HWW- FY14-15 Milestone Matrix

1. Increase acreage planted to varieties exhibiting improved FHB resistance (VDHR).

PIs	Months	Progress	Milestones	Outputs/Linkages
Marais Caffe-Treml Baenziger Bockus/Fritz	24		FHB resistance and DON accumulation tolerance of approx. 50 breeding lines per year evaluated and documented	Release of and increased acreage of FHB resistant varieties. Increase regional production interest in new varieties in comparison to existing resistant varieties, e.g. Everest and Lyman
Marais Caffe-Treml Baenziger Bockus/Fritz Ransom	24		Level of FHB tolerance in lines in the NE, KS, SD, and ND Winter Wheat Variety Trials for FHB and DON determined, and data incorporated into State Variety Trial Reports.	Provide growers with accurate information on all commercial lines in the HWW region so they can select low FHB and DON lines adapted to their farms. Identify promising FHB tolerant experimental lines near release.
Marais Caffe-Treml Baenziger Bai Bockus/Fritz Ransom	24		Produce approx. 1000 DH lines from 10 collectively selected populations which combine indigenous sources of FHB resistance with *Fhb1*. Increase approx. 500 DH lines genotyped to have *Fhb1*.	Produce breeding lines and populations with hard wheat quality and pyramided sources of FHB resistance QTL. **These populations will be shared within the region.**
Marais Caffe-Treml Baenziger Bockus/Fritz Gonzalez Ransom	24		Document and disseminate information on genotype x fungicide performance for FHB resistance.	Publish genotype x fungicide performance information and update ScabSmart database.

2. Increase the efficiency of breeding programs to develop and release new FHB resistant varieties, and **3.** Develop new breeding technologies and germplasm to further enhance short-term and long-term improvement of FHB resistance and to efficiently introgress effective resistance genes into breeding germplasm (VDHR).

PIs	Months	Progress	Milestones	Outputs/Linkages
Marais Caffe-Treml Baenziger Bockus/Fritz Bai	24		Map indigenous FHB resistance QTL in Overland and Lyman. Use MAB to pyramid *Fhb1* and *Fhb3* in adapted Jagger and Overland winter wheat backgrounds.	Release of approx. 10 highly FHB resistant breeding lines for use as parents by regional breeders.
Marais Caffe-Treml Baenziger Bockus/Fritz Dowell	24		Optimize optical and NIR seed sorting technologies to improve selection for quality, FHB resistance, and DON content on small breeder-size samples.	Remove subjectivity from the FDK assay and lessen current resource demand for DON evaluations. Improved, high-throughput selection techniques for FHB resistance.
Marais Caffe-Treml Baenziger Bockus/Fritz Friebe	24		Evaluation of FHB resistance transferred from *Leymus racemosus* , *Elymus tsukushiense , and Dasypyrum villosum* to adapted HWW germplasm. Develop adapted lines with homozygous translocations from each respective species.	Release of FHB resistant germplasm with new sources of resistance from *Leymus, Elymus,* and *Dasypyrum sp*. Release of pre-breeding lines to regional breeders with minimal introduced alien germplasm.
Marais Caffe-Treml Baenziger Bockus/Fritz Gonzalez	24		Pyramid various sources of FHB resistance based on family-based analysis (genotyping and phenotyping, and validate existence of markers for resistance QTL.	Early generation germplasm in regionally adapted winter wheat backgrounds are released for use by breeders. Publication and dissemination of performance of new resistance genes in combination with fungicide treatments.
Marais Caffe-Treml Baenziger Bockus/Fritz Yen	24		Compare regulation of *Fhb1* for between resistant and susceptible genotypes. Identify genetic cofactors responsible for regulation of *Fhb1*, and develop improved markers associated with the regulation of *Fhb1*.	Identification and publication of an improved marker or markers for *Fhb1*. Cloning of *Fhb1* or *Fhb1* regulation co-factors. Validation of improved marker(s) for *Fhb1* and release to breeders for more efficient selection of resistance.