



ICAR-Indian Institute of Rice Research NEWSLETTER

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RICE IS LIFE

October - December 2022

ICAR - IIRR Celebrates 8th Foundation Day



ICAR-Indian Institute of Rice Research celebrated its 8th Foundation Day on 21st December, 2022. Dr A Vishnu Vardhan Reddy, Vice Chancellor, ANGRAU was the Chief Guest of the event while Dr S K Pradhan, Additional Director General (FFC), ICAR, Dr R Jagadeeshwar Director of Research, PJTSAU and Dr M Sheshu Madhav, Director, Central Tobacco Research Institute were the guest of honours. Dr R M Sundaram, Director, ICAR-IIRR, welcomed the guests and presented the highlights

of the achievements of the Institute during the year. Dr R Jagadeeshwar, Director of Research, PJTSAU applauded

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the achievements of ICAR-IIRR and expressed happiness over the strong collaboration between ICAR-IIRR and PJTSAU. Dr M Sheshu Madhav congratulated the Institute for its significant achievements on all fronts including publications, products, patents, and projects. Dr S K Pradhan appreciated the noticeable achievements of ICAR-IIRR over the past one year in terms of releasing 13 rice cultivars and the development of the first genome-edited Samba Mahsuri rice lines showing a significant increase in

grain number. The Chief Guest, Dr A Vishnu Vardhan Reddy delivered the Dr. SVS Shastry Memorial Lecture. During his lecture, he praised the contribution of ICAR-IIRR in rice research and coordination. The outstanding scientists and other staff members of ICAR-IIRR were presented with awards for their contributions on this occasion. The meeting ended with the vote of thanks proposed by Dr R Mahender Kumar, Head, Agronomy Section, ICAR-IIRR.

Farmers' Day



ICAR-IIRR celebrated the Farmers' day enthusiastically with the theme "*Climate Resilient Rice for Farmers Welfare*" on 28 Oct. 2022. The program was attended by a large number of progressive farmers. The farmers visited fields of ICAR-IIRR and interacted with the scientists on various aspects of rice cultivation. Dr R M Sundaram, Director, ICAR-IIRR welcomed the farmers, guests of honour, participants from NGOs, scientists, and members of the print and electronic media. He briefed the participants about the achievements of the Institute and the research in progress in the interest of the farming community. Dr L V Subba Rao, Head, Crop Improvement

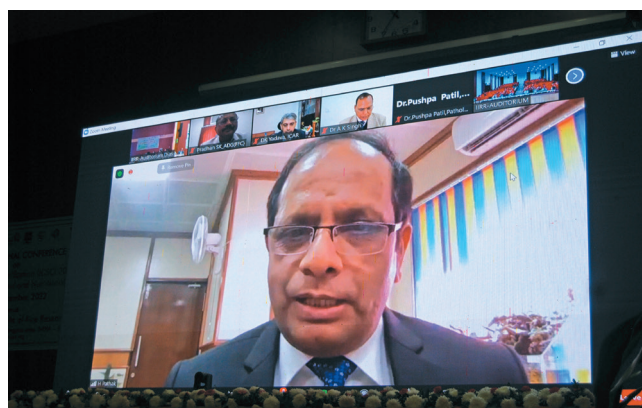
Division, explained to the farmers about new high-yielding varieties, hybrids, and other technologies of the Institute. The guests of Honour, Dr R Jagadeeshwar, Director of Research, PJTSAU, and Dr Sagar Hanuman Singh, Director General, National Institute of Plant Health Management, Hyderabad, extended their best wishes to the rice farmers and appreciated the research efforts of ICAR-IIRR. The progressive farmers identified from across the Telangana State were felicitated on this occasion. The farmers shared their experiences in rice farming and applauded the rice scientists for their contributions to rice farming for better livelihood and higher income. A special interactive session of farmers and scientists moderated by Drs M S Prasad and Shaik N Meera was held and the queries raised by the farmers were effectively addressed. Scientists belonging to various disciplines from ICAR-IIRR, ARI and PJTSAU interacted with farmers, NGOs, and FPOs representatives. Exhibits were displayed on various technologies, products and soil testing kits developed by ICAR-IIRR as well as technologies of sister ICAR institutes located in Hyderabad.

Industry Meet-2022



The industry meet was organized by ICAR-IIRR on 10th Nov. 2022. It was attended by 50 representatives of 20 private seed companies. The released technologies including varieties, hybrids, registered germplasm, non-varietal technologies, pesticide formulations, soil testing kits, value-added products, farm machinery, etc. of ICAR-IIRR were displayed at exhibition stalls. An interactive session with the participants was also organized to seek the feedback and requirements of the industry stakeholders. The industry meet was appreciated by private industry personnel.

International Conference on System of Crop Intensification (ICSCI 2022)



ICAR-IIRR in association with the Society for Advancement of Rice Research (SARR) organized the International Conference on System of Crop Intensification (ICSCI 2022) for Climate - Smart Livelihood and Nutritional Security in hybrid mode during 12-14 December, 2022. The inaugural session of the International Conference - ICSCI 2022 was chaired by Dr. Himanshu Pathak, Secretary, DARE & DG, ICAR with Dr. SK Pradhan, ADG (FFC) as co-chair. Dr. Alapati Satyanarayana, Former Director of Extension, ANGRAU, was the Chief guest for

the session. Guests of Honour include Dr. DK Yadava, ADG (Seeds), ICAR; Dr. AK Singh, Director, ICAR-IARI; Dr. R Jagdeeshwar, Director of Research, PJTSAU; Dr. Francesco Carnevale Zampaolo, Program Director, SRI-2030, UK; Dr. Abha Mishra, Former Director, ACISAI, Thailand. Dr. Himanshu Pathak, Secretary DARE & DG, ICAR, New Delhi welcomed the delegates. He pointed out several challenges in sustainable rice production like degrading soil quality and issues of greenhouse gases and mentioned that technologies like SRI and SCI can address several of these issues. He also mentioned that location-specific modification of SCI is needed to upscale the technology. Several publications related to rice cultivation were released during the inaugural session of the conference.

