DRR

Directorate of Rice Research

NEWSLETTER

Volume : 10, Number : 1 | RICE IS LIFE | January-2012

From Director's Desk...

I wish each one of you a very happy and prosperous new year, 2012. South-West monsoons (June-September 2011) for the country as a whole was normal with the exception that North-East India and July months experienced some moisture deficiency with 86 and 85% of normal rainfall. Out of the total 36 meteorological subdivisions, 33 subdivisions (92% of the total area of the country) received excess/normal rainfall.

With congenial monsoon, the country is poised to record the highest ever rice production of the *kharif* season i.e. 87.1 million tons (First Advance Estimates of production, Ministry of Agriculture). This production is 2.19 mt higher than the previous recorded higher production (2008-09). Of the 6.45 mt increase in rice production over previous year, basmati rice contributed 1 mt. Basmati rice production would be 15.3% higher than that of 2010-11 production (6.5 mt). This higher basmati rice production may lead to a steep fall in its market price. During the period under report, several significant events took place at DRR. Of the 22 research platforms identified for funding during 12th five year plan by ICAR, DRR scientists have submitted proposals for 17 platforms. This directorate has organized, two Directorate of Extension (DOE) sponsored training programmes for the benefit of subject matter specialist of state agriculture departments. One was on *System of Rice Intensification* (28 September-5 October) and the other one on *Hybrid Rice Production Technology* (29 October-5 November).

Two Farmers' days were organized by DRR; one at Nallavelli village, Mahaboobnagar district, Andhra Pradesh on *IPM practices* (15 November) and the other at Veerareddypalle, Kurnool district, Andhra Pradesh (17 November) on *Cultivation/adoption of Improved Samba Mahsuri variety* that is released by DRR. Over 450 farmers and state government officials took part in these two farmers' day programmes.

Hindi Week (14-22 September), World Food Day (18 October), Vigilance Week (31 October-5 November) and Women in Agriculture Day (5 December) were celebrated with full involvement of DRR staff.

I take this opportunity to thank the outgoing team and welcome the new Editorial team of newsletter. I hope that the contents of the newsletter would be quite informative and useful for all those involved in rice research. I earnestly solicit your valuable suggestions for further improvement.

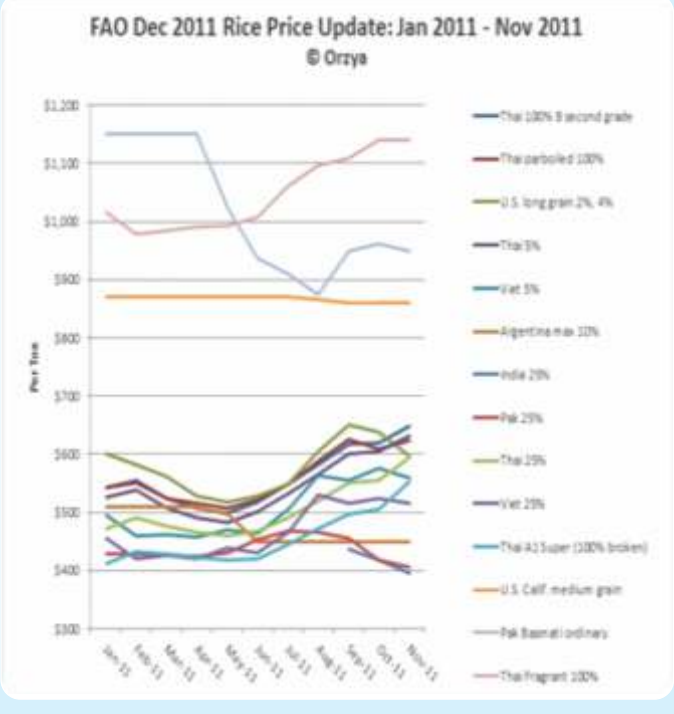
(B.C. Viraktamath)

IN THIS ISSUE

RICE EXPORT SCENARIO

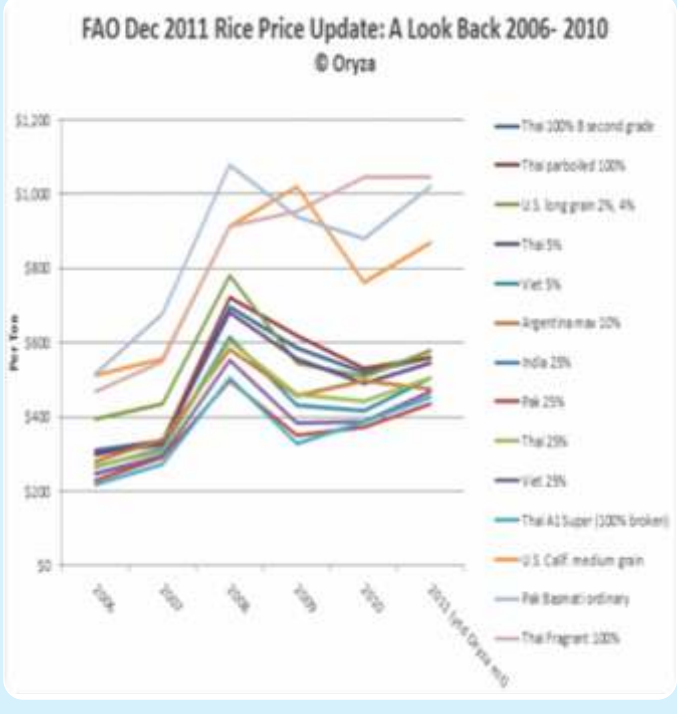
India's rice exports may triple to about 7 mt (21% of world trade of 33 mt) in the crop year (October, 2011 - September, 2012) up from 2.2 mt in 2010-11 (7% of world trade), according to a leading global analytics company located in India. The Government of India's decision to lift the ban on export of non-basmati rice in September, 2011 could not have come at a more opportune time. The lifting of the ban may translate into additional $2 billion in export revenue for India's rice millers and exporters in 2011-12.

