Quality Rice. Quality Life.

2017 National Rice R&D Highlights

PHILRICE BATAC

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

PhilRice Batac

Branch Director: Reynaldo C. Castro

Executive Summary

The R&D activities of PhilRice Batac are concentrated on adaptive research and proactive technology promotion. The station handles rice and rice-based components for complete and balanced technology advancement of the Northwest Luzon farmers. in 2017, the development sector of the station implemented seven core and eight externally-funded projects and activities. Its research sector conducted an externally-funded and seven division-based studies.

Clean, Green, Practical and Smart On-Farm Learning Center

JM Santiago, RI Sibucao Jr., DP Ligayo Jr., BA Pajarillo Jr., SVP Aqunio, LMdC Tapec, KJG Pungtilan, SV Briones, MB Alupay, and BM Catudan

A 0.5ha learning farm was established and maintained to showcase and package appropriate technology interventions to capacitate farmers, students, and station staff. It is also used as briefing area for Lakbay-Aral visitors. The farm featured relay rice planting, rice-based cropping pattern, dry direct-seeded rice, and off-season vegetable technologies.

The Rice and GulayCheck Learning Farms served as venues of hands-on sessions of 80 trainees. The relay rice set-up showcasing six growth stages (185m2 plot each) was transplanted 8 times per semester. NSIC Rc 352 was used following the technologies of the PalayCheck System, specific to the station's conditions. The yield from the relay plots planted in April and May were very low owing to bird damage and typhoon Gorio. Relay plots planted during wet season (June- August) yielded 4t/ha.

The rice relay set-up served as hands-on learning field of trainees for seed sowing (wetbed and modified dapog), land preparation, seedling pulling and transplanting, roguing, fertilizer application, Agro-Ecosystem Analysis (AESA), agronomic data gathering, manual and mechanical harvesting (brush cutter harvester) and threshing.

The 775m2 plot allotted for rice-based cropping pattern, specifically mungbean, yielded 0.5t/ha from the first priming only. The set-up was rotavated to serve as green manure in preparation for the Modified Dry Direct Seeding Technology (MDDST). MDDST was established by the participants of Clean, Green, Practical, and Smart Training Course using NSIC Rc 348, which yielded 2.1t/ha. The 980m2 area, kept idle for farm machine and equipment demonstration, enabled 53 trainees to try the plastic drum

seeder and operate 4-wheel type, hand type, and riding type tractors. A 438m2 was planted with NSIC Rc 348 by the participants of Clean, Green, Practical, and Smart Training Course using the plastic drum seeder yielded 2.7t/ha.

The 425m2 GulayCheck Learning Farm was planted with ridge gourd, tomato, bitter gourd, and eggplant to showcase simultaneously four growth stages (seedling, vegetative, flowering and fruiting). The 125m2 idle area at the station was converted as extension of the GulayCheck Learning Farm, in which snake gourd, red okra, upland kangkong, sweet potato, ginger, onion, cowpea, string beans, eggplant, ridge gourd, and pechay were planted. The area also served as hands-on learning field of student trainees in raising seedlings, mulching, transplanting, and harvesting. Fruit trees and medicinal plants within the Learning Farm were also maintained.

The 10-day boot camp on Clean, Green, Practical, and Smart Training Course on PalayCheck and Palayamanan Plus was attended by 29 fresh college graduates from state universities and colleges in Ilocos Norte, Ilocos Sur, Abra, and La Union. Basic Hybrid Rice Breeding, Geo Tagging, and Global Positioning System were included in the training module as suggested by the 2016 boot campers in the training evaluation. The average gain in knowledge was 79% while the course over-all rating was 91.6%.

Appreciation Course on PalayCheck and Palayamanan Plus was also conducted for new PhilRice staff. They were taught on the basics of rice science, PhilRice technologies, and the current trends and issues related to the Philippine rice industry. Characterization and germination test, operation of the bamboo bin dryer, and vermicomposting were included in the curriculum.

Nine PhilRice Batac staff also attended a training on Volvariella volvaceae mushroom production, natural mango vinegar, and dragon cactus foliar fertilizer preparation at Rocapor's Farm.

ONE-STOP-INFORMATION SHOP (OSIS) Promotion of Rice and Rice-Based Knowledge Products

MB Alupay, JM Santiago, LMdC Tapec, RI Sibucao Jr., and BM Catudan

The study was conducted to disseminate the recommended rice-based technologies to different rice stakeholders through database management system, Rice Science Museum, library, and knowledge products management. These components put together the essential elements of in-house available resources for advancing technology generation and adoption through knowledge products.