The Society for the Advancement of Rice Research (SARR) instituted seven awards from this year onwards,

out of which three awards were presented for the first time. These include Dr. R. Seetharaman best Ph.D. thesis award given to Dr. Sadras Bhavana, Ph.D in Crop Physiology, PJTSAU, Hyderabad; SARR young scientist award given to Dr. Divya Balakrishnan, Senior Scientist, Plant Breeding & Genetics, ICAR-IIRR, Hyderabad and Dr. SVS Shastry SARR Fellow conferred on Dr. LV Subba Rao, Principal Scientist & Head, Plant Breeding, ICAR-IIRR, Hyderabad. Five technical sessions were conducted during the conference. Each session included the presentation of lead talks by the experts, oral presentations, lightning talks, and poster presentations. A total of 209 participants including delegates from 16 Countries, i.e., USA, UK, Philippines, Germany, Italy, New Zealand, Netherlands, Japan, Iran, Nepal, Bangladesh, Vietnam, Tanzania, and India took part in the conference. Besides researchers and students, about 150 farmers also participated in this conference.

IIRR Wins Laurels at ICAR South Zone Sports Meet - 2022



Zonal Sports Meet of 26 ICAR Institutes of South India organized by ICAR-National Academy of Agricultural Research Management, Hyderabad, during November

2022. ICAR IIRR participated in all the games except Football namely, Carroms, Chess, Cycling, Field & Track Events - 100, 200, 400, 1500, relay, long jump, high jump, discus throw, shotput, javelin throw, and group games like TT, Volleyball (Shooting and Smashing), Cricket, Basketball, Kabaddi, and Badminton. On the very first day, in the first event i.e. 1500m running Dr Santosha Rathod secured the gold medal. Other events in which IIRR has won the medals include: *In individual events*- High Jump - Silver - Dr Revathi; Long Jump - Bronze - Dr Revathi; 1500 m Running - Gold - Dr Santosha Rathod; 800 m running- Bronze - Dr Santosha Rathod; TT woman Single- Gold - Dr Surekha. *In Group Events* - TT Men - Gold; TT Women

Double - Gold (Dr K. Surekha & G. Padmavathi); Basketball- Gold; and Cricket – Silver. For the first time, IIRR won the gold medal in basketball. ICAR-IIHR

emerged as the overall champion with the maximum number of points in this tournament followed by ICAR-CMFRI and ICAR-IIRR.

Research Notes

Development of Genome Edited Rice Lines by ICAR-Indian Institute of Rice Research Satendra Kumar Mangrauthia*

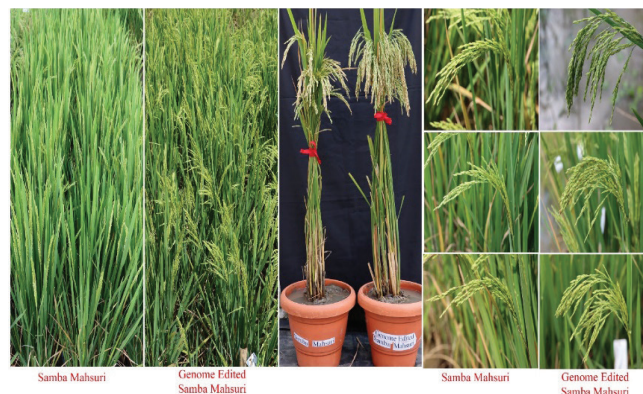
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Genome-editing, the new breeding technique, enables targeted precise changes to crop genomes and can improve a wide range of traits in various crops, including those that underpin food security. Recently, CRISPR/Cas based technology has taken a central stage in the area of plant breeding and crop improvement because of ease, quickness, precision, and specificity. It is considered as the cleanest technology in terms of genetic manipulation and gene modifications. One of the main advantages of using genome editing is that it can accelerate the delivery of improved crop varieties. Genes can be edited directly in elite breeding lines or commercial varieties, obviating the need for backcrossing, which is the preferred process to introgress a trait from a non-elite or wild relative ‘trait donor’. This reduces the so called “linkage drag”, a process wherein unwanted genomic regions are introgressed into elite cultivars and the time needed to develop an improved variety can be reduced by half.

The technology is relatively inexpensive to implement and has widespread accessibility, including private and public research institutions. The technology will have a greater role in enhancing the farmer’s income, and positive impact on society through improved food and nutritional security and also food safety. The technology can also be used to minimize the use of water, fertilizers, pesticides, and other costly and environment-unfriendly inputs in crops. Thus, the technology has an even larger impact on the environment and human health. Several countries including the USA, Brazil, Japan, Australia, Israel, China, Canada, and Colombia have put genome-edited crops away from the ambit of biosafety regulations of GMOs. The Indian government has recently approved the release of genome- edited crops involving SDN1 and SDN2, with minimal biosafety regulations at Institute Biosafety Committee (IBSC) level.

