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Research Category: VDHR-NWW

Duration of Award: 1 Year

Project Title: Improvement of Soft Winter Wheat that is Resistant to FHB and Adapted to Indiana.

PROJECT 1 ABSTRACT

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We will select wheat parent lines and effect parental crosses based on parental performance in the field and marker genotyping for desired FHB resistance genes/QTL and other important genes/traits. We will conduct field head row nurseries and performance nurseries to identify elite lines with highly effective resistance to FHB and release improved varieties with effective resistance.

Objective 1. Combine type 1 resistance from INW0412, Truman and Bess with type 2 resistance (Fhb1, and QTLs from F201R, Freedom, and Ernie. We already have combinations of these resistance factors in adapted lines/populations and will continue evaluating selected lines in greenhouse tests, and field nurseries of head rows and performance nurseries – a misted nursery at Lafayette, and nurseries at 4 other locations in Indiana (Wabash, Atlanta, Vincennes, Evansville), as well as selected lines in regional nurseries (NUWWSN, PNUWWSN, 5-State A, 5-State P, UEWWN).

Objective 2. Continue testing and selection of improved wheat lines that have the distal 1/3 (determined by CS 7D deletion lines bin mapping and SSR marker analysis) of 7DS.7DL-7EL introgressed segment with *Qfhs.pur-7EL* into elite adapted parent lines that have combinations of type 1 and other type 2 FHB resistance factors. Also, we will continue evaluating lines/ populations with *Qfhs.pur-7EL* in the misted nursery, head rows and performance nurseries.

Objective 3. Given that *Qfhs.pur-7EL* is located in the distal region of 7EL (Shen and Ohm, 2007) and it has been shown in other studies that for various reasons it is desired that the introgressed chromosome segment be as short as possible, we have crossed plant 275-4 to CS Ph1b deletion line. We will grow F₂ populations in the greenhouse in 2009-10 and identify plants that are heterozygous for 7E and homozygous for the Ph1b deletion.

Objective 4. Map FHB resistance gene(s) of wheat line Xing 117. We wish to phenotype the F_{8,9} RI population one additional time in the greenhouse, 2009-10.