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Project Title: Characterization of Novel QTL for FHB Resistance in Asian Wheat Cultivars.

PROJECT 2 ABSTRACT

(1 Page Limit)

Fusarium head blight (FHB) significantly reduced yield and quality of wheat grain. Growing resistant cultivars is the most effective measure to control the disease. However, a quantitative trait locus (QTL) for partial resistance used in breeding programs worldwide is from 3BS of Sumai 3, exploring other QTL for FHB resistance from various sources will enhance genetic diversity of resistance QTL and facilitate pyramiding of those resistance QTL to enhance the level of cultivar resistance. Our objectives in this proposal are to (i) characterize Type I FHB resistance and low DON content in mapping population Wangshuibai/Wheaton; (ii) verify the new QTL for Type II FHB resistance in Chokwang; (iii) identify molecular markers for minor QTL in Ning7840 and investigate their interactions with environments. Three RIL populations from the crosses Wangshuibai/Wheaton, Chokwang/Clark and Ning7840 /Clark will be repeatedly evaluated for various types of FHB resistance in field and greenhouse conditions. Amplified fragment length polymorphism (AFLP), simple sequence repeat (SSR) and expressed sequence tag (EST) markers coupled with bulked segregant analysis (BSA) will be implemented for identification of novel QTL and fine mapping in the QTL regions. Some markers closely linked to the QTL will be optimized for application in marker-assisted selection. DNA markers will be analyzed in automated DNA sequencers to improve resolution and throughput of marker analyses. The results will provide information on new QTL for various types of FHB resistance in the three important Asian FHB resistance sources, provide selectable markers for newly-identified QTL to accelerate gene deployment via MAS, diversify FHB resistance QTL for marker-assisted breeding and elucidate relationship between different types of resistance, which meet the FY06 research priorities in mapping section proposed by HGGRA of USWBSI.