

Research Advisory Committee meeting

Research Advisory Committee (RAC) meeting at ICAR-Indian Institute of Rice Research, Hyderabad was held on 5-6th July, 2019. Prof. Akhilesh Tyagi, J.C. Bose National Fellow, University of Delhi South Campus, New Delhi was the Chairman of the IIRR-RAC. Drs. Dinesh Kumar, ADG (FFC), N. Raguram, Mayabini Jena, ICAR-NRRI P.C. Rao, Former PG Dean, PJTSAU, Prem Lata Singh and J.N. Reddy, ICAR-NRRI were the members. Dr. S.R. Voleti, Director, IIRR welcomed the new RAC members and briefly presented the activities at IIRR. Dr. S.M. Balachandran, Member Secretary, RAC presented the Action Taken Report (ATR) on the recommendations of previous RAC.



This was followed by the presentation of research highlights by the Heads of the Departments and Pls. The RAC members also had an interactive session with the scientists of the Institute and discussed about the

issues related to execution of research projects. The RAC Chairman and members appreciated efforts of IIRR scientists and their contributions in rice crop improvement programme. The RAC meeting ended with vote of thanks by Dr. S.M. Balachandran.



Institute Research Council meeting

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Dr. S.R. Voleti, Director and Chairman, IRC conducted the proceeding of the Institute Research Council (IRC) Meeting 2019 from 8-10th July, 2019 at ICAR-Indian Institute of Rice Research with Drs. G.S. Laha and S. Arunkumar as Secretary and Jt. Secretary of IRC, respectively.

On 8th July, there were six project presentations by the scientists of Plant Breeding and Dr. Aravind Kumar, In-charge of Plant Breeding section summarized the overall achievements. This was followed by the presentation of work done by hybrid rice group and there were 4 presentations. Dr. A.S. Hariprasad, Head, Hybrid Rice Section summarized the hybrid rice program. In continuation. Plant Biotechnology group presented their work done in 7 presentations with summarization of salient achievements by Dr. S.M. Balachandran, Head, Plant Biotechnology, Dr. N. Sarla, National Professor made a presentation on her work on CSSL lines development. The scientists of Agronomy section narrated their work and achievements in their presentation. Dr. R. Mahendra Kumar, Head, Agronomy emphasized the delineation of the area under aerobic rice coupled with inclusion of pest and diseases data in rice based cropping system experiments. Presentations by the scientists from Agricultural Engineering, Agricultural Chemicals and Computer application in agriculture followed subsequently. Dr. S.R. Voleti stressed about the development of searchable database for AICRIP as per the RAC recommendation.



On 9th July, the discussion continued with presentation of scientists from Soil Science (8 projects) and Plant Physiology (3 projects) and summarization subsequently by Drs. Surekha, K. and Subramnyam, D. Principal Scientist and Head of sections, respectively. In addition, Dr. Subramanyam also reminded for more information on climate change as per the RAC suggestions. In the next leg, there were eight presentations from Entomology. Dr. G.R. Katti, Head, Entomology suggested to study active

ingredients in essential oils and also that essential oils should be tested first under laboratory/glass house conditions prior to taking it to the field level, as suggested by the RAC. In the last leg of the session, there were eight project presentations by the scientist of Plant Pathology section with summary by Dr. M.S. Prasad, Principal Scientist & Head.

The session on third day (10th July), started with presentation by scientists from Training and Technology Transfer Section and six projects were discussed. Subsequently, five new project proposals were presented for discussion and approval. However, the house deferred the approval for two new proposals seeking modification and resubmission.

An additional session of IRC meeting was again held on 9th August, 2019 for those members, who could not present their research finding during earlier instance. There were two presentations from Plant Breeding department, one presentation each from National Professor's group and TTT division. This was followed by presentations of two modified new projects, which were approved.

