

ICAR-Indian Institute of Wheat and Barley Research

Proceedings of the 23rd Meeting of Research Advisory Committee



Held on November 12, 2018

At

ICAR-IIWBR, Karnal-132001, Haryana

Proceedings of the 23rd RAC Meeting held on November 12, 2018 at ICAR-IIWBR, Karnal

The 23rd Research Advisory Committee (RAC) meeting was held at the ICAR-Indian Institute of Wheat and Barley Research, Karnal on 12th November, 2018. The following members attended the meeting:

Dr. HS Gupta, Former Director, IARI & DG, BISA	Chairman
Prof. RM Singh	Member
Dr. BS Mohapatra	Member
Dr. VC Sinha	Member
Dr. SM Bhatnagar	Member
Dr. GP Singh, Director, ICAR-IIWBR, Karnal	Member
Dr. Bhudeva S Tyagi, Principal Scientist, IIWBR, Karnal	Member Secretary

The meeting was also attended by all the Zonal Coordinators, Principal Investigators of various programmes and the Scientists of ICAR-IIWBR, Karnal including the representatives of its Regional Station, Flowerdale, Shimla.

Dr. BS Tyagi welcomed the Chairman, members, zonal coordinators and all other participants. Dr. HS Gupta in his opening remarks congratulated all the wheat workers of India for record production of more than 99 million tons and exhorted them to gear up for meeting the target of 140 million tons by 2050. He stressed upon that the major challenges ahead are depleting natural resources, climate change, additional energy requirements, and increasing nutrient use efficiency. He also emphasized on making wheat more nutritive in terms of beta-carotene, protein, Zinc and Iron.

Professor RM Singh in his remarks highlighted the problem of increasing temperature and need to develop genotypes with better heat tolerance at early growth phase and at anthesis. He also congratulated the IIWBR scientists for developing two new varieties DBW 187 and WB 2. Dr. BS Mahapatra suggested that research efforts should be strengthened on water and nutrient management alongwith sustainability of soil health with special reference to NEPZ. Dr. VC Sinha complimented the scientists for successfully managing wheat diseases. He stressed on development of in built host resistance genotypes in wheat and barley crops. Dr. SM Bhatnagar highlighted biofortification of Barley is an important area of work and suggested that enhancement of MSP of barley would help in increase barley area

Dr. BS Tyagi presented the action taken report of the recommendations made during the 22nd RAC meeting. The Chairman and members complimented that action on all the points has been taken up appropriately.

Dr. GP Singh, Director ICAR-IIWBR, presented a comprehensive overview of wheat and barley research in India during the year. He informed the house that this year India has registered a record wheat production of more than 99 million tons as per fourth advanced estimates and there has been no major outbreak of any disease during the year. He informed the house that extensive survey and surveillance on blast like disease is being undertaken regularly

and all efforts are being done to prepare India from this potential threat. This was followed by an interactive discussion with zonal coordinators regarding the problems and constraints prevailing in different wheat growing zones and the possible solutions. The discussion with zonal coordinators was taken up for identifying the regional issues. An urgent need was felt to train the technical / scientific staff of different voluntary and funded centers in the zone so that the quality of trial conduction and data reporting is improved. The issue of increasing fund per trial was also raised and it was agreed upon that depending upon allocation of budget from ICAR, the money may be increased. There were other issues of straw burning, blast like diseases and need of short duration varieties in east and Far East regions which were discussed in length.

The chairman was of opinion that denotification of old varieties be taken up yearly and the Director, IIWBR should pursue the case. The house suggested that the direct supply of wheat international nurseries / trials from CIMMYT or ICARDA be stopped and the material should be routed through IIWBR only.

The Division wise presentations were made by Dr. Ravish Chatrath (Crop Improvement), Dr. RK Sharma (Resource Management), Dr. DP Singh (Crop Protection), Dr. SC Bhardwaj (Regional Station, Shimla), Dr. Sewa Ram (Quality & Basic Sciences), Dr. AS Kharub (Barley Improvement) and Dr. Satyavir Singh (Social Sciences) on the achievements made in the research and the future research programmes.

