PhilRice Magazine

A quarterly publication of the
Philippine Rice Research Institute

QUALITY SEED MATTERS

19.3 million MT *palay* harvested in 2017; highest in PH history

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COVER PHOTO: RENE B. BAJIT

ABOUT THE COVER

The key to rice security is ensuring that seeds are of high quality. In 2017, the Philippines achieved its highest rice production thus far. The use of quality seeds is one of the factors that made this possible. This issue features strategies that PhilRice and its partners are pursuing to make quality seeds available, accessible, and affordable to all Filipino rice farmers at all times to help them produce even more.

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2009 Binhi Agri Magazine of the year
2007 Binhi Hall of Fame Awardee
2001 Gawad Florendo Awardee

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EDITOR'S NOTE

QUALITY SEED MATTERS

It has been said in various ways that from a small seed a mighty trunk could grow. In rice, it is not simply seed but quality seed (QS) that ensures plentiful harvest. Actual farming confirms research findings that the use of QS can boost yield by 5-10%. QS refers to seed grown following proper seed production protocols with high percentage of germination rate (85% and above). It is pure and is likely to produce higher yield. The crop's uniform growth and maturity spells rice beauty, adorned with its seemingly choreographed evenness (as shown on the back cover).

But only about 45% of our farmers use quality seeds. Conveniently, they recycle their own-harvest seeds that they claim to be more economical and practical. Some say even if they have access to certified seed, they could not afford it. They spend their limited money on other priorities. While the use of their own seed is not bad, quality cannot be guaranteed. Use of low-quality seeds results in more off-types and higher pest incidence. As a consequence, farmers lose their opportunity to snare a much better yield that could earn them a stouter net income.

The government sees this as a pathetic issue. It cannot allow our limited rice area to continue producing so little for our growing population of rice eaters. Efforts have been recalibrated to put greater premium on promoting the use of quality seeds. Seed exchange programs have been mulled as a pragmatic approach to ensuring the widespread use of QS in at least 55 major rice-growing provinces. Here, farmers will be thoroughly enabled to produce their own QS. Their so-called "rice IQ" will be capitalized on to challenge them to purify their own harvest, which they can use as planting material, as well. That way, they no longer have to buy seeds hence saving on cost, not to mention maximizing the yields of the modern varieties they would use. Not only that, this strategy also ensures them seed security for one to two more cropping seasons. Moreover, as featured in the PhilRice Magazine 2017 issue (2nd Quarter), public hybrid rice such as Mestizo 1 and Mestiso 20 will also be promoted.

This issue of our magazine supports this initiative. It highlights that investments in rice farming must all start with ensuring that the seed of a variety adapted and recommended for planting in a specific area must be of high quality. PhilRice believes that quality seed is tantamount to quality rice and, eventually, quality life for farmers and consumers. •

CARLO G. DACUMOS

PH HITS HIGHEST RICE PRODUCTION RECORD

The Philippines has achieved its highest rice production thus far with a total of 19.3 million tons (Mt) of *palay* harvested in 2017. This is equivalent to 12.5 Mt of milled rice, (enough to assure the public that there is sufficient rice in the country).

Dr. Flordeliza H. Bordey, an economist and acting deputy executive director for research, said the country had a carry-over rice stock of 2.7 Mt at the start of 2017, and approximately a million tons of imported rice.

"This means we had a total supply of 16.2 Mt of rice in 2017. We only need 13.1 Mt rice, including our food, seeds, raw materials for processing of value-added products, animal food, and even wastage. This is based on the assumption that about 105 million Filipinos individually consume approximately 110 kg of rice every year," Bordey explained.

At the start of 2018, PhilRice estimates roughly 3 Mt of carry-over rice stocks, which is sufficient for 87 days. Local farmers will harvest 23% of the total annual production during the first quarter of 2018, ensuring enough rice for every Filipino this quarter and even leftover stocks for the next 3 months.

Despite the availability of local supply, Bordey does not rule out the potential need for rice importation.

"We have to understand that rice production in the country is seasonal, which peaks in October- December, but our consumption is constant. Our stocks dwindle within the lean months from July to September. Without a comfortable level of stocks, the prices of rice tend to spike. This is where importation can help us manage the supply and demand for rice, and avoid sudden, unexpected increases in its price. Data tells us the country produces 23% of its total rice output in January- March, 21% in April-June, 16% in July- September, and 40% in October- December," Bordey said.

Bordey also cited the changes in government policies regarding international rice trade. Under our commitments to the World Trade Organization and ASEAN Free Trade Agreement, the government does not anymore limit the quantity of rice imports but will impose taxes on them instead.

"Cheap imported rice can now be brought in. Unfortunately, even with 35% taxes, Philippine rice is still more expensive than imported grains from Thailand and Vietnam."

Imported rice from Vietnam is only around P27/kg as against our local rice retailed at around P40/kg. "The only way our local rice can compete is to lower its cost by enhancing the competitiveness of our farmers," Bordey explained.

"Our farmers need to increase their yield per hectare and decrease their production cost. Planting hybrid and certified inbred seeds with appropriate crop management practices can help achieve high yield. Mechanizing farm processes and using other labor-saving technologies can lower our production cost," Bordey maintains. **-DONNA CRIS P. CORPUZ**

TWO RESEARCHERS NOW SCIENTISTS

DINDO KING M. DONAYRE

JAYVEE A. CRUZ

Two senior researchers were recently conferred a scientist rank by the Scientific Career Council.

Mr. Dindo King M. Donayre, a Senior SRS at the Crop Protection Division, has published 12 scientific papers on weed science, plant pathology, and pest management. He also authored the booklet *Weeds in Irrigated and Rainfed Lowland Ricefields in the Philippines* under the auspices of the Korea Program on International Agriculture (KOPIA). He obtained his BS in Agriculture major in Plant Protection from the Visayas State University in 1996, and MS in Plant Pathology minor in Weed Science from UPLB in 2011.

Ms. Jayvee A. Cruz, a Senior SRS at the Agronomy, Soils, and Plant Physiology Division, specializes on soil microbiology. She has advanced research studies on plant growth-promoting bacteria (PGPB) to boost rice yield and reduce cost in drought stress-prone environments. She has published 15 scientific papers and submitted a patent application. Cruz earned her BS Agriculture major in Soil Science in 2009, and MS Soil Science minor in Molecular Biology and Biotechnology in 2013, both from UPLB.

-ALLAN C. BIWANG, JR.

NEW PHILRICE DEPUTIES, BRANCH DIRECTORS

Acting Executive Director (ED) Dr. Sailila E. Abdula has designated three acting deputy EDs and three acting branch directors, effective January 2018.

Former PhilRice Agusan Director Abner T. Montecalvo is now acting DED for Administrative Services and Finance. An Outstanding Official awardee in 2002, 2013, and 2016, he has been in various managerial positions for 22 years at PhilRice. He earned his master's degree in Applied Business Economics at the University of Asia and the Pacific. Chief Science Research Specialists Karen Eloisa T. Barroga and Flordeliza H. Bordey are acting DEDs for Development and Research, respectively.

Barroga has been working at PhilRice's development sector for more than 30 years in different leadership capacities. She obtained her PhD degree from the University of Western Australia and recently completed a Master's degree in Development Management from the Development Academy of the Philippines (DAP).

FLORDELIZA H. BORDEY

ABNER T. MONTECALVO

KAREN ELOISA T. BARROGA

Bordey, an economist, has been with PhilRice for 18 years. She was formerly acting DED for Development. She holds a PhD in Agricultural Economics from the University of Illinois.