The database management system served as repository of the data and research results readily available for PhilRice researchers and other stakeholders. The Rice Science Museum where rice cultural materials, information and the science of rice farming were preserved, served as information source and experiential learning venue for stakeholders. It also served as one of the cultural attractions not only at the station but also for the City of Batac and the province of Ilocos Norte. Moreover, the place also served as learning venue of students who undergo On-the-Job training at the station. In 2017, the RSM had 1290 visitors. The library, on the other hand, served as ready source of up-to-date references for students, AEWs, researchers, and other stakeholders working on rice and rice-based farming systems.

Operationalization of Agrometeorological Service

JM Maloom, MJC Vives, NI Martin, AOV Capistrano, JG Tallada, and EJP Quilang

Weather database. The established database served as repository of the weather data gathered from the FMON and other available weather data from the online automatic weather stations (AWS), which were installed by the Department of Science and Technology-Advance Science Technology Institute (DOST-ASTI) in Ilocos Norte. Weather data from MMSU Agromet Station; PAGASA Sinait, Ilocos Sur; and PAGASA Laoag City were also available in the database. The weather data from the station's FMON can be viewed and downloaded from the weather underground website (https://www.wunderground.com/personal-weather-station/dashboard?ID=IPAOAY2). Weather data from PAGASA Sinait and Laoag City was downloaded from the OGIMET website (www.ogimet.com) on monthly basis. The localized weather forecasts and information products for rice farmers will be available for wet season 2018.

PhilRice Batac Intensified Rice-Based Agri-bio Systems (PhilRice Batac IRBAS)

MRM Abad, SV Pojas, DP Ligayo Jr., BM Catudan, and RC Castro

The PhilRice Batac IRBAS is composed of three components, (1) crop sequence, (2) oyster mushroom production, and (3) vermicomposting. The project aimed to fine-tune the technologies produced at the station for possible adaptation and promotion to farmers.

With the use of available weather data and weather predictions, an appropriate timing of mushroom production can now be deduced; thereby, maximizing the yield of oyster mushroom even during hot months. Value-added products for mushroom was studied to minimize wastage due to

limited irradiation and lack of drying equipment. Fresh and one-day-air-dried oyster mushroom was a hit to respondents; however, a slight bitter taste was reported in the two- and three-day air-dried ones. Incorporating powderized oyster mushroom to miki dough was also acceptable to all the 10 respondents. Vermicompost production technology that was developed with the use of effective microorganism-activated solution (EMAS) and stacking of 70:30 and 60:40 rice straw-manure and corn cob-manure in the same bin reduced the pre-decomposition to 1 month and 3 months, respectively.

Rice Business Innovation System (RiceBIS) Community
LMdC Tapec, MB Alupay, KJG Pungtilan, BM Catudan, NQ Abrogena, and BA Pajarillo Jr.

Rice Business Innovation Systems (RiceBIS) community project was initiated by PhilRice to increase the share of farmers in the marginal profit in the value chain. Brgy. Rayuray, City of Batac was selected as pilot site of the project with City LGU, PAO, ATI Region I, DA RFO-I, DOLE, DOST, DTI, and MMSU as partners. Farmers were clustered based on product interest. Market scanning was conducted with the farmers. Climate Smart Farm Business School (CSFBS) was also conducted with ATI Region I. Covering farm business management, 43 farmers attended the weekly class.

Localization of Rice Knowledge Products with Enhancing Knowledge Sharing and Learning (KSL) Activities
JM Santiago, LMdC Tapec, BM Catudan, and RI Sibucao Jr.

Knowledge Sharing and Learning (KSL) activities or technology promotion modalities were implemented: 1) briefings cum on-station technology tour of walk-in clients, 2) exhibits, 3) dispatch of technical experts and subject matter specialists, 4) On-the-Job Training for students, 5) Be Riceponsible and PhilRice Text Center Campaign; and 6) relevant broadcast news, production technology materials and successful stories of farmers and other stakeholders.

The station is also an active member of the Regional Agriculture and Fisheries Extension Network I (RAFEN 1) with which the station co-implemented the project, “Timpuyog idiay Ayaw, Dur-as inna Iburay.”

There were 3,455 stakeholders directly reached in 2017. Further, through these responsive and dynamic promotion modalities, the linkage of the station with other government agencies, the LGUs, SUCs and various high schools in the region under the K-12 curriculum was strengthened. Nine knowledge products were also localized and are now ready for the use of stakeholders.

Palayabangan: The 10-5 Challenge
LMdC Tapec, KJG Pungtilan, DP Ligayo Jr., LG Inocencio, JQ Polipol, and BM Catudan

A standard plot size of 2000 m2 was managed by each participant (farmers, researchers, and private companies) to showcase her/his outstanding rice production technologies to attain a yield of 10t/ha at P5/k of grain per hectare. In 2013-2017, the top three performers, out of 16 participants, were: Syngenta with 6.97t/ha at P13.92; Baysac, a Batac farmer, 6.33t/ha at P9.08/k; and Longping, 6.18 t/ha at P14.25/k. The high production cost was due to the high cost of irrigation and labor.

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
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 nursery
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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