

PhilRice Magazine

A quarterly publication
of the Department of Agriculture–
Philippine Rice Research Institute



**Shielding the
heartland with
Agri 4.0 technologies**

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ABOUT THE COVER

Rice farming landscape faces constant threats, from extreme weather to market vulnerabilities. At PhilRice, we embrace Agriculture 4.0 technologies to help farmers become resilient and climate-smart entrepreneurs; ensuring a prosperous future for Filipino rice farming communities. We do this by transforming challenges into opportunities, bringing innovations like climate-resilient rice varieties and data-driven pest management to even the most remote areas, so that every grain harvested reflects the hard work and dedication of our farmers.



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Adapting to changing threats

The rice farming landscape faces constant threats, and with every solution we devise, new challenges arise. The Office for the Coordination of Humanitarian Affairs (OCHA) released a map illustrating 50 years of tropical storms in the Asia-Pacific from 1966 to 2017. This map highlights that in the northern Pacific, island nations such as Micronesia, the Marshall Islands, and Palau, as well as the territories of the Northern Mariana Islands and Guam, lie in the path of many destructive storms, often reaching their peak as they hit the Philippines and Japan.

Extreme weather is not the only threat to rice farming. Recent phenomena like El Niño and La Niña also pose significant risks. Additionally, the vulnerability of the international rice market, which influences input prices, further complicates the situation.

Can we still make Filipino rice farmers happy amidst these challenges?

At PhilRice, we envision a future of prosperous, resilient rice farming communities. To help farmers cope with these changing threats, we have embraced Agriculture 4.0 in rice farming. We're developing field robots, ICT-based fertilizer recommendations, and data-driven pest management, among other technologies. We also assist farmers in meeting market demands by producing high-quality, safe, and affordable rice and rice-based products. Furthermore, we bring our innovations, especially climate-resilient rice varieties, closer to farmers, even in remote areas.

Our vision for the future of Filipino rice farmers is clear: to help them become thriving communities resilient to threats. We aim to ensure that every grain harvested reflects their hard work and dedication. We are committed to transforming farmers into climate-smart entrepreneurs who are satisfied with their lives.

As the threats to the rice farming landscape persist, we remain steadfast, never losing sight of the prosperous future we wish for our farmers and their communities.

Farmers, agri-staff members, and students ignite passion for farming as PhilRice commemorates milestones in the rice sector, highlighting new records in rice production, achievements in market linkage, and the release of climate-resilient rice varieties.

Rice sector milestones celebrated

PhilRice took center stage at the recent two-day Bagong Pilipinas town hall meeting during its Lakbay Palay event. It announced its contribution to the 2023 national record harvest, and also had it featured in the rice paddy art in Science City of Muñoz, Nueva Ecija.

Addressing over 500 farmers, Executive Director John C. de Leon announced that the Rice Competitiveness Enhancement Fund (RCEF) Seed Program has distributed 16.04M 20kg bags of inbred rice seeds to 2.4M unique beneficiaries over multiple cropping seasons. Since 2019, these certified seeds have been planted on 1.8M ha of land annually.

Through the RCEF Rice Extension Services Program, PhilRice helped produced 25-48 rice experts per region to assist farmers in diagnosing field problems. Over 4,300 graduates of the training-of-trainers program nationwide are now teaching farmers and setting up varietal trials at more than 300 farm schools.

"In previous years, we produced only 10-12Mmt of rice annually. Last year, we exceeded 20M. With our farmers' continued dedication, we aim to surpass this milestone year after year," de Leon said.

One of the achievements celebrated at the event was the Philippines' impressive rice production in 2023, setting a new record of 20.06M metric tons.

Also, 25 farmer clusters were linked to institutional markets such as Kiwanis International, MayaniPH, CM & Sons Food Products Inc. (Merzci), and the People's Disaster Risk Reduction Network, Inc.

PhilRice-bred NSIC 2023 Rc 730 SR and Rc 732, recommended in national irrigated and rainfed lowland areas, respectively, were approved for commercial release while varieties adaptive to complete submergence and flash floods with 100% survival 21 days after de-submergence are being developed.

The town hall meeting also served as a platform to inspire the next generation of agricultural leaders, and professionals, engaging approximately 500 students and faculty members in discussions about careers in agriculture. Dr. Hazel V. Antonio encouraged them to explore diverse opportunities within the sector.

"Thoroughly pursuing your chosen agriculture-related course is pivotal not only for personal growth but also as a stepping stone toward making a substantial impact in the agricultural sector. Excelling in your field enables you to devise effective strategies that bolster farmers' income. By collaborating, we can uplift farmers and transform the agricultural landscape," she emphasized.

The Institute's page on YouTube (<https://www.youtube.com/@philricetv/shorts>) and TikTok (https://www.tiktok.com/@rice_matters), which were created based on stakeholders' demand for rice information on said platforms, were also launched during the two-day program.

- CHRISTINE MAE A. NICOLAS



Mestiso 99, a public hybrid variety bred by PhilRice and UPLB, delivers impressive yields, averaging 6.6t/ha and reaching up to 10t/ha, providing farmers with cost-effective solutions for enhanced productivity and profitability.

Derby promotes hybrid varieties

Four public hybrid varieties that are cheaper than their private counterparts were introduced by PhilRice during the techno-demo called "rice derby" at the recent 17th National Rice Technology Forum in Sto. Domingo, Nueva Ecija.

"Farmers are constantly seeking methods to lower rice production expenses. This forum advocates for cost-effective, government-funded hybrid varieties that are accessible and ready for deployment," explained Jerry D. Batcagan, a rice specialist.

NSIC Rc 446H (Mestiso 73) set itself apart from 72H (Mestizo 1), 204 (Mestiso 20), and 544H (Mestiso 99) through its impressive performance.

In accordance with the Institute's mandate to regulate and provide reliable information regarding the rice sector, PhilRice has established the Data Analytics Center (DAC) designed to unify rice and rice-related data from research papers, surveys, industry reports, and government publications.

The DAC aims to generate information guaranteed to be reliable, easy to access, accurate, and consistent for policymakers, researchers, and the public. The key findings of the center can direct the Institute in farming strategies and technologies appropriate for mitigating timely issues in rice farming.

According to DAC Interim Director Dr. Leylani M. Juliano, the center improves agriculture by helping stakeholders through its two key products – the PalayCheck app and Ricelytics. The app provides farmers with actionable insights on best practices in crop management, optimizing operations, and ensuring sustainability. Meanwhile, Ricelytics offers detailed data analytics and visualization to inform decision-making researchers, policymakers, and agripreneurs.

“These tools benefit farmers by empowering them to practice data-driven decision-making that enhances productivity and reduces risks, support the nation through reliable food security and economic growth, and offer partnership and collaboration opportunities. Overall, the center helps make farming more efficient, sustainable, and well-informed,” Juliano emphasized.

Through the PalayCheck app, farmers may access a cropping calendar where

PhilRice data lake provides analytics and data-driven products



PhilRice's Data Analytics Center (DAC) empowers farmers and policymakers with tools like the PalayCheck app and Ricelytics, shaping a future of optimized farming practices, sustainability, and enhanced national food security through data-driven insights.

they can be advised of the best time to start land preparation up to harvest time. Appropriate crop management guidelines can also be accessed through this app, which may help farmers alleviate damages and issues in their crops. The app also provides an income-and-expense report where farmers may access their expenses and check their profit.

The Ricelytics website, on the other hand, largely provides summarized yet detailed information regarding the status of the local rice sector based on data gathered countrywide. Data about the country's rice industry, rice farmers, and farming practices from regional to municipal levels can be found on this website in just a few clicks.

As modern strategies and technologies progress, agriculture is thriving with its flow. With a futuristic approach, the Institute envisions a digital-based transformation that would benefit

not only the agency but ultimately the country's rice farmers.