Rhemilyn Z. Relado, Dr. Mary Ann U. Baradi, and Dr. Caesar Joventino M. Tado are acting directors of PhilRice Los Baños, Batac, and Agusan, in that order.

Relado, a Senior SRS, is former head of Socioeconomics Division. She earned two master's degrees – one in Agricultural Extension Education at the Pennsylvania State University, and the other in Development Management at DAP.

Baradi has been with PhilRice for 22 years. She obtained her PhD in Agricultural Engineering from UPLB.

Tado has served in various capacities in the 20 years he has been with PhilRice. He obtained his PhD in Agricultural Sciences (Engineering) at the University of Hohenheim in Germany. **-ALLAN C. BIWANG, JR.**

SMART RICE APP NOW AVAILABLE

PhilRice has developed a farm management tool called AgRiDOC App that can be used in Android smartphones and tablets. Intended for progressive Filipino rice farmers, researchers, and extension workers, the App aims to improve efficiency of farm management and rice crop production activities.

AgRiDOC App aims to convince Filipino youngsters and millennials that rice farming can be exciting, modern, and attractive.
It is free and now available for download in Google Play Store (bit.ly/AgriDOCApp).

Aside from farm management assistance, AgRiDOC App also provides information and knowledge links to help users make informed decisions on the care of their rice crops. Through its Rice Crop Insights, the app informs the user about the priority needs and concerns of rice plants for every growth stage. It contains basic recommendations on rice crop management practices from the PalayCheck System, and comprehensive information about released rice varieties. It provides links to rice knowledge banks and other useful websites. Moreover, it does not need internet connection to function.

The development of this app began in 2015 under PhilRice's FutureRice Program led by Roger F. Barroga. Under his watch, the project was implemented by Nehemiah Caballong, the Program's ICT Specialist, and Paul Austian Alday, its programmer. The app's interface and graphics were illustrated by Jude Klarence Pangilinan of the Community Relations Office.

The AgRiDOC App was funded by the Project IPAD of the National Rice Program through DA-BAR and by the FutureRice Program. -PAMELA V. CARBUNGCO

NATIONAL SCIENTIST JULIANO PASSES AWAY

PhilRice condoles with the bereaved family of its senior consultant and national scientist Dr. Bienvenido O. Juliano (BOJ), 81, who joined his Creator on February 21.

For more than 5 decades, BOJ served as grain quality expert particularly in the development of rice and rice-based products.

Dr. Juliano is considered the champion of the rice consumers as he was able to prescribe the formula of how to get the desired quality of rice products. At PhilRice, rice breeding outputs only get the final stamp of approval once the standards of eating quality set by BOJ have been met.

The engagement of BOJ with PhilRice for a good number of years has kept the Institute on the right track in its rice breeding, chemistry, and food science efforts. His mentorship of a number of our researchers has molded a young breed of BOJs.

Dr. Juliano also contributed greatly to the chemistry and technology of rice and rice food products. He is considered as a "world authority on rice grain quality", according to our National Academy of Science and Technology and an expert on organic chemistry.

"Dr. Juliano is a very amiable person. He is a towering light, well-mannered, just the way he stands and looks at you, you are impressed. PhilRice and the science community lost a giant among us but his legacy of scholarship and service to mankind will remain in the hearts and minds of his colleagues and friends," Dr. Santiago R. Obien, former PhilRice Executive Director shares.

BOJ's remains now rest at the Libingan ng mga Bayani. - JOY BARTOLOME A. DULDULAO

MORE VARIETIES FOR ADVERSE ENVIRONMENTS BEING BRED

Farmers situated in water-limited and salty planting conditions can keep their heads up high. PhilRice continues to develop more stress-resistant rice varieties to ease their difficulties.

PhilRice breeder Christopher Cabusora explained in a March 8 in-house seminar titled "*Variety Development Adapted to Adverse Rice Environments through Induced Mutation*" that ordinary rice varieties are highly vulnerable to abiotic stresses, such as drought, submergence, and salinity that can diminish yield by 17-50%.

Cabusora said the project "Rainfed-Stress Breeding" alone has produced five drought-resistant rice varieties. They fall under the Sahod Ulan series that average 3.3 t /ha. The five saline-resistant rices branded as Salinas average 2.8 t/ha.

"These varieties unlike the common rices can thrive under adverse environments, producing decent yields for farmers," Cabusora explains.

The process through which the varieties are developed called induced mutation was also highlighted during the seminar. As explained by Dr. Nenita Desamero, leader of the breeding project, induced mutation is a method of breeding that produces mutant (variant) lines, which can adapt to adverse environments, such as rainfed drought-prone, submerged, and saline areas.

Cabusora reported that the PhilRice breeding team has 258 promising mutants with multiple abiotic stress tolerance and 22 elite mutant lines ready for nomination to the National Cooperative Tests, 11 mutant lines being evaluated, 3 lines with distinct traits for Plant Varietal Protection application, and 12 rice tungro-resistant lines for validation. - **RIEMON D. BALAN-EG, ALEXIS T. MITAS, YVANNAH IOZABELLE V. SALUPEN**

SCHOOL-ON-THE-AIR LAUNCHED IN CAGAYAN

PhilRice Isabela has joined forces with the DA-Regional Field Office 2 (DA-RFO 2) and other organizations in the implementation of a *School-On-the-Air (SOA) Program on Climate-Smart Agriculture* launched in February 2018. "The SOA radio program, which will be broadcast throughout Cagayan, Isabela, Nueva Vizcaya, and Quirino, aims to involve 10,000 farmer-enrollees for the first season, later engaging up to 300,000 rice-based farmers," RFO 2 Director Lorenzo Caranguian explains.

Dubbed as "*Kaalamang Pagsasaka sa Himpapawid*", the SOA is a collaborative effort of DA-RFO 2, PhilRice, Philippine Federation of Rural Broadcasters, Philippine Agricultural Journalists, Cagayan Valley Agriculture and Resources R&D Consortium, Consultative Group on International Agricultural Research -Climate Change, Agriculture and Food Security (CCAFS), and other regional agencies, according to Dr. Rex Navarro, PhilRice and IRRI CCAFS-SEA consultant.

Cagayan Valley has also recently invested in the promotion of high-quality seed utilization through the use of hybrid and certified seeds. One component of the promotion is the *Rice Model Farm Cluster* project.

The SOA radio program will start its four-month airing in March 2018 every Mondays, Wednesdays, and Fridays, 5:30 to 6:00 AM.

Cagayan-based DWDA 105.3mhz FM, the official broadcasting station of DA-RFO 2, will produce canned radio broadcast materials for distribution to community and university radio stations in Region 2. **-MARITHA C. MANUBAY**

PhilRice Isabela and its partners launch the SOA program on climate-smart agriculture in Cagayan Valley.


PHILRICE PHOTO DATABASE

GO FOR COST-SAVING TECHNOLOGIES

To cushion the impact of costly fuel, Rice Engineering and Mechanization Division (REMD) Head Dr. Arnold S. Juliano offers the use of renewable energies in rice production. "Instead of using diesel or gasoline, farmers can now opt for biomass or rice hull, which can be converted into gas using the Water-Pump Gasifier (WPG)," Juliano says.

WPG is compact, light-weight, mobile, affordable for small farmers, and is now in the final stage of pilot-testing. A farmer in Occidental Mindoro, according to him, used this technology for one cropping season and his irrigation cost shrank from P15,000 to P2,000.

