both locations. Grain spawn (corn kernels cultured with the fungus that causes FHB) will be used to inoculate the nursery at both locations. The percentage of heads that show symptoms and how much of a head is infected will be determined for all of the lines. Grain samples of each line will be harvested at both locations in 2010 and at Urbana in 2009, and percentage of FDK will be determined. Grain samples will be sent to the DON evaluation lab at the University of Minnesota for assessment of the DON level in each line. Leaf tissue will be collected from seedlings, and DNA will be extracted. Molecular markers will be analyzed, and the marker results will be combined with the FHB resistance data collected in the field nursery to identify markers associated with genes for FHB resistance in this population. The information generated will be valuable in determining if the genes for FHB resistance in IL97-1828 are different from Chinese sources and from other soft red winter wheat sources of resistance such as Ernie and Truman. This information will contribute to enhancing the efficiency of selection for FHB in soft red winter wheat breeding.