“We can imagine a future being redesigned further by the advances in so-called disruptive, exponential SMAC (social media, mobility, analytics, cloud) technologies that can enable our farmers to earn more from their farming and empower them to become better versions of themselves,” Dr. John C. de Leon, executive director, said.

Utilizing modern gadgets such as smartphones in farm management conveniently provides information and guidelines, and serves as a communication tool that can greatly assist in modern farm activities. Through DAC, agri-apps and websites will be enriched based on the necessities of end users.

Figuring out what is and what's to come energizes the institute to mold interventions that aim to strategize practices in pest management, climate-resilient variety recommendations, and modern agriculture methods to make farming more convenient and productive. This will hopefully entice the future generations to venture into farming, all to achieve the country's goal of being rice-self-sufficient.

PhilRice-CES houses the DAC headed by Juliano and Dr. Jesusa C. Beltran as interim assistant director. The center is under the umbrella supervision of the Office of the DED for Research.

- ROCEL DYAN C. SILVA

Maturing in 113 days, it is moderately resistant to blast, sheath blight, and green leafhopper, averaging 6.6t/ha with a maximum yield of 11.6t/ha.

Miniature direct-seeding machines that PhilRice developed were also displayed while IEC materials and planting guides for Mestizo 1 and Mestizo 20 were distributed to more than 500 participants.

“Two farmers from Tarlac and Pangasinan expressed their interest in

adopting the multi-purpose seeder — a machine that sows seeds uniformly — saying that this intervention would be helpful for them in the upland and rainfed areas,” Batcagan recapped.

The forum themed, “Masaganang Agrikultura, Maunlad na Ekonomiya,” was also joined by the Philippine-Sino Center for Agricultural Technology and private seed companies.

- CHRISTINE MAE A. NICOLAS

Salt-tolerant lines introduced in Cagayan



Farmers in Cagayan will soon have salt-tolerant rice lines, paving the way for improved yields in saline-prone areas.

Twenty bags of seeds from three salt-surviving lines have been delivered and will be distributed to farmers in Buguey, Aparri, and Sta. Teresita in Cagayan for trial planting this wet season.

The three elite breeding lines along with 147 lines had undergone salinity testing in Buguey and Sta. Teresita, and some municipalities in Bicol Region from 2018 to 2022 under the project "Salt-tolerant rice varieties to Asian Food and Agriculture Cooperation Initiative (AFACI) member-countries." These were recently selected and applied for Plant Variety Protection (PVP) registration and DUS (distinct, uniform, stable) testing for two seasons (dry and wet seasons) at PhilRice.

The lines from International Rice Research Institute (IRRI) and one from PhilRice have shown at least intermediate tolerance to salinity in field and laboratory trials. They have good yields of 3-4t/ha under saline and 6.4-7.5t/ha under non-saline locations.

Farmers' fields planted with these new lines will be monitored in coordination with local governments following deployment protocols. The project had initially conducted adaptation tests on three registered varieties (Rc 330, Rc 534, and Rc 604) in these areas. Farmers were most impressed with Rc 534.

A techno-guide on rice production in saline-prone areas in Cagayan Valley and Bicol Region was developed by the project and 100 copies were distributed to the Cagayan farmers.

With support from the local government and DA, introducing more saline-tolerant rice varieties in Cagayan will arm farmers in addressing salinity issues and improving their yields, potentially leading to undiminished rice production.

- DELBERT A. SANTOS

To a sweet victory with low GI rice

MARK JOSEPH R. ZUÑIGA

Filipinos love rice so much that we eat it in almost every meal and relish it as a snack. It is our comfort, staple food. Unfortunately, high consumption of carbohydrate-rich foods, particularly white or polished rice, heightens the risk of contracting diabetes due to their high blood sugar-raising potential or glycemic index (GI). Glycemic index refers to the measurement of how slowly or quickly a food causes spikes in glucose levels.

Diabetes is the fourth leading cause of death in the country, says a 2023 Philippine Statistics Authority report. Given this, some PhilRice researchers and collaborators have been at the forefront of helping solve this health problem.

MARK JOSEPH R. ZUÑIGA



WHAT'S NEW IN RICE RESEARCH?



Dr. Marissa V. Romero, a PhilRice food scientist, said that they have started developing rice varieties with low GI to make them available to consumers, citing that low GI rice is healthier for individuals struggling with type 2 diabetes.

Developing low GI rice

According to Romero, the low GI rice research at PhilRice took off in 2016 when their Newton Project, “Enhanced Rice Quality for Health (EnRich),” was conceptualized. It was a collaboration among PhilRice, IRRI, and Rothamsted Research in the United Kingdom. They studied resistant starch, dietary fiber, and rice eating quality, which are

key factors considered in developing healthier and nutritious low GI rice.

In 2021, PhilRice and IRRI partnered once again through the OneRicePH project component, “Development of rice with low GI and high antioxidant activity for healthier rice niche markets,” to identify donors and incorporate low GI traits with high yield and quality background. Using their optimized in-vitro method in measuring GI levels, IRRI was able to screen and identify rice varieties with low GI. The low GI donors were passed on to PhilRice to start the breeding process. University of the Philippines at Los Baños (UPLB) also joined the team with the primary task of conducting human intervention studies.

Simultaneously, in 2019, development of low GI rice through induced-mutation and marker-assisted selection was funded by the Department of Science and Technology - Philippine Council for Agriculture, Aquatic and Natural Resources Research and Development led by Teodora E. Mananghaya, a PhilRice rice breeder. The project generated three NSIC Rc 160 mutants with high resistant starch that may have potential for intermediate to low GI rice lines.

Looking at the process

While the development of low GI rice proceeds, clinical testing trials of selected rice varieties and the processing effects on the GI of existing varieties, including pigmented ones, are being conducted in collaboration with UPLB.

“Our research look at the various processes that can lower their values. Cooking conditions and other processes relating to starch gelatinization can influence rice GI,” said study leader Rosaly V. Manaos, a PhilRice food scientist.

She explained that their work focuses on determining the GI of popular local rice varieties because consumers need to be provided with more data on widely eaten rice varieties to educate them on the prevention and management of diabetes.

A new chapter

In 2023, IRRI announced during the 6th International Rice Congress in Manila that they have identified the genes responsible for low and ultra-low GI in rice. Romero said that PhilRice has received the seeds containing those genes from IRRI and are being reproduced. These will soon be used by PhilRice breeders in combining the low GI traits with local backgrounds.

“Prevention is key with diseases like diabetes. With the ongoing development of low GI rice in the country, what we see is a new chapter for diabetic-friendly rice for much healthier rice lovers A-K-A Filipinos,” Romero concluded. 🍌



Christopher C. Cabusora, a rice breeder at PhilRice, conducts a marker aided selection to identify rice lines with low GI trait — a step forward after receiving the seeds containing the genes responsible for low and ultra-low GI provided by IRRI.

RICE ACROSS THE COUNTRY



Bicol



Batac



Midsayap

RCEF boosts farming practices nationwide

Agricultural initiatives under the Rice Competitiveness Enhancement Fund (RCEF) are significantly transforming farming practices across the country with Albay's agricultural extension workers (AEWs) training farmers, Ilocos Sur farmers adopting certified seeds, and techno-demo officers (TDOs) retooling for improved implementation of the PalaySikatan program.

In Albay, AEWs have been empowered to educate local farmers on modern farming techniques following a 15-day training program. This initiative, part of the RCEF Rice Extension Services Program, equipped 30 AEWs from various municipalities with vital technical knowledge in nutrient and pest management, high-quality inbred rice seeds, seed certification, and farm mechanization.

Janet L. Lorilla, an AEW from Daraga, emphasized the dual benefit of the training.

"Aside from becoming effective extension workers, we were also trained in facilitating learning among farmers. This micro-teaching approach will help farmers grasp modern farming technologies, revolutionize practices, and boost farm yield and income," Lorilla said.

Meanwhile, in Sugpon, Ilocos Sur, farmers have made a strategic shift from planting traditional rice varieties to using inbred certified seeds, thanks to the RCEF Seed Program. This transition, after over two decades, has led to a significant increase in agricultural productivity in the province.