Juliano elaborates WPG can continuously operate for two hours burning only about half-sack or 17 kg of rice hull. "Fuel is only necessary for the start-up of the machine during its first 10 minutes of operation. This can give farmers 30-40% savings in their irrigation costs," he adds.

The gasifier is also environment-friendly, as it reduces the use of fossil fuels. "The rice hull it burns, when carbonized, can be used for seedbed and other applications, promoting zero-waste among farmers," the engineer explains

Juliano also emphasizes the advantages of using the mechanical transplanter over the manual method. It ensures equal distance between hills that increases the chance of having more productive tillers.

"Using the mechanical transplanter, farmers can harvest up to 10 t /ha during the dry season, and up to 7 tons from their main crop.

Additionally, Juliano reminds farmers of the Alternate Wetting and Drying technology that allows them to use less irrigation water. Another way to save on water is starting land preparation two weeks after harvest that makes soil easier to manage.

"With all these technologies and our joint efforts with farmers, we can overcome more challenges in rice production. It's high time for farmers to adopt practices that can offer them better yield and income," Juliano concludes.

- DONNA CRIS P. CORPUZ

PHILRICE PHOTO DATABASE

PHILRICE CLINCHES 3 COMM AWARDS

PhilRice was cited anew for its initiatives in communicating agricultural development during the March 22 Binhi Awards held in Makati City.

Jayson C. Berto of our DevCom Division and an international award-winning video/photographer received his second win in a row as the competition's Agri Photo Journalist of the Year 2017. The five-man board of judges, led by science communication stalwart, Dr. Crispin Maslog, was impressed with Berto's perspectives on youth and women in agriculture and rice science technologies.

The National Rice Awareness Month, which, among other things, encouraged the public to eat the right proportion of rice and its healthy forms such as brown rice and rice mixes, won as the Agri Information and Media Campaign of the Year. The campaign resulted in the passage of about 70 local government unit ordinances and resolutions on the inclusion of half-cup servings and brown rice in food establishments all across the Philippines.

PhilRice Magasin, the sister material of this magazine written in Filipino, was declared Agricultural Magazine of the Year for the second straight year. It first won in 2015 as Agri-Newsletter of the Year. The winning issues featured farmers' success stories in availing of government programs, use of cost-reducing and yield-enhancing technologies, hybrid rice adoption, and the business side of producing rice.

Agriculture Secretary Emmanuel Piñol, the event's keynote speaker, urged the agri-journalists to strengthen their group as the country bids for available and affordable food and self-sufficiency.

"We have to intensify our efforts in promoting the government's programs to the farmers so that they can be equipped with enough information for them to achieve progress and for the agriculture sector to be competitive. The DA will assist you in your communication endeavors.... Let's work in unison," he emphasized.

Piñol also led the bestowing of a posthumous award to "Ka Louie" Tabing, founding chair of the Philippine Federation of Rural Broadcasters, anchor of the popular early-morning *Sa Kabukiran* radio program on ABS-CBN-DZMM, and one of PhilRice's media partners.

Binhi Awards is an annual competition organized by the Philippine Agricultural Journalists Inc. in cooperation with San Miguel Corporation that recognizes communication efforts in the agriculture, environment, and agrarian reform sector.

The winners, who bested more than 150 entries, received cash prizes, ranging from P15,000 to P50,000, and Binhi trophies.

- ANNA MARIE F. BAUTISTA

WHAT'S NEW IN RICE RESEARCH?

ELSIE E. REYES

PHILRICE PROJECTS UNEARTH 'MINES'

Now, farmers have more choices when it comes to traditional rice varieties.

Thanks to these two PhilRice researchers and their team who were highly involved in unearthing 'mines'—the traditional rice varieties (TRV).

For Dr. Marissa V. Romero, a senior food scientist, the revival of the country's TRVs can be likened to the venture of mining treasures. Romero said that while they are traditional, they are not forgotten – in fact, they still have many uses these days. Particularly, many of these varieties are excellent for rice-based food products. More importantly, many TRVs command higher prices in the local and international markets. Mr. Ruben B. Miranda, a senior development researcher, said that the country's black rice is export-quality.

The teams headed by Romero and Miranda worked on the recently completed *Profiling and Seed Purification and Multiplication of Selected Traditional Rice Varieties in Support of DA's Initiative for Exporting Quality Rice (TRV Profiling and Multiplication) Project, and the Heirloom Rice Project* that started in 2013 and 2014, respectively.

Through the two projects, about 30 TRVs such as Dumalengan, Red Blondie, and Dinorado were collected, profiled, purified, multiplied, and conserved. With the collaborative efforts from partner agencies, TRVs were made more available and accessible in different regions in the Philippines.

Traditional variety

JOSE MARI NOMBRERE

As a result of these undertakings, the two most preferred TRVs per region were identified and multiplied (see page 9). Seed producers were also trained, and community seed banks were established in different regions.

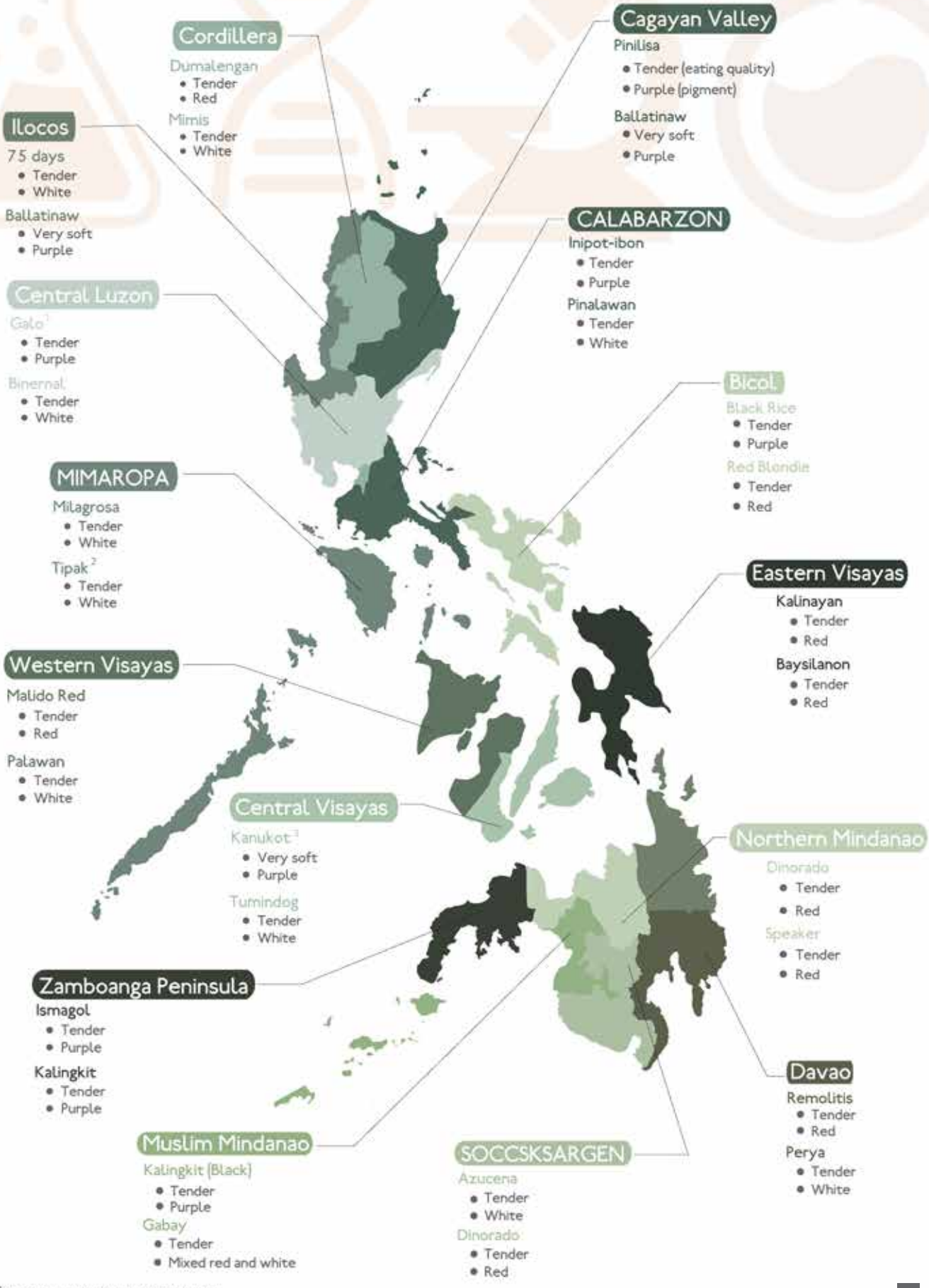
The availability and accessibility of these varieties, according to Romero, have given farmers more choices. Farmers can now seek for TRVs from seed producers in many regions of the country. They can also visit and withdraw seeds for increase from PhilRice's gene bank that conserves these varieties.

