Report of the USWBSI Hard Winter Wheat Coordinated Project Planning Meeting
May 18, 2017
Kansas Wheat Innovation Center
Manhattan, KS

John Rich coordinated the meeting.
Sunish Sehgal recorded the minutes of the meeting.

John Rich: Opened the session at 9.00am with introduction the signup sheet was circulated

Stephen Baenziger: requested to share the travel reimbursement form.

12 PI, co-PI or students attended the meeting (see signup sheet).

Reid Christopherson from South Dakota Wheat Commission shared the status of wheat in South Dakota.

Rich: discussed the concerns about commodity prices, WSMV and reduced acreage across the Midwest.

Status of the USWBSI and hard winter wheat- CP.
Baenziger: gave an update on the status of USWBSI funding. A two-million-dollar increase was approved of which $1 million would be for the research and the other $1 million would be for grants.

Rich: shared an update on the EC meeting in Minneapolis: Rich asked the group how much budget increase should the CP request.

Rich: shared with group the discussions at EC meeting regarding the hiring of a Technical Director at a PhD level for monitoring the funding and increasing the measure of success. A second position Communication Specialist to deal with communication by USWBSI on Facebook, Twitter was also discussed.

Baenziger: suggested to rehire any retired Professor or an industry professional to act as the technical director, Baenziger also suggested to hire somebody on a half time salary for the position.

Christopherson and Baenziger: both suggested outsourcing the communication to a third-party agency.

Rich: discussed the planning meeting schedule and agenda.

Rich distributed the proposal submission guidelines.

Baenziger discussed the timeline. There were no questions on the timelines.

Rich discussed the progress made by HWW-CP in last few years with release several cultivars like Everest.

Baenziger: discussed about Overland and Overland Fhb1.

Sehgal discussed about increased acreage of SDSU HWW varieties Redfield and release of Oahe.

Marshall Klinesmith and Cristiano Lemes da Silva students in Allan Fritz group shared an update on FHB to research at KSU.

Marshall discussed the progress made on mapping FHB QTLs in Everest and Art DH population. Three significant QTLs on chromosome 4B, 4D and 2D were identified.

Cristiano shared progress on Everest and Cedar DH population three consistent QTLs on chromosome 1BL, 3BS and 5AL were identified from this population.

Marshall also shared are updated on development of genomic selection models for improving FHB resistance in winter wheat.

Guihua Bai suggested that FHB resistance in Everest is most likely type-1 resistance and not type-2 resistance.

Baenziger suggested increasing the cooperation among the different members of HWW-CP. A set of 15 lines for better FHB resistance should be identified and shared among the group to serve as for FHB resistance.

Rich asked if we were ready for high throughput phenotyping for FHB. Marshall suggested this is complicated and needs more work on image analysis.

Baenziger suggested FHB was a tough disease to work with however, he proposed if we have good marker data and phenotype data for about 400 lines every year we could use that information to predict 1000-2000 lines from preliminary trials coming in the next year.

Rich asked for suggestions that will improve the projects in the next RFP.

Baenziger suggested that we should

1) Compile a list of crossable parents with good FHB resistance and share among the group.
2) We should request the EC to designate one of the EC member who would work with the CP to determine, define, and measure success.

Sid Perry (Monsanto) and Pravin Gautam (Bayer) the Private Industry representatives requested if the number of lines from Private Industry can be increased.

Steven Wegulo from UNL discussed the inconsistent results coming out of scab nurseries due fluctuating weather conditions and suggested to increase the number of locations.

Francis from NDSU also had the same opinion because Fargo FHB nursery was lost consecutively for last 3 years.

Baenziger suggested increased participation of private Industry in the nursery and addition of a fifth site in Montana.

Baenziger also suggested do incorporate resistance and management of FHB in hybrid wheat.

Rich discussed increased focus on management.

Baenziger suggested a joint meeting between the FHB management CP (MGMT) and HWW-CP for better coordination.

Baenziger further suggested that our group should screen large number of lines for Genotype X Fungicide response whereas management CP (MGMT) should standardized the Fungicide and the application times.

Rich discussed the importance of management in enhancing the resistance in Everest.

Baenziger suggested looking at the performance of CMS lines to scab resistance.

The goal of the HWW-CP should be
a) Integrate Genomic Selection
b) Development of back cross derivatives and pyramiding native resistance with Fhb1.
c) Sharing of the germplasm with other breeding programs.

