2020

PhilRice R&D Highlights

PhilRice Isabela Station

Contents

STATION

PhilRice Isabela

Branch director: Leo C. Javier

EXECUTIVE SUMMARY

PhilRice Isabela develops and promotes rice and rice-based production technologies to address production constraints in the Cordillera Administrative Region (CAR) and Region II. It is also envisioned as the R&D center for hybrid rice.

For 2020, PhilRice Isabela implemented two program-based and three station-initiated core-funded projects, two externally-funded projects, and 20 research and development studies based in the Central Experiment Station (CES). It also led the Rice Competitiveness Enhancement Fund (RCEF) Seed Program in Region 2 and CAR, which covered around 270,000ha in 2020.

The Rice Business Innovations System (RiceBIS) project initiated by PhilRice-Isabela has continued to guide 84 smallholder farmers of the MarDag RiceBIS Association in San Mateo, Isabela, to establish and operate four promising agro-enterprises, namely: branded milled rice, brown rice, custom hiring of farm machines, and KADIWA ni Ani at Kita market outlet. Through these entrepreneurial activities, smallholder rice farmers of MarDag were given the opportunity to get more of what they produce. Most importantly, they were able to generate additional income for their families. In addition to the previously established agroenterprises, the project guided five new organizations in Diffun, Quirino, and five new organizations in Alfonso Lista, Ifugao and correspondingly trained 225 and 209 smallholder farmers, respectively, on improved rice production and agripreneurship following the RiceBIS concept.

The station established community-level partnerships with five learning farm-cooperators. TESDA has accredited the two newly-established learning farms as farm schools, which are now PhilRice's partners in bringing rice technologies to farmers through the training programs they conduct under the RCEF-Extension Component.

The station was able to train 31 agricultural extension workers (AEWs) and farmer-leaders on the production of high-quality inbred rice and seeds and farm mechanization under the RCEF-Extension component.

R&D personnel also served as resource persons in training activities conducted by the DA-Agricultural Training Institute (DA-ATI) in Region II and CAR.

Moreover, the station assisted in verifying technologies and training highland farmers in increasing the heirloom rice yield. It also helped implement the Philippine Rice Information System, Rice Crop Manager, and other CES-led studies.

The station likewise kept its active membership in the Cagayan Valley Regional Research and Development Consortium, Regional Agricultural Research and Development Network, and Regional Research and Development Extension Network.

Through various technology promotion platforms, the station reached a total of 538,968 men and women next and end-users that include agency partners, extension partners, and farmers.

The Rice Seed Systems (RSS) project initiated by PhilRice Isabela has identified a fertilizer ratio that increased the production of the Business Development Division (BDD) by 626.4kg/ha during the 2020 dry season (DS) and 246kg/ha during the 2020 wet season (WS). The fertilizer ratio translated to an additional P22,855 income during the 2020 DS and P6,325 during 2020 WS compared to the existing fertilizer application of the BDD seed production.

The on-farm trial established to validate and document 10-ton yield technologies at P5-production cost revealed that on the on-farm level and farmer management, 10-5 is not achievable. However, the result is still promising compared with existing rice production levels, either at national or local. At the national level, we can at least double the yield level from 4.2t in irrigated areas to 8.5-9.1t/ha with a lower production cost from a P12 baseline to P7.6-8.3. These package of technologies when promoted can help improve the Filipino rice farmers' competitiveness.

In the National Cooperative Tests (NCT) for direct seeding establishment, one entry each for very early maturing varieties (group I, 90-110 days), early maturing varieties (group II, 111-115 days), and medium maturing varieties (group III, 116 days and longer) were identified during the DS with yields of 7.5t/ha to 8.2t/ha, and resistant to insect pests and diseases. During the WS, five selections were identified.

Under transplanted culture, two entries were identified under group I, one in group II, and another one in group III, with yield potential of yield 7.9t/ha to 8.3t/ha and with resistance to stem borer during the DS. During the WS, four entries from group I, five from group II, and one from group III yielded 7.4t/h to 8.6t/ha. These selections will be forwarded to the NCT multi-location adaption (MAT) trial.