Equally advantageous, researchers can now access seeds from the gene bank as parentals for breeding efforts and explore the enormous amounts of information generated from the comprehensive profiling of these TRVs.

Phase I of the *Heirloom Rice Project* had ended in 2017. Meanwhile, the *Specialty Rice Project*, an offshoot of the *TRV Profiling and Multiplication Project*, aims to look into the production and marketing of aromatic, pigmented, and glutinous rice.

Aside from their offshoots and continuations, more important manifestations tell us that the conclusion of the projects didn't really mean an end. With the availability and accessibility of TRVs, new opportunities in rice farming were opened. This is one interesting area to venture in for those who are already into farming or even those who aspire to try it. •

Eating quality and pigment of PH traditional rices



[1]Some Galo varieties are glutinous and have very soft texture.
[2]Some Tipak varieties have mixed pigments (red and white).
[3]Some Kanukot varieties are tender and have mixed pigments (red and white).

NEW KNOWLEDGE PRODUCTS*

COMPILED BY HANAH HAZEL MAVI B. MANALO

MAGAZINES

Rice Security amplifies good lessons learned from previous national rice programs and the directions being taken by the current administration to help build a rice-secure Philippines.

Revisiting Public Hybrid Rice reintroduces hybrid rice to the public, especially the farmers, to provide them options on how to become more competitive.

Mechanizing Rice features stories that explain how rice mechanization helps local farmers produce quality products at a lower price than their ASEAN counterparts.

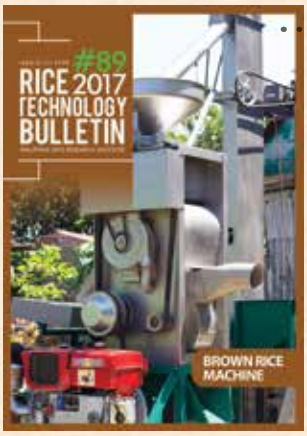
Unlocking the Door to Rice Security presents the seven new R4D programs of PhilRice, namely: Climate Resiliency for Enhanced Trade and Efficiency for Rice, Rice Seed Systems, Rice Business Innovations System Community, Public Hybrid Rice Commercialization, Hybrid Rice Research, Science-Based Policies in Advancing Rice Communities, and Rice Farm Mechanization and Modernization.

Serbisyong Maaasahan lines up the different agriculture-related services that farmers can avail of to help them achieve higher yield and income.

Tipid sa Gastos, Ani ay Busog shares farmers' *tipid* tips on rice crop management practices.

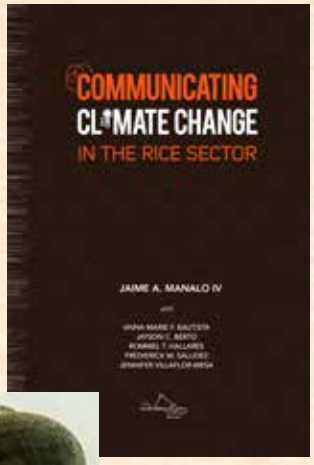
Ngiting Hybrid Rice tells success stories of farmers who have adopted hybrid rice for years.

Ano'ng Rice Combo Mo revolves around stories of farmers who are successful in rice farming but still venture in other rice-related businesses for additional income.



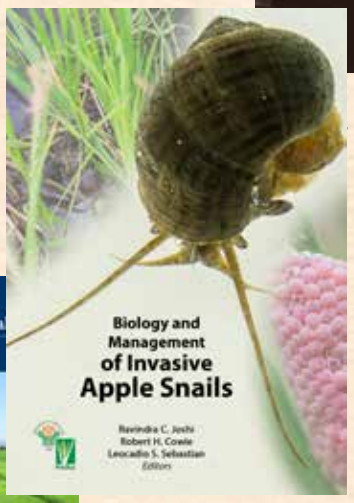
TECHNOLOGY BULLETIN

Brown Rice Machine weighs the advantages of developing the machine, its outstanding features, principles of operation, and economic analysis.



BOOKS

Communicating Climate Change in the Rice Sector offers ways on how to better communicate the weather phenomenon in agriculture based on literature and experiences in carrying out a climate change-related project.



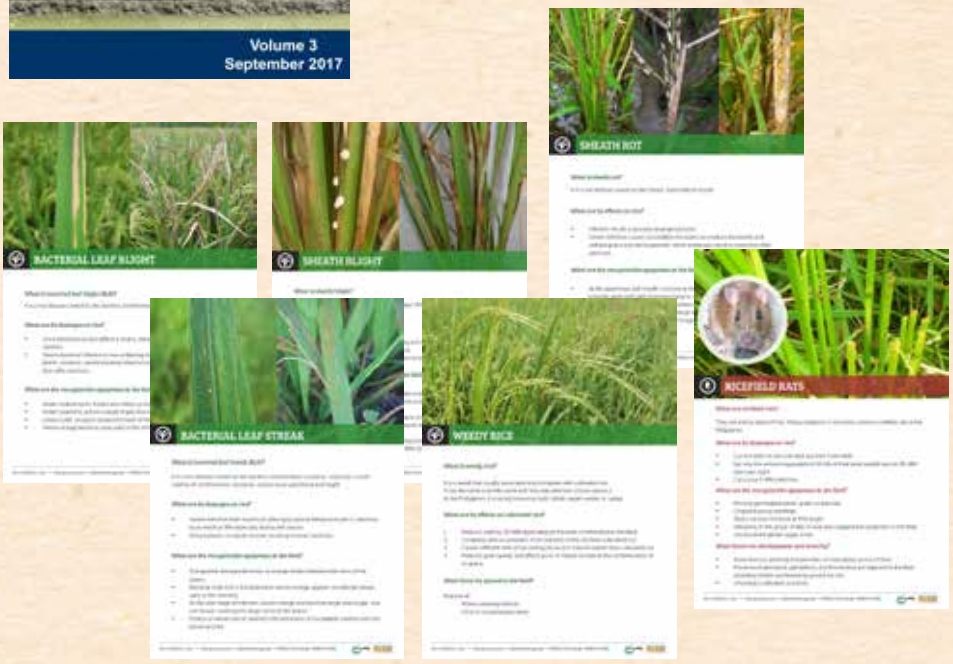
Biology and Management of Invasive Apple Snails contains new knowledge on apple snails reinterpreting old problems on these species, reflecting from various lessons of a country or region, and highlighting the need to prevent the further spread of these species.