"Sugpon yields have grown by 13.5%, rising from an average of 3.93t/ha in 2019 to 4.56t/ha in 2023," remarked Victoria S. Sumagca, municipal agriculturist.

Aurelio L. Dayag Sr., the municipality's indigenous people representative, highlighted the impact on the community, stating, "We used to plant traditional varieties mainly for family food consumption, reserving part of the harvest as seedlings for the next season. Now, with the increase in yield, our produce not only meets our consumption needs but also provides us additional income."

In addition, to further enhance the implementation of the RCEF PalaySikatan 2.0, 26 TDOs underwent specialized training. This two-day program focused on transformational leadership, social communication, partnership and networking, technical writing, providing technical assistance through the PalayCheck system, and agroenterprise capacity.

PalaySikatan now features 50ha clustered demonstration sites for rice production, showcasing various modern farm technologies designed to reduce production costs and increase yields. This marks the project's 10th season, expanding from the standard 3ha demonstration sites. The training underscored the importance of TDOs acting as catalysts for change, promoting a shift from traditional farming practices to science-based approaches. - **MLSATUITO, SMCABANSAG, AKSANDAY**



Negros



Agusan

RiceBIS delivers affordable rice, promotes gender equality

Efforts under the RiceBIS program are achieving notable progress in the Philippines, providing Sipaway Island with cheaper rice through a unique partnership and promoting gender equality in Agusan del Norte through comprehensive training.

In an initiative by the Quezon Codcod RiceBIS Farmers Agriculture Cooperative (QueCoRiFaCo), residents of Sipaway Island, San Carlos City in Negros Occidental are now enjoying more affordable rice.

By partnering with QueCoRiFaCo, the community has managed to reduce transportation costs for delivering milled rice to the island.

Josephine C. Fajardo, a member of the Barangay Ermita Whitesand Women

Association (BEWWA), explained that previously, transportation costs could add up to P25 per sack to the rice price. With this partnership, the cooperative not only expedites rice distribution but also strengthens community ties and economic stability.

“Through this partnership, in addition to saving on transportation expenses, the cooperative provides us with high-quality milled rice at a lower cost. This saves us between P150 to P250 per sack compared to other suppliers,” Fajardo said.

Meanwhile, in Agusan del Norte, the RiceBIS program is advancing its efforts to promote gender equality. A gender and development seminar was held for the Calamba and Luna clustered farmers in Cabadbaran City.

The event, attended by 84 women and 39 men, aimed to educate participants on the importance of addressing the needs and interests of both genders, fostering an Inclusive and fair community.

“These training sessions equip women with practical skills to combat discrimination and gender bias, fostering an inclusive RiceBIS community where everyone has equal opportunities to contribute to development,” Sharen T. Rivas, the RiceBIS and GAD focal person, said.

Farmer-participant Ruth P. Palatic, said that they will share the lessons with their children, grandchildren, and even neighbors to prevent gender discrimination. - **GACARREON, CMTNECESITO**



Los Baños

Mindoro satellite station's first province-wide Lakbay Palay

With the theme “Bida ang Sama-Sama,” the first Lakbay Palay 2024 dry season event held in Sta. Cruz, Occidental

Mindoro town brought together 300 farmers, stakeholders, and students to educate them about modern farming technology, machines, and newly-released rice varieties.

Participants were familiarized with the latest rice varieties, including NSIC Rc 204H, Rc 418, Rc 216, Rc 604, Rc 622, Rc 624, and Rc 626. The field affair also put on the spotlight farming technologies such as alternate wetting and drying (AWD), laser land leveler, results from the Minus-One Element Technique (MOET) demonstration, drone seeders, and other advanced rice farming machinery.

“Now I know which rice varieties are best for our area and season. We won't rely solely on what's offered to us anymore; we have basic knowledge of what to plant,” farmer Arvee C. Batitia shared. - **JOHN HERNAN M. TRINIDAD**

Mestiso 20 performs well in CAR and Cagayan

Public hybrid Mestiso 20 has sustained its impressive yield performance in Cordillera and Cagayan Valley regions, by delivering 8.73t/ha at 14% moisture content in Bangued, Abra.

The Provincial Rice Technology Forums' (PRTFs) public hybrid rice demonstration was observed by about 3,000 farmers in Kalinga, Apayao, Abra, Quirino, Nueva Vizcaya, Cagayan, and Isabela.

Mestiso 73 and Mestiso 99 also made news in Tuao, Cagayan by respectively achieving yields of 7.97 and 7.92t/ha.

PRTF is a joint initiative led by DA-Regional Field Offices and Provincial/ Municipal Local Government Units, in partnership with public and private hybrid rice seed companies and soil ameliorant and fertilizer manufacturers. - **DIANA P. LIM**

LA NIÑA-READY VARIETIES

► MARIEL M. ESPINOZA

SUBJECT MATTER SPECIALIST:
RICE TECHNICAL WORKING GROUP (RTWG)
JULIETA F. PARIÑAS

PAGASA predicts the increasing probability of La Niña to develop in June-August 2024, bringing above-average rainfall. The increased risks of flooding and waterlogged fields poses significant challenges for rice farmers in the country.

In response, collaborative efforts among PhilRice, International Rice Research Institute (IRRI), and University of the Philippines Los Baños (UPLB) have developed rice varieties that can thrive in extreme conditions caused by La Niña. Rainfed varieties are also developed and recommended for rice areas that do not have any access to irrigation water because they can respond to soil moisture fluctuations and drought-prone environments.

(SAHOD-ULAN 13)

3.4t/ha | 5.0t/ha 
(Rainfed) 116 days 

NSIC
Rc 416
*

(SAHOD-ULAN 14)

3.8t/ha | 5.7t/ha 
(Rainfed) 113 days 

NSIC
Rc 418

(GSR 8)

3.2t/ha | 4.4t/ha 
(Rainfed) 107 days 

NSIC
Rc 480

(SAHOD-ULAN 27)

2.5t/ha | 4.5t/ha 
(Rainfed) 115 days 

NSIC
Rc 570

(SAHOD-ULAN 28)

2.8t/ha | 4.5t/ha 
(Rainfed) 109 days 

NSIC
Rc 572
*



Average | Maximum yield



Maturity days

* PhilRice-bred variety

**NSIC
Rc 590**

(SUBMARINO 2)

3.9t/ha | 4.4t/ha

144 days (under submergence)

**NSIC
Rc 194**
*

(SUBMARINO 1)

2.5t/ha | 3.5t/ha

125 days (under submergence)

**PSB
Rc 68**

(SACOBIA)

3.4t/ha | 4.4t/ha

116 days

**NSIC
Rc 578**
*

(SAHOD-ULAN 31)

2.5t/ha | 4.4t/ha

113 days (Rainfed)

**NSIC
Rc 576**

(SAHOD-ULAN 30)

2.5t/ha | 4.3t/ha

113 days (Rainfed)

**NSIC
Rc 574**
*

(SAHOD-ULAN 29)

2.5t/ha | 3.6t/ha

113 days (Rainfed)

SUBMERGENCE-TOLERANT

These varieties can thrive despite complete flooding and submergence of up to 14 days at seedling to vegetative stage.

Seeds of NSIC Rc 480 are distributed under the RCEF Seed Program while seeds of PhilRice-bred varieties can be requested through the PhilRice Text Center.

Laser land levelers and field robots, anyone?

ROCEL DYAN C. SILVA AND MINARD F. PAGADUAN

Land preparation, if done correctly, will unlock efficient management of farm inputs that engenders better plant growth and good yield.

Using wooden planks and harrows attached to a carabao, our farmers had leveled the soil ready for rice planting. As years passed, necessity inspired the development of numerous farming technologies that are now called Agriculture 4.0 for brevity. Among these technologies are the land levelers and robotics, ready to transform practices.

