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Project ID: FY12-NW-006

ARS Agreement #: 59-0206-9-081

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

(1 Page Limit)

400+ parental crosses will be made, 90% of which involve at least one parent line that has type I and or type II FHB resistance. The pedigree method of breeding is the basis of the variety improvement program, involving F1 plants grown in an early fall cycle in the greenhouse and seeding of F2 populations about November 1 in southern Indiana to gain a generation each year. Head row nurseries are grown at 3 locations to increase probability of FHB infection - Lafayette (seeded in disced corn stover, and head rows in a misted nursery; Vincennes and/or Evansville, non-misted. Yield performance nurseries are grown in northern (Wanatah), central (Lafayette) and southern (Evansville), Indiana in replicated nurseries, some in disced corn residue. We participate in several regional performance nurseries (UEWWN, 5-State Advanced and 5-State Preliminary; and the P+NUWWSNs – all of which involve evaluation for FHB incidence, severity, index and FDK. We are focusing on type I and type II FHB resistance, from adapted 'native' sources as well as Chinese and European wheat lines, and a type II resistance factor from tall wheatgrass. We published markers associated with type I resistance of the cultivar Goldfield (Gilsinger et al., 2005. Theor Appl Genet 110:1218-1225); and we are using this resistance in our variety improvement program, along with type I resistance from Truman/Bess, and we are mapping type I resistance of Purdue cultivar INW0412, which we are also focusing on in our program. We have shown that a high level of type II FHB resistance is achieved with the combination of Fhb1 and Qfhs.pur-7EL, and we are characterizing moderately elite lines with combinations of these resistance factors along with type I resistance from combinations of Goldfield, INW0412, Truman and Bess; and type II resistance from Ernie, Wangshuibai and W14.