PLANNER

Towards a Healthier Me compiles easy-to-prepare, nutritious, and mouth-watering brown rice-dominated recipes.

JOURNAL

Rice-Based Biosystems Journal, Volume 3 publishes studies on azolla, new high temperature-tolerant rice genotypes, limewater-cooked rice, grasses, and nitrogen management.



HANDOUTS IN ENGLISH

They offer short tips on rice production to extension workers:

- Bacterial Leaf Blight
- Bacterial Leaf Streak
- Sheath Blight
- Ricefield Rat
- Sheath Rot
- Weedy Rice

* These knowlege products are available at www.pinoyrice.com, www.philrice.gov.ph, and PhilRice Development Communication Division.

RICE ACROSS

ALLAN C. BIWANG, JR.

BATAC BOOSTS CLIMATE RESILIENCY

Technologies that help farmers and other rice stakeholders adapt to climate change such as the treadle pump, a water-lifting device using renewable energy, and the low-cost drip irrigation system for dragon fruit cactus production, were specially showcased.

The station aimed to help farmers become more productive even with the challenges of climate change through experiential learning. About 850 participants had the opportunity to operate and use equipment and tools for planting and harvesting rice.

LOS BANOS PUSHES FOR HYBRID RICE

Some 200 participants from neighboring municipalities and provinces toured the station's hybrid seed production area and were encouraged to engage in hybrid rice farming. A technology forum followed focusing on the advantages of using public hybrid seeds.

Consultant Dr. Tomas Masajo emphasized that public hybrid rice could provide labor opportunities in seed production and distribution, and could bring down the country's dependence on importation.

CITY STUDENTS TAUGHT RICE FARMING

Over 100 students from Metro Manila experienced actual rice harvesting at the Rice Garden in Luneta. The Rice Garden was established to provide an

NEGROS PREACHES MECHANIZATION

In support of the DA's mechanization program, farm machines were introduced to about 500 farmers, students, and local project implementers during the Lakbay Palay. The station spotlighted the mechanical transplanter, four-wheel tractor, turtle, microtiller, combine harvester, and reaper to whet the appetite of potential farm owners and machine buyers in the region. The benefits of using the said machines were enumerated and promoted.

THE COUNTRY

accessible place for urban dwellers to learn more about rice farming and heighten awareness on the importance of rice and rice farmers. A rice relay system was established to showcase various traditional and modern rice varieties in their different growth stages.

RICE BLACK BUGS CONTROLLED IN AGUSAN

Farmers of Esperanza, Agusan del Sur are now worry-free of Rice Black Bug (RBB) infestation. This is after the local government unit of Esperanza on March 9 formally turned over 50 units of light trap to all rice-producing barangays in the municipality in support on the community-wide light trapping project. The signing of the memorandum of understanding was also held to ensure effective implementation of the project. Mayor Leonida P. Manpatilan thanked PhilRice and other partner-agencies for extending their technical expertise to their farmers. Dr. Caesar Joventino M. Tado, Acting Branch Director of PhilRice Agusan enjoined all farmers of Esperanza to take good care of the light traps and to serve as good example to other rice-producing municipalities.

SUCs IN REGION 2 TO SERVE BROWN RICE

In a region-wide campaign led by PhilRice Isabela, state universities and colleges were urged to serve brown rice in their cafeterias. During the media-launching, an agreement was signed among PhilRice and the Isabela/Cagayan/Quirino State Universities. The campaign was in celebration of the National Rice Awareness Month in November promoting brown rice, rice-mixed recipes, and healthier meals. According to Maritha Manubay, campaign focal person, the initiative also aimed to clarify the misconceptions of consumers about brown rice.

BICOL LAUNCHES RiceBIS PROGRAM

During its field day, the station and Dr. Aurora Corales, Rice Business Innovations System (RiceBIS) program leader, gathered more than 300 cooperative members and extension workers to whom they promoted the concept of agripreneurship. She focused on the components of the program that could easily complement projects of local government offices and agencies.

Through the station's learning farm and the *Palayamanan* site, farming technologies were especially promoted. A rice taste test was also conducted to introduce brown, black, and red rices.

Launched in December 2017, the *PalayTambayan*, a mini-library, houses publications on technological breakthroughs in rice farming. This will provide farmers and other rice stakeholders access to the latest documented rice production techniques. The micro-library was put up at Busay, Ligao City, one of the RiceBIS program sites. It is hoped that the publications will help enlighten farmers to adopt the best practices.

To help achieve the national average yield target of 6 t/ha at a cost of P8/kg, PhilRice joins forces with the Department of Agriculture to extensively promote the use of quality seeds through research for development (R4D) work. As indicated in the maps, good seeds (farmer-saved seeds) are still widely utilized.

QUALITY SEED, BOUNTIFUL HARVEST

Promoting Quality Seed in Strategic Rice-Growing Provinces

INFOGRAPHICS BY JAYSON C. BERTO AND TEOFILO C. PAULINO

To increase rice production in these **20 provinces** with yields more than 4t/ha, the following varieties will be promoted:

PUBLIC HYBRIDS

	MESTIZO 1	MESTISO 20
MAX. YIELD (T\HA)	9.9	11.7
MATURITY (DAYS)	123	111

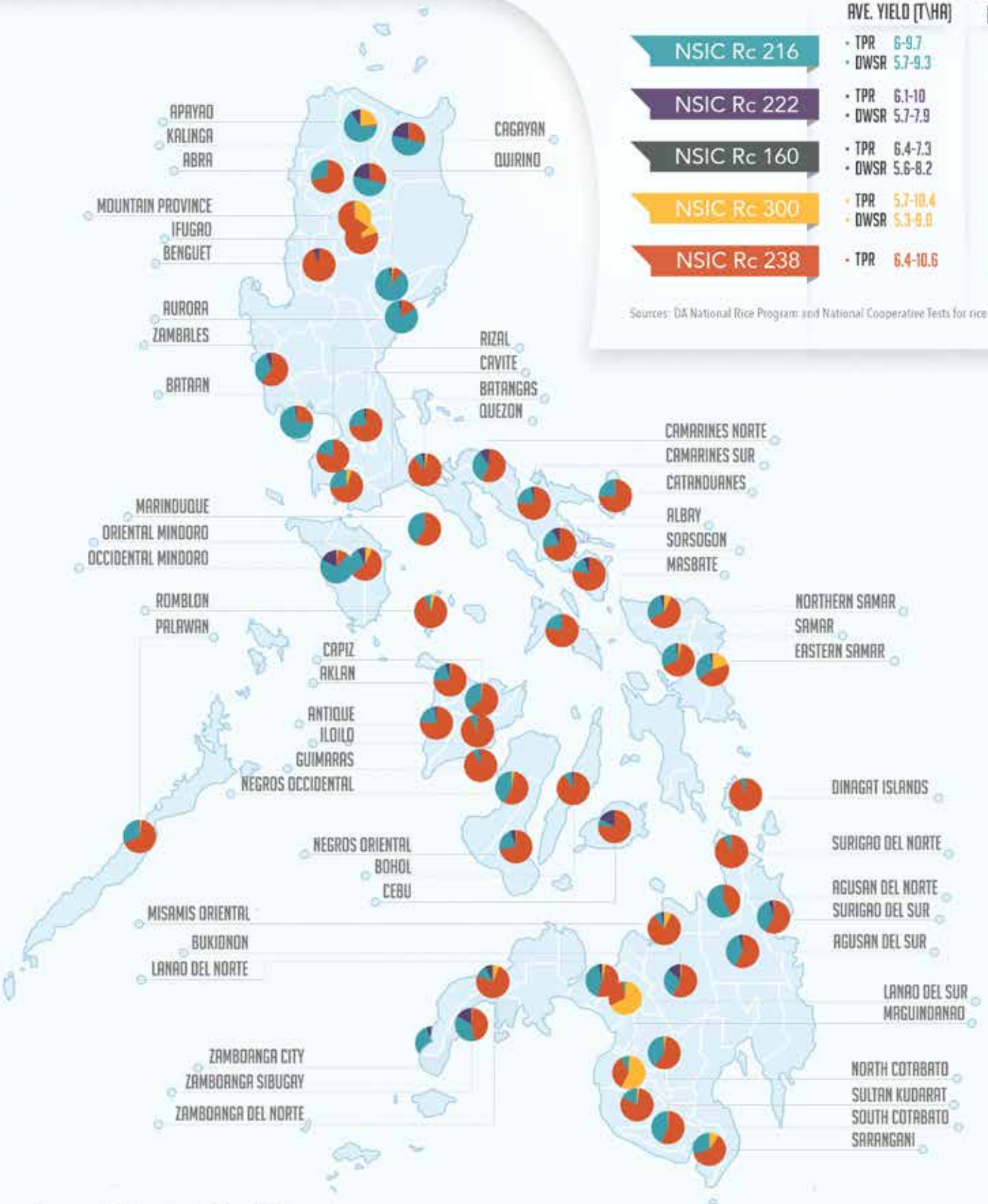
In these **55 provinces** with average yields below 4t/ha, the following **inbred varieties** are recommended for dry and wet seasons:

FIVE NATIONALLY RECOMMENDED INBRED VARIETIES FOR DRY AND WET SEASONS

TPR - Transplanted rice
DWSR - Direct wet-seeded rice

	AVE. YIELD (T\HA)	MATURITY (DAYS)
NSIC Rc 216	• TPR 6-9.7 • DWSR 5.7-9.3	112 104
NSIC Rc 222	• TPR 6.1-10 • DWSR 5.7-7.9	114 106
NSIC Rc 160	• TPR 6.4-7.3 • DWSR 5.6-8.2	122 107
NSIC Rc 300	• TPR 5.7-10.4 • DWSR 5.3-9.0	115 105
NSIC Rc 238	• TPR 6.4-10.6	110

Sources: DA National Rice Program and National Cooperative Tests for rice



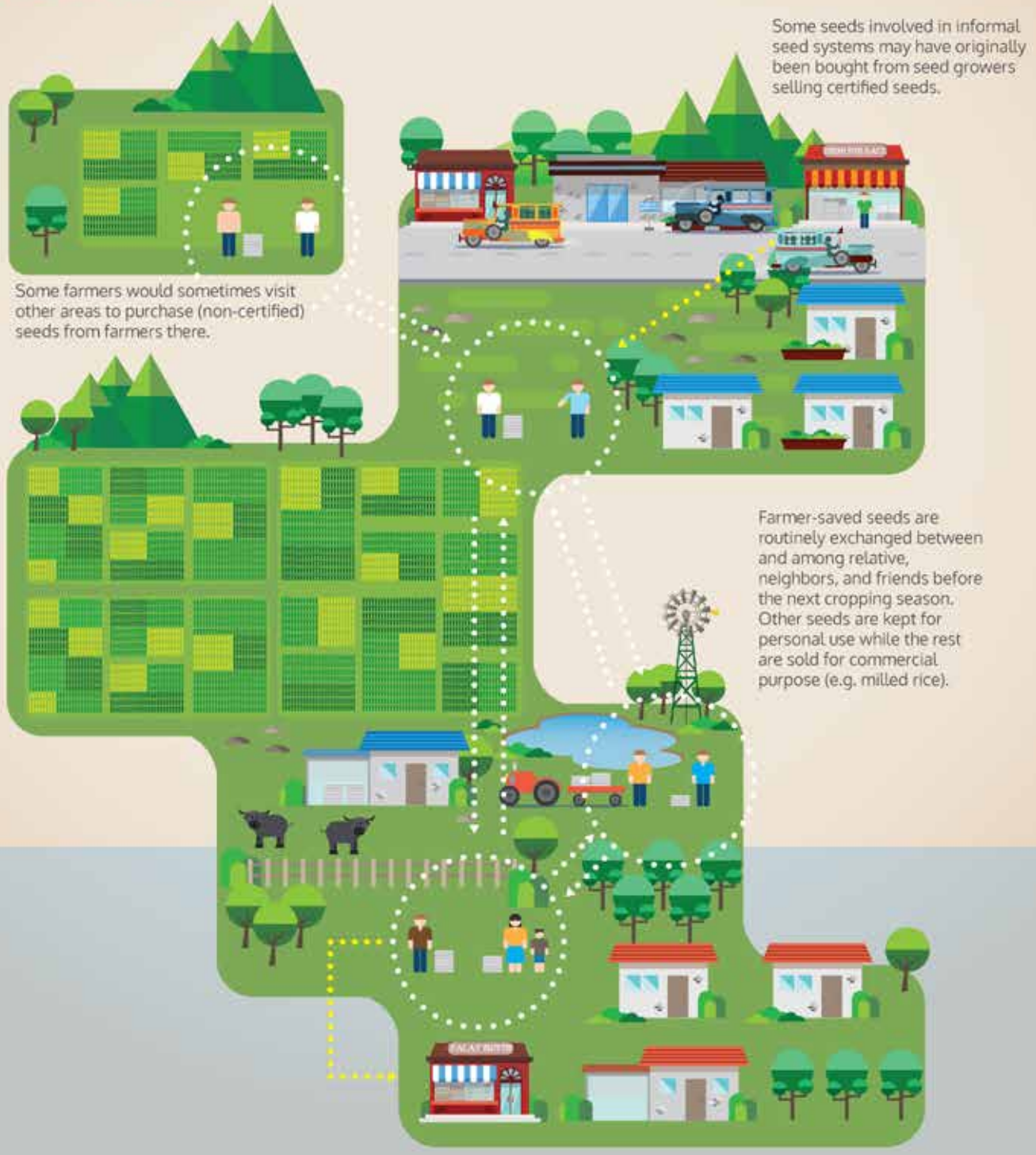
Source: DA Planning Office, 2016

SEED SYSTEMS IN THE PHILIPPINES

Written and Illustrated by: **Andrei B. Lanuza**
Subject Matter Specialists: **Glenn Y. Ilar**
Fidela P. Bongat