Samba Mahsuri (BPT5204) is a fine grain elite mega-rice cultivar having significant rice export contribution. The variety has expanded to several states of India occupying more than 4 million-hectare area under cultivation. Despite its moderate yield potential of ~5.0-6.0 tons/ha, the cultivar is very popular among farmers and consumers due to its premium grain quality and superior market price. It has been a great challenge for researchers to enhance the yield potential of Samba Mahsuri while retaining the original grain and cooking qualities. At ICAR-Indian Institute of Rice Research, a team led by Dr. Satendra Kumar Mangrauthia started working on genome editing since 2016 and later they received funding from ICAR-National Agricultural Science Fund (NASF) in 2018 to carry out the research work in the area of genome editing.



After establishing initial protocols and standardization of techniques, the IIRR team developed high yielding version of Samba Mahsuri in two years using the CRISPR/Cas genome editing technology. The genome-edited rice lines showed >35% grain yield than the Samba Mahsuri while retaining its original grain characteristics. In addition to the enhanced grain yield, the edited lines showed strong culm strength which helps in lodging resistance. The researchers have

used SDN1 genome editing to mutate a negative regulator of plant that inhibits the number of grains in a rice panicle. It is interesting to note that scientists have just removed a

few nucleotides from a gene encoding the negative regulator present in the rice genome. The transgene-free homozygous edited lines are ready for field testing and commercialization.

Effect of Kin Recognition among Wild Introgression Lines and Parent Cultivar Swarna

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Plants have been evolving for millions of years in nature and are competing for resources for survival. Kin recognition test differentiates the growth patterns with respect to related members of the species from non-related species. In our study between Swarna and a Swarna/*O. nivara* derived introgression line 166-9S, the effect of kin recognition on root and shoot growth was observed. The test was performed by growing 15 pairs of seeds in each petri plate with Swarna, Swarna +166-9S, and 166-9S arranged as a pair as shown in Figure 1. Equal growth of seedlings was observed when seeds of the same genotype are grown together. However, enhanced root and shoot growth in *O. nivara* derived 166-9S compared to the *O. sativa* cultivar Swarna was detected when both these genotypes are grown together (Figure 2). Roots are known to possess

the ability to distinguish between kin and non-kin genotypes. This kind of interactions greatly influence the experimental results where various genotypes are grown as neighboring lines in the experimental plots and the same growth effect may not be exhibited in field conditions where monoculture is followed. More resources are allocated for root growth and competition when non-kin genotypes are grown adjacently. These interactions may cause complex results when combined with water or nutrient stress. Our study showed that the kin recognition exists between different species of *Oryza* which can be exploited in crop improvement. Further, detailed experimentation involving various germplasm is required to prove that kin recognition exerts a significant effect on the phenotypic expression of various traits.

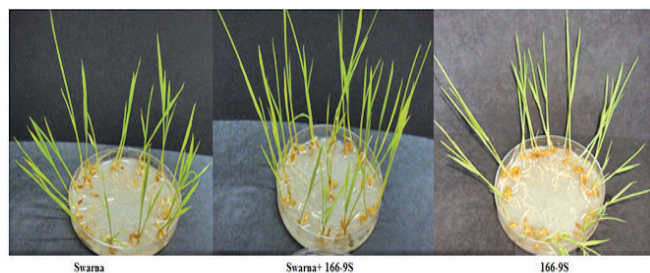


Fig. 1: Kin recognition test for Swarna, Swarna+166-9S, and 166-9S petri plates



Fig. 2: Shoot and root growth of Swarna, Swarna+166-9S, and 166-9S seedlings (Note: In Swarna+166-9S row, Swarna is on the left side and 166-9S is on the right side)

Screening of Elite Samba Mahsuri Mutants and Mutant Derivatives for Brown Planthopper Resistance

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The brown planthopper (BPH) (*Nilaparvata lugens* Stal) is one of the most destructive insect pests of rice. It is controlled by using chemical insecticides but excessive insecticide usage hampers the population of natural enemies and results in the development of insecticide resistance.

Breeding rice cultivars harbouring BPH resistance is an economical, feasible, and sustainable alternative. The stabilized Samba Mahsuri mutants serve as an excellent genetic resource for resistance breeding. A sub-set of Samba Mahsuri mutants and 15 derived lines developed

by crossing mutant lines were phenotyped in the wet season of 2022 for BPH resistance using the Standard Seedbox Screening Technique at ICAR-IIRR glasshouse in three replications at 12 days old seedling stage. Rice cultivars TN1 and PTB33 were used as susceptible and tolerant checks respectively, and scores were recorded according to Standard Evaluation Scale (SES) IRRI. Among these, one mutant derivative line (SP-M-MS-70; TI-140 X BPT-5204) showed a highly resistant reaction with a damage score of 0.0 score, three mutants were resistant (Damage score varied from 2.1 to 2.4) and four mutants were moderately resistant (score varied from 3.3 to 4.1) while the wild type, BPT-5204 showed a highly susceptible (9.0 score) response (Table 1 and Fig. 1). The identified lines can be deployed for exploiting molecular mechanisms and genes responsible for resistance. Also, the highly resistant mutant derivative line showing a 0.0 damage score can be employed as a donor in imparting BPH resistance in breeding programs. This line is medium duration with bold grain type with an average yield of 22 g/ plant.

