

ICAR-Indian Institute of Wheat and Barley Research

Proceedings of the 24th Meeting of Research Advisory Committee



Held on October 10-11, 2019

At

ICAR-IIWBR, Karnal-132001, Haryana

Proceedings of the 24th RAC Meeting held during October 10-11, 2019 at ICAR-IIWBR, Karnal

The 24th Research Advisory Committee (RAC) meeting was held at the ICAR-Indian Institute of Wheat and Barley Research, Karnal on 10th and 11th October, 2019. The following members of RAC committee attended the meeting:

Dr. HS Gupta, Former Director, IARI & Director General, BISA	Chairman
Dr. BS Mahapatra, Professor Agronomy, GBPUA&T, Pantnagar, and Former Director CRIJAF	Member
Dr. VC Sinha, Ex-Principal Scientist, IARI, New Delhi	Member
Dr. SM Bhatnagar, Former Head, RARS, Durgapura, Rajasthan	Member
Dr. GP Singh, Director, ICAR-IIWBR, Karnal	Member
Dr. Bhudeva Singh Tyagi, Principal Scientist, ICAR-IIWBR, Karnal	Member Secretary

The meeting was also attended by the Principal Investigators of various disciplines, Zonal Coordinators and the Scientists of ICAR-IIWBR, Karnal including the representatives of its Regional Station, Flowerdale, Shimla and Hisar. Dr. BS Tyagi welcomed the Chairman, members, zonal coordinators and all other participants.

Dr. HS Gupta in his opening remarks complimented the scientists, farmers and policy makers for attaining the target of wheat production of 100 million tons by the year 2020 a year ahead. The country recorded production of more than 102 million ton wheat during the year 2018-19 with an average productivity of 3.5 t/ha. He, however, cautioned that scientists should not be complacent as there are tougher challenges in terms of declining factor productivity and natural resources along with climate change. He advised the scientists to work tirelessly on reducing the adverse effects of abiotic and biotic stresses including wheat blast like disease and fall army worm. He also exhorted the scientists not to lose sight of basic, strategic, anticipatory and applied research keeping in mind the requirement of wheat in the country in the year 2030 and 2050.

Dr. BS Mahapatra in his remarks suggested to pay special attention to eastern region of the country to tap its full potential. He further advised that greater attention needs to be given on natural resource management and balanced application of chemical fertilizers in combination with organic manures. Dr. VC Sinha complimented the scientists for managing the biotic stresses successfully and advised to be ready for the new challenge in the form of blast like disease. Dr. Sinha complimented the scientists for their efforts in containing the rusts and informed the house that there has been no epiphytotic in wheat during the last 40 years. Dr. SM Bhatnagar expressed his concern about declining trend in the area of barley. He suggested that Vice Chancellor's of concerned Universities may be asked not to shift barley centres/personnel without valid reasons.

Dr. BS Tyagi presented action taken report of the recommendations made during the 23rd RAC meeting. The Chairman and members complimented that the action has been taken on all the points in letter and spirit.

Dr. GP Singh, Director, ICAR-IIWBR, presented a comprehensive overview of wheat and barley research of the institute and AICW&BIP during the previous year. He also informed that a total 17 varieties of wheat and that two of barley have been identified in the AICW&BIP workshop held at Indore during the month of August. Besides the varieties, a number of wheat & barley genetic stocks have been registered with NBPGR. He assured the Chairman and members that research program of the institute will continue to accord equal priorities to basic, strategic, anticipatory and applied research. He also informed the RAC about signing of more than 150 MOUs for seed production of the newly released variety DBW 187 (Karan Vandana) and the institute has generated resources of around one crore rupees from this.

The chair showed his concern about the declining standard of performance of some of the AICRP centers located in north India. He advised Director to activate these centers. The chairman was of opinion that the IIWBR should bring out a status paper depicting genetic gain in wheat after 1980 or so. This was followed by an interactive discussion with zonal coordinators regarding the problems and constraints in different wheat growing zones and the possible solutions. Dr. Laxmikant zonal coordinator of NHZ opined that the contingencies to centers conducting trials be increased. He also suggested training to newly joined wheat scientists.

