2017 National Rice R&D Highlights

PHILRICE ISABELA





Philippine Rice Research Institute Central Experiment Station Maligaya, Science City of Muñoz, 3119 Nueva Ecija

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PhilRice Isabela

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Executive Summary

Region 02 is the second rice producer with more than 200% selfsufficiency. However, its average yield is still at below 5t/ha level. Tabuk City, Kalinga, the Cordillera's rice granary, also has the best area in the region in terms of topography and irrigation. However, its average yield is at 3t/ha. The region also focused on its heirloom rice varieties grown in the upland and highland areas.

PhilRice Isabela conducted research and development activities that aimed to help the DA regions' thrusts and ultimately, help increase farmers' income. Rice-based production systems, which include mushroom, vermicomposting, and mungbean production guides, were packaged for farmers' adoption.

Farmers' associations were also organized and capacitated in agro-enterprises. New inbred and hybrid rice varieties and technologies were demonstrated on-station and on-farm to promote adoption. These technology promotion activities were complemented with capacity enhancements through trainings and seminars on-air and on-site, and field visits.

Partnership with various government and non-government agencies, local government units, and farmers were also established.

PALAYABANGAN: The 10-5 Challenge

Helen R. Pasicolan and Ju-Mark R. Pagaduan

The country's average rice yield is about 4t/ha, which is lower than other rice producing countries in South East Asia. With the onset of ASEAN Free Trade Agreement (AFMA), the need to look for alternative and appropriate technologies that can increase yield and reduce production cost is necessary to protect our local farmers in the global market and make them globally competitive.

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PhilRice launched Palayabangan: The 10-5 Challenge in WS 2013 to increase rice production to 10 t/ha with an input cost of P5/kg of palay. The contestants were composed of seed and fertilizer companies, NGOs, farmers, Gawadsaka awardees, and local government unit. A participant harvested 10.54t/ha computed at 14% moisture content with an estimated cost of P4.94/kg and was declared as Regional Winner in DS 2014. Most of the participants attained P70,000 net per hectare.

One-Stop Information Shop (OSIS) in State Universities MC Manubay and HR Pasicolan

The availability of rice and agriculture-related information in state universities can contribute to the knowledge acquisition of agriculture students. The OSIS in six state universities in the Cagayan Valley Region (Region 02) provided agriculture students the access to rice and agriculturerelated Knowledge Products. This study investigated the access and utilization pattern on rice and agriculture-related information by agriculture students. Baseline data showed that the most frequently consulted information sources on rice and agriculture-related information was Search Engine (ex. Google). The OSIS was visited 1,331 times by students, 96% of them were Bachelor of Science in Agriculture students. The most frequently searched topic on rice production was varietal selection and crop establishment, as showed in a structured Literature Search Survey. This could be attributed to the students' profile, who are mostly Crop Science major. The use of ICT-based tools and resources was generally low due to lack of computer and slow internet connection. A need-based library or information center is recommended to increase the use of KPs.

Provision of Timely Agricultural Information through Radio Plug-ins and SMS

AJB Acierto, AL dela Cruz, MC Manubay, HR Pasicolan, NR Gawat, and LC Javier

Dissemination of updated agricultural information is needed in increasing farmers' productivity and profitability. However, functional agricultural information delivery systems are lacking. Hence, this study was launched to bridge the gap through the 'MadiskartengPagsasaka' School-Onthe-Air (SOA) Program of PhilRice Isabela. A practicum based on the topics aired was also conducted to broaden the understanding and knowledge of farmer-listeners. They were also encouraged to use the PhilRice Text Center to answer a 'question of the day' and send their feedback and queries.

Through collaborations with DA-RFOs, SUCs, and municipalities, the program was given 30 minutes of free airing on various radio stations.

The SOA program started in 2013 with major activities such as project launching, baseline survey, use of radio broadcast information, establishment of SOA learning sites, monitoring of listeners, and farmers' meeting for the practicum of technologies. Graduates were from Maddela in Quirino; Amulung, Solana, Alcala, and Enrile in Cagayan; and Cordon, San Mateo, Quirino, and Quezon in Isabela. Each municipality has 20-25 farmerenrollees.

Evaluation showed that farmers still prefer radio as effective tool in disseminating agricultural information to address the lack of technical experts in the field. Farmers also said that the practicum enhanced learning.

Promoting CLEAN GPS Technologies through On-Station One-Stop-Information Shop and RICExhibits

AJB Acierto, NS Sosa, MC Manubay, HR Pasicolan, and LC Javier

PhilRice Isabela established its One-Stop-Information-Shop (OSIS) inside the station to help walk-in farmer-clienteles, researchers, students, employees, and its stakeholders to have easy access on the agricultural IEC and other promotional materials particularly on rice.

RICExhibit booth was set-up in agri-trade festivals in different provinces and or municipalities within the station's area of coverage to showcase updated technologies of rice. IEC materials were distributed while PhilRice souvenirs were displayed for sale.

