# 2017 National Rice R&D Highlights

# PHILRICE NEGROS





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

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# **PhilRice Negros** Branch Director: Rizal G. Corales

#### **Executive Summary**

In 2017, the station implemented 15 research studies and 13 development projects funded by PhilRice, Department of Agriculture -Bureau of Agricultural Research (DA-BAR), and International Rice Research Institute (IRRI).

The research studies included yield and agronomic performance of breeding lines, hybrid and inbred lines, special purpose lines and drought evaluation of near isogenic lines, and collection farmers' variety in Negros and Bohol Islands. On- and off- station field trials were conducted for FCSSP, Hybrid Seed Production, and ICT-based projects such as RCM PRISM.

Seminars, Lakbay Palay, coaching activities in the RiceBis Community, senior high school immersion, on the job trainings for agricultural students, and Rice Boot Camp for college graduates were conducted for extension and communication services. Technology guides were mass produced and translated. Learning fields showcased newlyreleased varieties and rice growth stages. Station-based Palayabangan was also established.

The station is one of the sites for evaluation and screening of promising rice selections before a variety is released. Advanced yield trials were conducted to determine the yield potential, adaptability, and field reactions to major insect pests and diseases of promising rice selections under the PhilRice Negros environmental condition.

Palayabangan: The 10-5 Challenge was participated by 12 competing and 4 noncompeting contestants. Intensified Rice-based AgriBio System (IRBAS) with key components of rice seed production, livestock, fish, ducks, organic fertilizer and mushroom production was implemented. RiceBis is also housed to improve the competitiveness of rice and rice-based farming communities in Negros Occidental. Farmer-participants increased their rice yield up to 5.58 t/ha in WS after seven months.

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# The Learning Farm

RG Corales, JAE Cordova, and LG Dogeno

The Learning Farm involved components, which directly address major challenges in rice production. Each component has objectives towards increased yield and reduced cost through varietal adaptability, competitive rice technologies, and application of rice-based initiatives. Youth's exposure to this farm would also instill significant skills and knowledge, which they can consider when choosing their career.

Rice relay planting was established in eight paddies at various planting dates to compare the performance of rice among establishment dates. Each paddy was divided into two methods: transplanted and direct seeded. However, the set-up was replaced with traditional varietal demonstration to evaluate major characteristics of each variety collected across the country.

Palayabangan: The 10-5 Challenge, an initiative to test technologies that can produce 10t/ha at P5/kg of palay. The goal of 10-5 was not attained in Negros.

Boot camp is a 12-day experiential training for agricultural graduates who were equipped through lectures on rice production and field activities. There were 26 agriculture-related graduates who registered 75-900% knowledge gain after the training.

## PhilRice Negros One-Stop Information shop

ACS Suñer, CU Seville, JAE Cordova, RG corales, and SS Sellado

The one-stop information shop aimed to increase awareness and knowledge of PhilRice stakeholders on rice and agriculture and on the institute's banner programs and campaigns. It is dedicated to cater to the information needs of PhilRice Negros' stakeholders, primarily the students, researcher, and agricultural extension workers and by providing accessible, comprehensive, and updated information about Philippine rice.

In 2017, the station participated in six exhibits and three info caravan in Negros Occidental and Oriental. About 3,000 copies of knowledge products such as magazines, posters, and brochure were distributed to farmers, extension workers, and partners. Database of pictures, reports, and researchers' data were compiled and stored for reference and easy retrieval. A satellite OSIS was also established in Dumaguete, Negros Oriental that is managed by the provincial local government unit. Lakbay Palay - Negros

RG Corales and PhilRice Negros Staff

The station's Lakbay Palay was conducted in October 27 with the theme "Kita kita sa Modernong Pagpanguma" [We are Together on Modern Farming]. Five-hundred three participants composed of farmers from 17 municipalities and cities, students from four schools, partners from Department of Agriculture, and guests from other PhilRice stations. It showcased the use of high-quality seeds, farm machineries, and climatesmart technologies. It also featured unique rice-based delicacies of Negros. The open forum was participated by National Irrigation Administration, Bureau of Plant Industry – National Seed Quality Control Services, Office of Provincial Agriculture of Negros Occidental, Philippine Crop Insurance Corporation, Philippine Carabao Center, and National Dairy Authority.

