



RICE VALUE CHAIN NEWSLETTER

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UTILIZING RICE VALUE CHAIN TECHNOLOGY

In Assam every year frequent floods have been destroying standing crops, creating water logging, soil erosion and affecting large crop areas and thus threatening the sustainability of the drive towards higher production and productivity of various crops in the State. In 2019, flood showed its devastating effects in 7.42 lakhs ha of agricultural land area in 30 districts of Assam, and 57,000 ha alone in Kamrup district. Thousands of rice fields were under flood water for several days.



Dhrubajyoti Medhi in his Ranjit sub I demo plot

Dhrubajyoti Medhi, a small farmer of Amaranga village of Chayani Bordua development block of Kamrup district is the one of the many affected, whose 10-bighas agricultural land is regularly affected by flood. During Sali season 2019, Krishi Vigyan Kendra, Kamrup provided certified seeds of Ranjit-Sub1 variety for 1 ha area to Dhrubajyoti and his brother, Golok Medhi under International Rice Research Institute (IRRI) supported APART demonstrations. He along with his brother transplanted the seedlings on July 13, 2019, but unfortunately three days of continuous rain after transplanting completely submerged the field. It was submerged for 6 days. After the 7th day, the water started receding slowly. Mr Dhrubajyoti visited his field on that very day and observed that some of the seedlings got uprooted which he later on filled up with seedlings of Ranjit- Sub 1. He applied additional doses of urea and MOP after receding flood, as recommended by IRRI. He also observed that the nearby Aijung plot was completely damaged.

“I was assuming that all my hard labour and money went in vain and started thinking of alternative sources of new seedlings and arranging money to buy the new seedlings. But, by the God’s grace, my field was not damaged to the extent which I had presumed. I memorised the learnings of Quality Seed Production Training, provided by IRRI & KVK experts that the variety can tolerate submergence up to 14 days. Now I have witnessed the magic of the variety in my field itself. I am very happy with the variety which not only tolerated flood but also gave me a very good yield of 22 mon per bigha” Said Mr Dhrubajyoti.

During the harvesting period of paddy, KVK Kamrup organized a field day and a post harvest machineries demonstration program in his demonstration plot. Nearby farmers were also invited to get firsthand experience on the performance of the variety. The crop was harvested by a reaper, provided by KVK Kamrup that gave him an extra benefit by saving his time and cost. He harvested 1 ha of land in one and half days and thus he saved 10 man-days @ Rs. 300 per ha by using reaper.

The overall performance of the variety impressed him a lot. He is determined to keep the seeds for the next season and to continue the cultivation of Ranjit - Sub 1 in his field. IRRI experts suggested him to store seeds in super bags as super bag can protect the seeds from any kind of storage pests. KVK provided him five super bags of 50-kg capacity. He dried the seeds properly before storage. He was also trained to use the moisture meter to measure the moisture percentage, which is a critical factor for the storage of seeds. He stored 45 kg of seeds in each bag.

“I stored 225 kg of Ranjit-Sub1 seed in super bags vis-a-vis other varieties stored in normal gunny bags. When I opened the super bags in this Sali season for taking out

the seeds for nursery sowing I saw that not a single seed was damaged and the bag was also free from insect. It was quite a surprising for me! I opened the normal gunny bag, numbers of insect flew out of the bag and about 30% of my seeds were damaged by pests. Super bag is very effective for seed storage. We should keep seeds in super bag only.” Mr Dhrubajyoti shared his experience after using the super bag .In this Sali season; he has sown the saved seeds in the nursery for his own 10-bighas land and another 26-bighas which he has leased-in. He has already transplanted 30-day old seedlings in the main field and is hoping for a successful crop to harvest.

PRODUCTION OF CERTIFIED SEED OF BINA DHAN 11

Seed is a prime and foremost component for improving production and productivity of rice in Assam, yet availability of quality seed is a matter of grave concern in the present scenario of seed production in the State. With an aim to reduce the vulnerability of climate on the rice production involving millions of farmers, subjected to multiple climatic stresses like submergence and drought, and the losses induced by them, stress-tolerant rice varieties (STRVs) are being introduced in Assam to mitigate the impact of flash flood - a common feature in the State. For strengthening seed systems and adaptation of climate-resilient rice varieties, popularly known as STRVs, International Rice Research Institute (IRRI) liaised with Allied Crop Care Private Limited and Assam Seeds Corporation limited and supplied 510 kg each, of breeder seed of BINA Dhan 11 in Boro season 2019 under the Assam Agribusiness and Rural Transformation Project (APART) to produce foundation seed, and certified seed to partially meet the farmer’s demand. The Allied Crop Care Private Ltd. produced around 45 tons foundation seed of BINA Dhan 11 in Boro season 2019 from the breeder seed supplied by IRRI.



