RICE VALUE CHAIN

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RICE VARIETY BINA DHAN 11 (CIHERANG-SUB1, IR09F436) PERFORMS WELL DURING SUMMER SEASON IN ASSAM

Given the erratic pattern of rainfall and flooding events in recent times, adoption of climate resilient technology is the need of the hour. Assam Agribusiness and Rural Transformation Project (APART), a World Bank financed project aims to add value to and improve resilience of selected agriculture value chains, focusing on smallholder farmers and agro-entrepreneurs in targeted districts of Assam. Rice is one of the major crops of the state where much emphasis is laid on development of the value chain. Under APART, Assam Agricultural University (AAU) and Department of Agriculture (DoA), Govt. of Assam is implementing rice program in consultation with International Rice Research Institute (IRRI) as the technical partner of the project.

During Boro season (2018-19) in Assam, BINA Dhan 11 – a medium-duration (125-130 days), submergence-tolerant rice variety has been successfully demonstrated in 16 (undivided as of 1st April, 2016) districts. It can tolerate complete submergence up to 2 weeks. The variety has a good grain quality, and has potential to replace other existing low-yielding varieties of the same duration offering a yield advantage of 1-3 t/ha under submerged conditions. This variety possesses green and erect flag leaves that remain green till maturity.

Characteristic features of the variety

Parent variety	:	IRRI149, Ciherang
Year of release	:	2013
Year of notification	:	2015 (Assam, Tripura, west Bengal)
Duration in days	:	120(In Assam the variety was harvested at 125-130 days after transplantation)
Suitable land type	:	Medium low land
Grain type	:	Medium slender
Plant height	:	107-115 cm

The variety was put to demonstration in Assam by AAU and DoA. The participating farmers in whose field the demonstrations were taken up got exceptionally high yields ranging from 5.5-7.0 tons per hectare.

Demonstrations on Bina Dhan11 by AAU and DoA in Assam during Boro 2018-19

S. No.	Intervention	Implementing agency	Total No. of demonstrations	Area covered (ha)
1	Mini-kits	AAU	349	43.62
		ATMA	2444	293.28
2	On-farm adaptive demonstrations	AAU	12	4.80
3	Cluster demonstrations	AAU	29	145
4	Demonstrations through dealer network	AAU	69	17.25
5	Head-to-head demonstrations	AAU	475	118.75
6	ICMD-STRVs	ATMA	232	58
7	ICMD-STRVs	AAU	51	12.75
8	LCD-STRVs	AAU	54	54
9	Wet DSR-STRVs	AAU	27	27
10	Dry DSR-STRVs	AAU	40	40
11	MTR-STRVs	AAU	40	40
Total number of different demonstrations			**3822**	**854.45**

Note: AAU: Assam Agricultural University; ATMA: Agricultural Technology Management Agency; ICMD: Integrated Crop Management Demonstration; LCD: Learning Centre Demonstration; DSR: Direct Seeding of Rice, and MTR: Mat Type Nursery and STRV: Stress Tolerant Rice Variety

The large scale demonstrations (3822)of shorter duration rice variety BINA Dhan 11 in Assam covering 854.5 ha areas in 16 (undivided as of 1st April, 2016) districts under APART showed that its cultivation saves time and allows the farmer for timely cultivation of succeeding Sali paddy, thus offers an viable option for system intensification and enhancing system productivity. The variety was demonstrated under different resource-efficient alternate establishment methods including Mechanical Transplantation, Wet Direct Seeding and Dry Direct Seeding of rice. It is worth mentioning that apart from normal transplanting, the mechanical transplanting, and direct seeding by seed-cum-fertilizer drill and drum-seeding got overwhelming response from the farmers.

WORKSHOP ON ASSESSMENT OF ACCEPTANCE LEVEL OF MACHINES INTRODUCED IN APART CROP VALUE CHAINS

A workshop on Assessment of Acceptance level of machines introduced in APART crop value chains was held on 10th June 2019 at the Conference Hall of the Chief Engineer (Agri), Agri Campus, Khanapara, Guwahati.

Dr Pankaj Baruah, Director, NERIWALAM, presented on the Agri mechanization scenario in Assam and highlighted that Direct Seeded Rice (DSR) may be more profitable than the transplanted rice, as far as mechanization is a concern. He informed that the use of combine harvester is increasing and has a good potential in Assam.