New rice varieties-Gazette notification

- In S.03220 (E) dt. 6th Sep, 2019 notified 21 rice varieties and 5 hybrids were notified. Only one variety Bhupesh (IET 233224-CN 1752-18-1-9-MLD19) is recommended by CVRC for 6 States namely, Tripura, Odisha, Bihar, Chhattisgarh, Rajasthan and Tamil Nadu. Remaining 25 were SVRC releases with 5 each recommended for cultivation in West Bengal, Uttar Pradesh, 3 each for Gujarat and Madhya Pradesh, 2 each for Jammu and Kashmir, Haryana, Andhra Pradesh, Tamil Nadu, and 1 for Karnataka.
- IET 21943 (RP4919-50-13) BC₃F₈ derived from KMR3 x *O. rufipogon* (WR120) released in West Bengal as Chinsurah Nona 2 (Gosaba 6) in 2016. It has been recommended for notification in the 82nd meeting of Central Sub-Committee on Crop Standards, Notification and Release of Varieties for Agricultural Crops held on 1st June, 2019 at New Delhi (File No.3-71/2019-SD.IV dated 2.8.19) and notified vide S.O. 3220(E) dt 6th Sep, 2019.





• Arize 6129 Gold BS-129G (IET 22878-HRI179), a rice hybrid from M/s. Bayer Bioscience Pvt. Ltd., Hyderabad was earlier notified vide S.0268(E) dt. 28/01/2015 for Haryana and Chhattisgarh vide S.01007(E) dt 30/3/2017. It is further recommended for area expansion to Madhya Pradesh vide S.01498 (E) dt. 1st Apr, 2019 and Uttar Pradesh vide .03220 (E) dt. 6th Sep, 2019. Developers: S.S. Aich and N. Sarla; Collaborators: A.Aich, M.K. Bhowmick, M.C. Dhara, (RRS, Chinsurah); T. Ram, Vandna Rai, Brajendra (IIRR, Hyderabad).

Research highlights of IIRR

IET 26826: A rice dual donor conferring resistance to planthoppers and tolerance to alkalinity

G. Padmavathi¹, V. Jhansilakshmi¹, M. Sheshu Madhav¹, M. Tahseen¹ and G. Shiva Prasad² ¹ICAR- IIRR, ²ARS, Kampasagar, PJTSAU

IET 26826 (RP 5690-20-6-3-2-1) evaluated along with other entries in Planthopper Screening trial, 2017 at 12 locations in 15 screening tests was found to be promising in 9/15 tests namely Cuttack, Ludhiana, Mandya, Raiendranagar and Hyderabad in five greenhouse tests (DS: 3.7) and in one field test (DS: 3.0) at Pantnagar against Brown planthopper (BPH); in Hyderabad against white backed planthopper (WBPH) in one greenhouse test (DS: 2.3); Maruteru and Warangal against mixed population of BPH and WBPH in 2 field tests (DS: 4). The resistant checks PTB 33 and MO1 performed well in 13/15 and 7/15 tests with a range of mean damage scores of 0.5 to 5 and 1.7 to 5 for BPH and WBPH respectively. For confirmation of resistance it was retested in PHS trial during 2018 at 13 locations in 16 tests. It was again found to be superior in 9/16 tests *i.e.*. Hyderabad. Ludhiana, Pantnagar and Warangal in 4 greenhouse tests (DS: 3.07) & 1 field test against BPH at Rajendranagar; one greenhouse test against WBPH (DS: 3.9) in Hyderabad and 2 field tests against combined population of BPH and WBPH at Gangavathi and Nawagam. The resistant checks PTB 33 and MO1 performed well in 14/13 and 11/13 tests with damage scores ranging from 1 to 5 and 1.6 to 5 for BPH and WBPH respectively.

The entry was also screened for tolerance to alkaline stress at ARS, Kampasagar in replicated yield trials for three years during 2016 to 2018 (pH 9.5- 10; ECe 1.9 to 2.6 dS m⁻¹) using standard national check varieties CSR 27, CSR 36 and CSR 10.



The grain yield of IET 26826 ranged from 2.5 to 3.0 t/ha under alkaline stress. Hence it could be a valuable genetic stock in rice breeding program for enhancing resistance to planthoppers as well as tolerance to alkalinity.

