

# INDIAN COUNCIL OF AGRICULTURAL RESEARCH

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## Subject: RAC Recommendations for ICAR-IARI, New Delhi- reg.

The RAC meeting of ICAR-IARI was held on **December 12–13, 2019** under the Chairmanship of Prof. V. L. Chopra, Former Member Planning Commission, Govt. of India and Former Secretary, DARE and DG ICAR at Dr. M.S. Swaminathan Library Conference Hall. The meeting was attended by other members of RAC viz., Dr. A.K. Sikka, Former DDG (NRM), ICAR, New Delhi and currently Representative-India and Principal Researcher, IWMI; Dr. J.P. Tandon, Former Project Director, Directorate of Wheat and Barley Research, Karnal; Dr. K.V. Peter, Ex-Vice Chancellor, KAU, Vellanikkara, Kerala; Dr. B.S. Parmar, Former Joint Director (Research), IARI, New Delhi; Dr. J.P. Khurana, Professor, Plant Molecular Biology, South Campus and Pro-Vice Chancellor, Delhi University; Dr. R. S. Deshpande, Ex-Director, Institute of Social and Economic Change, Bengaluru; Dr. D.K. Yadava, Assistant Director General (Seed), ICAR, New Delhi; Dr. A. K. Singh, Director, IARI, New Delhi and Dr. Ashok. K. Singh, Joint Director (Research) (Member Secretary), Joint Director (Extn.), Joint Director (Education) and Dean, Joint Director (Admn), Comptroller, Head of Divisions, Head of Regional Stations, Incharges of Units and Chief Admn Officers also participated in the meeting. School-wise presentations were made by School Coordinators for research achievements which were followed by Dean & Joint Director (Education) for post graduate school achievements, Joint Director (Administration) for Administrative activities and Comptroller for financial matters. In addition to the school-wise discussions, the Chairman and all RAC Members also held a separate meeting with Director and Joint Director (Research), IARI and discussed about the future thrust areas and road map to make IARI an Institution of Eminence. RAC members also visited the field experiments and laboratories of some of the Divisions, The salient recommendations along with comments of Crop Science Division are placed below for kind perusal and necessary action:

SN	Recommendations	Comments by SMD
	<b>School of Crop Improvement</b>	
1.	In the varietal development programme for conservation agriculture, water use efficiency (WUE), nutrients use efficiency (NUE), physical, chemical and biological properties of soil should also be taken into consideration.	Agreed
2.	Special efforts are required to popularize bio-fortified maize hybrids for crop diversification in rice-wheat cropping system.	Agreed
3.	Focus to be given on pre-breeding and use of innovative methods like genome editing for crop improvement.	Agreed
	<b>School of Horticultural Sciences</b>	
4.	Biotic stress in solanaceous crops should be focused especially on <i>Phomopsis</i> and bacterial blight in brinjal and tomato, respectively as well as abiotic stress against salt and cold resistance.	Agreed
5.	Iron deficiency is major threat and anaemic population is increasing in India. Therefore, vitamin and mineral rich bio-fortified vegetable varieties should be developed to alleviate nutritional hunger.	Agreed

6.	Comparison of vegetable production under traditional farming <i>vis-a vis</i> natural or good agricultural practices (GAP) production systems should be done.	Agreed
7.	Pre-breeding should be integral part of different horticultural crops for transferring specific traits in otherwise popular varieties/rootstocks.	Agreed
8.	Rootstock breeding should be given emphasis. In vegetables, grafting should be attempted using indigenous rootstock species to address the problems of bacterial wilt and other diseases in tomato, brinjal, chilli and melon etc.	Agreed
9.	To minimize the post harvest losses, research on extending the shelf-life, primary and secondary processing and scalable value-addition technologies should be strengthened to enhance farmers' house-hold income and to meet demand of industry.	Agreed
10.	Processing technologies needs to be developed and optimized to improve the yield, functionality, shelf-life and bioavailability of various macro-, micro- and phyto-nutrients in the processed and fortified foods for enhancing their consumer acceptability and economic viability.	Agreed
11.	More impetus to vertical farming particularly on scheduling and fertigation and minimizing cost of cultivation is required.	Agreed
<b>School of Basic Sciences</b>		
12.	Rice germplasm and RILs have been identified for variation in diurnal and nocturnal transpiration using phenomics facility. The physiological and molecular mechanisms of nocturnal transpiration need to be addressed for its use in crop improvement.	Agreed
13.	Water use efficient germplasm identified in rice and wheat in the phenomics facility should be taken forward for their use in QTL mapping and crop improvement.	Agreed
14.	Interaction of elevated CO <sub>2</sub> on WUE of crops needs to be studied considering the climate change scenario.	Agreed
15.	Genome editing need to be given more emphasis for development of elite mutants with high resource use efficiency, stress tolerance and quality.	Agreed
16.	Abscisic acid receptors play key role in stress tolerance and developmental process. Role of different ABA receptors on reproductive development and stress tolerance may be analysed using functional genomics approach.	Agreed
17.	Studies on physiological interventions such as spray of MOP or other growth regulators to enhance heat stress tolerance and grain yield in wheat may be undertaken.	Routine
18.	Research work on P and K, and micronutrient efficiency and tolerance to heat stresses may be taken up in the new projects.	Agreed
19.	In addition to rice and wheat, millets, oilseeds and pulses may be included in the basic research.	Agreed
20.	Research work on changes in quality of crops under abiotic stresses may also be taken up.	Agreed
21.	Targeted nutrient profiling should be attempted in major cereals (wheat, rice, pearl millet), pulses (chickpea and pigeonpea) and oilseeds (soybean) to identify nutrient-dense donors and factors controlling their accumulation need to be unearthed to develop nutritionally enhanced food crops, with improved content and bioavailability of essential nutrients.	Agreed
<b>School of Natural Resource Management</b>		
22.	Field experiments need to be conducted to evaluate STFR Meter-based	Agreed