“Laser leveling is very important to rice farming. It requires less water during land soaking and land preparation until before transplanting or crop establishment. It corrects the levelness of the field that is usually a difficult task for ordinary farmers,” said Dr. Elmer G. Bautista, PhilRice scientist.

Bautista explained that the laser-guided land leveler was introduced in the late '90s by IRRI. It was promoted through a collaboration with PhilRice under the WaterRice Project. PhilRice refined and adapted the technology based on the requirements of farmers to make farming more convenient and fast.

Laser leveling is the most important to consider when talking about farm mechanization. Precise leveling methods can save up to 35% irrigation water usage, lead to uniform crop growth, save labor costs as it shortens farm operating time by 10%, reduce weed problems, and increase productivity up to 50%. It is a resource-conserving technology that efficiently saves fuel and electricity used in irrigation.



The laser leveler corrects the level and requires 35% less irrigation water during land preparation.

Know how

A tractor with an attached bucket is guided by a laser transmitter positioned at the field's edge, creating a laser plane in the air. This laser plane serves as a reference for height, received by the system, which uses electronic and hydraulic controls to adjust the bucket's height accordingly.

In preparation for laser leveling, small field plots could be consolidated to allow optimum machine operations as headland maneuverings will be limited.

Bautista clarified that laser levelers can be bought from local distributors but local manufacturers for each of all the components are also not available. The machine alone costs approximately P800,000 excluding the tractor. This cost is, of course eye-bulging to individual farmers, who may opt to just rent this machine from service providers at P3000/hr of operation.

Robots

Of all the breakthroughs in agricultural technology, robotics stands out conspicuously. In today's digital age, where online platforms dominate entertainment, robotics in agriculture offers a unique advantage: it simplifies processes and reduces the need for human labor.

Dr. Jasper G. Tallada, a senior PhilRice researcher, developed interest in robotics after attending an

international training in 2016, where he first learned about Agriculture 4.0—a concept involving intensive use of robotics, drones, and ICTs. His destiny in this field was further cemented when a student-made robotic tractor from a Manila-based university had to be showcased to gather feedback and check its performance.

The initial design of RoboSeeder utilized 350W motors, but it has since been upgraded to incorporate 1000W motors for bolder performance. Through four trials and iterative development, it became clear that accuracy and precision are crucial for the effectiveness of robotics in farming automation.

As the global population grows, meeting future agricultural demands becomes critical. Robotics addresses challenges such as aging farmers, declining productivity, limited youth interest in agriculture careers, and the need for gender-inclusive farming practices.

The RoboSeeder – a notable innovation under development brims with exciting potential due to its multifunctional capabilities. It automates wet direct seeding of rice. Later on, it can also be used for land preparation and for spraying.

“We anticipate that this RoboSeeder will be fully operational within three years. Our implementation plan is still in development, but we expect it to have a transformative impact similar to what the combined harvester had achieved,” Tallada said. 🌱



RoboSeeder taking over farming duties, so that farmers dedicate time and effort to other activities. This advanced machine operates around the clock, collecting real-time data to optimize its performance.

START UP

RiceBIS communities into PhilGAP certification

ROCEL DYAN C. SILVA

In the country's verdant fields where rice paddies at times stretch as far as the eye can see, a shift in rice farming is slowly taking place. Amidst the challenges of fluctuating market demands, the low purchasing price of palay, and the need for sustainable agricultural practices, Filipino rice farmers are embracing a groundbreaking initiative: PhilGAP certification.

Philippine Good Agricultural Practices (PhilGAP) is a comprehensive certification program designed to elevate farming practices to be environmentally conscious to ensure food safety, farm field workers'

protection, and enhance the market competitiveness of farmers' produce. Spearheaded by the DA-Bureau of Plant Industry (DA-BPI), PhilGAP aims to standardize farming methods, improve product quality, and open doors to markets both domestically and internationally.

Organized farm, safer produce, healthier farmers

One big dilemma of farmers even before this generation was born is the immense price differential between the farm gate and market prices of their products despite the obvious picture of

who shed the most sweat to produce what's available in the market. Given that they must save again for the next cropping season, many farmers lack enough money to sustain their families.

Aware of this, PhilRice Isabela's Dr. Ofelia C. Malonzo, RiceBIS product innovations project leader, could never let this PhilGAP advantage get past her fingers. She worked to introduce the certification to farmers as it can help them not only stretch up the market value of their rice produce but also ensure their safety.

Saranay B. Gaboy, 54, from Dagupan, San Mateo, Isabela, foresees the benefit they can reap from the certification through the assistance of RiceBIS implementers in Region 2.

"As a pioneer member of the MARDAG coop, I have witnessed how the local rice has depreciated through the years due to imported rice. Although government agencies were trying to



MARDAG RiceBIS community will soon achieve PhilGAP certification, positioning their produce for premium markets while promoting sustainable agriculture. This certification will empower them to meet growing consumer demand for safe, high-quality rice.

mend the ill effects on the farmers, GAP certification is one way of adding value to our produce," she is optimistic.

Among the key aspects of PhilGAP certification are on traceability and documentation. Farmers are required to maintain detailed records of their farming activities, including inputs used, pest management paraphernalia, and harvesting procedures. Gaboy emphasized that it is vital to have a separate organized storage room to guarantee the welfare of farmers and safety of the crops. This traceability ensures transparency throughout the supply chain, instills consumer confidence, and facilitates compliance with food safety regulations.

Such certification opens doors to new market opportunities for rice farmers. With growing consumer awareness and demand for safe and sustainably produced food, certified products command premium prices in both local and international markets. By meeting PhilGAP standards, farmers gain access

to retail chains, export markets, and institutional buyers who prioritize quality and safety.

Certified farmers earn more

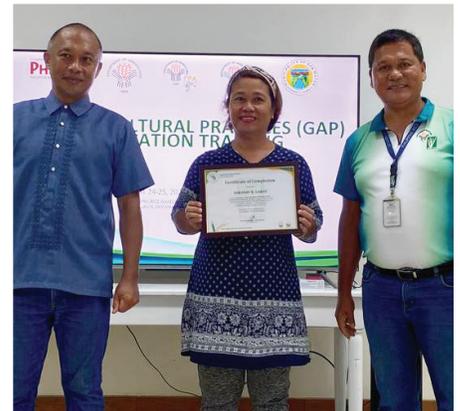
"Just recently, our coop members with GAP-certified farms sold their rice with a 50-centavo per kilo price advantage over the prevailing market price. This is a quantum leap already and our buyers were extremely satisfied with the 70% milling recovery of our palay," Gaboy exclaimed.

She pointed out that more and more markets are opening their doors to their cooperative. Institutionalized markets are now also after their GAP-certified rice. The demand is soaring, which encourages numerous farmers to apply for the certification that also promotes environmental management and consciousness.

"Having a GAP certification brings confidence to the farmers that their produce is more competitive in the

market as more and more people are delving into healthier produce," Malonzo enthusiastically observed.

The project is targeting up to 400 farms for GAP certification by November this year. Implementers are continuously pitching in their efforts to attain this goal and hopefully produce a future with healthier and safer food, improved farmers' welfare, and a sustainable environment. 🌱



With the end in mind of becoming a resilient farmer, Saranay B. Gaboy proudly commits to sustainable practice and open doors to new market opportunities.



MOTIVATE

RCMAS revitalizes Gerona rice fields

CHRISTINE MAE A. NICOLAS



Jayson G. Galleon, farming for 15 years

For many years, farmers in Sembrano and San Bartolome, Gerona, Tarlac relied on traditional nutrient management methods passed down through generations. These practices included the use of various fertilizers without precise guidelines, organic manure like carabao dung, and foliar sprays. However, these methods often failed to substantially boost yields or reduce production expenses.

"Farmers in these barangays admitted having no basis for the amount, type, and timing of nutrient application, resulting in high fertilizer costs without yield increases. They'd also only apply fertilizer when they noticed their crops turning yellow," said Irene B. Laureano, SMART rice officer.