In MAT, two promising selections were identified during DS, index 5 and index 12, which yielded 9.4t/ha, suitable for direct seeding, early maturing, and resistant to insect pests and diseases. Two promising selections were identified during WS, index 3 and index 7, which yielded 8t/ha, early maturing, and are resistant to insect pests and diseases. On the other hand, the identified six selections (index 2, 4, 6, 7, 9, 10) suitable for transplanted culture yielded 7t/ha to 8t/ha, exhibited tolerance to stem borer, and can be considered early to medium maturing.

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NSIC Rc 438, Rc 440, and Rc 442 performed in Isabela with a yield of 6.07t/ha to 7.02t/ha and could be recommended to be planted for both DS and WS.

Three lightweight machines customized for the Cordillera condition were developed to reduce the cost and time needed for land preparation and threshing in the highlands. The micro tiller, weighing 100kg, has a field capacity of 714m^2/h to 1000m^2/h and fuel usage of 1.5L/h. It reduces land preparation cost by about P0.75 to P1.50 per square meter compared with the conventional manual trampling, with a time reduction of about 12 to 15 times lesser. For threshing, the mini axial flow thresher performs an average capacity of 85kg/h at 0.8L/h fuel, doubling the output of manual threshing. Intended for long-awned and non-shattering heirloom rice varieties, the wire-loop hold-on type thresher was able to thresh at 90% efficiency with a 95kg/h capacity. The prototypes are at CES REMD for final evaluation and assessment for a patent application.

Prototypes of brown rice milling machines (BRM) namely: village-type, retrofitted type, and portable type BRM, were tested in San Mateo and Santiago City, Isabela, with an average recorded capacity of 104kg/h, 103.64kg/h, and 5.82kg/h, respectively. Problems encountered include recurrent clogging in the portable BRM and high blower rate, yielding a low BRM recovery and poor brown rice quality. The increased suction rate of the blower and the absence of destoner lessened the utilization of the village-type BRM. Provision of the village type and the portable BRM allowed the respective cooperating users to engage in brown rice enterprise.

For this 2020 WS, promising entries for F1, B, and R-lines were identified. For F1, M1 regained its high yield performance, while the other nine entries had 6t/ha yield levels. PR15B for maintainer line is very promising, as well as PR38689-2-105-6R for restorer lines because of their high yield, which is directly correlated to high fertility and seed set, indicative of their productive pollen, which are the primary considerations in selecting parents.

For the 2020 WS trial under PhilRice Isabela environment, out of the 100 entries, 13 were identified to have the potential for a higher NCT level, particularly in special purpose rice entries. These 13 entries yielded 7.8t/ha to 7.0t/ha, which are considered potent as future varieties.

PROJECT 1

PROMOTION OF RICE PRODUCTION TECHNOLOGIES IN NORTH EAST LUZON AND CAR

Ofelia C. Malonzo, April Joy A. Bernardo, Christian Paul A. De Leon, and Joillie Nicole A. Lacbayan

This project generally aims to promote rice and rice-based technologies in strategic areas of Region 2 and Cordillera Administrative Region (CAR). Specifically, it seeks to: 1) enhance the capacities of men and women partners in sharing gender-friendly rice and rice-based technologies; 2) engage capable men and women partners in the promotion of gender-friendly rice and rice-based technologies through the establishment of learning farms; and 3) increase the awareness of various clients on gender-friendly rice and rice-based technologies. To meet the above objectives, three studies were developed. Study 1 involves the conduct of training activities that focus on strengthening the capacity of partners in sharing rice and rice-based technologies; study 2 focuses on engaging partners in showcasing rice and rice-based technologies through learning farms; and study 3 focuses on the promotion of rice production technologies to large groups of audience using mass-based platforms, namely: Farmers' Field Day and Field Walks, Rice Awareness activity, exhibit, rice information shop, social media posts, distribution of knowledge products, and technology tour and briefing of visitors.

Under study 1, the targeted training activities did not push through because of the pandemic. Instead, the database of training activities conducted from 2015 to 2019 was established. Based on the data gathered, there were 40 training activities delivered for the period involving 1,149,558 men and 591 women farmers, agricultural extension workers, youth, legislators, and technical vocational teachers. The establishment of a training database will be beneficial as the graduates could be tapped as partners in implementing the station's research and development initiatives.