Table 1: Mean damage score of Mutants and their derivatives to brown planthopper

S. No.	Entry	Parentage	Score	Reaction
1	SP-M-MS-70	Mutant derivative (TI-140*BPT 5204)	0.0	Highly resistant
2	TI-112	Stabilized mutant lines of BPT-5204	2.1	R
3	TI-139		2.4	R
4	TI-113		2.4	R
5	TI-140		3.3	MR
6	TI-145		3.6	MR
7	TI-41		4.0	MR
8	TI-40		4.1	MR
9	PTB33	Resistant Check	1.4	R
10	TN1	Susceptible check	9.0	HS
11	BPT-5204	Wild type	9.0	HS

HR: Highly resistant; R: Resistant; MR: Moderately resistant; HS: highly Susceptible.



Fig. 1: Samba Mahsuri Mutants and Mutant derivative lines showing BPH resistance. (SC-susceptible check, RC-Resistant Check)

Identification of High Zinc Accessions of African Rice (*Oryza glaberrima* Steud.)

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Biofortification of rice varieties with the identification of suitable donors is an effective approach to tackle micronutrient deficiencies in humans. In this context, African rice (*Oryza glaberrima*) has some intriguing natural allelic variations for micronutrient traits, making it an important genetic resource for biofortification. Accordingly, the current study was undertaken to evaluate 29 accessions of *O. glaberrima* along with three check varieties (Chittimutyalu, IR64, and BPT 5204) for grain zinc content at ICAR-IIRR for three seasons (Rabi 2020-21, Kharif 2021 and Rabi 2021-22) using Energy Dispersive X-Ray Fluorescent Spectrophotometer (ED-XRF). Grain Zinc content exhibited manifold variation ranging from 7.30 ppm to 34.40 ppm. Four accessions outperformed the check varieties with higher Zn content in the brown rice. Among accessions, CG 239 (EC 861816)

recorded consistently the highest Zn content in all the seasons with a mean of 34.4 ppm (Table 1), making it a valuable donor for the genetic improvement of *O. sativa* cultivars for high Zinc content.

Table 1: Zinc content in high zinc accessions of *O. glaberrima* over three seasons

Accession	Rabi 2020-21	Kharif 2021	Rabi 2021-22
	Zn (ppm)	Zn (ppm)	Zn (ppm)
CG 239 (EC EC861816)	34.40	34.1	34.7
IR-64 (Check)	16.70	17.1	17.5
BPT 5204 (Check)	27.40	25.6	25.3
Chittimutyalu (Check)	22.80	22.2	21.1

Samba Mahsuri Mutants Having Desirable Glycaemic Index and Protein Content

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Samba Mahsuri is a highly popular variety in the Southern and Eastern parts of India. It shows the best cooking quality with a good yield and a low Glycaemic Index (GI). The glycaemic index is defined as the area under the blood glucose response curve that is measured two hours after a fixed amount of available carbohydrate is consumed compared to a reference food (white bread/ glucose). Considering the rampant prevalence of diabetes in India (global diabetes capital), it is essential to identify and develop low GI rice lines. A GI classification system is in common use in which foods are categorized as having low (≤ 55), medium (56-69), or high GI (≥ 70). Additionally, rice with high protein content is desirable to combat malnutrition along with essential micronutrients. In the AICRPR Biofortification trial, lines having protein content equal to or above 10% are recommended as high protein lines. We screened three months aged grains of 98 ethyl methane sulphonate (EMS) Samba Mahsuri mutants (selected and progressed based on high yield, biotic/

abiotic stress resistance/ tolerance) jointly developed by ICAR-IIRR and CSIR-CCMB for glycaemic index and protein content. The GI was estimated using *in-vitro* method, with standard glucose as a reference, and protein content was estimated using the Folin Lowry method in two consecutive seasons (2020 and 2021). Among the 98 mutants, 12 mutants recorded lower GI than Samba Mahsuri (53.50) viz. TI-9 (46.11), TI-132 (47.14), TI-12 (47.23), TI-10 (47.40), TI-113 (48.23), TI-45 (48.50), TI-128 (49.16), TI-4 (49.80), TI-170 (50.20), TI-11 (51.14), TI-5 (51.50), TI-49 (52.03) and three mutants recorded protein content higher than Samba Mahsuri (9.19%) viz. TI-128 (11.39%), TI-60 (11.38%), TI-40 (10.34%). The above-identified mutants are a promising material for grain quality and nutritional studies. Captivatingly, one mutant line viz. TI-128 recorded low GI (49.16) and high protein content (11.39%). This mutant line can be further explored for understanding the biochemical and molecular mechanisms related to quality and nutrition.

Panorama of Institute Activities

Valedictory Function of Hindi Chetana Mass



The *Hindi Chetana Maas* program was concluded on 19th October, 2022. Mr. Shitanshu Kumar, Chief Administrative Officer, explained the importance of Hindi Day and provided detailed information regarding various competitions being organized during Hindi Chetana Mass. Dr. RM Sundaram, Director, ICAR-IIRR distributed the prizes and certificates to the winners of the various competitions

organized during Hindi Chetana Maas and also appealed for the use of modern tools for the progress of official language implementation in the Institute. He appreciated the efforts of Mr. Shitanshu Kumar, Dr. Mahesh Kumar and Mrs. Vanita for successfully organizing all programs of the *Hindi Chetana Maas Samaroh*.