Bai: asked about how to deal with sharing of early generation crossing material.

Baenziger suggested amendment in the MTA to give specific permissions for…. while keeping the commercial rights. Baenziger insisted that pre-breeding was really an important part of the CP.

Francois requested to share early generations from Bai group whereas Baenziger requested later generations after BC3.

Rich asked Dowell Floyd how could we expand on his research program.

Floyd discussed their SKCS analysis and benchtop version is being used by many breeders for estimating FDK and DON content with decent accuracy.

Floyd discussed expanding to high speed NIR was not possible until the USDA Research Unit was restored (discontinued several years ago). At present, the option would be implementation of on the shelf items.

Baenziger recommended we should have a plan two use available technology and maintain it and if Floyd's group could screen 100 seed from all entries in the four scab nurseries for DON content that could be very help full.

Sehgal advocated the need to increase the number of samples for DON analysis.

Rich suggested use of single kernel analysis to get rid of worst stuff using Floyd's NIR and selected lines should be sent for wet chemistry based DON analysis.

Floyd suggested we can get an estimate on single kernel however bulk samples would be tough to analyze.

Baenziger suggested also suggested to use NIR as a pre-screen.

Sehgal, Francis, and Baenziger insisted on increasing the ability to develop DH lines that would increase the pace of variety development.

Bernd Friebe discussed efforts on discovery of new sources of resistance like Fhb6, which is presently being transferred to Everest, Lyman and Overland.

Baenziger again stressed on importance of pre-breeding and why there is a need to invest in these long-term strategies and in emerging technologies like genomic selection and CRIPR-CAS9.

Bai updated on mapping of FHB QTL in Lyman, however, more data is needed for developing consistent markers. He further discussed pyramiding Fhb1 and Fhb5A presently material is in BC1 Stage. Bai also shared the progress on mapping of 2DL QTL.

Further, Bai also discussed their efforts on cloning Fhb1. Four groups have claimed to clone Fhb1, however Bai said their marker was working well and is available to all breeding programs on request.

Bai also offered to genotype a fixed number of lines from each program to help support genomic selection for FHB resistance.

Baenziger and Sehgal also suggested collaborating with Rob Graff in Canada.

Francois recommended on testing at another site as the Fargo site FHB Nursery was connectively lost for last 3 years.

Private Industry representative Pravin suggested incorporating FHB resistance and management of hybrids in our future strategy and suggested access to DON testing for industry.

Perry also requested to increase the number of lines in Private Industry Nursery.

Break for lunch. 12.15 pm

Tour of Kansas wheat Innovation Center, Heartland Plant Innovation.

After lunch, Wegulo gave an update on WSMV outbreak in Nebraska.

Discussion on hard winter wheat CP RFP was initiated.

Baenziger suggested to add measurable objectives and define success and timelines in the RFP. Baenziger also advocated the need to share with EC what we expect from Management CP.

Following additions were suggested

Objective 1:
a) Sharing of germplasm among the group.
b.) Expanding of a region to include Montana and Idaho
c.) Increased private-sector lines, access to DON analysis and increased DH availability
d.) Screening of samples by NIR.
e.) Include hybrid wheat

Objective 2:

a) HWW-CP will identify genotypes that show response to genotype X fungicide for large number of genotypes and the management CP would evaluate the effectiveness of fungicides in reducing FHB and DON.

   Wegulo suggested the information fungicides would also provide information on other diseases.

   Baenziger proposed our intent is to develop best genetics with best fungicides to reduce FHB infection and DON accumulation.

b) HWW-CP fungicide treatment would be based on management CP recommendations.
c) There is a need to enhance our communication by data availability on T3 and we should provide the content for communication and use available State extension services to inform the Growers. Use Scab smart and radio talks, papers, Twitter and Facebook.
d) Baenziger suggested we expect from management CP to study fungicides on 4-6 varieties for standardization.
e) A map of most concerned locations for scab for each of the states in the region should be developed.
f) Reid Christopherson suggested management CP should be represented by all classes.
g) Baenziger suggested Steven, Pravin and Eric should represent our group in management CP. Bai and Friebe should represent our group in genetic engineering and discovery for better coordination among CPs.
h) Christopherson suggested representation of millers or bakers in our CP.

The session was closed with these discussions.

Meeting was adjourned 2.40 pm.