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Project Title: Genetics and Breeding of FHB Resistant Soft White Winter Wheat for the Northeastern U.S.

PROJECT 1 ABSTRACT

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Our long term goal for this project is to develop an elite soft white winter wheat gene pool that has a high level of native non-Asian resistance combined with at least 2 or 3 major QTL for resistance to FHB. This project will coordinate activities with the NUWWSN collaborators to avoid redundancy and build on the complementary information generated by different research programs. Also, we will continue the activities established in previous USWBSI-funded projects and the IFAFS (MASWheat) project, including a FHB marker assisted backcross breeding project for the northeastern US wheat production region.

Objectives:

- 1) Continue evaluation of adapted wheat varieties and elite germplasm for resistance to FHB in the NUWWSN and our Cornell University FHB Advanced Line nursery.
- 2) Pyramid FHB resistance genes by hybridizing elite lines with native FHB resistance to new sources of FHB resistance both Asian and other sources.
- 3) Continue MAS for FHB using elite lines and varieties from Michigan, New York, and Canada as recurrent parents or in forward selection schemes, population enrichment and top-crossing.
- 4) Evaluate methods of single plant selection and mass screening of our main breeding nursery for FHB resistance.
- 5) Phenotype and genotype an RIL population from the cross NY8080 x Caledonia that is believed to be segregating for a novel source of resistance that is complementary to other native sources of resistance.
- 6) Participate in the coordinated sharing of information from the above activities to generate a comprehensive source of information that can be used in forward breeding strategies.

This project is relevant to the goals of the U.S. Wheat and Barley Scab Initiative in that breeding FHB-resistant wheat varieties maximizes the likelihood of success in our effort to minimize the threat of FHB to farmers, millers, bakers and consumers of wheat.