During the workshop, the International Rice Research Institute (IRRI) presented the current scenario of mechanization in the rice value chain under the initiatives taken up by APART. Er. Suryakant Khandai, Post Harvest Expert, IRRI, made a detailed presentation on machines introduced in Rice value chain of APART and informed that mechanization in Agriculture has contributed to 15-20% savings in seed, 15-20% savings in fertilizers, 20-30% saving in time, 20-30% reduction in labor, increased cropping intensity by 5-20%, with substantial reduction in drudgery of farm workers especially that of women. He also highlighted that maximum mechanization is observed during harvesting and threshing stages i.e. around 65%. In paddy value chain maximum labour requirement was found to be in transplanting which necessitates the need for the introduction of transplanters. It was observed that within North East, the maximum farm power availability is in Meghalaya (1.44kW/hr) while in Assam it is 0.80 kW/hr, which is far below the national average of 1.5 kW/hr. He further highlighted that per bigha cost saving to farmers through mechanization comes to Rs. 1400. If we consider only 0.25 million ha area (10% of the total area of 2.5 million ha) under rice then total saving for the farmers is around INR 262 crore. He also informed that precision levelling is an important component for precision & conservation agriculture; therefore laser land leveller could be a desirable option besides mat nursery raising machine and reaper binder, which can be introduced under APART.

Under APART rice value chain, the machines are being introduced at various stages of the value chain. In the crop establishment stage, the machines being introduced include: (i) seed cum fertilizer drill (ii) mechanical transplanter (iii) drum seeder (iv) sprayer cum spreader (v) power weeder (vi) combine harvester. During the harvest stage, the machines being introduced include combine harvester and reaper. Postharvest phase machineries include (i) axial flow thresher (ii) open drum thresher (iii) solar bubble drier (iv) re-circulating batch drier (v) Super bag (vi) RCC ring bin while in the rice (processing) value chain, the machines being introduced include (i) portable rice mill (ii) indent cylinder separator (iii) dry grinding machine (iv) rice puffing machine (v) rice flake machine.

Few challenges in the process of farm mechanization were also discussed, which included : (i) small size and scattered holding, financial inability of farmers, (ii) lack of proper knowledge about farm machineries, (iii) lack of repair and replacement facilities especially in remote and rural areas, (iv) limited availability of sale outlets, (v) lack of accessibility for procurement and maintenance. These issues need intervention through the project in order to bring mechanization of farming closer to the farmers.

TECHNOLOGY SHOWCASE FOR PROMOTING ENTREPRENEURSHIP AMONG RURAL FARMERS

A technology showcase exhibition was jointly organized by the Krishi Vigyan Kendra (KVK), Nagaon and International Rice Research Institute (IRRI) under APART in Assam on 27th June 2019 at Barkachari Gaon, block Kathiatoli, district Nagaon. The purpose of the exhibition was to create awareness, promote farm mechanization and post-harvest technologies and encourage entrepreneurship among the farming community, women groups and other stakeholders. Major emphasis was on showcasing the necessity and benefits of the technologies in rice production system of Assam and creating awareness among different stakeholders, particularly in the government system.

Nine selected frontline farm and postharvest technologies were demonstrated during the exhibition. BINA Dhan 11, a rice variety that was introduced recently in Assam was used for live demonstration of mechanized transplanting, direct seeding of rice by drum seeder, harvesting, drying and milling operation. About 200 farmers from Nagaon, Sonitpur, Kamrup and Morigaon districts participated in the event. It is noteworthy to mention that out of total participation more than 60% were women farmers.

"We never imagine a technology festival in our village before. It is encouraging to see these machines which can bring the changes in our villages and make agriculture profitable and employment oriented". Mr. Jadav Basumatary, an overwhelmed progressive farmer expressed on the event.

The event was graced by presence of Mr. Jadav Saikia, Deputy

Commissioner of Nagaon district as chief guest and Dr. P.K. Pathak, Director of Extension Education, Assam Agricultural University (AAU) as distinguished guest. Officials from ARIAS Society, Department of Agriculture, and Scientist from Assam Agricultural University, ICAR-Agricultural Technology Application Research Institute (ATARI) and International Rice Research Institute attended the day long program.

Mr. Jadav Saikia in his address, appreciated the efforts of KVK, Nagaon and IRRI for organizing such a mega event and said, "We must recognize the contribution of the farmers and take advantage of their experiences to design a roadmap for attracting the youth in the agriculture sector. It would be possible if best technologies can reach farmers in shortest possible time". Speaking on the occasion, Dr. P.K. Pathak stressed upon farmer-scientist interactions for faster dissemination of technologies to the farmers and adoption thereof. While welcoming the delegates and farmers, Dr. Niranjan Deka, Head, KVK, Nagaon highlighted the unemployment scenario of Assam and appealed the youth to join hands with APART for improving the agriculture scenario of Assam, using the demonstrated technologies. Dr. Kanwar Singh, Resident Consultant, IRRI for APART highlighted the purpose of the event and elaborated upon the advantages of these technologies in increasing productivity, profitability, and improving the quality of farm produce. He also expressed his gratitude to the implementing partners, AAU and Department of Agriculture for popularizing BINA Dhan 11 during summer and Sali seasons in Assam. This variety is becoming popular among the farmers and stakeholders for its tolerance to submergence, grain quality, yield advantage, milling quality (71% head recovery) and taste. "Post-harvest management is key component of value chain of rice that helps in enhancing product quality, marketability and assures profitability. Moreover, motivating youth to purchase machines and opening up of localized Custom Hiring Centres can help in fast dissemination of technologies to the farmers." said Mr. Harin Baishya, Agriculture Coordinator, ARIAS Society.