Indian rice exports so far have been a success with about 1.2 million tons already shipped, mostly to Africa, though India also made a 250,000 tons sale to Indonesia and sold 30,000 tons to Iraq, dependent on quality. India has agreed to export 10,000 tons of non-basmati rice at less than $400 per ton to three African nations in the horn of Africa (Kenya, Somalia and Djibouti) as a part of government-to-government deal.



The report also projects Indian rice production of about 100 million tons, up 6% y/y, a conservative estimate considering some forecasts have been as high as about 103 million tons. The agency says that Thailand, Vietnam, and Pakistan will lose market share to India-based on current price dynamics. Rice production in Thailand, the largest exporter, is expected to decline in 2011-12 due to a damaged crop, following floods. The Thai government's decision to increase its minimum purchase price of rice may also reduce the competitiveness of Thai rice globally. White milled Thai rice, for instance, is expected to be priced at $600 to $610 per ton, higher by $120 to $150 per ton over the comparable variety of Indian rice. Meanwhile, Indian rice exports are helped by healthy export opportunities, low paddy prices and a favourable exchange rate.

The study says that India's rice millers should enjoy increased profitability as paddy prices should decline about 25% from 2010-11 while global milled rice prices are unlikely to reduce by the same proportion, given the low supplies from the leading rice-exporting nations. The agency says the credit ratings of Indian rice mills are unlikely to improve much however since they have high levels of debt.



The Food and Agriculture Organization (FAO) released its December *2011 "FAO Rice Price Update."* The report captures rice prices for various origins and types from 2006 through this year up until November. It confirms that generally speaking, 2011 rice prices are the highest they have been since 2008 and on average prices are up about $300 per ton from 2006 and up about $100 per ton from last year.

Breeding rice varieties adaptable to Conservation Agriculture

Suneetha Kota, P. Senguttuvel, V.P. Bhadana., N. Shobha Rani, G.S.V. Prasad,
B. Gangaiah, M.B.B. Parsad Babu, D. Subramanyam,and B.C. Viraktamath

Declining irrigation water availability to agriculture and escalating fuel prices threaten the water and energy intensive puddled irrigated rice production system and calls for developing and promoting new rice production system that uses less water and energy. Further, the labor shortage, and depleting soil fertility issues are leading to increasing interest in shifting from puddled and transplanted rice to conservation rice culture i.e. direct seeding (DS) and reduced tillage rice culture with residue retention.

Conservation agriculture (CA) is a concept for resource saving agricultural crop production that strives to achieve acceptable profits together with high and sustained production levels while concurrently conserving the environment. CA which is mainly based on the three principles of minimum soil disturbance, permanent soil cover and crop rotation has shown to improve, conserve and use natural resources more efficiently through integrated management of available soil, water and biological resources. The varieties developed and released for conventional transplanted conditions may not necessarily be well adapted to direct seeding and CA. No systematic breeding efforts have been made to develop varieties and hybrids specifically adapted to CA. Presence of significant G x E interaction between the varieties and crop establishment methods indicate the greater potential in developing specific varieties suited to CA practices. Therefore, a preliminary study was conducted to evaluate the performance of selected genotypes under direct seeded and conventional transplanted condition.

An experiment with 50 genotypes consisting of *O. rufipogon* introgression lines as well as released varieties was conducted in Alpha lattice design with 3 replications under direct seeding condition as well under puddled transplanted condition as control during *kharif*, 2010 at Ramachandrapuram farm of DRR. Observations on various morphological, functional traits as well as yield & yield components were recorded. The data were analyzed using SAS 9.2. The genotypic and phenotypic co-efficient of variation, heritability and genetic advance as per cent of mean (GAM) were estimated for all the 13 characteristics of yield, yield components and physiological traits. The summary of statistics for all the traits studied are presented in Table 1.

