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Project ID: 0506-MU-024

FY04 ARS Agreement #: 59-0790-4-116

Research Area: GIE

Duration of Award: 1 Year

Project Title: Introgression of FHB Resistance from Hexaploid, Diploid, and Intergeneric Hybrids into Soft Red Winter Wheat.

PROJECT 1 ABSTRACT

(1 Page Limit)

Because the best known sources of resistance to Fusarium head blight (FHB) are characterized as 'partial' rather than 'complete', it is logical to try to pyramid resistance alleles from an array of cultivated wheats and their relatives to develop a higher level of resistance. The goal of this research is to introgress potentially novel sources of FHB resistance from selected A genome diploid wheat relatives, winter-type accessions of the Sando intergeneric hybrid collection, North Carolina adapted triticales, and hexaploid wheat lines with novel haplotypes at loci known to control FHB resistance. Previous funding has led to the development of BC₂F₂ seed from crosses of North Carolina adapted soft red winter wheat with 1) a moderately resistant *T. monococcum* sp. *monococcum* accession and, 2) three resistant triticales. This material will undergo greenhouse and field evaluations in 2004-05 and 2005-06 to determine if resistance has been introgressed from the related species into the adapted background. Previous screening of accessions of *T. monococcum* sp. *monococcum*, and winter-type intergeneric hybrids from the Sando collection identified 51 accessions with potential resistance. These will undergo a second round of evaluation for Type II resistance followed by hybridization of resistant accessions with a susceptible North Carolina adapted soft red winter wheat during 2004-05 and 2005-06. Hybridizations with *T. monococcum* sp. *monococcum* accessions will require embryo rescue. During the summer of 2004 we obtained F₁ seed from crosses between 16 hexaploids identified as having novel haplotypes at loci known to control FHB resistance, and the very susceptible NC99-13022. This geographically diverse set of donor parents included three CIMMYT lines from their highly successful synthetic hybrid program that appears to be an effective method of incorporating FHB resistance from the D genome *Aegilops tauschii*. Fifty BC₁F₁ seed will be obtained per hybrid combination in 2004-05 and up to 800 plants will be evaluated to identify approximately three superior plants per combination for further backcrossing in 2005-06. The proposed objectives are related to the USWBSI goal of developing, as quickly as possible, control measures that minimize the threat of Fusarium head blight to the producers, processors and consumers of wheat.