	recommendations with the conventional fertilizer recommendations.	
23.	Research on risk assessment of arsenic-contaminated soils should be strengthened including the areas with high possibility of such contamination.	Agreed
24.	For CA experimentation, specific varieties developed by the Crop Improvement School should be used.	Agreed
25.	Complete analysis of treated waste water with respect to heavy metals and other contaminants, impact on soil physical and chemical properties, micro-organisms and the food safety of produce needs to be studied. Guidelines for use of waste water should be developed.	Agreed
26.	In Integrated Farming System model interaction among different enterprisers in terms of nutrient, water and energy saving needs to be analyzed.	Agreed
27.	Research work on sensor-based soil and plant health characterization and inputs application should be initiated.	Agreed
28.	Research work on drone-based monitoring of crop disease, pest, nutrient and irrigation should be strengthened.	Agreed
29.	Potential use of alternate sources for urea coating in mitigation/mitigation-adaptation of greenhouse gas emission in agriculture should be explored.	Agreed
30.	The efficacy of plant-based oil extract (egKaranj oil) and its use with urea should be compared with neem coated urea for their GHG mitigation potential in agriculture.	Agreed
31.	Crop residue management technologies integrating mechanical and microbial solutions should be demonstrated at farmers' fields to alleviate residue burning problems.	Agreed
32.	Use of green energy (solar and bio) powered technologies should be demonstrated at farmers' fields.	Agreed
33.	Efforts may be intensified for obtaining patent, license and commercialization of developed technologies.	Routine but important
34.	Saving of water due to hydrogel application must be worked out and hydrogel should be aggressively promoted along with precision irrigation.	Agreed
<b>School of Plant Protection</b>		
35.	A document on potential biocontrol agents/ bioformulations with proven bio efficacy be prepared for generating toxicological data before commercialization.	Agreed
36.	A clear roadmap with timeline needs to be developed for discovery and commercialization of the potential new molecules. A strategy needs to be developed by the Institute in line with industry requirements and partnership, for the validation of bio efficacy, safety and toxicological data required before offering the products to the industry.	Agreed
37.	Work on the development of indigenous quality formulations, particularly those of biopesticides, should be supported to keep pace with the current international interest in these products. Economics of bioformulations developed should be estimated.	Agreed
38.	Impact assessment of the formulations already commercialised should be done.	Agreed
39.	Concerted efforts must be made to promote and commercialize the new version of Pusa Hydrogel technology viz. Pusa SPG 1118 hydrogel and constraints in large scale adoption, if any, should be identified and addressed	Agreed
40.	Emphasis should be given on establishment of pilot plant facility for synthesis of bulk materials like hydrogels and extraction/ synthesis of bio-	Agreed

	actives.	
	<b>School of Social Sciences</b>	
41.	Impact analysis of various flagship programmes of the Government should be undertaken.	Agreed
42.	Latest and robust research methodologies should be used in Social Sciences research.	Agreed
43.	Impact assessment of IARI technologies should be carried out and documented.	Routine
	<b>Post Graduate School</b>	
42.	Student intake should be increased to improve ranking in National Institute Ranking Framework.	May move a separate proposal
	<b>Administration/ Finance</b>	
41.	Vacancies of technical and supporting staff should be filled on priority.	To be done on priority
	<b>General recommendations</b>	
42.	Institutional Mechanism for field testing/ on-farm testing of technology developed by Divisions/ scientists which are not field oriented, be developed.	Agreed
43.	Since many institutes have come up in ICAR, there should be clear distinction of work between IARI and other institutes.	Needs to considered while formulating EFC 2020-25
44.	We should get out of divisional approach and integrate in cross cutting interdisciplinary mode.	
45.	Some of our disciplines are thinly populated in expertise. To become internationally competitive, this issue should be addressed.	
46.	Worldwide concerns of restricted water and pesticide use should be addressed.	
47.	Discipline wise 3-4 focused areas should be identified while formulating the project for 2020-25 period.	
48.	Efforts should be made to develop processable varieties of vegetables and other crops.	

School-wise recommendations should be addressed while formulating the new EFC-2020-25 and Institute programmes.

Issued with the approval of Deputy Director General (Crop Sciences).



Assistant Director General (Seed)