PhilRice, through the then SMART Integrated Crop Management (ICM) protocol, reduced production costs by introducing mature technologies to convergence sites. They brought in the Rice Crop Manager Advisory Service (RCMAS) and the Minus-One Element Technique (MOET) to both barangays.

As a result, 64 farmers adopted RCMAS recommendations across 101.5ha of farmland. RCMAS is a free digital agriculture service designed to provide farmers with precise information to enhance productivity and profitability combined with Integrated Crop Management (ICM) developed by International Rice Research Institute (IRRI) and PhilRice, this service is deployed nationwide with support from DA Regional Field Offices, the Agricultural Training Institute (ATI), and local agricultural extension workers (AEWs).

The need for change

The inefficiency of traditional practices not only led to mealy harvests but also escalated costs. Many farmers, like 52-year-old Warlito V. Viernes of Sembrano, found themselves spending a considerable amount of P19,000 on fertilizers without seeing a proportional growth in yield.

This imbalance intensified the thirst for more effective farming methods, particularly fertilizer application.

"Before using RCMAS, my harvest was mired at 4.3-4.4t/ha. Despite using 12 bags of fertilizers, including urea and 14-14-14, the returns were not substantial," Viernes sighed.

Similarly, father and son Danilo P. and Jayson G. Galleon of San Bartolome spent P25,000 to P35,000 on farming implements, particularly for nutrient management, but had to content themselves with modest harvests.

Danilo, 62, wondered why he produces only 4.2-4.5t/ha in his 2ha field, while his son can only keep getting 1,700kg in 0.5ha despite significant expenditure.

Meanwhile, 70-year-old Erlinda Ingrad lamented how not only poor nutrient management but also water crisis made her give up rice farming in the 2023 dry season.

"Water is a big problem for us, especially when the water supply is weak and gasoline is expensive. Last time, we harvested only 300kg/ha. This is very meager because we neglected the fields due to the water shortage," she regretted.



Danilo P. Galleon, farming for 45 years



Erlinda D Ingcad, farming for 6 years



Warlito V. Viernes, farming for 29 years

A turnaround with RCMAS

PhilRice conducted a series of lectures on pest and nutrient management, which sparked particular interest among the farmers in improving nutrient management on their farms.

“Since the farmers were still sticking to outdated practices, we introduced RCMAS and demonstrated potential yield increases and lower production costs. We provided a sample result with reduced fertilizer amounts and explained the specificity of the recommendations,” Laureano detailed.

The introduction of RCMAS marked a pivotal shift for the farmers, providing them with customized recommendations that optimized fertilizer use and improved crop management, resulting in better yields and reduced costs.

Viernes saw a remarkable transformation in his harvest. “After complying with the RCMAS guidelines, my yield shot up to 5.5t/ha. That’s an additional 10 cavans, and the weight per sack was heavier by 5kg. I now

only need six bags of fertilizer, cutting my costs significantly while boosting production,” he figured out.

The yield increase was also enjoyed by Danilo and Jayson as they now boast of their harvest and lower costs. “I’m now harvesting 5.2t/ha and my costs dropped from P35,000 to P30,000. RCMAS has truly been a game-changer,” Danilo emphasized.

“My yield increased from 1.7t to over 2.4t in 0.5ha. Not only that, my expenses dropped from P25,000 to P20,000 because we are provided with a clear guide on when to fertilize and how to manage our crops,” Jayson added.

Apart from the yield increase, Erlinda highlighted how PhilRice not only helped them in nutrient management but also assisted them in other areas of rice farming to improve their lives.

“In my six years of farming, I always relied on old practices. Now, with PhilRice, I have learned a lot, from land preparation to managing elements that really affect plant growth. I’m happy

with the results my field is producing now,” she said.

Continuous growth

After adopting innovative farming practices since the last quarter of 2023, farmers in Sembrano and San Bartolome are actively exploring other technologies offered by PhilRice.

“We will continue using RCMAS to confirm its effectiveness further. I recommend it to others to reduce costs and increase yield because farmers like us should embrace modernized farming,” Danilo said.

The achievements of these farmers in Gerona, Tarlac attest to the helpfulness of adopting innovative farming practices. The technology introduced has not only increased yields and reduced costs but also promoted more sustainable farming methods.

“The key to success with RCMAS is understanding and following the guidelines precisely. It’s about learning new techniques and leaving behind old practices that no longer serve us,” Viernes emphasized. 🍃

A JOURNEY TOWARD **digital** **transformation**

► YOBHEL LOUISSE P. BELTRAN

PhilRice has developed the Rice Seed Monitoring System (RSMS) to digitally transform its operations for efficient data collection, monitoring and analysis, and promote transparency and accountability. The system now caters to inbred and hybrid seed distribution.



Then called RCEF-Seed Monitoring System, it consisted of web-based modules limited to seed delivery, inspection, and distribution.

2019

2020

2021



- Release of Binhi e-Padala distribution app alongside a web-based online monitoring dashboard.
- Dashboards for managing SGC/A commitments, deliveries, buffer, and inventory of seeds.



- Monitoring dashboard for the DA-Regional Field Offices was developed and released following the integrated implementation of the RCEF Seed Program and DA-National Rice Program.
- Developed a client-facing website to highlight our outputs for public consumption.

With more than 1,300 City/Municipal local government units partners, 67 Seed Grower Cooperatives/Associations (SGC/A), and hundreds of Farmer Cooperatives Associations (FCAs) utilizing the RSMS in one way or another, digitalization efforts help these organizations infuse digital technology into their operations in meaningful ways.

This engenders greater appreciation for and adoption of the same toward digitally transforming the rice seed value chain.



Developed mobile applications such as the Drop-off Point Maker and Delivery & Inspection App, and integrated them with the RSMS.



- User dashboards were developed to facilitate data encoding, consolidation, and automated report generation.
- Distribution module for information, education, and communication materials/knowledge products under RCEF-Rice Extension Services Program was also released.
- Mobile application for collecting survey responses was developed.
- RSMS integrated with the Farmers and Fisherfolks Registry System to allow seamless information.

2022

2023



Rodel G. Parcon, a rice farmer, once grappled with anxiety at the mere sight of even the tiniest insects in his paddy fields. Aware that pests and diseases could slash an average of 37% from rice yields, his unease led to heavy reliance on pesticides despite their known risks to both the environment and human health.

“Who wouldn’t be nervous, right? Then things turned bright when PRIME invited me to be one of their collaborators,” the 66-year-old son of Pototan, Iloilo began his story.

Funded by the DA-Bureau of Agricultural Research and National Rice Program, the Pest Risk Identification and Management (PRIME) project ensures that rice crop health is efficiently monitored across the country. Implemented by the DA-Bureau of Plant Industry, PhilRice, DA-Regional Field Offices, and IRRI from 2017 to 2022, the project provided the government and rice farmers with timely information on pest outbreaks to better plan program interventions and field management strategies to avoid or mitigate crop losses due to pests and diseases.

“Our goal is to stay ahead of pests and diseases,” emphasized Dr. Eduardo Jimmy P. Quilang, PhilRice’s deputy executive director for research and then project leader.

Data-driven defenses against rice pests

REUEL M. MARAMARA

“Beyond field experiments to deepen our understanding, PRIME leverages historical data, remote sensing technology, and meticulous field validation and monitoring. This allows us to map pest risk factors, enabling us to visualize and predict possible outbreaks in specific areas,” Quilang added.

“The system promptly alerts us of these possibilities, which we validate in the field. Once confirmed, we advise our partners — especially local government units — enabling them to plan targeted interventions and offer guidance to farmers,” elaborated Cherry E. Tayson, senior science research specialist and PRIME data manager of the DA-Regional Crop Protection Center in Western Visayas.

Shields up

Armed with advanced insights, Parcon now implements appropriate defenses against pests and diseases.