Moreover, students' accommodation for internship (designed for college students) and immersion (designed for high school students) took place. Before the pandemic, one batch of high school students from Centro de Cultura High School in Cauayan City, Isabela completed their week-long immersion, and one batch of college students from Isabela State University-San Mateo Campus completed their internship program. Both college and high school students were briefed on the various activities of the station, including lectures and hands-on field exercises on land preparation, seeding, agronomic data gathering, fertilizer management, among others. An average knowledge gain of 144.56% was attained by the high school students, while the college students could not take their post-test since classes were suspended as Luzon was put into lockdown.

Still, under Study 1, the F1 Hybrid Rice Cultivation module was tested online with 11,389 viewers. Results showed that many are interested in the topic. Thus, it is highly recommended that the module be fine-tuned and to consider F1 Hybrid Rice Cultivation as one regular training offering of the station using a blended learning approach.

The last activity being undertaken under the study was a tracer study involving the 2018 Rice Boot Camp participants. The activity was conducted to monitor the status of the training graduates and find out if the training had benefited them, particularly in their chosen careers. The participants claimed that the training helped them in their careers, particularly in securing employment.

Under Study 2, five technology demonstration/learning farms were established during the DS in Isabela, Nueva Vizcaya, and Cagayan. During the wet season, seven technology demonstration/learning farms were established in Dupax del Norte, Nueva Vizcaya; Diffun, Quirino; and Alfonso Lista, Ifugao. The demonstration and learning farms showcased location-specific high-yielding and cost-reducing technologies.

The result showed that across sites, the yield of farmer-cooperators increased by using the recommended PalayCheck-based technologies. Also, the use of drumseeder or mechanical transplanter, the seeding rate of 40kg/ha, and proper nutrient management have gained the interest of the farmer-cooperators and the neighboring farmers and training participants. They claimed that these technologies had decreased their production cost. The use of drumseeder in crop establishment is now widely used by the farmers in the project sites in Nueva Vizcaya, Cagayan, and Quirino.

In the learning farm in Cagumitan, Tuao, Cagayan, a Farmers' Field School on PalayCheck System of Rice Production was conducted. It was participated by a total of 51 rice farmers (32 men and 19 women). Results showed that after the conduct of the training, their adoption rate of the various rice production technologies increased from 50.42% to 73.39%, and their awareness increased from 59.58% to 92.18%. After the season-long training, the average yield of men and women rice farmers increased from 5.41t/ha to 7.80t/ha.

The average knowledge gain after the training was 40.71%. Men rice farmers attained 40.38% knowledge gain while women rice farmers got 41.27%. Across sites, farmers gave positive feedbacks on the interventions made that resulted in full adoption of the showcased technologies this 2021 DS.

Under Study 3, PhilRice Isabela reached 538,968 men and women next- and end-users through various technology promotion platforms, including farmers' field days and farm walks, campaigns, exhibits, and social media posts. Specifically, 232 participants, 155 men and 77 women, were reached through farmers' field day and field walk, wherein 96.36% of the participants claimed that they were satisfied with the conduct of the activities.

Moreover, from January to October, 140 Facebook posts were made with 536,971 total reach compared with last year's 77 Facebook posts. Overall, there was an increase of 323.87% in total reach.

Given all the interventions being undertaken by the project, PhilRice-Isabela contributes to making rice and rice-based technologies become visible and accessible to the men and women rice farmers in regions 2 and CAR through the help of its allies.

Component 1: Strengthening the Capacity of Partners in Sharing Rice and Rice-based Technologies for Impact

April Joy A. Bernardo, Ofelia C. Malonzo, Christian Paul A. De Leon, and Joillie Nicole B. Lacbayan

The study aims to: 1) deliver training courses to enhance the capacities of various men and women stakeholders and development partners, and 2) determine the immediate impact of training activities among men and women training graduates through the tracer activity. Generally, the study aims to enhance the capabilities of men and women partners in sharing gender-friendly rice and rice-based technologies.

