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

PROJECT 1 ABSTRACT

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It is our aim to use MAS and phenotypic selection in a program that will insure a steady release of FHB resistant cultivars for Ohio while building parents for future success. Our objectives are

1. Evaluate the FHB resistance of all breeding lines in OSU program and develop populations from which FHB resistant cultivars can be developed in the future.
2. Evaluate the FHB resistance of cultivars in the OSU Commercial Cultivar Trial.
3. Backcross FHB resistance QTLs into promising OSU breeding lines in early stages of their evaluation.
4. Coordinate a uniform nursery for evaluating FHB reaction in SWW adapted to the northern US.

Ideally, breeder's would produce a steady stream of new cultivars each year with the desired agronomics, quality, and FHB resistance. This can be achieved by integrating phenotypic selection, directed use of MAS for FHB resistance in a good genetic base, along with parent building. The genetic base of the OSU program has considerable native resistance that compares favorably with the FHB resistance of other SRWW programs. We will exploit this base by crossing and selection while also complementing it with selected exotic alleles. We have developed an innovative MAS scheme to complement our phenotypic selection. BCing must be initiated in year 1 or year 2 of the development of the recurrent parents (RP) to produce commercial quantities of seed while the RP is still relevant to growers. OSU has initiated early BCing and is developing a large set BC-derived lines from RPs of high yield plus proven FHB QTL. The BCing also generates a large, diverse set of parents fixed for these QTL.

Due the vagrancies of FHB phenotyping, multi-environment testing is essential. The Northern Uniform Winter Wheat Scab Nursery has grown from 8 environments and 28 entries from 6 programs in 1999, to 15 environments (3 countries) and 120 entries from 14 breeders in 2008. It is essential that a test of this size be coordinated and information disseminated in a timely fashion.