“Our pest management practices were very different from what PRIME recommends. Before, we sprayed pesticides right after planting, and then we applied again every 7 to 10 days,” Parcon, who tills a 12-ha rice area, said.

Guided by the municipal agriculture office, Parcon now applies pesticides only when necessary — a significant cost reduction.

“From over P3,000/ha, now I only spend less than P1,500/ha when I need to,” he estimated.

Pototan agricultural technologist Vanessa Mae C. Ebron said they emphasize monitoring to manage pests and diseases.

“Based on PRIME advisories, we alert farmers of potential pest outbreaks and tell them always to monitor their fields, and not immediately spray pesticides. Since we know what pest or disease is coming our way, we can advise them of appropriate control measures. Some farmers also set traps and attractants as their first line of defense,” she said.

Aside from giving advisories, the local government trains farmers on pest management and other related areas, such as proper land preparation, and water and nutrient management through farmer field schools.

“All these efforts have not only benefitted our farmer-cooperators but have also influenced other farmers in their communities. They saw that the practices were effective and were enticed to do the same,” added Gilbert B. Quimba, Pototan municipal agriculturist.

This shows that data empower us to overcome challenges in rice farming. Building on this, PhilRice maintains the Philippine Rice Information System, the first satellite-based rice monitoring system in Southeast Asia that generates maps and other rice-related data, such as areas planted, seasonality, yields, and risks. The Institute is also developing Climate-smart Maps to map out vulnerable areas to climate-related risks, like the recently concluded El Niño.

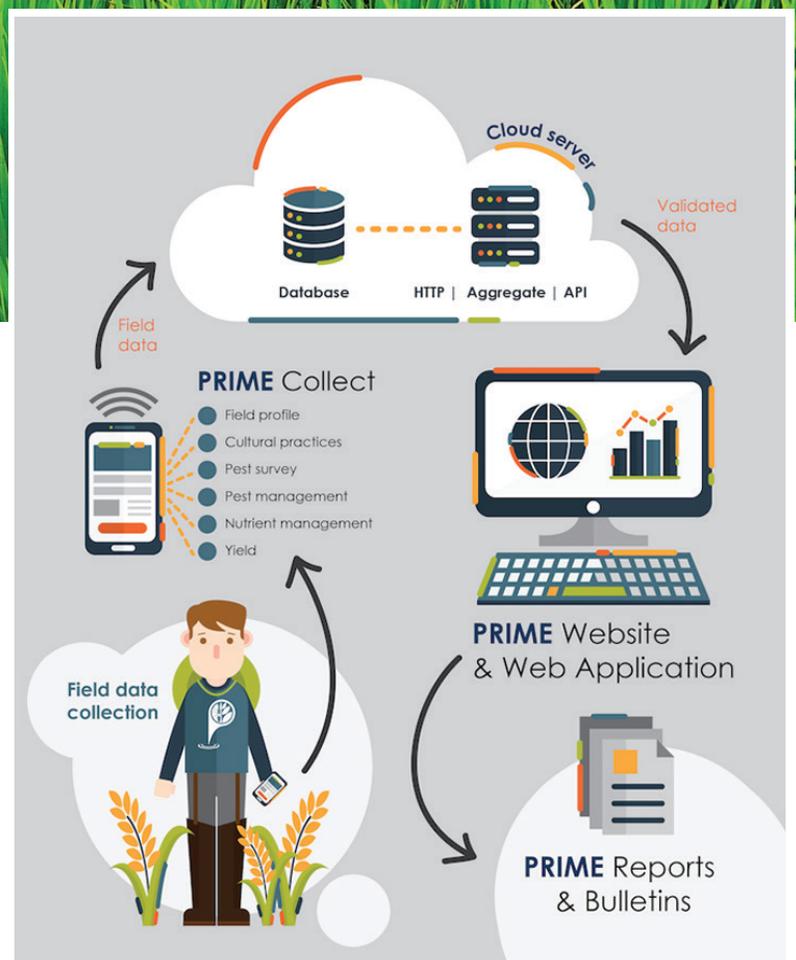
“These decision support tools enable the government to make informed choices, enhancing the precision and effectiveness of our interventions. We can adjust, say, our planting calendars, to avoid risks, and mitigate our losses,” Quilang said.

During the “Ugnay Palay: The 35th National Rice R4D Conference” held at PhilRice in November 2023, Ulysses G. Duque, a crop pest management expert from the DA-Bureau of Plant Industry, emphasized that this improvement would benefit farmers through better-targeted programs and provide rice consumers with more affordable rice, resulting from a more stable supply. The expert also noted that reducing rice losses due to pests and diseases just by half could yield an additional one million metric tons of milled rice annually.

With all these stimuli, Parcon’s heart, once weighed down by fear, now feels lighter knowing that outsmarting challenges in rice farming is no longer a distant dream. Data has become his steadfast ally. 🌱



VANISSA MAE C. EBROK



source: <https://app.pestrisk.da.gov.ph/>

FEATURE

Feedback magic

Transforming
insights into agricultural
innovations

► SHEREEN R. FRANCIA



ROCEL DWAN C. SILVA

PhilRice's successful adoption of Elie N. Manjares' innovative tweak to the construction material used in fabricating the bed of the recirculating airflow flatbed dryer in 2018 highlights the Filipino farmers' ingenuity and their role in the technology evolution cycle.

Stashed in the British Museum is the world's oldest customer complaint. The letter, chiseled onto a clay tablet, dates back to 1750 BC and is addressed to a merchant named Ea-nasir, who allegedly delivered the wrong grade of copper and treated the writer's servant rudely. It remains a mystery what Ea-nasir did with this letter.

Fortunately for us today, giving and receiving feedback is a far cry from the time and effort-consuming stone-carving medium our ancestors used. Feedback has become alchemy; an indispensable tool for continuous improvement and innovation. It helps organizations understand the needs and preferences of their users, identify problems, and develop solutions that enhance user satisfaction and overall experience. It is worth mentioning that because of feedback, we now have emojis, night-mode features in smartphones, Google Maps in offline mode, and GPS-guided tractors, among other novel and useful creations.

For the past 38 years, PhilRice has relied heavily on harnessing collective wisdom from its diverse community, including technology users, project partners, and employees. A number of these insights worked like magic, resulting in innovative adjustment to an existing product and improvement in the seed distribution process, to name a few, each exemplified in the following stories, showcasing their tangible impact.

Simple does the trick

"It will suffocate!" Elie N. Manjares, farmer and former municipal agriculturist of Tabaco City, Albay, bemoaned in his head as he keenly eyed the perforated screen lining the floor of the reversible airflow flatbed



Rice farmers from Pinamalayan, Oriental Mindoro can now look forward to a more efficient and hassle-free seed claiming experience as Binhi E-Padala brings the distribution center closer to their locality. Iba (Zambales), Maramag (Bukidnon), and Lala (Lanao del Norte) are the only three municipalities nationwide to fully employ the BeP mode of distribution, complementing the regular LGU-led pathway.

dryer (RAFBD) being demonstrated during his visit to PhilRice Bicol in 2017. As 8t of rice grain make contact with the surface of the vast rectangular and concrete bin, Manjares was convinced that the bantam-sized holes of the sheet metal flooring will suffocate or result in an uneven and slow distribution of heat. Bigger holes should do the trick.

He thought of a simpler alternative and mentally computed the costs. “Perforated screen is not only more expensive; it is also only available in Metro Manila. Why not use steel matting with chicken wire? These are cheaper and locally available,” he surmised. So, when he had his first PhilRice-designed RAFBD assembled, he had the contractor apply this option. It worked.

It was not long after when friends started trickling in for a visit to his customized RAFBD. One of its early adopters, Felix S. Serrano, a seed grower from Libon, Albay, noted the sheer cost difference in the making of the bed: P40,000 (perforated sheet) vs. P12,000 (steel matting with chicken wire and net). Overall drying time is also shorter, Serrano attested.