The *per se* performance of the genotypes under transplanted as well as under DS varied. Interestingly, some of the genotypes were found to perform better under both conditions, while some of them exhibited superior performance under DS and *vice versa*. Rasi, Aathira, Kalinga II, Swarna Prabha, ASD19, Amruth and Shakuntala performed better under direct seeded condition. *Oryza rufipogan* introgression lines *viz.*, S-467, S-166, and S-194 also exhibited superior performance under DS. Under transplanted condition, superior *per se* performance was recorded by IR 64, Aathira, PMK2, GAUR 2, Amruth, Jaishree, Shakuntala, S-473, S-381, S-215 and S-194. High to moderate heritability coupled with low to high genetic advance as per cent of mean was observed for most of the characteristics under direct seeded condition. Under DS, the characters *viz.*, shoot biomass, number of tillers, productive tillers, and specific leaf area *etc.*, showed positive correlation with plot yield indicating that these traits may be considered during selection. The shoot biomass which showed positive correlation with yield is also an important indicator for early seedling vigor during the initial stages of the crop establishment. Among them, Sabita was identified to possess weed suppressive ability with early seedling vigor and higher shoot biomass under direct seeded condition. Hence, under a given environmental condition *viz.*, puddled transplanted and direct seeded condition, differential response of genotypes with respect to yield and yield components as well as the physiological traits was observed.

Table 1: Summary of simple statistics

Variable	Direct seeding condition				Transplanted condition			
	Mean	S D	Min.	Max.	Mean	S D	Min.	Max
Days to 50% floweing	81.64	11.51	56.00	97.67	100.60	8.82	86.00	118.00
Plant height (cm)	89.53	16.22	65.00	123.67	99.69	18.77	66.60	147.67
Shoot biomass	11.03	3.32	7.05	26.06	17.03	3.15	9.40	24.53
Productive tillers	8.93	1.22	6.00	12.00	6.21	1.18	4.33	10.33
Panicle length (cm)	20.59	1.86	12.60	23.60	21.88	1.60	17.80	25.20
Single plant yield (g)	16.06	7.26	4.40	46.00	14.34	3.51	6.53	22.17
Sterility (%)	20.86	8.94	8.11	55.10	13.09	6.19	2.75	26.17
Specific leaf area (cm^2/g)	176.09	31.22	123.03	252.27	162.71	15.40	135.33	194.69

Vol. 10 No.1, 2012
DRR Newsletter

AICRIP NEWS

Rajendra Agricultural University, Pusa, Bihar

Pusa, the headquarters of the University is located in Samastipur district of Bihar on the Western and Southern bank of river Burhi Gandak (25^{0}98' N latitude and 85^{0}67' E longitude, 52 m above mean sea level). The centre's sub-tropical climate is characterized by hot-dry summers and cool winters with a mean annual rainfall of 1260 mm (90 per cent of which is received from mid June to mid October). The period from last week of November to February receives occasional showers. May-June is the hottest months of the year. January is the coldest month with average maximum temperature ranging from 21.4^0- 23.7^{0}C and minimum from 8.7 - 10^{0}C.

Pusa happens to be the birth place of agricultural education and research in India. The foundation stone of the Agriculture Research Institute and College was laid by Lord Curzon on the 1 April 1905.Pusa received imperial status in 1918, being renamed as the Imperial Agricultural Research Institute. Bihar earthquake in January 1934 resulted in shifting of this agricultural temple to New Delhi, now known as Indian Agricultural Research Institute (IARI).

Systematic rice research at Pusa was started after the inception of All India Coordinated Rice Improvement Project (AICRIP) in 1978. During the same period, RAU headquarters was also shifted to Pusa from Patna. Some great scientists like Dr. B.N. Singh and Dr. R. Thakur contributed significantly to the rice research at Pusa station. Now it is being carried forward by the team led by Dr. N.K. Singh (Chief scientist, Rice) with able support from colleagues Dr. Rajesh Kumar (Jr. Scientist, Rice), Dr. A.K. Mishra (Entomologist), Dr. Bimla Rai (Pathologist), and Dr. S.K. Chaudhary (Agronomist).

Overall Achievements

Over a dozen varieties have been released from this centre (Table 1). The released varieties include three for rainfed upland, two for rainfed shallow land, one for irrigated, one for semi deep water, three for *boro* season, two for deep water and one scented variety. The improved material developed from the centre for irrigated upland, aerobic, semi deep water and deep water conditions are under evalauation at state level.

Centre is maintaining nearly 266 germplasm lines that include about 100 land races for deep water condition. Over 200 AICRIP trials were conducted by this centre during XI five year plan under Breeding, Agronomy, Pathology and Entomology section. Improved breeding materials (28 entries) have been nominated in different categories for screening at national level during XI five year plan. Two improved varieties Rajendra Bhagwati (for upland) and Swarna Sub-1 (for low land condition) have been released in state from the AICRP trials. Three M.Sc (Ag) and two Ph D students have completed their work on Rice. The centre has produced nearly 25 tonnes of breeder seed of improved varieties, on demand during the XI plan.

Future Plans

The centre has well established screening facility for deep water, semi-deep water & submergence conditions. The facilities include a agro-met observatory, storage godown and a well laid out 200 acres of farm for research and seed production. The centre aims to introgress submergence tolerance in Rajendra Mahsuri-1 background through marker assisted back crossing in the coming years. The biotech lab was established recently at this center to strengthen the rice research work.

Table. 1. Rice varieties released by RAU, Pusa centre.