Cybersecurity awareness program



As a part of Cyber Jaagrookta Divas Annual Day Celebrations, ICAR-IIRR in association with Pranadhara Foundation, Bapatla organised Cybersecurity Awareness Program through ABCs of information security campaign in Cheruvu Jammula Palem village, Bapatla, Andhra Pradesh on 10.10.2022. Dr. B. Sailaja, Principal Scientist (Computer Applns.) briefed on Cyber safety tips and Dos and Don'ts of using mobiles and computers. Drs. B. Nirmala, Senior Scientist (Economics) and D. Krishnaveni, Principal Scientist (Pathology), ICAR-IIRR, Sri Pundarikakshudu and Sri Kiran Prakash from Pranadhara Foundation, Mrs. Vijaya Nirmala, DDA, FTC, Mrs. Lakshmi, ADA, Bapatla actively participated in the program. About 30 progressive farmers attended this program.

Vigilance Awareness Week



As per the directions of the Central Vigilance Commission of India, Vigilance Awareness Week was celebrated at ICAR-IIRR from 31st October to 6th November, 2022. The theme of this year's Vigilance awareness week was "Corruption-free India for a developed Nation. The main aim of the Vigilance awareness week is to encourage all

the stakeholders to collectively participate in preventing corruption in public life. Several awareness programs were organized during this week. It started with the vigilance oath and integrity pledge administered by Dr. R. M. Sundaram, Director, ICAR-IIRR to all the staff members on 31st October. An essay writing competition was organized on "Integrity and transparency in the workplace" on 1st November, 2022. A special awareness lecture for the farm labours on various aspects of office duties and responsibilities in the Telugu language by Dr. A.V.S.R. Swamy was organized and a poster competition was held on 4th November. In the concluding ceremony held on 4th November, Dr. G. S. Laha, Vigilance officer, ICAR-IIRR briefed about the importance of vigilance awareness week, and Dr. R. M. Sundaram, Director, IIRR addressed all the staff of the Institute on various aspects of office rules and responsibilities and urged all the staff to follow the path of honesty and integrity in all official matters. A special lecture was delivered on "Duties, responsibilities, and office conducts of the employees" by Mr. Saroj Kumar Singh, CAO, ICAR-IIRR, Lucknow in online mode. The meeting ended with a vote of thanks proposed by Dr. G. S. Laha.

Pradhan Mantri Kisan Samman Sammelan - 2022



ICAR-IIRR participated in *Pradhan Mantri Kisan Samman Sammelan -2022* on October 17, 2022 and organized an interactive session with farmers on rice cultivation and felicitated the farmers. ICAR-IIRR participated virtually in the Global Launch of Mission Life by the Hon'ble Prime Minister of India on 20th October, 2022.

Constitution Day



ICAR-IIRR celebrated Constitution Day on 25th November, 2022. Dr D. Subrahmanyam, Director (I/C), Administered the Constitution Day pledge to all the staff of the Institute

World Soil Day



ICAR-Indian Institute of Rice Research celebrated the World Soil Day 2022 on the 5th of December. The program was attended by farmers and staff of ICRA-IIRR. Dr. K. Surekha, Head, Soil Science Section, welcomed and addressed the gathering. Mr. Sandeep Kondaji, CEO, and his team demonstrated soil testing using the indigenous machine – KRISHIRASTAA. More than 50 soil health cards were distributed to the beneficiary farmers by Dr. R M Sundaram, Director, IIRR. A Memorandum of Understanding (MoU) was signed between ICAR-IIRR and Krishitantra for the joint initiative of Krishirastaa.

Swachta Pakhwada



ICAR-IIRR organized Swachta Pakhwada during 16-31 December, 2022. Various Swachta activities were organized around the Institute campus during this program.

Capacity Building Programs

ICT-based training programs on Improved Rice Production Technology

An off-campus ICT-based training program on 'Improved rice production technology' was organized by ICAR-IIRR at Cheruvu Jammulapalem, Bapatla Mandal, Guntur district of Andhra Pradesh during Oct. 10-11, 2022. Dr. B. Sailaja, PS (Computer Applns.) explained about the use of the 'Rice mobile app' developed by ICAR-IIRR. The app was installed on the mobile phones of the farmers. Several applications of the app were discussed with the farmers. Diagnosis of the pests and diseases using the app was narrated by Dr. D. Krishnaveni, PS (Pathology), ICAR-IIRR. Awareness on possible solutions after diagnosis

by using the app was also created among the farmers. Dr. B. Nirmala, Senior Scientist (Agricultural Economics), ICAR-IIRR elaborated upon the importance of the app in helping to take up timely crop protection measures and for profitable rice production. On 11/10/2022, under ICAR-IIRR-SCSP a similar training program was organized at Ether village of Bapatla Mandal of Andhra Pradesh. The farmers reported leaf folder incidence in rice. Dr. D. Krishnaveni suggested solutions for the management of the leaf folder and IPM strategies. Dr. B. Nirmala emphasized the importance of Integrated nutrient



management in rice and demonstrated the use of Leaf Color Charts developed by ICAR-IIRR. The LCCs were distributed to the farmers. These ICT based training programs were coordinated by Drs. B. Sailaja, B. Nirmala and D. Krishnaveni. The team also organized an ICT-based training program 'Integrated Pest Management in Rice', under SCSP at Avancha village, Nagarkurnool district on Dec. 28, 2022.

Training on soil health management

ICAR-IIRR Scientist Dr. Brajendra offered training to 5000 Agri-Horti-Extension officers of Telangana and Andhra Pradesh states on sustainable soil health management plus rapid soil testing at Kanha Shanti Vanam, Timmapur, Hyderabad.

October, 2022 at ICAR-IIRR under the SCSP program. The program was coordinated by Drs. B. Nirmala, P. Jeyakumar, Brajendra, V. Manasa and P. Muthuraman.