Collection of artifacts, paintings, photos, and traditional varieties were conserved and showcased in the mini-rice museum, which displayed the transformation from traditional to modern farming.

Lakbay Palay

LC Javier and PhilRice Isabela Staff

Two Lakbay Palay were conducted in dry and wet season, which was participated by 1,400 farmers, agricultural workers, private companies, and agriculture professors and students from Region II and CAR.

The station showcased on-station rice researches and technologies including varietal demo, Palayabangan: 10-5 demo area, rice-mungbean demo, learning farm, and IRBAS. PhilRice Isabela Rice Science Museum was also showcased to the visitors. An Agro-Fair was also displayed.

Agromet Isabela

Jerome V. Galapon

Automated Weather Station is a compact equipment powered by storage battery and solar cells, which are more accurate and dependable instruments for collecting climatic data such as temperature, rainfall, relative humidity (RH), and heat index.

This study aimed to produce weather data that enables optimal timing and control of all field operations. The data is gathered, stored, viewed, and analyzed to come up decisions that lessen risks in farm management.

The highest average temperature was recorded in June 2017 with 35.2° C while the lowest temperature was recorded in February, 2017 with 19.7°C. The high temperature ranged from 26.2°C to 35.2° C while the low temperature was recorded from 19.7° C to 25.6° C.

The total rainfall recorded was 1,181.6mm. The highest total rain was recorded in May 2017 with 281.1, followed in August with 198.7mm.

Palayamanan Plus- Isabela

AL dela Cruz Jr., JV E Adolo, and RC Inovejas

The Palayamanan Plus project in PhilRice Isabela started in WS 2014 in response to the challenge of rice-based farm intensification on Clean GPS program. The project started with rice-mungbean as the major commodity with paddy and milky mushrooms and vermicomposting as additional components. The technologies being tested, which showed potential for adoption and commercialization included the rice-mungbean relay, mushroom production for both oyster (Pleurotus sp) and paddy (Volvariella volvaceae) mushroom, and vermicomposting using 100% plant biomass.

Rice Community Business Innovations System (RiceBIS) – PhilRice Isabela

AL dela Cruz Jr., JVE Adolo, and RC Inovejas

High production cost is one of the reasons why rice is more expensive in the Philippines. RiceBIS Program aimed to improve the competitiveness of rice and rice-based farming communities, particularly in Isabela and Kalinga. To achieve this, the project showcased location-specific, yield-enhancing and cost-reducing technologies on a 50-ha. The program also aimed to enhance the technical and organizational building and management capability of farmers and farmer organizations on rice and ricebased agro-enterprise. Farmers and their associations were also assisted in developing a marketing plan. They were also linked to markets and financing institutions in the local rice value chain.

Localization of Knowledge Products and Enhancing KSL Activities *AL dela Cruz Jr., MC Manubay, and JVE Adolo*

Farmers continuously gather rice information to learn new technologies that will help them increase yield and income. While there are multiple sources of information available for farmers, a mismatch seems to persist due to lack of understanding on the clientele's challenges and needs. As such, modalities employed in development and extension work should be carefully analyzed. This study used the Knowledge Sharing and Learning (KSL) activity to capture relevant information from rice stakeholders. The KSL activity was also maximized in developing the localized technology guides.

Strengthening the Promotion of Direct Seeded rice culture: Strategy for Climate Change Adaptation

HR Pasicolan, NR Gawat, AJB Acierto, and D Alasaas

The direct seeding technology can help address high-labor cost in rice farming, in which 40% of the production cost is saved from seed bedding, pulling, and transplanting. Through the technology, 60% of energy is saved from seedbed preparation and puddling.

This activity is being conducted to improve awareness on directseeding and show farmers its effectivity. Its components included technology promotion, field day before harvest season, and training and education.

Abbreviations and acronymns

ABA – Abscicic acid Ac – anther culture AC – amylose content AESA - Agro-ecosystems Analysis AEW - agricultural extension workers AG – anaerobic germination AIS – Agricultural Information System ANOVA - analysis of variance AON – advance observation nursery AT – agricultural technologist AYT - advanced yield trial BCA – biological control agent BLB – bacterial leaf blight BLS – bacterial leaf streak BPH – brown planthopper Bo - boron BR – brown rice BSWM - Bureau of Soils and Water Management Ca - Calcium CARP - Comprehensive Agrarian Reform Program cav – cavan, usually 50 kg CBFM – community-based forestry management CLSU – Central Luzon State University cm - centimeter CMS – cystoplasmic male sterile CP – protein content CRH - carbonized rice hull CTRHC - continuous-type rice hull carbonizer CT – conventional tillage Cu – copper DA – Department of Agriculture DA-RFU - Department of Agriculture-Regional Field Units DAE – days after emergence DAS – days after seeding DAT – days after transplanting DBMS - database management system DDTK – disease diagnostic tool kit DENR – Department of Environment and Natural Resources DH L- double haploid lines DRR – drought recovery rate DS – dry season DSA - diversity and stress adaptation DSR – direct seeded rice DUST - distinctness, uniformity and stability trial DWSR – direct wet-seeded rice EGS – early generation screening EH – early heading

