

INDIAN COUNCIL OF AGRICULTURAL RESEARCH
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Sub: Approval of the proceedings of the Research Advisory Committee (RAC) meeting of ICAR-IARI, New Delhi held on December 21-22, 2023

RAC meeting of ICAR-IARI, New Delhi was held in hybrid mode on 21-22 December, 2023 under the Chairmanship of Prof. R.B. Singh, Former Director, IARI and Former President, National Academy of Agricultural Sciences (NAAS), New Delhi. The RAC members who physically participated in the meeting were Dr. H.C. Sharma, Former VC, YSPUHF, Solan; Dr. Mruthyunjaya, Former Director, ICAR-NIAP, New Delhi; Dr. K.K. Narayanan, Founder & Director, Sthayika Seeds Pvt Ltd, and Director & CEO, Agrigenome Labs Pvt Ltd, Bangalore; Dr. N.S. Bains, Director Research, PAU, Ludhiana; Dr. Praveen Rao, Former Vice Chancellor, PJTSAU, Hyderabad; Dr. A.K. Singh, Director, ICAR-IARI, New Delhi; Dr. D.K. Yadava, ADG (Seed), ICAR, and Dr. Viswanathan Chinnusamy, Joint Director (Research) and Member Secretary RAC. Dr. Sanjay Kumar, Chairman ASRB and Dr. S.P.S. Khanuja, Former Director, CIMAP, Lucknow joined the deliberations online. Prof. Nazeer Ahmad, Former VC, SKAUST(K), Srinagar could not join due to personal reasons. In addition, Dr. Anupama Singh, Dean and Joint Director (Education), Dr. R.N. Padaria, Joint Director (Extension); Dr. P. S. Brahmanand, Project Director, WTC; Shri DD Verma, Senior Comptroller; Shri Ajay Kumar Soni, Chief Administrative Officer, School Coordinators joined physically; and all Heads of the Divisions, Heads of Regional Stations, Incharges of different service units at IARI, Principal Investigators of the in-house projects and scientists of IARI also attended the RAC meeting through online mode.

School Coordinators made school-wise presentations for research achievements, which were followed by the presentations by Dean & Joint Director (Education) on achievements of Postgraduate School, Joint Secretary (Finance)/ Sr. Comptroller on financial matters and Chief Administrative Officer on various administrative matters. After thorough deliberations on the presentations, the recommendations of RAC along with comments of Crop Science Division are placed below for kind perusal and necessary action:

S.N.	Recommendations	Comments by SMD
A.	School of Basic Sciences	
1.	In addition to the Genome editing work in rice, genome editing of oil seeds such as mustard need to be taken up. Genome editing should also be used for functional validation of genes in different crops.	Mustard already included. Agreed for functional validation of genes using Genome editing.
2.	Crops physiological studies on how nano-urea reduce nitrogen fertilizer requirement and nano-DAP while maintaining yield is urgently needed.	Agreed
3.	Comprehensive profiling of phenolics and other secondary metabolites should be carried out in pearl millet genotypes and landraces to dissect their role in nutritional quality enhancement and shelf-life improvement of pearl millet flour.	IARI may collaborate with ICAR-IIMR under Global Hub for R&D in millets
4.	Innovative methods need to be developed for improving the nutritional and functional properties of plant-based proteins for their enhanced use in food products to combat ever increasing	Agreed