INFORMAL

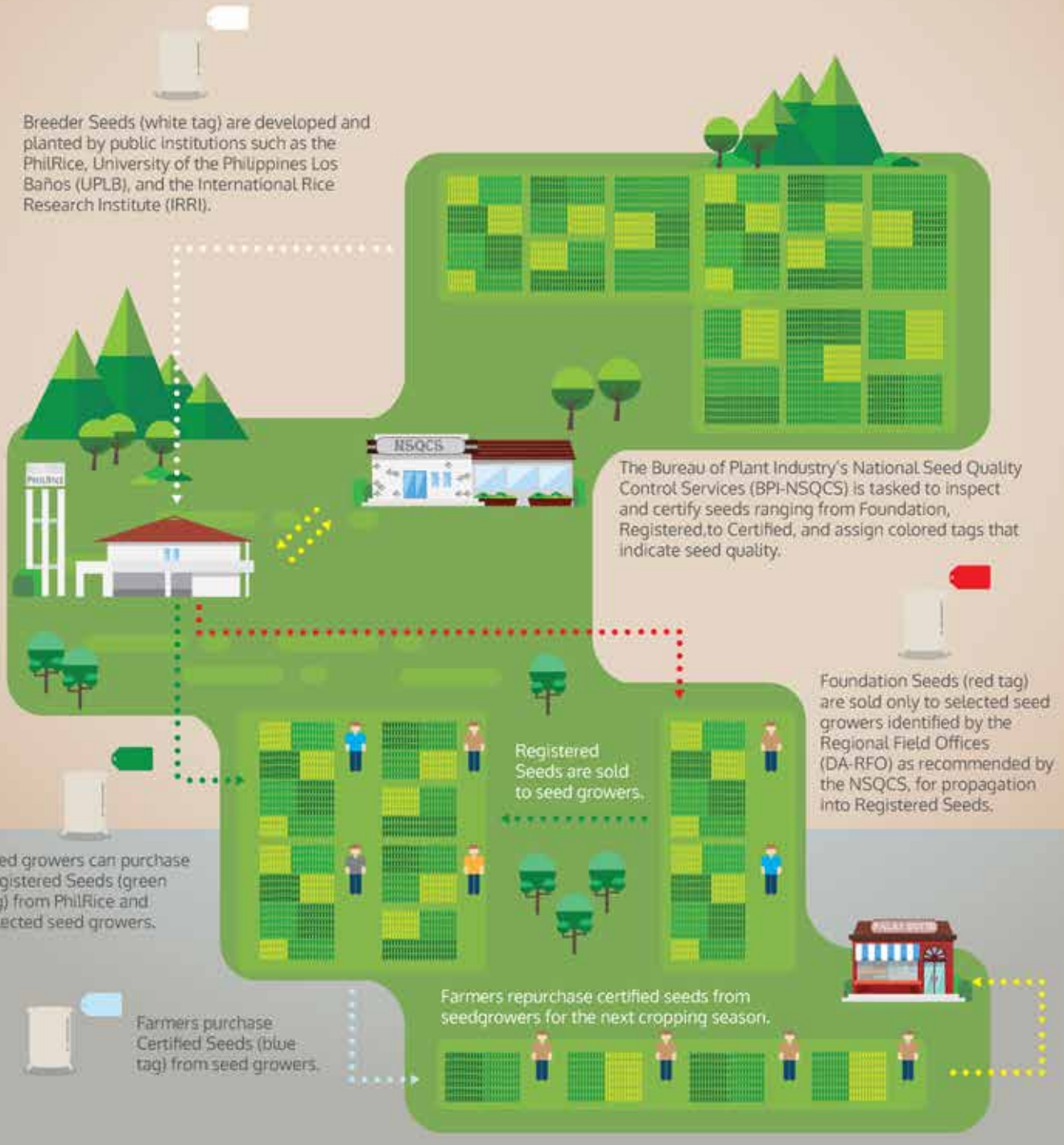
In an **Informal Seed System**, farmers themselves produce and share their seeds. This system is flexible and accessible. However, they must always ensure the quality of rice seeds.



Through seed systems, farmers get high-quality inbred seeds of new rice varieties that they want and need. These systems entail the development, maintenance, and diffusion of crop varieties, and the production, storage, and distribution of seeds. The Philippines has informal and formal seed systems.

FORMAL

In a **Formal Seed System**, governing procedures and regulations are adhered to from varietal development to approval and release, up to the distribution of seeds. The private and government sectors work together in this system.



LET THERE BE MORE SEEDS

ANNA MARIE F. BAUTISTA

Quality seeds give birth to plentiful harvest. Thanks to the government, it doesn't just watch our farmers fend for themselves. Instead, it always has its hands full as it helps to make seeds available here and there.

For seed grower Ricardo Abriam of La Union, the seed subsidy program in his municipality is a blessing. Not disgruntled with falling in a long line of other growers ahead of him, he eagerly waits for his turn to acquire premium-quality seeds of either NSIC Rc 216, Rc 222, Rc 346, Rc 352, or Rc 358 that are all suitable in their area.

For Ilonggo farmer Edgar Belago, participating in the *Next-Gen project* eventually "desalinated" his feeling of helplessness over his saline-prone rice field. He witnessed how NSIC Rc 392 and Rc480 thrived in his 1-ha land, and tripled his yield from 35-45 to 90-120 sacks.

For Michael Lumas-i of Kalinga, government-sponsored technology demonstration was the "northern star" that led him to Mestizo 1 (M1), a public hybrid rice variety. Planting M1 coupled with good production practices was Michael's key to being recognized as the *National Gawad Saka Outstanding Hybrid Rice Farmer.*

SEED-CENTERED INITIATIVES

Frequent and severe climate disturbances push the DA and local government units

Model farm implementers are given inputs such as high-quality hybrid and inbred seeds that they prefer and are best adapted in their areas. The Rice Crop Manager technology will be used to generate specific crop management recommendations, specifically in using fertilizers.

Dr. Andrew B. Villacorta

to become proactive in disaster response through the seed buffer-stocking program.

"With seed buffer-stocking, we can ensure that seeds and planting materials are available at any given time during calamities and other fortuitous events," says Dr. Andrew B. Villacorta, DA assistant secretary for Agribusiness and Director for Field Operations Service.

Under the program, at least 10% of the rice seed requirements of each region are pre-positioned to enable farmers to replant quickly after calamities.

Meanwhile, PhilRice's Rice Seed Systems (RSS) program aims to alleviate the farmers' problem on limited access and availability of seeds in some areas. The program addresses three basic parameters of a seed security framework: availability, access, and utilization. It will update seed production and distribution protocols, and establish a responsive ICT-based information system.

Accentuating the importance of good farming practices, along with using quality seeds to ensure that their potentials are maximized, the DA also implements the Rice Program Model Farm in irrigated and/or selected rainfed areas with adequate water.

"Model farmers are given inputs such as high-quality hybrid and inbred seeds that they prefer and are best adapted in their areas. The Rice Crop Manager technology will be used to generate specific crop management recommendations, specifically in using fertilizers. The farmer-recipients are also required to attend briefings on rice production to qualify," Villacorta mentions.

This is also similar to the High-Yielding Technology Adoption project wherein inputs are provided under a "Grant-Recovery-Roll-Over" scheme. An organization distributes seeds and inputs to its individual members, payable after harvest either in cash or in kind, at a rate earlier agreed upon. The income generated by the organization forms part of its capital to procure seeds and fertilizers for the next cropping season.

REINTRODUCING PUBLIC HYBRID SEEDS

The use of hybrid seeds in favorable areas is among the strategies of government to increase total rice production and energize the competitiveness of Filipino farmers. The DA and PhilRice are up to implement the Credit Assistance Program for Hybrid Rice Production, Hybrid Rice Research Program (HRRP), and the Public Hybrid Rice Commercialization Program (PHRCP).