Variety	Year of Release	Duration	Ecosystem	Yield (t/ha)
Kanchan	1976	90-100	Rainfed upland	3.0-3.5
Rajshrre	1987	135-140	Rainfed Shallow lowland	3.5-40
Satyam	1987	140-145	Semi deep water	4.0-4.5
Sudha	1987	165-175	Deepwater	2.0-2.5
Kamini	1991	130-135	Scented	3.0-3.5
Prabhat	1994	90-100	Rainfed upland	3.0-3.5
Turanta	1995	90-100	Rainfed upland	3.0-3.5
Vaidehi	1995	160-170	Deepwater	2.0-2.5
Gautam	1995	115-120	National Cheek for Boro	5.0-5.5
Dhanlaxmi	2000	100-110	Boro	4.5-5.0
Richharia	2000	115-160	Boro	4.0-4.5
Santosh	2001	135-140	Rainfed Shallow lowland	5.0-5.5
Rajendra Bhagwati	2009	110-115	Irrigated upland	5.0-5.5


Rajendra Bhagawati Variety

MONITORING OF AICRIP TRIALS

DRR is entrusted with the responsibility of collective planning, implementation and coordination of multidisciplinary rice research activities being carried out at more than 100 research centres spread over 27 states and two Union Territories. Monitoring of AICRIP trials, breeder seed production, DUS testing, frontline demonstrations in farmers' fields and research activities of the centres is very crucial to ensure desired results and proper implementation of the coordinated programme. This year in phase II, six multidisciplinary teams from DRR along with a nodal scientist from the respective regions have completed the monitoring of rice trials as per the details given below:

S.No.	DRR team and Nodal Scientist	AICRIP centers monitored	Period of visit	Remarks
1.	S.M. Balachandran, S.R. Voleti, M. Mohan, K. Suneetha and M.P. Rajanna	Ambasamudram, Trichy, Aduthurai, Mandya, and Bengaluru Warangal, Maruteru and Rajendranagar	10-22 October 31 October–1 November	Monitored Southern region trials. The trials were timely sown with good crop stand. However, at Mandya and Trichy sowings were delayed. Occurrence of BLB and sheath blight among the diseases and Brown plant hopper and yellow stem borer incidence was observed.
2.	V. Ravindra Babu	Coimbatore and Bengaluru	19-20 October	Monitored aerobic rice and high iron and zinc trials. Sporadic incidence of leaf folder, stem borer and BPH in farmer's field at Coimbatore was observed.
3.	N. Shoba Rani, A.S. Hari Prasad, R. Mahenderkumar and Amit Kumar	Titabar, Jorhat Imphal, Wangbal Barapani, Upper shillong, Gerua, Arundathinagar and Lembuchera	8-18 October	Monitored North East region trials. Overall crop stand was good. Severe leaf folder damage was noticed in Arundathinagar. At Gerua, because of scarcity of water, semi deep water conditions could not be maintained after August. Bacterial leaf streak was observed for the first time at Titabar.
4.	T. Ram, P. Revathi, A.P. Padmakumari and K.V. Rao	Nawagam, Derol, Navsari, Danti, Karjat, Panvel, Sakoli and Sindewahi	10-17 October	Monitored Western region trials. The trials were well laid out with good crop stand. Most of the trials were at flowering-maturity stage. At Nawagam WBPH damage was more. At Karjat,yellow stem borer was the major pest. At Sakoli,most of trials were severely damaged by gall midge.
5.	L.V. Subba Rao and M.S. Prasad	Chinsurah Bhubhaneswar Cuttack, and Canning	30 October – 7 November	Monitored Eastern region trials. General crop stand was good. Severe stem borer incidence was noticed. In Canning, immediately after transplanting, a flood occurred that remained for a week. Heavy rainfall occurred in Chinsurah.
6.	N. Sarala, J.S. Bentur, and P.C. Latha	Cuttack, Chinsurah, Pusa, and Patna	30 October – 4 November	Monitored deep and semi-deep water & NIL (submergence) trials. General crop stand was good. Brown spot incidence was common in Pusa, however less incidence in aerobic trials. Screening for dry seeded rice can be carried out in RCER-Pusa. Heavy inundation was noticed in some trials at Chinsurah
7.	P. Senguttuvel, M. Sampath Kumar, and N.G. Hanamaratti	Gangavati, Mugad Sirsi, and Mudigere	7-14 November	Monitored Southern region trials. The crop was late sown at Mugad, Sirsi and Mudigere due to heavy rainfall and the crop stand was good.Severe incidence of BPH and WBPH in farmers' field at Gangavati and neck blast at Mudigere in local varieties was observed.

PANORAMA OF INSTITUTIONAL ACTIVITIES

Farmers' Day organized

DRR organized Farmers day on 15 November, 2011 at Nallavelli village of Nagar Kurnool Mandal, Mehabubnagar District, Andhra Pradesh, in association with KVK, Palem (ANGRAU). The main purpose of the farmers' day was to showcase the IPM interventions made during *kharif* 2011 in the farmers' field for adoption by the farmers in large scale. The farmers day programme began with the visit to demonstration fields. The visit was followed by the interactions with farmers at the fields and the adopted farmers shared their field experiences with their farmers friends. RAWE students of ANGRAU shared their learning experiences to the Project Director, ADR- RARS Palem, Scientists from DRR and KVK Palem and the participating farmers.