# **Operation and Maintenance of PhilRice Agromet System (AWS) Network** *RG Corales and LG Dogeno*

Agro-meteorological AWS systems measure in-situ weather conditions in parallel with local forecasts. The AWS at PhilRice Negros aimed to provide weather data useful in the analysis and precise recommendation. The AWS facility stopped its operation in the first quarter of 2016 because of the connection disruption between the modem and data logger. This was resolved through manual gathering of weather data.

In 2017, the average temperature ranged from 26.43 to 29.45 °C. The highest average temperature was in May, followed in June measured at 29.45 and 28.61 °C, respectively. The precipitation rate or rainfall ranged from 480 to 7730ml. The lowest average temperature and lowest precipitation rate was achieved in February, while the highest average temperature and precipitation rate was obtained in June. The month with highest number of sunshine hours was in April while the lowest was in June.

## Intensified Rice-Based Agribio System (IRBAS)

EM Libetario, RG Corales, APO Pajarillo, CU Seville, and HA Pajarillo

IRBAS' key components included rice seed production, livestock, fish, ducks, organic fertilizer, and mushroom production. Farm wastes including rice straws and banana pseudostems were used as beddings for ducks, substrate for mushroom, and mulch for vegetables and vermicomposting. Rouged palay and half-filled grains served as feeds for ducks while carbonized rice hull was used as beddings for swine. Beddings were harvested and then scattered in the organic rice seed production as

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The crop seed production was fertilized with vermicasts, mudpress, and station-produced formula. At tillering stage, ducks were introduced; completely eradicating insects and snails. Ducks were not only utilized for pest management but also served as source of additional income.

Fishes were also grown in ponds, which were managed with minimal feed requirement. Floating plants were introduced as alternative feeds.

The goat production contributed organic fertilizers and meat. The wastes were the used for vermicomposting.

Vermicomposting was produced through rice remnants and wastes. Station-produced fertilizers were used in vegetable and rice seed production. Mushroom production was maintained under controlled environment. Substrates were mainly acquired within rice environment.

### **Rice Business Innovation System Community**

RG Corales, CU Seville, JAE Cordova, RF Austria, AO Pajarillo, VA Tingson, and MA Etchon

This project aimed to improve the competitiveness of rice and ricebased farming communities, particularly in Negros Occidental for the project's first phase. Specifically, the project sought to: (1) showcase locationspecific, yield-enhancing and cost-reducing technologies on a 50-ha area; (2) enhance the technical and organizational building and management capability of the farmers and farmer organizations in undertaking rice and rice-based agro-enterprise; and (3) develop a marketing plan by linking farmers to markets and financing institutions in the local rice value chain.

After seven months of project implementation and intervention in the community, innovative farmer-participants increased their yield up to 5.58t/ha in WS 2017. Learning from the project included: (1) organization needs to be educated and organized properly to be more cooperative and united and (2) mind-setting activities are effective if it addresses the needs and major problems of the participating farmers. Localization of Knowledge Products and Enhancing KSL activities ACS Suñer, CU Seville, and JAE Cordova

The study identified farmer-partners who will help set-up Rice Info Hub; established Rice Info Hub in partnership with other local stakeholders; promoted Rice Info Hub thru farm visits and media platforms; documented and analyzed the use of Rice Info Hub; localized matured rice technology; and produced rice techno guides.

Five technology guides were localized, in which three were already mass produced and distributed in 500 copies. Handbook on farm machineries was also produced and distributed in 350 copies. Evaluation showed that farmers perceived the technology guides to be very useful as they are localized.

#### 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<sup>-1</sup> - 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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