Er. Suryakant Khandai, IRRI Senior Specialist for Post-Harvest Management and Rice Value Chain for APART demonstrated the machines and described their operation process, use and benefits in rice production system to the delegates and farmers. The technologies namely Battery-operated Sprayer, Mechanical Transplanter, Drum-seeder, Axial Flow Thresher, Portable Rice mill, Crop Harvester, Power Weeder and Solar Bubble Dryer were showcased and live demonstration of each technology was carried out .

Senior officials present on the occasion among others were Mr. Ashok Sarma Khaound, District Agriculture Officer, Nagaon; Dr. Mrinal Saikia, Associate Director of Research (Agri), Assam Agricultural University (AAU); Dr.A.K.Tripathi, Director, ICAR-ATARI; Dr. Kalyan Pathak, Principal Scientist and Alternate Nodal Officer (APART), Assam Agricultural University; Dr Putul Chandra Sarma, Chief Scientist, RARS, Nagaon; and officials from IRRI and KVK, Nagaon. The Program was ended with vote of thanks by Dr. Kalyan Pathak, AAU, Jorhat.


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DEMO Type: - ICMD (STRV)

Variety in Demo:-Bina 11 Variety in Control Plot: - Local Variety

Farmer - 1

1. Name of farmer: - Jamadur Rahman Tapadar
2. Vill: - Khelma Part V1, PO:- Gumrah
3. Block: - Kalain
4. Yield in Demo Plot:- 10.5 MT per Hectare
5. Yield in Control Plot: - 4.7 MT per Hectare

Farmer - 2

1. Name of farmer: - Pradip Das
2. Vill: - Mahadevpur Part 1, PO:- Jalalpur
3. Block: - Kalain
4. Yield in Demo Plot:- 10.2 MT per Hectare
5. Yield in Control Plot: - 4.7 MT per Hectare

DEMO Type: -MINIKIT

Variety in Demo: - Bina 11 Variety in Control Plot: - Local Variety

Farmer - 1

1. Name of farmer: - Ramanyj Nath
2. Vill: - Mahadevpur Part 1, PO:- Jalalpur
3. Block: - Kalain
4. Yield in Demo Plot:- 7.2 MT per Hectare
5. Yield in Control Plot: - 4.5 MT per Hectare

Farmer - 2

1. Name of farmer: - Anukul Das
2. Vill: - Mahadevpur Part 1, PO:- Jalalpur
3. Block: - Kalain
4. Yield in Demo Plot:- 7.15 MT per Hectare
5. Yield in Control Plot: - 4.4 MT per Hectare

INITIATIVES ON PROCUREMENT OF BINA DHAN 11 THROUGH APART

BINA Dhan 11 is a climate resilient paddy variety introduced under APART by IRRI through demonstrations with Assam Agricultural University and Department of Agriculture for the first time in Assam. To understand market perception of Bina Dhan 11, a number of milers were invited for discussion on 6th of July, 2019 and small samples of paddy and rice presented to them. Established millers of the state namely : (i) Dhula Rice Mill Pvt. Ltd., Hirapara, Dhula, Darrang, (ii) Green Valley Rice Tech Pvt. Ltd., Amingaon, Kamrup and (iii) KDG Foods Pvt. Ltd., Bahjani, Kamrup were present for the discussions.

The initial procurement of Bina Dhan-11 on a sample basis is planned from Goalpara & Kamrup district (Rangia Cluster), wherein around 38 MT of paddy is expected to be delivered to the identified miller, the KDG Group, for verification of the quality of paddy, moisture content, foreign matter etc and accordingly procurement. This is an effort by the Project to offer another viable option to the farmers to sell their Bina Dhan 11 produce. Discussions and field visit of the millers to the field site was arranged in Goalpara & Kamrup district, where the millers along with IRRI and APART officials discussed on the possible terms and conditions from both ends.

This initiative of APART has been lauded by the farmers, as this is the first time that the variety was cultivated by them, and with a good harvest, they expect a good price and better post harvest management of the harvested paddy under scientific guidance.

Bina Dhan 11 cultivation and harvest in APART districts

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