New Research Projects-Externally funded projects

Dr. Divya Balakrishnan received DBT BioCARe sanction of Rs. 43 lakhs for 3 years.

Project	Investigators	Duration	Funding agency
Exploring Chromosome	PI- Dr. Divya	30.07.2019-	DBT
Segment Substitution	Balakrishnan	29.07.2022	BioCare
Lines from inter-specific	Mentor/ Co		
crosses to decipher the	PI- Dr N Sarla		
genetics of grain weight			
and earliness			

Chromosome segment substitution lines (CSSLs) are an excellent bridging material for transfer of genes from wild donors to cultivars. CSSLS from wild species in the

background of popular cultivars like Swarna and MTU1010 were developed at IIRR under ICAR-National Professor Project and are available as a resource for mapping related genes and for their functional analysis. Genotype by Environment analysis revealed stable CSSLs having high thousand grain weight and earliness after multiple environment testing. To unravel genes/ genomic regions associated with grain weight and earliness and functional characterization of those CSSLs by integrated approach is the objective of this proposal. Identified wild inrogression CSSLs will be explored to develop mapping populations to detect associated chromosome segments and genomic regions. Further QTL seq, will be employed to identify candidate single nucleotide variation. This study is also aimed to identify high yielding short duration varieties from mapping populations, to meet the expected demand by improving the production per unit area as well as unit time.

New Institute projects

Five new institute projects have been initiated with the approval of Institute Research Council (IRC) 2019.

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S. No	Title of the Project	Investigators	
1	Role of silicon in inducing abiotic stress tolerance in rice	Dr. P. Raghuveer Rao (PI) Co-PIs: Dr. Sanjeev Rao, Dr. Mangaldeep Tuti	
2	Bio-formulations of antagonistic microbes for disease management in rice	Dr. C. Kannan (PI) Co-PIs: Drs. V. Prakasam, Chitra Shanker, PC Latha, P. Senguttuvel	
3	Smart Village Strategy for accelerated rice technology transfer	Dr. Amtul Waris (PI) Co-PIs: Drs. P. Muthuraman, Shaik N. Meera, P. Jeykumar, P.A. Lakshmi Prasanna, B. Nirmala, S. Arun Kumar, S. Rathod, C.N. Neeraja and Jyothi Badri	
4	Statistical modeling and soft computing approaches for genomic selection in rice	Dr. Santhosha Rathod (PI), Co-PIs: Drs. C.N. Neeraja, R.M. Sundaram, C. Gireesh, P. Senguttuvel	
5	On-Farm Adoption of IPM Technologies and impact Analysis	Dr. P. Jeyakumar (PI) Co-PIs: Drs. Ch. Padmavathi, C. Kannan, Amtul Waris, S. Arun Kumar and Santhosha Rathod	

Meetings and Seminars of ICAR-IIRR

Quinquennial Review Team meeting

QRT chaired by Dr. H.S. Gupta with Drs. R. Sridhar, P.S. Birthal, JL Dwivedi, S. Kundu and TVK Singh as members first met at IIRR during 27th-28th November, 2018. Again in this quarter, QRT reviewed AICIRP centres in the Western zone and concluded with a final meeting at IIRR, Hyderabad.

• QRT meeting was held on 17-18th Aug, 2019 in Goa and nine AlCRIP centres viz., ICAR-CCARI, Goa, RARS, Karjat, MRRS, AAU, Nawagam, MRRS, NAU, Navsari, ARS, Shirgaon, ARS, Vadagon, ARS, AAU, Derol, R.R.R.S, Vyara and ARS, Lonavala were reviewed. Dr. L.V. Subba Rao, Principal Scientist, IIRR and Member Secretary participated in QRT meeting.



 3rd quarter marked the conclusion of the series of QRT meetings with a final meeting held during 16-18th Sep, 2019 at ICAR-IIRR, Hyderabad. In the final wrap up meeting of QRT, team members interacted with Scientists of IIRR on 18th Sep, 2019.