Training program on rice production technologies

A training program on rice production technologies was organised for the SC farmers of Telangana during 16-17

Signing of MoUs with Universities

ICAR-Indian Institute of Rice Research signed MoUs with Sanskriti University, Mathura, Uttar Pradesh, and Satyabama Institute of Science and Technology, Chennai on 16-12-2022.



Workshops, Webinars & Seminars

As a part of the *Azadi ka Amrit Mahotsav*, ICAR-IIRR in association with the Society for Advancement of Rice Research organized the following webinars:

- Webinar on “Integrated approaches towards the development of rice varieties for alternative irrigation systems” by Dr. Niranjana Baisakh, Associate Professor, Louisiana State University Agricultural Centre, USA, on 9th Nov. 2022. Dr. Baisakh emphasized on the deployment of alternative irrigation systems and mapping approaches for critical yield traits in rice.
- Webinar on “IARI interface with rice industry” by Dr. VP Singh, Retd. Professor, IARI was organized on 11th Nov. 2022. He shared his vast experience of research and pressed on the need for breeding quality-related traits in rice.
- Webinar on “Development of healthier rice to achieve global nutritional security” by Dr. B.P. Mallikarjuna Swamy, Senior Scientist, IRRI, Philippines, was organized on 15th Nov. 2022.

Extension and Outreach Activities

Organizing Field Days on IIRR Rice Varieties

A Field Day was organized on IIRR varieties DRR DHAN 64, 48, 49 and 51 at Chandepally village of Yadadri Bhuvanagiri district of Telangana on 16 November, 2022 in which 80 farmers participated. Dr. P. Muthuraman, PS & Head, TTT, ICAR-IIRR, Shri. Narender, Scientist, Eruvaka, Yadadri Bhuvanagiri, Mrs. Sujatha, Agriculture Officer, Mootakondur mandal, Smt. Shivani, Agricultural

Extension Officer, participated in the field day. The field day was organized by Dr. B. Nirmala, Senior Scientist (Agri. Economics) and PI-ICAR-IIRR-SCSP. Another field day was organized at Manchal, Ranga Reddy District, Telangana on 30-11-2022 and SCSP demonstrations at Thummalagudem were monitored on 25th November, 2022.



Participation in Conferences

ICAR-IIRR participated in the “International Conference on Reimagining rainfed agroecosystem: challenges and opportunities” from 22-24 December, 2022 and displayed the IIRR technologies for the benefit of stakeholders. Dr. Panjab Singh, former DG, ICAR, and other dignitaries

visited the IIRR stall. ICAR-IIRR also participated in the “BioAgri 2022” Organized by BioAgri Input Producers Association during 19-20 October, 2022 and displayed the IIRR technologies.



Visitors to the Institute

Dr. H.K. Chaudhary, Vice chancellor, CSKHPKVV, and his team including Dr. S. P. Dixit, Director of Research, Dr. Vinod Sharma, Assoc. Director, HAREC Bajaura, Dr. Pankaj Sood, Principal Scientist-cum-Programme Coordinator, Krishi Vigyan Kendra Mandi at Sundernagar, and Shri Ram Saran Sharma, Section Officer, Office of Vice



Chancellor of the University visited ICAR-IIRR, Hyderabad and interacted with the Scientists on 1st October, 2022.

B.Sc. (Ag.) final year students from the College of Agriculture, KARAD, MPKV, Rahuri, Maharashtra visited and interacted with the Scientists of ICAR-IIRR.



Staff News

Deputations

- Dr. R. M. Sundaram, Director, ICAR-IIRR was deputed by ICAR for participating in the Council for Partnership on Rice Research in Asia (CORRA) meeting held at BRRI, Dhaka, Bangladesh during Nov. 28-29, 2022.
- Dr. V. Prakasam, Senior Scientist, Plant Pathology, was deputed for participating in the workshop on Establishing Danish-Indian Partnership on smart plant



protection (SPP) held at the University of Copenhagen, Denmark, from Nov. 28 - Dec. 2, 2022.

- Dr. S. Vijaya Kumar, Scientist, Agronomy, was deputed for participating in the 8th International Weed Science Congress held at Bangkok, Thailand during Dec. 4-9, 2022.



Awards

Dr. B. Nirmala, Senior Scientist (Agri. Economics) received the **Raithu Nestham Award-2022** from Shri. M. Venkaiah Naidu, former Hon'ble Vice President of India on 20th November, 2022 at Swarna Bharat Trust, Muchintal, Hyderabad, during the Raithu Nestham Foundation's 18th Annual Award Ceremony in the presence of about 500 farmers from Andhra Pradesh and Telangana.



Promotion/Appointment/Transfer/Superannuation

- Dr. D. Subrahmanyam, Principal Scientist, Crop Physiology, superannuated on 30th November, 2022.
- Ten Skilled Supporting Staff (SSS) grade employees (V. Chandamma, D. Kalavathi, V. Pentamma, M. Anjamma, K. Laxmi, G. Sailoo, K. Manamma, B. Sarooja, P. Bhararathamma and S. Pochamma) were superannuated on 31st October, 2022. Dr. R. M. Sundaram, Director, ICAR-IIRR appreciated their outstanding services to the Institute and felicitated them on this occasion.
- Dr. M. Sheshu Madhav, Principal Scientist,