Certified Seed Production plot under APART

Allied Crop Care Private Limited, in association with Sonai Farmer Producer Organization (FPO), Jaluguti, Morigaon has further planned to produce certified seed of BINA DhanII in 88.5 ha during the Boro season 2020. It is worth mentioning that more than 1000 farmers are associated with this FPO. The production of certified seed from this 88.5 ha net sown area of foundation seed is estimated to be 350 tons.



Inspection of the paddy by IRRI and APART team

The variety BINA Dhan II, being submergence-tolerant, is well suited to late sown Sali season, and even performs well under post-flood condition due to its early maturing character. This variety can be grown as a high yielding rice variety in Boro season also, as it can be harvested before the onset of active monsoon if planted/sown timely. Therefore making the availability of good quality seed of this variety for the farmers of Assam is very much essential for dissemination on a large scale. This estimated production of 350 MT will partially help, to meet the seed need of small and marginal farmers.

HEAD TO HEAD (H2H) DEMONSTRATION: A TOOL FOR COMPARING VARIETIES

Assam Agricultural University with the technical support from International Rice Research Institute (IRRI) under Assam Agribusiness and Rural Transformation Project (APART) has implemented 1221 Head to Head (H2H) demonstrations at different locations (KVKs/RARs/HRS) during the Sali season 2020. The objectives of the H2H demonstration are:

- » To enable farmers, to compare the performance of introduced Stress Tolerant Rice Varieties (STRVs) with their own rice varieties

- » To test the performance of new STRV exactly against the available technology, resources and constraints of farmers
- » To develop/enhance the evaluation-based learning skills of the farmer
- » To promote better adoption of variety through self-evaluation

The total area of each head to head demonstration is 0.4-hectare. Out of 0.40-hectare area, the 0.25-hectare area is covered by stress-tolerant rice varieties (STRVs) and 0.15-hectare area is covered by farmer's variety. Ten (10) kg seeds of STRVs (Ranjit-Sub1, Bahadur-Sub1, Swarna-Sub1 and BINA Dhan 11) for each H2H demonstration were supplied to the farmer. For the farmer's variety, 6 kg seed for the 0.15-hectare area of the demonstration was contributed by the farmer himself/herself. The following points are considered in an H2H demonstration:

- » **Selection of farmer variety:** Duration of selected farmer variety in days should be near to the STRV used in the H2H demonstration. The duration of Ranjit-Sub1 and Bahadur-Sub1 are 150-155 days, whereas that for Swarna-Sub1 is 140-145 days. Some of the long-duration farmer's varieties in Assam are Ranjit, Bahadur, Swarna, Masuri etc.
- » **Agronomic practices:** The agronomic practices should be similar for the STRVs and farmer's variety. The spacing (20 x 15 cm) of STRV should be similar to farmer's variety.
- » **Soil testing:** The soil testing of the H2H demonstration field should be done in advance, at least one month before sowing/transplanting of the rice crop or after harvesting of the preceding crops. The fertilizers should be applied as per soil test based recommendations.



Head to Head (H2H) demonstration plot

Finally, the agronomic data of all H2H demonstrations are recorded to compare the performance of STRV against farmer variety.

CUSTOM HIRING CENTER: IN A RISING TREND

Mechanization has become a necessity due to the paucity of farm labour and the high cost of wages. In the State, every year a large proportion of skilled and unskilled farm hands move out from rural areas to the cities in search of work. To carry out different agricultural operations timely and efficiently, it is difficult for the resource-poor small and marginal farmers to purchase all types of equipment, as it is a very costly affair. Custom hiring is an apt way out. Realizing the significance of Custom Hiring Centre (CHC), the World Bank-funded Assam

Agribusiness and Rural Transformation Project (APART) emphasized establishing one CHC in each of APART district through Krishi Vigyan Kendra (KVK) of the respective districts with the technical support from International Rice Research Institute (IRRI).