IMC meeting conducted at IIRR

The XXIII Institute Management Committee (IMC) meeting of IIRR was held on 8th August, 2019 at IIRR. IMC meeting was chaired by Dr. S.R. Voleti, Director, IIRR, with Dr. R. Jagadeeshwar, Director of Research, PJTSAU, Dr. Bandaru Kushalaiah, Dr. V. Dinesh Kumar, Principal Scientist, IIOR and Shri Ramaniah Chakilam as members with Shri. B. Satish, SAO, IIRR as Member Secretary. Dr. Gururaj Katti, Principal Scientist and Shri. K. Srinivasa Rao, Finance & Accounts Officer, IIRR also attended the meeting.



Deputation seminars

Three deputation seminars were held on 9^{th} Aug, 2019 at IIRR.

- Dr.S.N.Meera, Principal Scientist, Agricultural Extension, presented seminar on his deputation to Cairo, Egypt from 15th June, 2019 to 5th July and shared experiences of his participation in Design Mission for IFAD funded STAR project 2019.
- Dr. Satendra Kumar Mangrauthia, Senior Scientist, Plant Biotechnology presented about his learning during the training he received from Heinrich Heine University (HHU), Düsseldorf, Germany, in the laboratory of Prof. Wolf B. Frommer under ICAR

- Lal Bahadur Shastri Outstanding Young Scientist Award-2016. He completed three months of training on "CRISPR/Cas mediated genome editing in rice".
- Dr. Divya Balakrishnan, Scientist, Plant Breeding-presented her Post Doctoral Fellow research project results on "Exploring genetic architecture of blast resistance in chromosome segment substitution lines using standard differential blast isolates". The research work under INSA Indo-Japanese joint project "Establishment of young researcher fellowship programme" was carried out for the period of 6 months (27-01-2019 to 27-07-2019).

Other Meetings

- Dr. S.N. Meera, Chairman, PMEC presented in brief about the PMEC on his training at NAARM on 09-08-2019.
- A talk on "Microbial one carbon cycling in sub surface systems (Microbial methane cycling and impact on food security) was delivered by Dr. Deepak Kumarasen, Environmental Microbiologist, Queen's University, Belfast, UK on 4th Sep, 2019 at IIRR.

Outreach programmes of IIRR

Distribution of critical inputs for Front Line Demonstrations of Rice by AICRIP, RARS, Warangal

Regional Agricultural Research Station, Warangal organized Input distribution programme under FLDs on Rice at Paidipally Nagaram village, Parkal mandal, Warangal Rural district on 31-08-2019 under the chairmanship of Dr. P. Jagan Mohan Rao, Associate Director of Research, RARS, Warangal. In this Programme, Dr. Shaik N. Meera, Principal Scientist & Coordinator for Front Line Demonstrations on Rice, AICRIP and Dr. Arun Kumar, Scientist, Agrl. Extension from IIRR, Hyderabad graced the occasion. Smt. A. Saritha, Sarpanch, Paidipally Nagaram village participated in the meeting. During Kharif, 2019, 10 FLDs in Paidipally Nagaram each with 1 ha. unit area and 10 FLDs in Kaniparthy village each with 1 acre unit area were taken up under AICRIP scheme RARS, Warangal. Siddhi (WGL-44) and Warangal Rice-1(WGL-915) were selected for these varietal FLDs. As part of the programme, critical inputs like oxadiargyl, carbofuran 3G granules, isoprothiolane, imidachloprid+ethiprole, propiconazole and acephate were distributed to the farmers. About 28 farmers attended the programme.

Dr. P. Jagan Mohan Rao, Associate Director of Research, RARS, Warangal reiterated the importance of mechanization in agriculture particularly in rice crop. He also suggested the farmers for adoption of all recommended practices for these demonstrations to realise the full potential of these varieties. Dr. Shaik N. Meera, informed the house that conduct of such FLDs form a platform for successful technology transfer from lab to land and testing of real worth of technologies/varieties. Rice Scientists from RARS, Warangal- Dr. S. Malathi, Dr. U. Nagabhushanam, Dr. B. Satish Chandra and departmental official of Parkal mandal Sri. B. Srinivas participated in the meeting and gave technical suggestions to the farmers.