	protein malnutrition in global population.	
5.	Different combinations of suitable prebiotics and probiotics should be deployed for the enhanced enrichment of soymilk with nutrients like vitamin B ₁₂ and folic acid.	Agreed
6.	Facilities need to be created at ICAR-IARI for the accurate determination of bioavailability of macro- and micro-nutrients in different food matrices.	Collaborate with Institute working in the area
7.	The new products/technologies/processes developed should be protected through patents on priority and efforts should be intensified for their commercialization.	Agreed
B.	School of Crop Improvement	
1.	ICAR-IARI should take a lead in research efforts towards adaptation of rice varieties to direct seeded rice in the north-western India through targeted trait prospecting and introgression.	Agreed
2.	Efforts may be initiated to develop mechanism to leverage the newly developed tropical haploid inducers in maize for public-private collaborations.	Agreed
3.	Research on seed producibility of the hybrids in crops needs to be intensified, where hybrids have been released.	Agreed
4.	Collaborations with different divisions of school of crop protection may be strengthened for effective management of diseases and pests.	Already in place, however, may further strengthen
C.	School of Horticultural Science	
1.	Efforts should be made to develop variety/hybrid in different maturity group of Indian cauliflower rich in β -carotene and anthocyanin exploiting <i>Or</i> and <i>Pr</i> genes for nutritional content.	Agreed
2.	Anthocyanin rich hybrids of brassica (cauliflower and cabbage) should be tested for Insect susceptibility.	Agreed
3.	To address the problem of heavy use of pesticides in vegetable crops, disease/ insect resistant varieties should be developed by introducing genes from wild relatives.	Agreed
4.	The efforts to be made to scale up the commercialization of vegetable varieties and hybrids.	General
5.	To increase export, breeding for export-oriented varieties with desirable traits need to be developed.	Agreed
6.	More breeding efforts should be made in development of heat tolerant and processable varieties/hybrids in chili and tomato.	Agreed
7.	Considering the emergence of viral diseases in different vegetable crops specially in okra, melons and gourds, efforts should be made to develop resistant lines and utilized for breeding diseases resistant varieties and hybrids.	Strengthen ongoing programs
8.	IARI should focus on conversion of waste into nutraceuticals products and novel products with high value active ingredients.	Agreed
9.	To increase the productivity through high density planting, dwarfing root stock research in mango should be intensified.	Agreed
10.	CPCT should focus for development of complete package of practice of varieties/ hybrids developed for protected cultivation, and a comprehensive effort for promoting peri-urban horticulture should be prioritized.	Agreed
11.	IARI should develop varieties of vegetables, flowers and fruit crops suitable for urban farming and vertical farming.	Strengthen ongoing programmes
D.	School of Natural Resource Management	

1.	The technology of Pusa Decomposer may be modified with an objective of reducing the duration of decomposition of crop stubbles.	Agreed
2.	IARI should lead the in-depth and science/ evidence based multi-disciplinary research investigation on impact of nano-urea and nano-DAP on nutrient release pattern, nutrient balance sheet (inputs & outputs), crop growth, yield and profitability.	Agreed
3.	Need to develop futuristic climate resilient adaptation technologies and policy prescriptions based on the validation of crop models.	Agreed
4.	The climate action plan should be based on robust weather data and it needs to be integrated with policy briefs for faster dissemination to the farmers.	Agreed
5.	The economics of integrated drip cum mulch technology for field crops and horticultural species need to be worked out, and its impact on ecological parameters also need to analyzed.	Agreed
6.	Upscaling of the need-based and location-specific IFS models at farmers' fields should be taken up.	General
7.	The diversification of the existing rice-wheat system with profitable and environmentally robust alternative cropping systems irrigation and nutrient management including conservation agriculture systems should be explored for developing bundled solutions to farmers.	Agreed
8.	Studies on nutrient dynamics, water use efficiency, footprints, and profitability under subsurface irrigation in different crops should be undertaken for developing the environmentally and economically robust irrigation practice.	Agreed
9.	A complete study on natural and organic farming should be done to bring out concrete recommendations like water budgeting, soil nutrient balance, microbial buildup, its impact food production under intensive (high input) and rainfed (low input) production systems and economics.	Agreed
10.	The synergy of microbiome mapping and management with agro-ecological sustainability and carbon economy should be fostered.	Agreed
11.	Emphasis needs to be laid on development of robotic technologies for operations like weeding and spraying which are labor intensive and have major bearing on human health.	Collaborations with IITs and similar Institutes be explored
12.	Keeping pace with the advancements in industry, horizon of smart/digital farming (sensing & mapping, data analytics and precise delivery and control of inputs) needs to be broadened through use of AI, IoT, Sensors, UAVs, Big data analytics, precise agriculture needs to be broadened through use of AI, ML and DL for real time input application, crop monitoring and quality evaluation.	Agreed
13.	IARI may initiate a research project on virtual assistant technology such as “Alexa” for developing an integrated agriculture database of farmers’ queries and answers.	May explore based on technical competence/ collaboration
14.	Efforts may be intensified for patenting and commercialization of developed NRM technologies.	General
E.	School of Plant Protection	
1.	Need to work on mechanisms, basis and inheritance of resistance to different pests and pathogens in crops and their wild relatives. This will help develop resistant varieties.	Needs more focus
2.	Dynamics of important diseases/insect pests should be studied in relation to climate change scenario as new diseases/insects are emerging recently.	Integral part of all ongoing programmes

