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Research Category: **VDHR-SPR** **Duration of Award: 1 Year**

Project Title: Breeding Fusarium Head Blight Resistant Spring Wheat.

PROJECT 1 ABSTRACT

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This proposal contains breeding and germplasm screening/pre-breeding activities contained in the former VDUN and HGR research areas, respectively. The objectives of the grant address three of the four new VDHR research priorities.

Objectives:
1) Develop Fusarium head blight resistant wheat germplasm and varieties adapted for commercial production in Minnesota and the surrounding region.
2) Characterize the level of FHB resistance of all wheat varieties grown in the region.
3) Characterize identified sources of FHB resistance in spring wheat by evaluating the types of resistance and by haplotyping with DNA markers linked to resistance QTL
4) Introgress and pyramid novel sources of FHB resistance into adapted spring wheat backgrounds
5) Utilize MAS to increase frequency of FHB QTLs in advanced lines

Crosses will be made between and among FHB resistance sources and regionally adapted germplasm. We plan to screen about 2,700 breeding lines from our program, including about 2,000 F_5 lines, 400 preliminary yield trial lines, 200 advanced yield trial lines and varieties, and 100 other lines with very high levels of FHB resistance. We will also screen the Uniform Regional Scab Nursery in two field nurseries. All of these lines will be tested in at least two inoculated/misted field nurseries in 2009 and more advanced materials in three nurseries.

Approximately 25 named varieties and 10-15 pre-release lines are tested each year for yield performance at 7 Minnesota locations. This information is not only useful to growers for variety selection on their own farm, but also for breeding programs regionally and globally for selection of parents for crossing. About 50 highly resistant lines from the germplasm introgression project will be evaluated in the FHB nurseries in 2009.

We plan to submit ~1,000 F_5 samples for marker assisted selection. Pre-screening any new resistance source (predominantly from the germplasm project currently funded through the former HGR), allows us to avoid materials containing these QTLs and focus our attention on materials containing potentially novel QTL.