Farmer-student and scientist interaction meet at Polkampalli village

B. Sreedevi. PS (Agronomy) participated chief as auest in interaction meet of Farmers-RAWEP Students of DAATT centre. PJTSAU, Scientists of PJTSAU and ICAR-IIRR at వ్యాక్తులు ది మాకరిద్ది, బి ఓమ్యేకరిన్ని, జి గంగారల్లినిక్క గాత్రమలో అరిఎద సూచనికిడ్డి, ఇక్లమ్మేకరిన్ని, జి గంగాలిసికిక్కి గాత్రమల్లి పాల్గన్నారు. Polkampalii village, Parigi



: మండలంలోని పోల్కంపల్లి గ్రామాన్ని శుక్రవారం నాగర్కు జిల్లా పాలెం వ్యవసాయ కళాశాల విద్యార్థులు సందర్శించారు. గ్రామీణ వ కృషి అనుభవ కార్యక్రమంలో భాగంగా వారు పోల్కంపల్లిని సందర్శించి గ్ర బువంటి వనరులు, భవన సముదాయాలు, దేవాలయం, పా డ్డ చి(తీకరించారు. గ్రామానికి సంబంధించిన స్థితిగతులు, రైతులు పండించే పం వివరాలను వారు అడిగి తెలుసుకున్నారు. ఇండియన్ ఇన్బోట్యూట్ ఆఫ్ రైస్ రీసెర్స్ శాస్త్రవేత్త డ్యార్ శ్రీదేవి మాట్లాడుతూ తడి పొడి పద్దతి ద్వారా తక్కువ నీటితో వరిన గు చేసే మెళుగువలను రెతులగు తెబిసారు. ఈ కారంగవ

Mandal, Vikarabad District on 30th August, 2019, RAWEP students have displayed different agricultural practices of the village, Agricultural University interventions for improved farming systems, the host farmer's agricultural profiles, other village development programs and the impact of their RAWEP program on the village activities etc. As majority of the host farmers are growing rice, Dr. B. Sreedevi explained in detail about water saving methods in rice cultivation, reducing cost of fertilizers, integrated pest management and other low cost production technologies. She also suggested as to how the students can educate and create awareness among the farmers about the improved technologies and reducing cost of cultivation.

Farmers Field Demonstrations on aerobic rice cultivation at Rangapur village on 18-09-2019

Dr. B. Sreedevi, PS (Agronomy) organized field demonstration program on aerobic rice cultivation in Rangapur village, Vikarabad District, Telangana State, through DAATT centre, PJTSAU during *Kharif* 2019. As part of the demonstration program, seed of aerobic variety - MTU1010, preemergence herbicide-Purazosulfuron thyl two post emergence herbicides-Penaxsulam and Cyhalofopbutyl herbicides, mechanical weeders (Star weeders), neem products were arranged to the farmers. Usage of new low-dose herbicides for aerobic rice in the farmer's fields was also demonstrated. RAWEP Students of PJTSAU also volunteered in the program and assisted the farmers in cultivating rice in aerobic system. Two of the farmers have done mechanical weeding only, while two others have adopted only chemical weed control.

రంగాపూర్ను సందర్భంచిన పాలెం విద్యార్థులు







Demonstrations on 'Good Agricultural Practices' in Nagarkurnool district of Telangana (Herbicide and water pipes distribution undertaken under SCSP on 09/09/2019)

Demonstrations on 'Good Agricultural Practices' under ICAR-IIRR-SCSP, are being organized on 250 SC farmers' field of five villages viz., Balanpally, Bavajipally, Gummakonda, Itolu and Potureddypally of Nagarkurnool district of Telangana. Off-campus training programs on 'Water saving technologies in Rice' and 'Integrated Weed Management in Rice' were organized at Balanpalli and Bavajipally villages on 09/09/2019. Dr. B. Nirmala, Senior Scientist and PI-SCSP appraised the farmers about the SCSP scheme and technology package to be demonstrated on the farmers' field. Dr. R. Mahender Kumar, PS, IIRR, demonstrated the usage of water pipes in the field. He mentioned that the farmers can apply requisite amount of water in rice field by monitoring the water depth on the field through water pipes and thus reduce the water usage in rice. He also motivated the farmers to adopt ''Integrated Weed Management'' techniques in Rice. Dr. P. Muthuraman, PS, IIRR emphasized the need for