The posters on various Rice IPM interventions undertaken and other related activities were displayed for the benefits of the visiting farmers from Nallavelli and other nearby villages.

The scheduled programme of the farmers' day started at 11.00 AM with the Welcome address by Dr. Mangal Sain. It was followed by the Introduction about IPM project by Dr. Sreedevi who explained about various IPM interventions like seed, nursery, nutrient and weed management, insect pest and disease management followed during the IPM demonstrations at Nallavelli village during *kharif*. Dr. Dharma Reddy, Associate Director Research, RARS, Palem appreciated the DRR efforts in popularizing the IPM practices in rice. He announced that other interventions like drum seeder can be included in the future interventions. Three farmers shared their experiences during adopting various IPM interventions in their fields. They highlighted mostly the monetary advantage which they have gained along with the labour saving practices due to reduce seed rate, chemical weed control and other practices like use of leaf color chart, applying need based fertilizer and pesticides.

Dr. B.C. Viraktamath, Project Director, DRR explained the genesis of the IPM demonstration project and expressed his happiness in the way the farmers have practiced and benefited. He stressed the importance of IPM in coming years where the cost of inputs like fertilizers and pesticides are increasing. He explained various cost saving rice production technologies like direct seeding, and mechanical transplanting.

The programme was concluded with Vote of thanks by Dr. Samuels, PC, KVK, Palem. About 150 farmers from Nallavelli and nearby villages, RAWE students from ANGRAU, Staff from RARS and KVK Palem participated in this programme.

Another Farmers' Day was organized by DRR on 17 November, 2011 at Veerareddypalle village of Sirivella Mandal, Kurnool district, Andhra Pradesh to out scale the adoption of Improved Samba Mahsuri a fine grain rice variety with complete resistance to bacterial leaf blight (BLB). This variety was developed by DRR and released through Central Varietal Release Committee. The variety has spread to over 16,000 ha in the traditional rice area of Kurnool district. Since the KC canal area produces high quality rice where in the incidence of BLB is very severe, the variety has become a boon to rice farmers.

Dr. B.C. Viraktamath, Project Director, Dr. J.S. Prasad Head, Crop Protection and 10 scientists of DRR participated in the farmers' day. Shri. Swaroop, Assistant Director of Agriculture, Allagadda Division and Mrs. Lavanya, Agricultural Officer also attended this event. A progressive Farmer Shri. C. Siva Reddy narrated the importance of Improved Samba Mahsuri variety to BLB prone Sirivella mandal. Project Director, DRR emphasised that next year DRR will follow the cluster approach and demonstrate the integrated improved rice cultivation practices in 100 acres to benefit the farmers. Dr. J. S. Prasad asked the farmers to be more vigilant about the biotic stress and advised them to follow the crop protection measures more judiciously which will reduce the cost of cultivation and safeguard the environment.

More than 300 farmers participated in this function. A question answer session was conducted in which DRR scientists and department officials clarified the doubts of farmers. Literature and a CD containing video films of rice cultivation in Telugu were distributed to the farmers.

TRAININGS CONDUCTED

System of Rice Intensification (28 Sept-5 Oct)

A Model Training Course on,''System of Rice Intensification'' sponsored by the Directorate of Extension (DOE), New Delhi was organized at Directorate of Rice Research, Hyderabad from 28 September to 5 October, 2011. Twenty three participants from eleven states were trained in this program. The training was inaugurated by Dr. B.C. Viraktamath, Project Director, DRR on 28 September, who also presided over the valedictory function on 5 October and gave away the completion certificates to the participants.

Hybrid Rice Production Technology (29 Oct-5 Nov)

The Directorate of Extension, New Delhi sponsored model training course on “Hybrid Rice Production Technology” was organized by this Directorate from 29 October - 5 November, 2011. The main aim of this training was to develop confidence among the trainees, by equipping them with latest knowledge and skills on hybrid rice production technology. Nineteen participants from 11 states were trained in this program. The training was inaugurated on 29 October by Dr. B.C. Viraktamath, Project Director, DRR who also presided over the valedictory function on 5 November and distributed the certificates to the participants.

RICE NEWS

Synthesis of Human Blood Protein from Transgenic Rice Seeds

The research group led by Daichang Yang, Wuhan University, China and colleagues from the National Research Council of Canada and Centre for Functional Genomics, University at Albany, Rensselaer, New York reported rice seeds as a bioreactor for large-scale production of *Oryza sativa* recombinant Human Serum Albumin (OsrHSA). The research is published in the Proceedings of the National Academy of Sciences, USA (www.pnas.org/cgi/doi/10.1073/pnas). The findings showed great potential for production of HSA, which typically comes from human blood donations. OsrHSA can be highly and stably expressed in rice seeds and can be processed cost-effectively. OsrHSA was found to be equivalent to plasma derived Human Serum Albumin (pHSA) in terms of biochemical properties, physical structure, functions, and immunogenicity.