The Division-wise presentations were made by Dr. Gyanendra Singh (Crop Improvement), Dr. RK Sharma (Resource Management), Dr. Sudhir Kumar (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 on October 10 & 11, 2019.

RAC opined that the current research work must have practical relevance for solving the existing and future problems. It was pointed out by the PI (Resource management) that Maize-Wheat system is more profitable under conservation agriculture. The chairman suggested that results of Rice-Wheat and Maize-Wheat systems be compared critically and the results be published for its dissemination among researchers of the country. It was opined by the RAC members that IIWBR should approach editors of *Kheti* or Indian Farming for bringing out a special issue of these periodicals on wheat and Barley covering all the aspect of these two crops. Dr. HS Gupta also suggested to compare the carotenoid content of coloured wheat with that of the normal wheat varieties like HD 2967, HD 3086, DBW 187 and DBW 222. In addition, a detailed analysis on productivity and profitability of coloured wheat with that of one or two of the latest varieties of normal wheat should be done and published to avoid confusion about its scope on large scale adoption as nutri-rich wheat variety for *chapatti*/bread. It was also decided that hull-less barley be projected as a nutri-cereal and be presented as an alternative to finger millet- a popular cereal but having a constraint of short shelf life.

After presentations of all the Principal investigators the following recommendations were made by the RAC:

1. Annual genetic gain in wheat productivity (in India) should be worked out and a strategy be developed for increasing the same.

2. Research work on biotechnology with emphasis on CRISPER-based genome editing and speed breeding be strengthened.
3. Fertilizer based biofortification is a faster way to increase the grain quality. Therefore, research work on fert-fortification of Fe and Zn through foliar spray should be undertaken and correlation between Fe/Zn & protein content should be studied in detail.
4. Soil health has remained neglected for a long time and therefore nutrient balance in the soil should be worked out. Also get microbial consortia from IARI, New Delhi and establish a compost unit at IIWBR, Karnal.
5. Research work on dual purpose wheat (for fodder & grain) may be started from next year in the hills.
6. Yield maximizing trials should be conducted in all the zones.
7. New genes for all the three rusts be identified and pursued relentlessly to continue to checkmate rust in India.
8. Promote malt-specific varieties of barley and the hull less barley (varieties) as nutri-cereals to increase the profitability of barley cultivation.
9. Strengthen research work on reducing adverse effects of climate change on wheat production and productivity in the country.
10. Research on molecular biology of herbicide tolerance (in wheat) needs to be revisited as private sector has invested huge resources in this area and IIBR should be clear about the objective of such study.
11. Efforts on reducing 'Adoption Lag' in wheat varieties should be intensified.
12. Demonstration of 'Rotary Disc Seeder' should be organized at large scale in farmer's fields in and around Karnal right from this crop season.
13. IIWBR should pursue with ICAR HQ to bring out a special issue of *Kheti* or Indian Farming to commemorate the achievement of the goal of 100 million tons of wheat a year before the target 2020.

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



(BS Tyagi)
Member Secretary



(HS Gupta)
Chairman

Action Taken Report of 23rd RAC Meeting- 2019 (held on November 12, 2018)

