

Proceedings of the 20th Meeting of Research Advisory Committee



Held on March 04, 2016

**ICAR-Indian Institute of Wheat and Barley Research
Karnal-132001, Haryana**

Proceedings of the 20th RAC Meeting held On March 04, 2016

at ICAR-IIWBR, Karnal

The 20th Research Advisory Committee (RAC) meeting of the ICAR-Indian Institute of Wheat and Barley Research, Karnal was held on March 4, 2016. The following members attended the meeting.

Dr.SK Sharma , Former Director and Vice- Chancellor	Chairman
Dr. IS Solanki , ADG (FFC), ICAR	ICAR Representative
Dr. HS Nainawatee , Former ADG (Education), ICAR, New Delhi	Member
Dr. BN Patil , Former Director, UAS-Dharwad	Member
Dr. GS Mahal , Former Director (Seed), PAU, Ludhiana	Member
Shri Ved Pal Ji , Progressive Farmer, Karnal	Member
Dr. RK Gupta , Director, IIWBR, Karnal	Member
Dr. BS Tyagi , Principal Scientist, IIWBR, Karnal.	Member Secretary

The meeting was also attended by all the Principal Investigators of various programmes and the Scientists of ICAR-IIWBR including the representatives of Regional Station, Flowerdale, Shimla. Dr. JS Sandhu, DDG (Crop Science) also participated in the meeting for a while and provided valuable comments/suggestions.

Dr. BS Tyagi welcomed the Chairman, members and all other participants. Dr. RK Gupta, Director IIWBR presented a comprehensive overview of wheat & barley research in India. He presented the gains made by the country in wheat & barley production during the last 35 years. Dr.SK Sharma, Chairman mentioned that during the coming years climate change, soil health and shrinking resources will be the challenges for wheat research and development in the country. Further he emphasised that data on germplasm characterization and evaluation need to be integrated with the national data base of NBPGR, New Delhi.

Action Taken Report and Confirmation of Minutes: The agenda items were approved by the committee. The Member Secretary Dr. Bhudeva Singh Tyagi presented the action taken report to address the recommendations made by 19th

RAC. Dr SK Sharma, Chairman said that the recommendations made by RAC should remain actionable during the coming years until the purpose of the recommendations is met. The same was discussed and approved (Annexure-I).

Dr. JS Sandhu DDG (Crop Science), ICAR who also joined the meeting for a brief period, advised to work in a synergetic manner to make IIWBR a national institute of excellence. He pointed out that rusts, KB, heat stress, doubled haploid technique, hybrid wheat and varieties suiting to zero-tillage are some priority areas for IIWBR. He emphasised that the Institute must deliberate on the requirement of infrastructure, human resource development and plan of action to make IIWBR an institute of excellence.

Dr. IS Solanki suggested to work on RCTs / CA technologies in wheat and barley. He opined that more research efforts for lodging tolerance and physiological parameters (lignin) through genetic improvement and crop management practices be taken on priority. He also advised to generate materials through pre-breeding and distribute to co-operating centres.

Dr. Nainawatee suggested to be prepared to use the wheat genome sequencing information likely to be available by 2017, for the improvement of Indian wheats. He advised to generate information on the area occupied by different improved wheat & barley varieties developed by the IIWBR and initiate more efforts on human health related benefits of barley. He was of opinion that the Biofortification should be inbuilt in varieties instead nutrient supplementation for mitigating hidden hunger.

Dr. BN Patil stressed upon the nutrient and water use efficient strategies and need for farmer participatory research on these aspects. He suggested that awareness should be created on seed replacement and front line demonstrations should be comprehensive involving best crop management practices. He felt satisfaction on the experiments involving CA at IIWBR.

Dr. GS Mahal said that in view of rising temperature in October/November and during crop maturity, varieties which can mature 10 days earlier like PBW 550 are required for the timely sown conditions. He also advised to breed resistant varieties for biotic stresses especially yellow rust and KB.

Sh. Ved Pal advised that more efforts should be made to take the research outputs to the benefit of farmers. He pointed out that the new generation is leaving the agriculture profession and, therefore, technologies should be developed to make it more lucrative. There should be a 24 hr advisory service to farmers. He was apprised that under **Mera Gaon Mera Gaurav** programme such efforts have already been initiated.

