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Project Title: Uniform Nursery for SWW and Development Scab Resistance Varieties for Ohio.

PROJECT 1 ABSTRACT

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The deployment of high-yielding FHB resistant varieties is a critical component of effective economic control of FHB. Breeding for FHB resistance is difficult due to environmental effects and complex genetics. Development of a resistant variety requires screening many lines to combine FHB resistance with the other traits required in an economically viable cultivar. Thus, conducting a large-scale phenotyping nursery is essential to breeding. The use of molecular markers may facilitate breeding by allowing breeders to use marker-assisted selection (MAS).

Two major objectives of the USWBSI are to develop FHB resistant cultivars as quickly as possible and to assess the use of MAS to rapidly develop such cultivars. Both objectives can be achieved in an integrative fashion using germplasm from our variety development program and currently detected QTL and markers.

Our objectives are:

1. Evaluate the FHB resistance of Ohio State University lines that are candidates for release and develop populations from which FHB resistant cultivars can be developed in the future.
2. Phenotype and genotype lines from crosses among SWW lines to validate markers and to select progeny with strong resistance.
3. Coordinate a uniform nursery for evaluating FHB reaction in SWW adapted to the northern US.

In objective 1 we plan to screen ~1400 lines in 2004-05 to capitalize on the inherent resistance in the OSU germplasm. Many of these will also be evaluated for other traits including yield, quality, and resistance to other diseases. Our second objective is to validate QTLs from Freedom, Ernie, and a Chinese source (ZM10782). This will involve phenotyping and genotyping lines from populations derived from these parents. Finally we will coordinate the thorough FHB evaluation of two sets of soft winter wheat lines in the eastern US.