EMBI – effective microorganism-based inoculant EPI – early panicle initiation ET – early tillering FAO – Food and Agriculture Organization Fe – Iron FFA – free fatty acid FFP – farmer's fertilizer practice FFS – farmers' field school FGD – focus group discussion FI – farmer innovator FSSP - Food Staples Self-sufficiency Plan g – gram GAS – golden apple snail GC – gel consistency GIS – geographic information system GHG – greenhouse gas GLH - green leafhopper GPS – global positioning system GQ - grain quality GUI – graphical user interface GWS - genomwide selection GYT – general yield trial h – hour ha – hectare HIP - high inorganic phosphate HPL – hybrid parental line I - intermediate ICIS – International Crop Information System ICT – information and communication technology IMO - indigenous microorganism IF – inorganic fertilizer INGER - International Network for Genetic Evaluation of Rice IP – insect pest IPDTK - insect pest diagnostic tool kit IPM – Integrated Pest Management IRRI – International Rice Research Institute IVC – in vitro culture IVM – in vitro mutagenesis IWM – integrated weed management JICA – Japan International Cooperation Agency K – potassium kg – kilogram KP – knowledge product KSL – knowledge sharing and learning LCC – leaf color chart LDIS - low-cost drip irrigation system LeD – leaf drying LeR – leaf rolling lpa – low phytic acid LGU – local government unit

LSTD - location specific technology development m – meter MAS – marker-assisted selection MAT – Multi-Adaption Trial MC – moisture content MDDST - modified dry direct seeding technique MET – multi-environment trial MFE - male fertile environment MLM - mixed-effects linear model Mg – magnesium Mn – Manganese MDDST - Modified Dry Direct Seeding Technique MOET – minus one element technique MR – moderately resistant MRT – Mobile Rice TeknoKlinik MSE - male-sterile environment MT – minimum tillage mtha⁻¹ - metric ton per hectare MYT – multi-location yield trials N – nitrogen NAFC - National Agricultural and Fishery Council NBS - narrow brown spot NCT – National Cooperative Testing NFA – National Food Authority NGO - non-government organization NE – natural enemies NIL – near isogenic line NM – Nutrient Manager NOPT - Nutrient Omission Plot Technique NR – new reagent NSIC – National Seed Industry Council NSQCS - National Seed Quality Control Services OF – organic fertilizer OFT – on-farm trial OM – organic matter ON – observational nursery OPAg - Office of Provincial Agriculturist OpAPA - Open Academy for Philippine Agriculture P – phosphorus PA – phytic acid PCR – Polymerase chain reaction PDW - plant dry weight PF – participating farmer PFS – PalayCheck field school PhilRice – Philippine Rice Research Institute PhilSCAT – Philippine-Sino Center for Agricultural Technology PHilMech – Philippine Center for Postharvest Development and Mechanization PCA – principal component analysis

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PI – panicle initiation PN – pedigree nursery PRKB – Pinoy Rice Knowledge Bank PTD – participatory technology development PYT – preliminary yield trial QTL - quantitative trait loci R - resistant RBB – rice black bug RCBD - randomized complete block design RDI - regulated deficit irrigation RF – rainfed RP - resource person RPM – revolution per minute RQCS – Rice Quality Classification Software RS4D - Rice Science for Development RSO – rice sufficiency officer RFL – Rainfed lowland RTV – rice tungro virus RTWG – Rice Technical Working Group S – sulfur SACLOB - Sealed Storage Enclosure for Rice Seeds SALT – Sloping Agricultural Land Technology SB – sheath blight SFR – small farm reservoir SME – small-medium enterprise SMS - short message service SN – source nursery SSNM - site-specific nutrient management SSR – simple sequence repeat STK – soil test kit STR - sequence tandem repeat SV – seedling vigor t – ton TCN – testcross nursery TCP – technical cooperation project TGMS – thermo-sensitive genetic male sterile TN – testcross nurserv TOT – training of trainers TPR – transplanted rice TRV - traditional variety TSS - total soluble solid UEM – ultra-early maturing UPLB – University of the Philippines Los Baños VSU – Visayas State University WBPH – white-backed planthopper WEPP - water erosion prediction project WHC – water holding capacity WHO – World Health Organization WS – wet season WT – weed tolerance YA – yield advantage Zn – zinc ZT – zero tillage



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We are a government corporate entity (Classification E) under the Department of Agriculture. We were created through Executive Order 1061 on 5 November 1985 (as amended) to help develop high-yielding and cost-reducing technologies so farmers can produce enough rice for all Filipinos.

With a "Rice-Secure Philippines" vision, we want the Filipino rice farmers and the Philippine rice industry to be competitive through research for development in our central and seven branch stations, coordinating with a network that comprises 59 agencies strategically located nationwide.

We have the following certifications: ISO 9001:2008 (Quality Management), ISO 14001:2004 (Environmental Management), and OHSAS 18001:2007 (Occupational Health and Safety Assessment Series).

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