Presentations by IIWBR Scientists:

The in-house projects of the institute were formulated during 2010 and completed in 2015 and hence the RPP-III was presented for these projects. At the same time new projects were formulated and the RPP-I of these projects was presented and discussed. After the observations/comments of RAC, project wise presentations were made by Dr. Vinod Tiwari (Crop Improvement), Dr. M S Saharan (Crop Protection), Dr. SC Bhardwaj (Regional Station, Shimla), Dr. RK Sharma (Resource Management), Dr. RK Gupta (Quality & Basic Sciences), Dr. AS Kharub (Barley Improvement) and Dr. Satyavir Singh (Social Sciences) on the achievements and future research programmes. They were also supported by other scientists in respective sections. After the presentations, observations/concluding remarks were made by the chairman and the members. The RAC along with the scientists visited the ongoing experiments in fields and laboratories.

A. Specific Recommendations









- 1. The development of climate smart genotypes and technologies is to be strengthened*
- 2. Germplasm resources are required to be identified for initiating work on varietal development for conservation agriculture,*
- 3. Hybrid wheat program based on CMS to be rejuvenated.*
- 4. Biofortification should be inbuilt in varieties instead of nutrient supplementation and work on food nutrients in wheat and barley be initiated,*
- 5. The access to the data to and from NBPGR of germplasm characterization and evaluation be easily and quickly accessible particularly for the biotic stress.*

6. Modules for inter-cropping and precision water management be developed under changing climate conditions,
7. Steps should be taken so that advisories reach the farmers in more effective and quicker way.

B. General Recommendations as advisories:

1. The research projects should be short term and long term outcome oriented.
2. For IIWBR to become a National Institute of Excellence, there is a need to deliberate on the development of infrastructure and human resource development and the actionable points so that the justified requirements are included in the ensuing plan of the Council.
3. NBA should be approached for designating rust pathotypes collection of RS, Shimla as national repository.
4. The scientific positions in the disciplines Food Science and Technology are required to be created in next plan to start/strengthen work on barley/wheat based novel health foods.

The meeting ended with the vote of thanks to the RAC members and staff of IIWBR by the Member Secretary Dr. BS Tyagi.

 Bhudeva Singh Tyagi Member Secretary	 HS Nainawatee Member	 BN Patil Member
(Could not attend) Ashutosh Sarker Member	 GS Mahal Member	 (IS Solanki) Member
 Ch. Ved Pal Member	 RK Gupta Member (Director)	 S K Sharma Chairman

Annexure-I

Action Taken Report of the 19th RAC Meeting

On the basis of the presentations, interventions and deliberations of the meeting, the following recommendations were made during the RAC meeting:

SN	Recommendations	Action Taken
Crop Improvement		
1.	Pre-breeding activity should be continued and further strengthened with double haploid production and embryo rescue technique. Focussed research on water logging, saline and alkaline tolerant wheat varieties may be initiated and if required wild relatives and primitive land races should be used in the breeding programme.	<ul style="list-style-type: none"> • Pre-breeding has been strengthened with embryo rescue technique. Further, an EFC Flagship project on Pre-breeding in wheat has also been initiated in the present plan with four network centres. Wild, progenitor species and synthetics of wheat are being screened and hybridized for introgression of biotic, abiotic and grain quality features. • Experiments for evaluating water logging, saline and alkaline tolerant wheat genotypes have been planted in this season also.
2.	Varietal development for conservation agriculture needs to be looked into. The appropriate genotypes be evaluated under CA in field to address this issue.	Wheat varietal development under CA technologies with emphasis to rice-wheat cropping system has been planned for NWPZ.
Crop Protection		
3.	Sequencing of rust pathotypes for mining of SSR markers for strain typing, genetic diversity, race identification, acquisition of virulence etc. should be started as a long term strategy.	The work on molecular aspects of rust pathotypes has been initiated. SSRs have been synthesized and used for DNA fingerprinting of wheat rusts pathotypes.
4.	Work on nematodes and root aphids need to be strengthened. Also studies on storage insects be taken care of alongwith the residual analysis in the grains as chemical treatment in grains is injurious to health.	Post of Nematologist is vacant at IIWBR, Karnal since 2011 and the efforts are under way to get it filled. Work on nematological aspects is being taken by co-operating centres at Ludhiana, Hisar, Durgapura, Delhi and Pusa under AICW&BIP. Research work on root aphids has been initiated under the Flagship project on biotic stresses. Work on storage grain pests (Insecticidal treatment on viability of grain under ambient conditions) has been initiated at Durgapura, Pantnagar, Karnal and Ludhiana under AICW&BIP.
Resource Management		
5.	Screening varieties for conservation agriculture may be initiated and strengthening of integrated weed management programme is necessity.	The multi-location experiment on screening varieties for conservation agriculture has been initiated and the work on integrated weed management programme is already in progress.