Due to the COVID-19 pandemic, the conduct of training activities was suspended. Thus, targets were replaced with the establishment of a database of all training activities conducted by the station from 2015 to 2019 and the conduct of a tracer study. Based on the training database, a total of 1,137 farmers, agricultural extension workers, and other partners were trained from 2015-2019. Also, results of the tracer conducted showed that the Rice Boot Camp 2018 participants helped the trainers in their career, particularly in serving employment related to agriculture. Prior to the declaration of the Luzon lockdown, one batch of On-the-Job Training was given to 14 students of Isabela State University – San Mateo Campus and one batch of immersion to 45 High School students from Centro de Cultura High School in Cauayan City, Isabela with an awareness knowledge gain of 144.56%.

Component 2: Engaging Partners in Showcasing Rice Production Technologies Through Learning Farms

Christian Paul A. De Leon, Ofelia C. Malonzo, and Joillie Nicole B. Lacbayan

This study aims to tap and engage capable partners in showcasing location-specific rice production technologies by establishing partner-managed learning farms. Specifically, it seeks to identify and promote gender-friendly rice production technologies adopted in the area, identify and engage capable local farmer-partners in establishing technology demonstration/learning farms, and train partners to be farm advisors and agricultural educators of the community.

This study involves two activities: 1) searching and engagement with partners and 2) operating learning farms. During the DS, five technology demonstration/learning farms were established. These were located in Brgy. Rizal, Santiago City; two techno demo farms at Brgy. La Suerte, Amulung, Cagayan; Brgy. Ineangan, Dupax del Norte, Nueva Vizcaya; and Brgy. Cagumitan, Tuao, Cagayan. During the wet season, seven technology demonstration/learning farms were established. These were located in Brgy. Ineangan, Dupax del Norte, Nueva Vizcaya; Brgy. San Isidro, Brgy. Gulac, Brgy. Isidro Paredes, and Brgy. Bannawag Sur, Diffun, Quirino; Brgy. Namillangan xand Brgy. Namnama, Alfonso Lista, Ifugao.

One Farmers' Field School (FFS) on PalayCheck System of Rice Production was conducted at Brgy. Cagumitan, Tuao, Cagayan. It was participated by 51 rice farmers (32 male and 19 female), with an average age of 55 years old. Results showed that after the conduct of the training, their adoption rate of the various rice production technologies increased from 50.42% to 73.39%. The awareness of the men and women rice farmers also increased from 59.58% to 92.18% on rice production technologies. After the season-long training, the average yield of the men and women rice farmers was 7.80t/ha, a 66% yield increase from the previous DS before the FFS took place in the area, with an average of P30,657/ha cost of production.

The average knowledge gain after the training was 40.71%. Specifically, men rice farmers acquired 40.38% knowledge gain while women rice farmers gained 41.27%. Across sites, farmers gave positive feedbacks on the interventions made, which resulted in full adoption of the showcased technologies this coming 2021 DS.

Component 3: Strategic and Mass-based Technology Promotion

Joillie Nicole B. Lacbayan, Ofelia C. Malonzo, and Christian Paul A. De Leon

The study aims to: 1) share gender-friendly rice and rice-based technologies to various clients in the region using mass-based approaches and 2) strengthen the partnership with various rice stakeholders. The study used mass-based technology promotion strategies to reach a more significant part of the target audience and clients, involving men and women, indigenous groups, persons with disabilities, and those who belong to the LGBT community. These include on-site farmers' field days and field walks, rice awareness activity, exhibits, rice information shop, social media posts, distribution of knowledge products, and technology briefings.

From January to November this year, 538,968 men and women were reached by PhilRice Isabela through various mass-based platforms. Specifically, 232 participants were reached through on-site farmers' field days, 14 students from ISU-San Mateo, Isabela through the conduct of rice photo contest and rice technology vlog, 150 people through exhibits in Tabuk, Kalinga, and 189 men and women from San Mateo, Isabela participated in the rice awareness activity. Also, 140 posts highlighting various activities, events, and other station initiatives were posted on PhilRice Isabela Facebook page with 536,971 total reach, 5,559 total likes, and 2,005 total shares. Compared with last year's data with 77 Facebook posts, there was an increase of 69.22% in total likes, 376.25% in total share, and 323.87% in total reach.

Results of the client satisfaction survey made during the field day in Santiago City and field walks in Diffun, Quirino, showed that out of 163 participants, 96.36% were satisfied with the conduct of the activities.