3.	Work on functional genomics of host-plant resistance genes for pest and diseases need to be initiated.	In collaborate with NIPB
4.	Collaboration with different ICAR Institutes (NCIPM, NBAIR and NBAIM) to be strengthened.	Agreed
5.	Work on eco-friendly management and green molecules for management of diseases/ pests need to be strengthened keeping in view the health hazards and environment pollution due to use of chemicals.	Agreed
6.	Exploring aerial remote sensing (RS) using drones with intelligent visual systems for efficient and inexpensive way for farmers to detect crop pests and diseases in major field crops.	Agreed
F.	School of Social Sciences	
1.	Conducting social science research that is responsive to the changing demands of farmers and the Nation, and focus on niche areas and policy requirements should be pursued.	Agreed
2.	The impact of IARI technologies can be broadened to encompass not only economic aspects but also the livelihoods, and well-being of farmers, ecosystem services, and overall societal improvement.	Agreed
3.	A formal mechanism for fostering close and frequent interaction between social science and other disciplines should be strengthened, to facilitate collaboration, convergence and synergy in the research for development.	Agreed. Production Unit needs to be enlarged and activated
4.	Examine the areas requiring enhancement in the participation rate of farmers in operation of e-NAM and propose viable solutions/ reforms in trading practices, early settlement of claims, reducing hurdles in quality checking etc. resulting in higher price realization.	Agreed
5.	Social science research can concentrate on a range of areas, such as pioneering research methodologies, enhancing the skill development of undergraduate students, addressing extension needs for farmers, supporting agribusiness start-ups, aligning policy and science for societal impact, addressing climate change, advancing Sustainable Development Goals, exploring employment issues, and optimizing processing techniques.	Agreed
6.	Planning for social science research and policy analysis can be undertaken across short, medium, and long-term durations for sustainable agricultural development.	Agreed
7.	AI based extension technologies such as “Alexa of Agriculture” need to be developed to answer questions of farmers in realtime.	May explore based on technical competence/ collaboration
G.	Post Graduate School	
1.	Efforts may be made to admit foreign students in UG program, and joint/ sandwich degree program for Ph.D. Students.	Agreed
2.	In all Hubs of IARI, facilities need to be strengthened, and experiential learning units to be opened.	Matter may be taken up with Education Division
3.	Initiative on study material content development should be made and IARI lectures/ study material should be made available on internet for wider access.	Agreed
4.	Facilities should be developed to enable students perform experiments individually.	May decide based on available resources
5.	Lecture halls should be equipped with latest smart boards for effective teaching.	Matter may be taken up with Education

		Division
6.	The potential of IARI Alumni must be tapped for teaching UG programs in IARI and its hubs.	General
H.	Financial and Administrative Issues	
1.	Filling of Finance officer positions should be taken up.	Agreed
2.	Promotion of office automation is suggested.	Agreed
3.	Filling up of technical post on priority to provide necessary technical support to the Scientists is required immediately.	Agreed

Institute should ensure to implement/ follow the overall recommendations (Point 1-4 of Original proceedings) of the RAC.

Further, the D.O. No. Secy. (DARE/DG(ICAR/2015 dated 654 dated 27.04.2015 from ICAR may kindly be followed by RAC while making recommendations in future.

Issued with the approval of competent authority of the Crop Science Division i.e. Deputy Director General (Crop Science).

Assistant Director General (Seed)