Quality Improvement		
6.	Work on Celiac disease needs to be initiated and strengthened as the gluten allergy cases are increasing. Simultaneously the Bio-availability of micro nutrients to be studied.	Keeping in view the importance of gluten sensitivity, a new project has been initiated on celiac disease funded by DBT. One project on CRP on Biofortification has been approved by ICAR and enhancing bioavailability of Fe and Zn is an important aspect under the project. NIN Hyderabad will conduct bioavailability studies on wheat grain samples provided by ICAR-IIWBR, Karnal.
Barley Network		
7.	Work on barley quality improvement needs to integrate with molecular tools. While the work on barley amylose, phytic acid needs to be initiated in addition to beta-glucans.	<ul style="list-style-type: none"> • New project has been started to improve existing popular cultivars for low beta glucan and high protein content using marker assisted breeding approach and work on amylose, phytic acid, beta glucan and arabinoxylans on biochemical/ molecular basis. • Available markers for barley quality traits like protein, amylose and beta glucan content have been confirmed in germplasm/RIL population and can be used for MAS.
Social Sciences		
8.	Collaboration with SAUs, KVVKs, NGOs and DoA in all extension programmes must be in place to demonstrate mechanisation technologies particularly the use of small machines at farmer's field.	Wheat and Barley FLDs are allotted to different centers including SAUs, KVVKs and NGOs (KVVKs) and are conducted with the involvement of State Department of Agriculture. Under 'Mera Gaon Mera Gaurav' scheme, Agriculture Awareness Programmes were organized in respective adopted villages by different teams of scientists in collaboration with the State Department of Agriculture.
General Recommendations as advisories		
9.	Mapping populations such as MAGIC & RILs should be developed continuously for traits of interest.	More than 12 RIL populations for different traits are available at IIWBR (02 durums + 10 bread wheat) while work on developing magic populations has been started during this season.
10.	The phenotyping of the parents and the mapping/breeding populations is to be done very precisely both for quality and quantitative characters.	The phenotyping facility has been developed at IIWBR. The rain-out shelter and temperature controlled facilities besides poly house have developed for precision phenotyping. Seed planting methodology has also been developed.
11.	The physiological traits relating to drought and heat tolerance are required to be studied.	Physiological traits like stomatal opening, vascular bundles, wax on plants, CTD, fluorescence, chlorophyll content etc have identified as important ones. New project under NICRA has been initiated.

12.	Synergy/ linkage is required between breeders and biotechnologists so that conventional breeding and marker assisted selection/ breeding become complementary.	New projects have been started this year and this point has been taken up. The breeders and biotechnologists both have been associated in projects where ever desired.
13.	Registration of genetic stocks, new and extant varieties should be a continuous process. The efforts may also be made to register the farmers' varieties under PPVFRA. Application should be put up to the National Biodiversity Authority for recognising the IIBR Regional Station, Shimla as designated repository for rust Bio-resource. Efforts should be made for managing Karnal Bunt in disease prone areas for wheat export.	Till now the registration was being done for extant varieties only but now this has become a mandatory activity to breeders of a variety. Shimla centre is discussing this matter and as per suggestions of RAC members, Dr. SC Bhardwaj has been asked to expedite the process. Work on KB is going on and this year four genetic stock for KB tolerance have been submitted for registration at NBPGR, New Delhi.
14.	Linkages should be explored with the ICAR institutes for IPM and bio-control of insects. The friendly insects / pest should be identified and laboratory rearing techniques be developed so that the population of these be increased to a threshold level.	The pathology scientists have been requested to take necessary action on this recommendation.
15.	Biosensors and bioinformatics can be integrated in wheat improvement and natural resource management programme.	Biosensors like NDVI, soil thermometers, moisture meters are being calibrated for precision input management in wheat improvement and natural resource management programmes.
16.	Integration of molecular markers for quality needs to be further strengthened.	Use of molecular markers has become integral part in wheat quality improvement. One project on improvement of biscuit making quality of wheat using molecular marker approach has been approved by DBT and the work is in progress.
17.	Cost of cultivation of Barley needs to be calculated and brought to the knowledge of farming community and price and cost commission also.	Cost of cultivation of Barley was calculated for FLDs and was published in the Progress Report of Social Sciences 2014-15 and was presented in the Annual Wheat and Barley Research Workers' Meet 2014-15 for the benefit and knowledge of different stakeholders. Commission for Agricultural Costs and Prices (CACP) is already aware of Cost of Cultivation of Barley published by the Directorate of Economics & Statistics, Gol through which it calculates and recommends the Minimum Support Price (MSP) for every crop season to the Government.