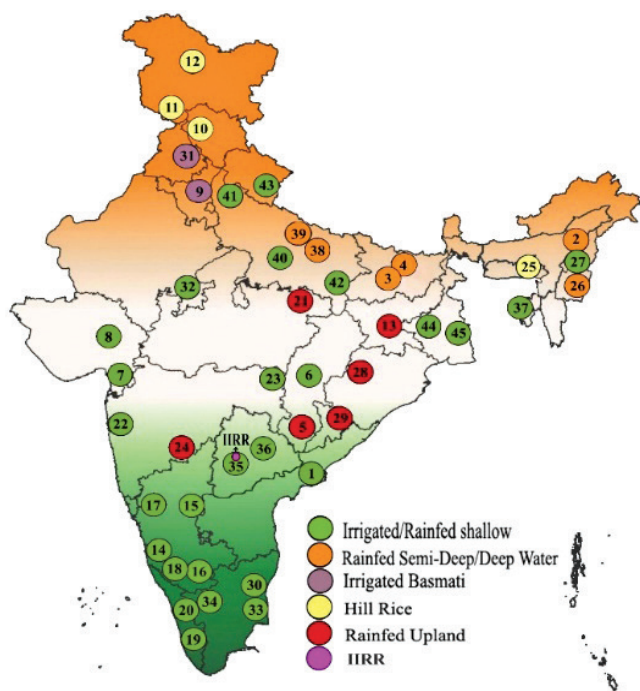
- Biotechnology, was elevated to the Director, ICAR -CTRI, and relieved from the Institute on 10/11/2022.
- Shri. K. Narasimha, Senior Technical Assistant promoted to next higher grade of Technical Officer (T5) w.e.f. 29/06/2021.
- Shri. A. Ramesh, Senior Technician is promoted to the next higher grade of Technical Assistant (T3) w.e.f. 14/07/2018.
- Mr. Rama Murthy joined on 1/10/2022 as Personal Assistant after completing the deputation period.



AICRP on Rice News

About eighteen multi-disciplinary teams consisting of scientists from ICAR-IIRR, ICAR-NRRI, and ICAR-IARI were constituted to monitor the AICRP on rice experimental trials in crop improvement, crop production, and crop protection disciplines being carried out at various AICRP

centres. These teams visited the centres located across the Northern, Central, Southern, Western, Eastern, and North-Eastern zones of the country encompassing all rice growing ecologies and meticulously monitored the status of experimental trails.



GOLDEN RICE PROVIDES SIMPLE SOLUTION TO VITAMIN DEFICIENCY: IIRR DIRECTOR

In the late 1990s, German scientists developed a genetically modified variety of rice called Golden Rice. It was claimed to be able to fight Vitamin A deficiency, which is the leading cause of blindness among children and can also lead to death due to infectious diseases such as measles.



Dr Raman Meenakshi Sundaram

The claim has sometimes been contested over the years, with a 2016 study from Washington University in St Louis reporting that the variety may fall short of what it is supposed to achieve.

However, it's believed that large scale cultivation and consumption of Golden Rice provides a safe, culturally simple solution in countries like India, Bangladesh and the Philippines, where staple food grains, such as rice, are the primary source of calorie.

2 How is Golden Rice different from regular rice and biofortified rice?
Regular white rice (i.e. polished rice) is devoid of many vital nutrients including beta carotene while Golden Rice contains them in significant quantities. The term biofortified rice is used for rice grains possessing significant quantities of micronutrients like zinc.

the Philippines.

If Golden Rice is commercialised in India, how can it benefit consumers?

If it is found to be safe and nutritionally rich by the regulatory agencies of Government of India, then it can possibly be cleared for cultivation by farmers and consumption by the people in the country. Consumption of Golden Rice may help mitigate and reduce vitamin A deficiency among small children and lactating mothers and other vulnerable groups and may reduce the extent of blindness caused due to Vitamin A deficiency. Few studies carried out in the Philippines and elsewhere have shown that Golden Rice can play a significant role in mitigating Vitamin A deficiency.



What is the current status of Golden Rice in India?

Currently, there is no cultivation or commercialisation of Golden Rice in India. However, a version of Golden Rice, called GRIE1 has got the necessary approvals related to its regulatory clearance in the Philippines and it is being cultivated in huge areas in that country. If it is determined that GRIE1 Golden rice has adequate quantities of beta carotene and other carotenoids, it can be brought to the country and after evaluation of its food and feed safety and other biosafety aspects, it can be possibly considered for de-regulation and commercial cultivation after suitable bio-

What is Golden Rice and beta carotene?

Golden Rice is a genetically modified version of rice, which accumulates significant quantity of beta carotene and other carotenoids in the grain. Beta carotene is the precursor of Vitamin A and after ingestion into the human body it is converted into Vitamin A by our digestive system. Golden Rice was developed by transcribing maize genes into rice. It also contains carbohydrates. Beta carotene converts this rice into

What is the status of Golden Rice in other countries?
As mentioned earlier, GRIE1 Golden rice has already got the necessary approvals related to its regulatory clearance in the Philippines and 70 tonnes of the nutritionally rich Golden Rice has been harvested at the end of wet season 2022 for human consumption. Bangladesh has also developed its own versions of GRIE1 Golden Rice, which are undergoing biosafety related tests and may be released for cultivation in the future.

Are there any proposals before the government of India for the approval of Golden Rice?