“Originally, clients wishing to avail of the RAFBD may choose between using perforated screen and wooden slot with net overlay for the bed. However, these materials were not easily accessible in Bicol. Manjares’ idea made sense in terms of costing and technical feasibility so we adopted it,” said Engr. Joel A. Ramos, supervising science research specialist from the Rice Engineering and Mechanization Division.

At present, RAFBDs featuring this innovation can be found in the Ilocos provinces, Palawan, Bohol, Davao Oriental, and Mindoro and are used to dry rice and corn, among others.

Albay is a typhoon-prone area which puts many farmers’ livelihood at greater risk. “There was a time we would lose as much as 200 bags of palay due to rain because we did not have dryers (here in Tabaco City). Now we don’t lose that much anymore,” Manjares recounted.

“As a researcher it is fulfilling to witness and hear from our clients that they are benefiting from the technologies we develop. During the course of technology development, we may overlook some aspects. The solutions may come from the stakeholders themselves. User is a vital element of technology improvement. This is how the evolution process should look like,” Ramos said.

Spell of success

At the start and end of each cropping season, officers and staff of the Rice Competitiveness Enhancement Fund (RCEF) Seed Program hold an open and exit conference to reflect on their nationwide seed distribution activities. Two questions guide their conversation: what did we do right and what went wrong?

In the case of Binhi e-Padala, a digitally aided seed distribution scheme launched during the dry season of 2021, recurring feedback from farmers sent through the PhilRice Text Center emerged: location woes. Individual farmers either found it challenging to

locate the seed growers cooperative (SGC) or it’s too far away. A client satisfaction survey in 2021 pegged this sentiment at 31%.

During the exit conference, they came up with a scheme where the SGC releases seeds to the farmers’ or irrigators’ associations (FAs/IAs) instead. This move was received well. From only 69% of the respondents claiming the distribution centers were nearby in 2021, this rose to 84% in 2022 and 93% in 2023.

“It’s a big deal that seeds have been brought closer to the farmers. In Binhi e-Padala’s new setup, distribution is almost at the barangay level because members are usually within the rice area clusters, and officials from the FAs/IAs often visit the members to remind them to pick up the seeds,” said Lorenzo A. Lopez Jr., project development officer from the RCEF Field Operations and Monitoring Division.

The key is to not only hear but truly listen. RCEF’s culture of continuing improvement and client-focused approach has spelled success for their efforts.

True magic

Every organization claims that the true magic lies in achieving customer happiness. These narratives vividly demonstrate the crucial role of feedback in driving PhilRice’s most impactful initiatives, achieved by skillfully engaging stakeholders and valuing their insights — a lesson that the Ea-nasirs of the modern world should heed. 🍌

FEATURE

Rice farming is clearly the backbone of our agricultural livelihoods, yet it is harassed by drought, submergence, and salinity, not to mention other hazards. Farmers often struggle to identify suitable varieties and effective management practices for these environments, leading to diminished yields or total crop failure. These adversities are exacerbated by the ill-effects of climate change, which introduce unpredictable weather patterns and further stress already vulnerable agricultural systems. To ensure the sustainability and productivity of rice farming, it is imperative to invest in R&D on resilient varieties, as well as to provide farmers with the necessary training and resources. By adopting innovative approaches and adaptive farming techniques, we can better equip our agricultural communities to hurdle

challenges and erect food security for future generations.

Serendipity

In Socorro, Oriental Mindoro, a remarkable story of agricultural resilience and innovation has emerged, transforming the way local farmers view rice cultivation after a certain variety turned out to be a game-changer for the community.

The story began when Victor R. Sanque from the Farm Fifty One Agricultural Learning Center requested rice seeds from Dr. Norvie L. Manigbas of PhilRice for a varietal demo, as part of their package of technologies for the Rice Competitiveness Enhancement Fund - Farmer Field School (RCEF-FFS). "By experimenting with various rice varieties, including NSIC Rc 624, 480, 512, 436,

344 and the initially overlooked NSIC Rc 440, we discovered that Rc 440 has impressive drought tolerance and suitability for our local climate, especially during the dry season," Sanque recounted.

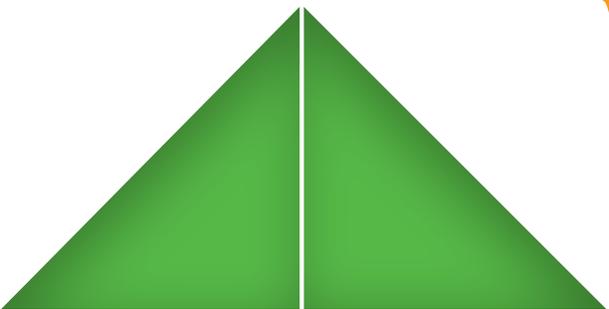
As the dry season set in, Rc 440 thrived where other varieties struggled. Its sturdy growth and resilience even with limited water surprised the farmers. "From the day we planted these varieties, we only irrigated once. Despite minimal irrigation and no chemical spraying, Rc 440 and 624 performed exceptionally well, standing out even in their reproductive stages," Sanque added.

Local farming impacted

The success of Rc 440 quickly spread throughout Socorro. Farmers from the farm school witnessed its unexpected

We RICE up: A vision of the future

ARDIAN M. DOLERA



performance during the dry season, producing substantial yields where other varieties faltered.

Mary Joy R. Mortel, 32, RCEF-FFS participant, expressed her view about Rc 440 saying, "This variety will change our approach to farming, allowing us to reduce our reliance on water-intensive crops and ensuring more consistent harvests. The economic benefits will be profound, giving us a more stable and reliable income."

The good reputation of Rc 440 in Socorro duly sparked a broader interest in its potentials. Local agricultural leaders and policymakers are now advocating for its widespread adoption across Oriental Mindoro. There is a growing recognition that this variety could be a key component in achieving food security and sustainable farming in the province.

With the serendipitous discovery of NSIC Rc 440, farmers are now exploring opportunities to market this resilient rice variety. Its consistent yield and quality have made it an attractive product for the market. By branding it as a drought-tolerant, locally-grown variety, farmers can potentially command better prices, improving their economic chances.

A lifeline of the rice farmers for saline

While Rc 440 is making waves in Oriental Mindoro, another transformative project starring saline-prone varieties is unfolding in Bicol. The "Scaling up of Integrated Crop Management (ICM) for Saline" project co-funded by DA-Regional Field Office 5 and PhilRice, was launched in June 2022 to contain the challenges of rice farming in saline environments.

Tiwi, Albay first welcomed the comprehensive package of technologies tailored for saline conditions. This included selecting salt-tolerant rice varieties, optimizing irrigation methods, and advanced soil management techniques. The success in Tiwi prompted expansion to Camarines Sur, where promising outcomes continue to be unlocked.



FFS trainer Victor R. Sanque and scholar Mary Joy R. Mortel envision a future where rice farming withstands the challenges of climate change by adapting new farm practices such as use of drought-tolerant varieties.

Before the project's intervention, farmers were grossly unaware of the best rice varieties and effective management practices for saline environments, resulting in chronically low yields. The project has dramatically altered this equation, with farmers now reporting substantially better yields due to the adoption of introduced technologies.

PhilRice Bicol's Marie Antoinette R. Orbase, project manager proudly said, "This transformation underscores the power of targeted agricultural practices in overcoming salinity stress."

Regional expansion and future prospects

Following triumphs in Tiwi and Camarines Sur, the project is set to commence in Sorsogon this June. Interest is burgeoning across Region 5, with various municipalities keen to adopt these practices.

"Even other provinces within and outside our region such as Masbate and Lavezares, Northern Samar, including the PhilRice stations in Isabela and Midsayap look forward to revolutionizing rice farming in saline environments. It's inspiring to see such widespread

enthusiasm for improving our agricultural methods," Orbase attested.

Orbase envisions scaling this initiative nationwide, aiming to support farmers across the Philippines facing salinity challenges. The broader implementation seeks to transform the agricultural landscape, ensuring food security and shaping up farmers' livelihoods. The ICM saline project stands as a testament to targeted agricultural interventions, promising a new era of resilience and prosperity for rice farmers.