In pursuit of this endeavor, the first CHC was established in Nalbari district, with the joint efforts of KVK-Nalbari and IRRI under APART. All types of machineries procured through APART and housed at KVK-Nalbari, were handed over to the CHC, who made decent



Inauguration of CHC in Nalbari district



Portable Rice Mill reaching out to the farmer's door step

earnings when put to use in custom hiring mode. During the season, the CHC provided services of the reaper and axial flow thresher, and both the machines made notable earnings in the beginning phase of the CHC. The CHC earned Rs 29,300/- through reaper service by harvesting 73 bighas of paddy, and also served 108 farmers in threshing operation using axial flow thresher with an earning of Rs 1,74,920/-

With the emergence of COVID-19 cases in India, the Government of India on

March 24, 2020, imposed a total national lockdown for 21 days in the country that severely impacted the farm activities. Of course, there was an exemption for Custom Hiring Center. Farmers could not move or go to rice mill for milling their paddy during this period. The portable rice milling machines were made available at the farmers' doorstep, and could mill 2.4 tones of paddy of 16 beneficiaries in the village. The service was provided to farmers with a nominal fee but was a great help for the farmers. The CHC members expect that more and more farmers get associated with them in the coming days to reap the benefits of the machines, which will eventually increase their business volume in the coming years.

CROP CAFETERIA: A VARIETAL EVALUATION PLATFORM FOR PREFERRED SELECTION

Crop cafeteria is a replicated trial to promote the diffusion of highly preferred rice varieties, climate-resilient stress-tolerant rice varieties (STRVs), state/national level released varieties, private sector varieties, high yielding varieties and premium quality rice varieties among the key stakeholders of the rice value chain. Under APART, Assam Agricultural University (AAU) with the technical support of International Rice Research Institute (IRRI), has planned two crop cafeterias, conducted at Regional Agricultural Research Station (RARS), Titabar in Jorhat and Krishi Vigyan Kendra (KVK), Nagaon during the ongoing Sali season 2020.



Farmers sowing seeds in the nursery of Crop Cafeteria

Crop cafeteria is the best platform to involve different stakeholders/farmers to select a rice variety suited to their preference in a particular region/agro-climatic zone. Many of the varieties grown in crop cafeterias are introduced in Assam and

their duration, flowering time and productivity are not known as per the local agro-ecological condition. IRRI scientists, in consultation with the AAU scientists at RARS, Titabar and KVK, Nagaon, have raised staggered nursery sown on three different dates based on previous reported flowering time. Out of 24 rice varieties, there are 14 STRVs, 6 Premium Quality Rice (PQRs), 2 high yielding rice varieties and 2 local popular rice varieties collected from different national and international reputed institutes. Sowing of the first, second and third batch of different varieties was completed on June 8, June 15 and July 6, 2020, respectively at KVK, Nagaon whereas, the first, second and third batch sowing of different varieties was done on June 11, June 19 and July 10, 2020, respectively at RARS, Titabar. Transplanting of different batches of various varieties was completed on July 13, July 16 and July 30, 2020, respectively at KVK, Nagaon whereas, the first, second and third batch sowing of different varieties was done on July 21, July 22 and August 10, 2020, respectively at RARS, Titabar.



Crop Cafeteria

IRRI have provided the technical guidance, seed-source information and trial implementation plan. Uniform management practices have been followed in all three replications across varieties. Two participatory varietal evaluation events (one at RARS, Titabar, and another at KVK, Nagaon) is planned to be organized to exhibit and evaluate at crop maturity stage. A group of stakeholders will be invited for evaluation of the varieties and to select varieties that suited their agro-ecological conditions and get suited their agro ecological conditions and get preference from consumers. It is an effective tool to strengthen the formal and informal seed system of Assam.

After completion of the trials, results will be shared with the officials of DoA, especially the State Seed Certification agency. Scorecards (varietal performance/liking to be ranked by participants in crop cafeteria events) will be endorsed by AAU and DoA. It will be further used for seed indent and introduction /release of new STRVs and PQR in the State.

The combined result of actual agronomic data, farmers score sheet and formal seed system stakeholders score sheets (agronomic parameter) is considered to promote the stress-tolerant rice varieties/premium quality rice.



A Bird's eye view of the crop cafeteria at RARS, Titabar



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