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Project Title: Molecular Mapping of Fusarium Head Blight Resistance Genes in Tetraploid Wheat.

PROJECT 1 ABSTRACT
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Fusarium head blight (FHB) is one of the most devastating diseases of wheat and durum. Resistant sources of hexaploid bread wheat have been identified and are currently being employed in breeding programs, but development of resistant tetraploid durum wheat has met with less success. Resistance has been identified in *Triticum dicoccoides*, a wild tetraploid relative, which readily hybridizes with durum wheat. Resistant accessions of *T. dicoccoides* were used to create disomic chromosome substitution lines in the Langdon durum background. Screening of the substitution lines for FHB resistance indicated that chromosomes 5B and 7A contain resistance factors. Using Langdon and the 5B and 7A substitution lines as parents, recombinant inbred chromosome line (RICL) mapping populations were developed. The populations are being subjected to FHB inoculations, and genetic maps of chromosomes 5B and 7A will be generated using molecular markers such as RFLPs, AFLPs, and microsatellites. Quantitative trait loci (QTL) analysis will be performed to identify genomic regions associated with resistance. Putative QTLs will be further targeted to identify markers tightly linked to them. The most informative markers will be converted to user-friendly PCR-based markers and freely distributed to interested breeders and geneticists. The diagnostic markers should expedite the introgression of *T. dicoccoides*-derived resistance genes into elite durum lines using marker-assisted selection. Combining the FHB resistance genes identified from this project along with genes identified by others from different sources should lead to a highly resistant durum cultivar.