Human serum albumin is widely used in clinical and cell culture applications such as treating burns, traumatic shock and liver disease. The market demand for HSA is estimated at more than 500 tons per year worldwide. Currently, commercial production of HSA is primarily based on collected human plasma, which is limited in supply but of high clinical demand. There is an increasing public health concern with plasma-derived HSA with its potential risk for transmission of blood-derived infectious pathogens such as hepatitis and HIV. To eliminate the potential risk of viral contamination, regulatory agencies have encouraged pharmaceutical companies to use non-animal-derived sources for pharmaceutical production. Thus, the development of a low-cost method for the production of recombinant HSA (rHSA) is essential as a safer and potentially unlimited alternative to pHSA. This report showed successfully the production of OsrHSA from transgenic rice seeds. An endosperm-specific promoter was used for HSA gene expression and a callus-specific promoter for a selective marker gene were used to generate OsrHSA transgenic rice. The level of OsrHSA reached 10.58% of the total soluble protein of the rice grain. Large-scale production of OsrHSA generated protein with a high purity. Physical and biochemical characterization of OsrHSA revealed it to be equivalent to pHSA. Further, the efficiency of OsrHSA in promoting cell growth and treating liver cirrhosis in rats was similar to that of pHSA. OsrHSA displays similar *in vitro* and *in vivo* immunogenicity as pHSA. The report says that a rice seed can be used as a bioreactor to produce cost-effective recombinant HSA that is safe and can help to satisfy an increasing worldwide demand for human serum albumin.

Here are some facts about the findings:

- OsrHSA accumulates highly and specifically in the transgenic rice endosperm.
- OsrHSA is structurally and biochemically equivalent to pHSA.
- OsrHSA functions equivalently to pHSA in terms of binding capacity and promotion of cell growth.
- Production of OsrHSA from transgenic rice seed is cost-effective.
- OsrHSA displays the same immunogenicity as pHSA.

Due to the high dosage of HSA in clinical applications, large scale production of OsrHSA requires field production of transgenic rice. These field trails of transgenic plant raise concerns of environmental safety, because rice is a staple food worldwide. Recently, rice was listed as a favourable host for molecular farming for the following reasons: first, rice is a highly self-pollinated crop, and rice pollen is remarkably short-lived (<10 min) when it is out of the anther; with regard to biosafety assessment of transgenic rice it shows a very low frequency (0.04–0.80%) of pollen-mediated gene flow between genetically modified rice and adjacent non-GM plants. This low frequency can be decreased to negligible levels by a short spatial isolation. To manage the environmental impacts of plant-made pharmaceuticals, the US Department of Agriculture (USDA) and European regulatory authorities have already issued guidance for field testing of GM organisms intended for industrial and pharmaceutical use.

Green: the new colour of rice

Rice consumers worldwide can now look forward to eating "green" rice with the launch of an initiative that will set environmentally sustainable and socially responsible rice production management standards.

The "Sustainable Rice Platform" will elevate rice production to a new level by helping farmers – whether subsistence or market-focused – boost their rice production, keep the environment healthy, facilitate safer working conditions, and generate higher incomes to overcome poverty and improve food security.

"There are many different sustainable technologies and practices for rice – the world's most important food crop that feeds half the planet," said Mr. James Lomax, from the United Nations Environment Programme (UNEP) that initiated the Sustainable Rice Platform.

"The trouble is, we need a way to deliver and upscale these practices," he added. "The Sustainable Rice Platform is an exciting opportunity to promote resource-use efficiency and sustainable trade flows in the whole of value chain of the global rice sector."

The Sustainable Rice Platform will learn from established commodity initiatives that promote sustainability such as for sugarcane, cotton, and coffee, and apply them to rice. It will set sustainability targets, develop and promote regional and global standards of best practices for rice production, and support rice farmers to adopt these practices. It will also identify criteria to assess how well the sustainability targets are being met and whether farmers are implementing the practices.

"For example, we will harness our know-how to set standards to better manage insect pests in rice to reduce the unsafe and ineffective use of pesticides, which can damage the environment and the health of farmers," said Dr. Bas Bouman, who will lead the work at the International Rice Research Institute (IRRI) – one of the project partners.

"We can also develop and promote the use of specialized field calculators to determine the environmental footprint of water, carbon, greenhouse gas emissions, or chemical use," he added.

Rice presents a unique challenge for any quality control system because it is mostly grown by hundreds of thousands of poor farmers who have only very small farms of less than 1 hectare each. Moreover, 90% of rice is grown in developing countries in Asia, where access to knowledge and support is limited.

Dr. Bouman said. "To create an impact in rice, we need to move forward in two directions: public policy development and voluntary market transformation initiatives."

National government agricultural departments could explore and test management practices to make them nationally relevant and to promote them to rice farmers. Non-government organizations could help develop the sustainability criteria to safeguard or improve environmental health. Rice farmer, production, processing, or trade organizations and businesses could use the Sustainable Rice Platform to secure a premium rice market or higher prices.

Kellogg Company Chief Sustainability Officer Ms. Diane Holdorf said, As a major user of rice, we support UNEP in the mass adoption of more sustainable rice-growing practices to help improve the world's food supply and the lives of the farmers and the communities producing it.

"In addition to financial support," she added, "we are fast-tracking sustainable techniques into our contract growing programs. We'll share the results with the Sustainable Rice Platform and use them to inform our global rice policies and direction."