Happy ending

The successful varietal demo on NSIC Rc 440 and the impactful scaling up of ICM for saline project have transformed agricultural practices, giving credence to the power of innovative solutions. These achievements amplify not only the effectiveness of advanced rice varieties and management techniques but also the unwavering dedication and resilience of the farming communities. Their commitment to adopting and making use of these innovations has paved the way for more sustainable and prosperous agricultural futures, ensuring food security and economic stability for generations to come. 🌾

What network do we need to tap to improve the effectiveness and efficiency of the rice-farming industry, particularly in the postharvest aspect?

COMPILED BY: MINARD F. PAGADUAN

Diosa Rhea L. Ercillo
Community Development/NGO
General Mamerto Natividad, Nueva Ecija

We should collaborate with non-government organization (NGOs) and Local Government Units (LGUs) that offer programs to support rice-farming communities. NGOs provide entrepreneurial training for farmers and help establish partnerships with networks specializing in storage, logistics, and processing. These collaborations enhance postharvest management, stabilizing productivity and profitability in the rice-farming sector.

Hannah R. Domingo
Cooperative Development/Agriculture/Government
San Jose City, Nueva Ecija

Organizing farmers into associations or cooperatives is essential. This approach links farmers with institutions like PhilRice and PHilMech, enhancing their production from seed to postharvest. It ensures high-quality grains, minimizes losses and boosts cost efficiency and profitability. Continuous improvement in modern farming methods, mechanization and postharvest handling processes is crucial.

Marlon C. Enriquez
Trading & Trucking Service/Private
Zaragoza, Nueva Ecija

The current system in the postharvest aspect is quite effective. Perhaps only a few improvements are needed, such as the establishment of an independent and unbiased unit in each municipality actively controlling the prices of rice and grains. This unit would also provide a free classification of rice (moisture content, percent of recovery, possible price range) before it is sold by the owner to private traders to ensure fair pricing of harvests.

Rebilyn R. Quiroz
Agriculture/Government
Science City of Muñoz, Nueva Ecija

Networks for farmers have already been established and the DA has various programs and projects to support our rice farmers from production to postharvest led by PhilRice, Bureau of Plant Industry - National Seed Quality Control Services (BPI-NSQCS), and Philippine Center for Postharvest Development and Mechanization (PHilMech). However, small rice farmers often lack access to essential postharvest facilities such as drying, storage, and milling. This limits their ability to market their produce at higher prices and maintain good-quality rice (seeds/grains). Small farmers should have equitable opportunities compared to clustered or farmer groups.

Daryl Lou A. Battad
Agriculture/NGO
Quezon City

We need to address challenges like losses, poor infrastructure, technical inefficiencies, and limited access to agri-technology. Leveraging the private sector is crucial due to their available machinery, advanced logistics, and investment in digital tools for enhancing rice field operations. With production losses averaging 30%, a concerted effort between the public and private sectors is essential for large-scale improvements in postproduction processes. Private capital can drive investments, ensuring a more resilient and sustainable rice industry.



Arch. Renato B. Bajit, 65

VILLASIS, PANGASINAN

Chief Admin Officer / Resident Architect
Head, Physical Plant Division
Length of service: 37 years

For 37 years, “Kuya Rene” has been the architectural mastermind who designed PhilRice infrastructure and facilities in all stations.

Bajit’s journey began in Los Baños, where he played a pivotal role in pioneering the establishment of PhilRice facilities. Facing tough challenges with resilience early on, he envisioned a multi-functional design that set the stage for innovation and efficiency.

His contributions span beyond blueprints and designs; he orchestrated the expansion and development projects across PhilRice stations, including other DA agencies from livestock to fisheries. He also turned old buildings into new ones, with his passion and expertise. Each story embodies purpose and functions, characterized by timeless design and meticulous planning, with every detail carefully considered through thorough consultation.

He also chairs the Board of Medical Ambassadors Philippines, Inc., championing socio-medical-spiritual services to improve the lives of hard-to-reach poor communities. Bajit was an advocate of cultural treasure preservation of the rice terraces in Batad, Banaue, and Mayoyao, Ifugao in partnership with DA and the National Commission for Culture and the Arts.

Bajit’s celebrated legacy is defined by dedication, passion, and honesty. His work inspires future generations to create structures with purpose. His leadership created offices and laboratories that became conducive and productive workplaces.

“Our life has its own beautiful story when we see it from the right perspective” Kuya Rene intimates as he reflects on his commitment to excellence, which leaves an impact on PhilRice and inspires those who will carry on his professionalism.



Dr. Ricardo F. Orge

Career Scientist III

This “Farmer’s Scientist” grew up in Merida, Leyte witnessing his farmer-father’s struggles. Orge’s dedication to science, fueled by his Christian faith and commitment to public service, led to numerous groundbreaking innovations with his supportive wife, Hazel Jane, Admin Division Head at PhilRice.

His notable contributions to rice farming include the smokeless rice hull carbonizers and typhoon-resistant multi-purpose farm structures, each addressing the critical needs of rice-based farming communities, making obvious his mission to uplift farmers’ livelihood through technology advancements.

Despite numerous awards and accolades, Orge remains humble, viewing these honours as reflections of his commitment rather than personal achievements. As he puts it, “I’m not working for an award, but if you do good in your work, awards will come for you.”



Dr. Jaime A. Manalo

Career Scientist II

Driven by Mindanao realities and the potential of communication interventions to address poverty, he began his career as a staff member of the Office of the Executive Director.

He worked as a communication specialist, creating important publications and radio broadcasts for previously impoverished farmers who now had abundant products.



Dr. Norvie L. Manigbas

Career Scientist III

NSIC Rc 600 is the first high-temperature-tolerant rice variety in the Philippines. The Rc 298, the first variety for direct wet-seeding, is planted widely in irrigated lowland areas in the country. He helped develop both rice varieties.

As a result of a collaborative project, an elite rice line from PhilRice was released as a variety, INPARI Digdaya, in Indonesia. He is co-breeder of NSIC Rc 624, Rc 730SR, Rc 738, and Rc 740.

He has accumulated recognitions: Dangal ng PhilRice award for individual excellent performance in 2021; Outstanding Professional in Agriculture Award from the Philippine Professional Regulation Commission (2021); Gawad Saka Award in Region 3 (2018); and the prestigious Presidential Lingkod-Bayan Award (2018).

His string of academic degrees: Postdoctoral Fellowship at NICS, RDA in South Korea; PhD in Crop Physiology, minor in Plant Breeding at UPLB; MS credit units in Plant Breeding at Wageningen Agricultural University; Master and BS in Agriculture from University of the Philippines Los Baños.

Manigbas’ innovative breeding techniques science providing practical solutions that address food security. He inspires and mentors young researchers to pursue agricultural research toward sustainable agriculture, ensuring food for the future.

From junior researcher, he now heads the Socio-Economics Division steering pioneering projects in climate change adaptation, technology adoption in agriculture, and ICT for development, youth, and agriculture.

Manalo advocates for recognizing communication as a vital scientific field and aims to increase the number of Development Communication (DevCom) professionals pursuing careers as scientists.

He holds a BS in DevCom as cum laude from UP Los Baños and a Master’s and Doctorate in Communication for Social Change from the University of Queensland, Australia.

At 38, this career scientist from Canaman, Camarines Sur continues to innovate in rice R4D. He shares his professional journey with his wife, Hanah Hazel Mavi, also working at PhilRice, and their children Maria Mayumi and Lukas Mateo, further enriching their personal and professional lives.



“Laser leveling is very important to rice farming. It requires less water during land soaking and land preparation until before transplanting or crop establishment. It corrects the levelness of the field that is usually a difficult task for ordinary farmers.”

DR. ELMER G. BAUTISTA, PHILRICE SCIENTIST (2024)



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