The PI Crop Improvement was suggested that the genotypes showing promise at IIWBR should be sent to IARI for precise phenotyping. The committee members advised Dr. Sewa Ram, PI Quality and Basic Sciences, to work out economics of spraying Zn, & Fe to increase Zn as well as Fe content in wheat grains. They also suggested repeating the experiment in the ensuing season with greater sincerity

Chairman & members RAC congratulated the Director and all staffs for the achievements made by the institute during the years. After a day-long exhaustive deliberation, following recommendations were given by the RAC:

1. There is a need to evolve strategies to increase the organic content of soil, preferably through green manuring.
2. Demonstration on diversification in rice-wheat system involving green gram should be arranged in nearby area by RM division.
3. The experiment on ZnSO₄ spray to increase Zn content in wheat grain may be conducted at Indore and Dharwad also to confirm the results obtained at Karnal and Ludhiana.
4. ICAR-CIAE may be approached for improvement in rotary disc seed drill for use in conservation agriculture practices or some Pvt company be involved to speed up the work.
5. More accessions of *Triticum boeoticum* may be taken up for physiological / biochemical studies to confirm the C 4 nature.

6. The hybrid wheat programme may be monitored intensively for the next three years and depending upon the progress it should be decided whether it needs to be continued or be discontinued.
7. One day training for the newly recruited/deployed scientists/technicians of cooperating centres in different zones may be organized in order to get the quality trial conduction and data recording.
8. In case of evaluation of molecular marker assisted breeding trials, the best check of the region/zone should also be taken alongwith the recipient/ donor parent for yield comparison.
9. The exotic varieties having susceptibility to disease may not be allowed to be imported as this may result in epidemic like situation in the future.

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



(BS Tyagi)
Member Secretary



(HS Gupta)
Chairman

**Action Taken Report of the 22nd Meeting of
Research Advisory Committee**

Action Taken on Specific Recommendations		
SN	Recommendations	Action
1	Core/mini-core collection of genetic resources of wheat should be developed by 2019-20, so that they are made available to researchers/ collaborators in the country for use in breeding program.	The core collection from NBPGR (1479 lines) along with IIWBR selected core (114 lines), were evaluated as per DUS testing guidelines in a standardized uniform pattern. Work on 38 agro-morphological traits has been completed, while observations on quality traits are going on. After completing the observations, a core collection will be developed using software power core.
2	Pre-breeding should be strengthened and winter × spring hybridization program can be a part of this activity from Feb. 2018 onwards.	The winter X spring hybridization program has been merged with NWPZ program. And the Scientist will carry the advance material in that project. The promising lines emanating from this program have been included in PYT for NWPZ during this crop season.
3	Development of varieties for restricted irrigation should be given priority to reduce the adverse effects of climate change and water shortage.	<ul style="list-style-type: none"> ❖ Emphasis is being given on the development of wheat varieties possessing ability to produce more under less water. This year, common PYT under restricted irrigation condition was proposed. This trial will consist of genotypes developed in different wheat breeding programs at the institute. ❖ At IIWBR, one Station Trial under restricted irrigation condition has also been constituted and is being conducted for promotion of genotypes to coordinated trials under RI. ❖ During 2018-19, restricted irrigation (RI) trials have been proposed at many locations in all the five wheat growing zones: viz NWPZ, NEPZ, CZ, PZ & NHZ.
4	Innovative / novel breeding strategies especially hybrid wheat, MAS and other emerging technologies should be strengthened and pursued vigorously to obtain quantum jump in wheat yield.	<p>Hybrid wheat</p> <ul style="list-style-type: none"> ❖ CMS based hybrid wheat development programme is being pursued as a part of CRP-Hybrid technology. During the previous crop season, a total of 36 hybrid combinations were evaluated at HSR of which 9 showed heterosis over HD 3086 (FSR). During 2018-19, ten hybrid combinations will be in Common hybrid trial for timely sown and late sown conditions each. ❖ Marker Assisted Selection has been initiated in the institute using major genes and already validated QTLs for various biotic and abiotic traits ❖ Three resistance genes viz., <i>Lr32</i> for leaf, <i>Yr15</i> for stripe and <i>Sr26</i> for stem rust resistance were selected for introgression. <i>Lr32</i> is being incorporated in DBW 88, DBW 107 and DBW 110. <i>Yr15</i> in DBW 88 & DBW107 and <i>Sr26</i> in DBW110. ❖ A QTL (<i>QSb.iiwbr-7B</i>) from the spot blotch resistant donor parent BH 1146 is being incorporated to improve spot blotch resistant in high yielding cultivar i.e. HD 2967. <p>Marker Assisted Selection (MAS) to enhance tolerance to drought</p>