The Sustainable Rice Platform initiative was launched on 30 November 2011 at IRRI headquarters .

(Source : irri.org)

STAFF ACTIVITIES

Trainings/workshops attended

Name of the Official	Name of training	Venue of training	Period
Dr. D. Venkateswarlu and Ms Vanitha	Hindi Training Programme	CRIDA, Hyderabad	1-2, November
Dr. P. Revathi (Scientist, Breeding)	Molecular Plant Breeding for Crop Improvement	ICRISAT, Hyderabad	7-18, November
Dr. V. Ravindra Babu (Principal Scientist, Breeding)	Management Development Programme on Leadership Development (A pre-RMP programme)	NAARM, Hyderabad	1-21, November

Depurations abroad

Name of the Official	Name of training	Venue of training	Period
Dr. J.S. Bentur, Principal Scientist (Entomology)	Partnership Development Workshop for Enhancing Brown Planthopper Resistance and "Global Rice Science Partnership (GRiSP): Developing New Generation Climate adapted Varieties	IRRI, Philippines	23-25, November 28-30, November
Dr. T. Ram, Principal Scientist (Breeding)	Global Rice Science Partnership (GRiSP): Developing New-Generation Climate adapted Varieties	IRRI, Philippines	28-30, November
Dr. Shaik N. Meera, Sr. Scientist (Extension)	Workshop on ICT and mobile phone application for small scale rice farmers	IRRI, Philippines	7-9, December

Promotions

The following technical personnel were promoted during the quarter as per details given below.

Name	Promoted as	W.e.f
K. Ramulu	T-4	30.11.2010
P. Vittalaiah	T-4	01.01.2011
Md. Sadath Ali	T-4	12.01.2011
E. Nagarjuna	T-4	20.06.2011
K. Janardhan	T-4	29.06.2011
Md. Tahseen	T-4	12.07.2011
Ch. Anantha Reddy	T-4	16.09.2011
P. Chandrakanth	T-3	01.07.2010
A. Venkataiah	T-3	16.01.2011
T. Venkaiah	T-3	17.01.2011
K. Narasimha	T-3	29.06.2011

The Project Director and staff of DRR congratulate them.

Transfers

Shri. P. Prakash Babu, Administrative Officer, DRR, Hyderabad was transferred to CRIDA, Hyderabad on 5.12.2011

Awards


Project Director receiving the DUS award

- DRR got the best DUS test Center Award for maintaining large number of reference collection of varieties (RCV) and also for promotion of registration of varieties. The award was presented to Dr. B.C. Viraktamath, Project Director, DRR and Dr. L.V. Subba Rao, Nodal Officer, DUS testing, DRR by Dr. R.S. Paroda, Chairman, TAAS, and Former DG, ICAR on 11 November, 2011 at NBPGR auditorium, New Delhi.


Project Director and LV Subba Rao at the award ceremony

- Dr. S.K. Mangrauthia received the Moti Lal Dalela Gold Medal for Best Research Paper at Bundelkhand University, Jhansi on 14-16 October.


Dr. Sampath Kumar receiving the award

- Dr. M. Sampath Kumar, Scientist (Entomology) got Brig Anil Adlakha Award of TNAU for the best Ph D thesis in rice "Management of rice stem borers using indigenous pheromone technology".

Bonvoyage

- Dr. G.S. Laha, Senior Scientist (pathology) was deputed on Norman E. Borlaug International Agricultural Science and Technology Fellowship Programme-2011, for the training in the field of "Molecular Plant Pathology at IOWA State University, USA for a period of three months from 3.12.11 onwards.
- Dr. R.M. Sundaram, Senior Scientist (Biotechnology) was deputed to avail the Indo–US Research Fellowship sponsored by IUSSTF in USA for a period of 12 months from 5.12.2011 onwards.

Team DRR wishes both the scientists for a happy stay and fruitful learning.

New Institute Joint Staff Council (IJSC) Constituted

The new IJSC is constituted with the following members. The IJSC will have a period of 3 years starting from 1.1.2012.

Official Side	Staff Side
Dr. B.C. Viraktamath, Project Director, Chairman,	Shri. M. Ezra, Technical Officer, Member
Dr. B. Sridevi, Senior Scientist, Member	Shri. Ch. Anantha Reddy, T-4, Member
Dr. Brajendra, Senior Scientist, Member	Shri. R. Udaya Kumar, Private Secretary, Member
Shri. P. Narendra, AAO, Member & Secretary	Shri. K. Bikshapathi, SSS, Member
Shri. K. Srinivasa Rao, Accounts, Member	Shri. M. Chandra Kumar, SSS, Member

Brown Plant hopper – *Nilaparavata lugens* (Stal): (Homoptera : Delphacidae)

Dr. Jhansi Lakshmi, DRR, Hyderabad

Brown plant hopper (BPH) is a common and widely distributed pest in all the rice growing areas of the country causing yield reduction as high as 100% depending on the degree of infestation. The insect prefers rainfed and irrigated wetland fields to upland rice and transplanted fields to direct sown fields.

