

**Report from the Hard Red Winter Wheat Cooperative
Project (HRWWCP) Planning Meeting**

April 28, 2008
Manhattan, Kansas

The meeting began with introductions a review of the agenda. We then discussed our definitions of success as they relate to stakeholders within the Hard Red Winter Wheat (HRWW) region. Representative of the milling industry want to offer a whole grain product without having to worry about deoxynivalenol (DON). For the growers, success means that scab is no longer an issue for wheat production, and that they can still maintain grain yield and quality.

The milling industry currently follows FDA guidelines of 1 ppm DON in finished food products, but acknowledge that industry is headed toward 0.5 ppm threshold. The industry generally looks for approximately 50% “milling loss” in DON in the transition from grain to flour, but expect no milling loss in whole grain products which are an increasingly important aspect of the finished product market. The milling industry does not like the expense of testing for DON, nor the hassle of grain segregation and blending.

Initial goal for HRWWCP should be to have commercial grain produced with less than 1 ppm DON and flour yield of less than 0.5 ppm. The group acknowledges that this level of management will likely require a combination of genetics and crop management including the use of fungicides. We also note that resistant varieties will only be successful (used by growers) if they have the yield, and quality desired by growers.

The time line for reaching this goal was also discussed. We noted that development of spring wheat varieties may serve as an example. Breeding for scab resistance began in earnest in 1993 following major disease epidemics in ND, SD, and MN. First resistant varieties became available in 2000 with the release of Alsen and Back-up. The trait “FHB1” is now (2008) incorporated into about 50% of newly released spring wheat varieties. After discussion among breeders, the group concluded that we are likely half way through the process relative to the spring wheat breeding experience (basically they have one half the generation time that winter wheat has, hence can get two or more generations per year) . They anticipate that it will take seven more years we will have multiple varieties available with competitive yield and quality traits. The Milling industry was hoping for completion in 3 years, but even in the best case scenario, it would be hard to be successful that soon because it takes 12 years to release a cultivar and the initiative is only 10 years old.

Developing a plan

The group discussed the possibility of increasing the rate of selection by having additional screening locations/environments (historically we have had three, but have recently added a fourth with a limited number of entries). Access to additional screening nurseries would be particularly helpful to our commercial colleagues who have one or rely upon natural infections to determine if a line is FHB tolerant. We also discussed several procedural requirements that will facilitate the compilation of data including standard varieties as checks representing maturity groups and disease susceptibility in all of our nurseries so that we can immediately make comparisons across nurseries from preliminary nurseries in our state to the cooperative multistate nurseries. We also noted the need for a tangible measure in progress of grower adoption for new varieties, and

discussed the use of current varieties as a “base-line” for which all improvements can be made.

Goals for Cooperative effort

- Incorporate additional interactions with disease management research
- Integrate known sources of resistance into elite lines that can be either released or used as parents.
- Mapping resistance genes. Need for additional mapping populations and incorporation into cooperative screening nurseries for these mapping populations.
- Identifying new sources of resistance and making sure the breeders use the best sources early in breeding cycle. Confirm it is new using mapping technology, and inheritance patterns.
- Incorporate alien sources of resistance (durum and wild grasses)

Strategies for Evaluation and Testing

- Timely seed distribution (Sept 1, 15 grams 4 reps for 4 screening locations)
- Further discussion of standardization of screening protocols
- Develop a mechanism to test commercially developed lines so as to speed the quantification of their level of FHB resistance.
- Commitment to integrate new sources of resistance in fall crossing blocks and communication of what parents to use as part of the crossing (Nov 1)
- Communication of varieties to use in integrated management experiments
- Develop mechanism for exchange with other research areas. We will work closely with the management area. For the other research areas, we will develop mechanisms for tracking their progress and create transparent goals for how we wish to work with them (for example, all of our lines will be available to them for use, when a transgene has the same effect as FHB1, we will begin rapidly backcrossing it into our elite lines, etc.)

Developing sub-committees of HRWWCP to follow-up on action items.

- Breeding – S. Baenziger
- Germplasm – B. Friebe
- Screening and testing – B. Bockus
- Technology – F. Dowell
- Management – S. Wegulo

Leaders of sub-committees are to organize a quarterly phone conference

Mark Hughes of the Cereal Disease Lab demonstrated databases for plant breeding effort. Show promise for helping breeders track performance of lines at different locations, as well as provide transparent data to producers.

Meeting closed with discussion of the second year budget and encouragement for the group to reach out to colleagues that may be able to make significant contributions.

Meeting Participants:

Grant Principal Investigators:

P. Stephen Baenziger, NE
Yang Yen, representing SDSU wheat breeding
Joel Ransom, ND
GuiHua Bai, KS
Bikram Gill, KS
Floyd Dowell, KS
Bill Bockus, KS

Stakeholders Group:

Industry Reps

Jay Romsa, General Mills
Virgil Smail, ConAgra
Dave Green, ADM
Brian Walker, Cargill
Greg Hudec, Bayer

Commodity Groups (i.e. Grower Reps)

Aaron Harries, KS
Royce Schaneman, NE
Chet Edinger, SD
Neal Fisher, ND
Barry Morton, NAWG

Co-PIs, key scab workers or key support workers, USWBSI co-chair.

Alan Fritz, KSU
Bob Bowden, USDA-ARS, KS
Erick DeWolf, KSU
Mike Pumphreys, USDA-ARS, KS
Rollie Sears, AgriPro, KS
Stephen N. Wegulo, NE
Elizabeth Maghirang, USDA-ARS, KS
Lili Qi, KSU
Tom Shanower, KSU
Art Brandli, MN