Such proposals can be possibly submitted in future, once data from large scale feeding trials is available from the



THEHINDUBUSINESSLINE.COM
Rice research body 'genome edits' Samba Masuri to increase yields

తక్కువ పెట్టుబడితో సాగు లాభదాయకం

బాబట్ల, న్యూస్టుడె: పరి సాగులో పెట్టుబడి తగ్గించుకోవటం ద్వారా రైతులు ఆదాయం పెంచుకోవాలని హైదరాబాద్ అఖిల భారత పరిశోధన సంస్థ శాస్త్రవేత్త డి.కృష్ణవేణి అన్నారు. మండల పరిధిలోని చెరువుజమ్మలపాలెంలో ప్రాథమిక శ్రుష్ట అధ్యర్థంలో వెదసాగుపై సోమ వారం నిర్వహించిన కార్యశాలలో ఆమె మాట్లాడారు. వెద సాగు ద్వారా ఎకరాకు రూ.4 వేల వరకు పెట్టుబడి ఖర్చు తగ్గించుకోవచ్చన్నారు.

కులీల కొరత అధిగమించాలంటే రైతులు తప్పనిసరిగా యాంత్రికరణ వైపు దృష్టి సారించాలన్నారు. కృత్రిమ మేద ద్వారా పరిలో తెగుళ్ల నివారణ చేపట్టి విధానాన్ని వివరించారు. రైతులు తమ మొబైల్ ఫోన్లలో ఐటీఎం యూజి డౌన్లోడ్ చేసుకుని స్వయంక్షణ చర్చల సమాచారం పొందాలన్నారు. శాస్త్రవేత్తలు శైలజ, నిర్మల, డీడీపి విజయనిర్మల, ఏడీపి శ్రీలక్ష్మి, శ్రుష్ట సంచాలకుడు పుండరీకాక్షయ సాల్గన్నారు.

పోషక సమృద్ధ బియ్యానికే ప్రాధాన్యం!

- 6 రకాల బియ్యాలపై పోషక మగంధాలను వివరించిన సీసం భారత పరిశోధన సంస్థ
- 2024 మార్చి నుంచి చేపించాలని అయిదు నెలల పాటి



పోషక సమృద్ధ బియ్యం పంపిణీ

పోషక సమృద్ధ బియ్యం పంపిణీ కోసం భారత పరిశోధన సంస్థ (IIRR) 2024 మార్చి నుంచి చేపించాలని అయిదు నెలల పాటి ప్రయోగం చేపట్టనుంది. ఈ ప్రయోగం ద్వారా పోషక సమృద్ధ బియ్యం పంపిణీ కోసం అనుకూలమైన పద్ధతులు నిర్ణయించబడతాయి.

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మధుమేహులకూ మేలైన వరి

- 'మెరుగైన సాంబమసూరి' రకం వరిని త్రోవేసే ప్రయత్నం చేపట్టారు
- ఈ తప్పిందల్లో సాంబమసూరి రకం తప్పిందాన్ని 50.9 శాతం



తనాడు - కైరతాబాద్

మెరుగుపరిచిన సాంబమసూరి రకం... దీనిని

తెలుగు, అధిపతిగా పనిచేసే దీనిని తప్పిందాన్ని 50.9 శాతం త్రోవేసే ప్రయత్నం చేపట్టారు. తప్పిందాన్ని 50.9 శాతం త్రోవేసే ప్రయత్నం చేపట్టారు. తప్పిందాన్ని 50.9 శాతం త్రోవేసే ప్రయత్నం చేపట్టారు.

దీనిని, అదాయం అధికంగా లాభదాయకంగా ఉండేలా చేయడానికి ప్రయత్నం చేపట్టారు. తప్పిందాన్ని 50.9 శాతం త్రోవేసే ప్రయత్నం చేపట్టారు. తప్పిందాన్ని 50.9 శాతం త్రోవేసే ప్రయత్నం చేపట్టారు.

భారతీయ చావల అనుసంధాన సంస్థానం మే 11 వేల రూపాయలకు సమావేశం



భారతీయ చావల అనుసంధాన సంస్థానం మే 11 వేల రూపాయలకు సమావేశం. భారతీయ చావల అనుసంధాన సంస్థానం మే 11 వేల రూపాయలకు సమావేశం.

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Forthcoming Events

- Hill Rice Workshop will be held during February 2023.
- The Institute Biosafety Committee (IBSC) meeting is scheduled during February 2023.
- The 58th ARGM (Annual Rice Group meetings) will be held at Assam Agricultural University (AAU), Jorhat during April/ May 2023.

RICE BASED HEALTH CARE PRODUCTS

Rice Riche CREAM FOR CRACKED HEEL



The product is useful for therapeutic and cosmetic applications for cracked heels and dry skin disorder. It softens the heel and foot skin, preventing the feet and other parts from forming thick & hard skin.



Rice Riche FACE SCRUB

Rice Riche Face Scrub is an exfoliation product which has been designed specifically for use on the face. It removes dead skin cells to give a more polished and healthy look by making skin softer and brighter.

Rice Riche PAIN RELIEVING GEL



Rice Pain Relieving Gel is highly product effective for minor aches, pains of muscles and joints associated with simple strains, bruises and sprains. It absorbs well in the skin, thereby active ingredients get absorbed fast and provide quick relief.



Rice Riche MOISTURIZING LOTION

Rice Moisturizing Lotion is a skin care product. Its regular application makes skin smooth, soft and supple. The antioxidants of the product fight with free radicals and slow down the effect of aging.

IRON RICHE RICE

Anemia caused by iron deficiency is a major public health issue affecting infants, young children and pregnant women. This problem can be overcome if the rice which is the staple food of majority of the Indian population, is fortified with iron. Keeping this view in mind, a protocol for production of iron fortified rice was developed with proven results. Hemoglobin level measured in moderately subjects increased from 9.25 to 10.83 g/dl while in subjects with severe anemia increased from 6.77 to 10.36 g/dl.

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