Nature of Damage: The insect infests rice crop at all stages of its growth. The nymphs and adults stay at the base of the plant suck the sap and as a result plants turn yellow and dry up rapidly. At early infestation, round yellow patches appear which soon turn brownish due to the drying up of the plants. This condition is called hopper burn. The patches of infestation may then may spread out and cover the entire field. In field conditions, plants nearing maturity develop hopper burn if infested with about 400-500 nymphs. Crop loss is usually considerable and complete destruction of the crop occurs in severe cases. BPH insect is a vector of the virus diseases-grassy stunt, ragged stunt and wilted stunt.


Eggs


Nymphs


Adults


Hopper-burnt field

Life Cycle: Banana shaped white eggs (0.99 mm long) that become darker at hatching are inserted in groups in a straight line in midrib of leaf sheaths. The egg laying sites appear as brownish streaks. Before egg hatching, two distinct spots appear, representing the eyes of the developing nymph. Some of the eggs are united near the base of the flat egg cap and others remain free. Eggs hatch into tiny nymphs within 7-11 days. The nymph has triangular head with a narrow vertex. Its body is creamy white with a pale brown tinge. It has a prominent median line from the base of the vertex to the end of its metathorax. These nymphs undergo four moults with five nymphal instars in 12-20 days. Mature nymph is 2.99 mm long. BPH adult is brownish black with yellowish brown body. It has a distinct white band on its mesonotum and dark brown outer sides. The adults exist in two forms, macropterous (long-winged have normal front and hind wings and thus are adapted for long distance flights and are known to migrate thousands of kilometers across land and sea) and brachypterous (short-winged with reduced hind wings). A prominent tibial spur is present on the third leg. Macropterous forms are the first to appear in the newly planted field and began colonization. The adults mate on the day of emergence and the female start laying the eggs from the day following mating. The adults survive for 10-25 days.

Integrated BPH Management:

- Cultivate resistant/tolerant varieties: Vijetha, Chaitanya, Krishnaveni, Nandi, Sonasali, Manoharsali .
- Avoid excess use of N fertilizers and apply them in more splits.
- Avoid close planting and provide 30 cm alleyways at every 2 m to reduce the pest multiplication.
- Synchronous planting by all farmers of a location.
- Crop rotation with non-rice crops to avoid continuous supply of food to the insect.
- Mid-season draining of the field.
- Periodic surveillance for the pest population once in a week or 10 days.
- Conservation of natural enemies like predatory spiders, mirid bugs (*Cyrtorhinus lividipennis*, *Tytthus parviceps*), *Microvelia* spp, coccinellids, ground beetles and rove beetles and parasitoids like *Anagrus* sp, *Oligosita* sp etc.
- When the BPH population exceeds economic threshold level (10-20 nymphs/ hill), spray monocrotophos 36WSC @1.3 l/ha, or carbaryl 50WP @1.5 kg /ha or acephate 75SP @ 1.5 kg/ha or BPMC 50WP @1.25 kg/ha which gives protection for a week or spray ethofenprox 10EC @1 l/ha or buprofezin 25WP @0.75 kg/ha or carbofuran 3G granules @ 25 kg/ha which are effective for 15 to 20 days, or spray neonicotinoids like imidacloprid 200SL @0.125 l/ha where insecticide resistance is not reported.

ANNOUNCEMENTS

International Dialogue on Designer Rice for Future: Perceptions and Prospects

The Society for Advancement of Rice Research, will be organizing a two-day dialogue on "*Designer Rice for the Future: Perceptions and Prospects*" during July 9-10th, 2012 at ICRISAT, Patancheru, Hyderabad. The event will be a serious brain storming exercise to perceive and deliberate on the prospects of designing rice capable of meeting the needs of tomorrow. The dialogue would have in all 12 lead presentations by eminent scientists from India and abroad and 24 discussants from India to supplement besides 50 invited observers including young students. The topics to be covered briefly are (a) Genomic Resources, (b) Approaching theoretical yields, (c) Economizing input Use, (d) Defending against stresses, (e) Coping with changing climate, (f) Nutrient rich wholesome rice and (g) Panel discussion. Interested scientists and students who are involved in upstream research on the above mentioned topics may send their biodata and abstracts to: Jbentur@yahoo.com

47th Annual Rice Research Group Meeting (ARGM)

Venue : DRR, Hyderabad
Date : 5-8 April, 2012

ACKNOWLEDGEMENTS

The Project Director and the staff of DRR profoundly thank the outgoing Editorial Team of DRR Newsletter Dr. M.B.B. Prasad Babu, Dr. S.K. Mangrauthia. Dr. K. Suneetha and Dr. M. Sampath Kumar for their splendid efforts in successfully bringing all the issues of News Letter on time with most interesting information.

BOOK POST

Published by	:	Dr. B.C. Viraktamath, Project Director
Editorial Committee	:	Dr. B. Gangaiah, Dr. P. Senguttuvel, Dr. D. Ladhalakshmi and Dr. S. Arun Kumar
Address	:	Directorate of Rice Research, Rajendranagar, Hyderabad – 500 030, AP, India
Phone	:	+91-40-24591216, 24591254
Fax	:	+91-40-24591217
e-mail	:	pdrice@drricar.org
Website	:	http://www.drricar.org