SN	Recommendation	Action Taken
1.	There is a need to evolve strategies to increase the organic carbon, content of soil preferably through green manuring.	The recommendation of growing <i>sesbania</i> as a green manure crop to improve the soil health has been extended and RM division has a long term trials. In addition, promising results on incorporating crop residue under CA also helps to improving soil organic carbon.
2.	Demonstration on diversification in rice-wheat system involving green gram should be arranged in nearby area by RM division.	The demonstrations on green gram were arranged and conducted at farmers' field in village Sagga and Koel under rice-wheat system. Long term experiment conducted at ICAR-IIWBR , Karnal revealed that system productivity in terms of wheat equivalent yield and production efficiency increased 37.85 and 8.38 %, respectively with rice-wheat-green gram cultivation as compared to rice-wheat cropping system. The increase in system productivity by introduction of green gram has been shown in Figure 1 below.
3.	The experiment on ZnSO ₄ 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.	Agronomic Biofortification experiments conducted at UAS, Dharwad demonstrated significant increase in both Fe and Zn content by both soil and foliar (0.5%) application of ZnSo ₄ 7H ₂ O and FeSO ₄ 7H ₂ O in wheat. Similarly the experiment conducted at IARI-RS Indore by the application of both Fe (1.0%) and Zn (0.50%) showed improvement in both yield and micro nutrient content.
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.	ICAR-CIAE was approached many times during previous years but there was no reply. Recently, the machine has been improved in collaboration with M/s Beri Udyog Limited, Karnal and the initial testing was convincing. The large scale testing is proposed in the ensuing wheat season.
5.	More accessions of <i>Triticum boeiticum</i> may be taken up for physiological / biochemical studies to confirm the C 4 nature.	The anatomical studies on five lines of <i>T. boeiticum</i> showed presence of C ₃ pathway. The chloroplasts were found only in mesophyll cells and not in bundle sheath cells in all studied lines. The carbon dioxide compensation point studies for different species also indicated that <i>T. boeiticum</i> has C ₃ pathway of photosynthesis and not the C ₄ .
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.	The hybrid work is being monitored by the Director. The work under hybrid wheat is being carried under CRP project and the hybrids are being evaluated in NWPZ. It has also been planned to extend evaluation in marginal areas of CZ/PZ. Based on the results of trials, a decision will be taken about its continuance.

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.	Organized 2 days hands-on training in quality seed production and marketing during April 6-7, Training program on “Scaling up breeding and agronomic management for increasing wheat productivity” was conducted during Oct.11-13, 2018. Two farmers’ awareness programs on adoption of new technologies were also arranged at Karnal.
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	The following checks have been included: PBW 840 for Lr and Yr genes (NWPZ) PBW 550 as marker check All the check varieties of NWPZ
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 higher officials at ICAR level (Director General and DDG, CS) have been apprised of possible threats to Indian barley and wheat crop by sowing of exotic susceptible varieties. As a consequence, this year the company has not approached us for testing of such material.

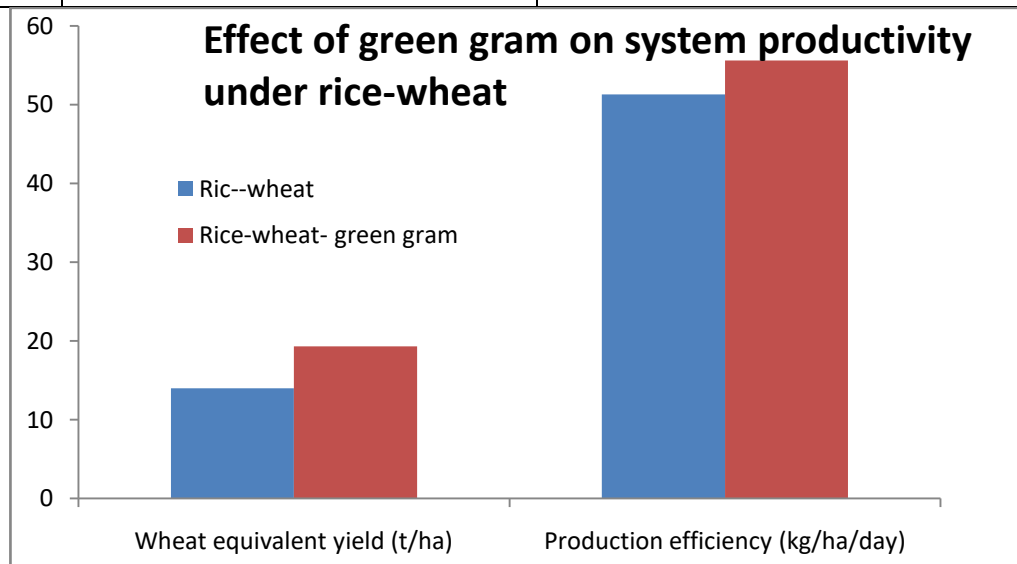


Fig 1: Increase in system productivity by introduction of green gram