adoption of 'Good Agricultural Practices' to achieve better yields under farmers' field conditions. Dr. D. Krishnaveni, PS, IIRR elaborated upon the 'Integrated Pest Management' in rice. Water pipes and Pre and Post emergence herbicides were distributed to the beneficiaries of Balanpalli and Bavajipally villages and farmer-scientist interactions were organized in both the villages.



Staff news

Meetings attended

 Dr. Satendra K. Mangrauthia, Sr. Scientist (Biotechnology) delivered a talk on Genome Editing during Workshop on "Fundamentals of CRISPR-Applications in Genome Editing" 27-29 September, 2019 at JNTU, Hyderabad.

Joining

 Shri. K. Srinivasa Rao., Finance & Accounts Officer, IIOR, Hyderabad joined at IIRR on 22.07.2019 and is holding an additional charge of FAO.

Deputations

Dr. Chitra Shankar, Principal Scientist (Entomology)
was deputed to receive Endeavour Research Fellowship
organized by the Graham Centre for Innovations,
Charles Sturt University, New South Wales Australia
during 02.09.2019 to 02.01.2020.

Dr. Divya Balakrishnan, Scientist (Pl. Breeding) successfully completed INSA_DST_JSPS post-doctoral fellowship awarded under Indo-Japanese Joint Project on "Establishment of Young Researcher Fellowship Program 2018-2019". She joined for conducting advance research on project entitled "Exploring genetic architecture of blast resistance in Chromosome segment substitution lines using standard differential blast isolates (SDBLs)" for a duration of six months (Jan 30 - July 29, 2019).





Research work was carried out at Tropical Agricultural Research Front, International Research Center for Agricultural Science (JIRCAS), Ishigaki, Okinawa, 907-0002, Japan. The fellowship was funded by Indian National Science Academy (INSA), New Delhi, Department of Science & Technology (DST), Government of India and Japan Society for Promotion of Science (JSPS).

• Dr Suneetha Kota, Senior Scientist (Plant Breeding) was selected as Postdoctoral Fellow-Plant Breeding at International Rice Research Institute, Philippines under IRRI-UK collaborative Newton project from 19.02.2017 to 18.08.2019. She worked on introgression of salinity and drought tolerance into targeted Philippines and Vietnamese popular varieties. She was involved in genome sequencing methods that allow genome wide association studies (GWAS) for fast screening of populations and genome editing techniques. As a part of this project, she was also trained at University of York, UK on "CRISPR/Cas" mediated genome editing in rice, worked on CRISPR/Cas 9 constructs and in the development of complete pipeline for gene edited rice lines for salinity stress tolerance.

Study leave/ Resumption

 Mr. Satish Namdeo Chavan, Scientist (Nematology) granted study leave for a period of three years w.e.f 01.08.2019 to 31.07.2022 for pursing Ph.D with Netaji Subhash ICAR -International Fellowship at Ghent University, Belgium.

Retirements

- Shri. Shivanarayana, Technical Officer, retired from the Council's Service w.e.f 30.09.2019 on superannuation.
- Shri. R. Yellaiah, SSS retired from the Council's Service w.e.f 30.09.2019 on superannuation.

Crèche for employee's children-an ICAR-IIRR initiative

In tune with the Government's policy of Maternity benefit act, 2017, ICAR-IIRR had taken an initiative to start a crèche to support its employees with children from 6 months to 6 years of age.



In this direction a small facility was created in the institutional premises and started on 15^{th} August, 2019 to cater to the needs of the employee mothers and their children.



Editorial Committee: Drs. Nageswara Rao, D.V.K., Jyothi Badri, Senguttuvel, P., Kalyani M Barbadikar, Basavaraj, K., Bandeppa, S., Arti Singh and Amtul Waris

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