		stress is being carried out using major and validated QTLs (>20% PV) for high grain yield under drought stress in varieties WB 2, HD 3086, Raj 4120 and DBW 39.
5	R&D efforts on diversification of rice-wheat system (by including suitable crops especially legumes and green manure) should be strengthened to make the wheat-rice system sustainable. This will help in containing the problem of straw burning also.	<ul style="list-style-type: none"> ❖ At ICAR-IIWBR, Karnal, the efforts are being made to intensify the rice-wheat system by inclusion of a legume crop in between rice and wheat sequence. Adoption of legume crops in between rice and wheat crops has been found to improve physical health of soil as well as 25% saving of N application in rice crop. ❖ Various experiment conducted at IIWBR, showed that the rice-wheat- green gram, rice-wheat-cowpea and rice-vegetable pea-wheat crop sequence resulted in higher wheat equivalent yield and more profitability than rice-wheat system alone. An experiment on maize +legume intercropping is also being conducted to diversify rice-wheat system.
6	Efforts on finding out solutions for successful management of <i>Phalaris minor</i> should be accelerated in collaboration with Directorate of Weed Research, Jabalpur and solution be found within a time frame.	<ul style="list-style-type: none"> ❖ The new herbicides namely Flumioxazin, Pyroxasulfone and Flufenacet having different mechanism of action have been identified for control of multiple herbicide resistant <i>Phalaris minor</i> (resistant to isoproturon, clodinafop and sulfosulfuron). The Flumioxazin will be available in the market during this crop season 2018-19 and the rest two are in the process of registration. In addition, studies are in progress on integrated weed management practices including herbicides, tillage and residue management options. ❖ During the first fortnight of September, awed scientist visited the DWR, Jabalpur and held discussions on the options for management of <i>Phalaris minor</i>. The scientists working at the DWR, Jabalpur were also of the view that the Pyroxasulfone is effective in controlling herbicide resistant <i>Phalaris minor</i>.
7	Concerted efforts should be made by the institute to identify wheat blast-like disease along Indo-Bangladesh border. As this disease is knocking at our door, the surveillance and management of this disease should be pursued vigorously.	<ul style="list-style-type: none"> ❖ During 2017-18, a set of 100 wheat genotypes was screened against wheat blast in Bangladesh. Based on the data, three genotypes BRW 3806, HD 3249 and DBW 252 showing high resistance, were promoted to the final year of testing in coordinated trials. ❖ This year again, 353 wheat genotypes comprising of checks and test entries of AVTs & NIVTs (2018-19) are being sent for screening against wheat blast in Bangladesh and Bolivia. This set also includes the promising lines identified last year. ❖ The wheat blast like disease (WBLD) was monitored vigorously by undertaking mobile surveys during crop season and also during off season by teams of scientists of IIWBR, IARI, BCKV and UBKV. ❖ A total of 13 such surveys were conducted all along Indo-Bangladesh borders. In addition, eight trap plot nurseries were planted near borders in West Bengal. ❖ Trainings on identification of diseases were conducted for farmers, seed growers and even BSF personnel. The samples

		<p>were analysed at BCKV Kalyani.</p> <ul style="list-style-type: none"> ❖ Adhoc IPM was developed and chemicals were screened in field conditions against WBLD.
8	<p>Transfer of technology with special reference to front line demonstration should be strengthened to increase the productivity in north eastern plains zone as about 6-7 million tonnes of extra wheat may come from this zone.</p>	<p>To provide foster breeder right at Sabour, Ranchi, Pusa and Dholi centers, the ICAR-IIWBR, Karnal is providing the nucleus and breeder seed for spread of new wheat varieties. In addition to this, we are conducting FLDs in aspirational and other districts of eastern India (Eastern UP, Bihar, Jharkhand, West Bengal and Assam) for transfer of wheat production technology.</p>
General Suggestions and Advisories		
9	<p>IIWBR's co-operators in eastern region had been very effective in the past especially in developing new varieties. This needs to be rejuvenated, to help attaining next green revolution. Some of the strategic centres viz. Pant Nagar, Cooch Behar, Kanpur, Kalyani and Varanasi need to contribute significantly in wheat research program.</p>	<ul style="list-style-type: none"> ❖ The progress and contributions made by these centres are regularly reviewed and monitored in workshop. ❖ Allocation of higher quota in different NIVTs is allotted to increase contributions and promotions. ❖ Budget allocation and deployment of scientific staff has been reviewed and needful support is ensured to promote wheat research activities. ❖ Ready to use breeding material is shared with most of these centres through shuttle breeding. ❖ Special set of yield trial is constituted and sent to centres in eastern India to support location specific selections and contributions.
10	<p>RAC noted that a private company has imported malt barley lines which were found susceptible to rust in north western plain zone and now again these lines are being tested in central zone, such susceptible material may be avoided (to test) in other zone/s.</p>	<p>ICAR-IIWBR gave the comments at EXIM committee meeting that the susceptible material should not be imported and the matter was discussed with DDG (CS) and ADG (Seeds). It was informed that most of the exotic material tested under AICRP was susceptible to rusts. IIWBR has developed better yielding and short duration varieties suiting for malting purposes.</p>