From the estimated 400,000 hectares planted to hybrid seeds, the DA through its National Rice Program aims to expand to additional 200,000 ha through the credit assistance program.

Farmer-borrowers pay their loans with an interest of 6% per annum but without collateral. Qualified seed companies, irrigators' associations, and farmers' cooperatives can avail of the loans.

"Through the different schemes, we aim to encourage and invigorate public-private partnership, mainstream credit assistance to support and sustain the financial requirements of the rice farmers, and empower them through seed varietal preference," Villacorta notes.

Meanwhile, the HRRP will develop widely adaptive and high-yielding hybrids with good agro-morphological traits, acceptable grain and eating qualities, and resistance to major insect pests and diseases.

Program Lead Dr. Nenita Desamero says they will also work on seed purification and multiplication techniques to develop nucleus and breeder seeds, seed quality-testing, improvement of seed quality standards, provision of technical support in hybrid seed production, and seed certification training.

"PHRCP, on the other hand, aims to resolve issues on the availability and affordability of F_1 seeds in the market. To do this, we should look at ways to increase the production and intensify the promotion of public hybrid rice" says Leylani Juliano, program lead.

Farmers Michael, Edgar, and Ricardo count on the good results of these initiatives. They hope to improve their production practices and become more competitive. •

RICE SEEDS MADE AVAILABLE IN STRATEGIC AREAS

DONNA CRIS P. CORPUZ

Building a rice-secure Philippines is ensuring first and foremost that seeds to be used are of high quality and are available, accessible, and affordable to all farmers across the country – whether in top-producing provinces or in poor and remote areas.

To realize this goal, three PhilRice satellite stations have been established in Sta. Cruz, Occidental Mindoro in Luzon; Catarman, Northern Samar in the Visayas, both in January 2015; and in Zamboanga City, Zamboanga del Sur in Mindanao in November 2017.

THE VISION BEHIND

One compelling reason for the rise of these satellite stations is the need for a more strategic and stable access to modern technologies such as high-quality rice seeds.

The satellite stations are designed to produce high-quality seeds, and cater to the needs of seed growers and farmers within their areas of coverage.

The satellites also demonstrate technologies for farmers who are far from PhilRice branch stations and other agricultural service centers. Rice stakeholders near the satellites can now access rice technologies and new varieties from them. The advantages of using high-quality seeds will be showcased to eventually attract more users and potential seed growers.

These satellite stations are envisioned to be seed production areas in the sense that they are positioned where quality seeds are limited but needed, and establish access there. They serve not only their immediate areas of responsibility, but also other stakeholders from neighboring provinces, especially the seed growers and farmers.

These next-door stations also aim to address issues affecting rice production, such as high cost of production, low yields, depletion of soil fertility, and lack of post-harvest facilities.

Hugely involved in the establishment of these stations are the Department of Budget and Management that allocated funds, the Department of Agriculture and its regional offices and agencies, the local government units of the host provinces and towns, and the University of Eastern Philippines in Catarman and Western Mindanao State University in Zamboanga City.

SAILILA ABDULA FB PAGE

DA-RFO 10 OIC Regional Executive Director Carlene C. Collado hands certificates of turn-over to PhilRice Executive Director Sailila E. Abdula for the 35hp Kubota tractor for PhilRice CMU.

GROUND FORCES

Rene Valdez of PhilRice Mindoro accounts that the station is now continuously improving and strengthening its services. Its facilities include a warehouse, solar and flatbed dryers, motorpool, and handtractors.

The Samar station and its partners target to promote rice research for development, and increase rice productivity in the whole island. Station Head Mario Ramos has the following to depend on: a 200-ton-capacity warehouse, an 8-ton-capacity solar and reversible flatbed dryers, machinery shed, handtractors, and a field where agriculture students can also conduct thesis studies on rice and agricultural engineering for farm machines and postharvest facilities.

PHILRICE PHOTO DATABASE

PhilRice and its partners during the groundbreaking of the multi-purpose building for PhilRice Zamboanga Satellite Station.

Seeds are highly important in rice production. As a farmer myself, I want to see my fellow farmers improve their knowledge and skills in rice farming. Now, with these satellite stations, they no longer have to travel far because we already brought the technologies and services closer to those who really need them.

- Mr. Rene Valdez

The fledgling Zamboanga station is to put up an administration building, warehouse, seed processing shed with dryer, other necessities, and a 2-ha *Palayamanan* demo farm. Under the direct stewardship of PhilRice Midsayap, the satellite caters to the needs of rice agriculture in Zamboanga del Sur and other Region 9 provinces.

Valdez and Ramos, who are respectively supervised by PhilRice Los Baños and Bicol, both emphasize that this vision of bringing high-quality rice seeds to farmers in far areas demands for their sacrifices that make more Filipino farmers happier, to say the least.

"Working here means being far away from my Isabela-based family and being able to see them once a month at most. But I am very happy to serve PhilRice and see farmers improve their income in rice farming," Ramos radiates gratification.

They also affirm that pushing for the development of the three satellite stations is a huge step closer to the rice-security dream that the whole country cherishes.

"Development will certainly require labor, sacrifices, and perseverance. Right now, we are identifying and solving each bottleneck but soon we can say that we'll be on our way to competitiveness in seed production," Valdez figures out.

It will take time before these satellite stations can fully maximize their potentials in serving more rice stakeholders, but with collaboration, hardwork, and dedication, confidence is strong that rewards could soon be reaped. •

ASHLEE P. CANILANG

CARLO G. DACUMOS

SEED-SECURE COMMUNITY

SONNY P. PASIONA

Farm leaders from an upland community in Palawan testified to the effectiveness of using the community seed banking (CSB) approach in managing seeds, ensuring food security in their households, and improving their seed access and farm productivity. And through CSB, farmers in their area were entwined into a stronger sense of community.

Senior citizen Salome Diestro recalls a sad episode in their community life when they were reusing upland rice seeds from their previous harvest, which resulted in a decline in yield and income every season. This was the scenario until the Department of Agriculture (DA) and PhilRice pleasantly intervened to help them produce quality seeds, make good yields, and erect food security in their households.

In 2012, PhilRice led the Upland Rice Development Program (URDP) to "harness the potential of the upland rice ecosystem as one of the major sources of the country's rice supply and other food staples." When the program was introduced in Marangas, Bataraza, Palawan farmers like Diestro found a new hope in upland rice farming.

RISE WITH UPLAND RICE

"We improved a lot," Diestro said when asked how the program changed her fate.

When upland rice technologist Marlo Montero first arrived in Bataraza, he observed that farmers were not properly oriented on how to do agriculture in the uplands. "Traditionally, they would slash-and-burn," he recalled.

When URDP was introduced, farmers learned sustainable farming systems.

"We used to focus only on lowland farming while we only planted *kamote* in the uplands. With URDP, we learned that monocropping is not good so we made use of our upland areas and made them productive," Diestro explained.

PhilRice and other DA agencies conducted an Upland *Palayamanan* Farmers Field School (FFS) where Marangas "enrollees" experienced hands-on training in a demo-farm. Farmers learned the seed-to-seed process — from purification to propagation, and from production to storage during their season-long FFS.

Eva Gualon, 53, recounted that because of what she learned from FFS, her one sack of seeds yielded 30 sacks *palay*, up from the 15 sacks she used to harvest from less than a hectare of land.

"We used to follow our traditional ways of farming in the uplands. But after participating in FFS, we saw the importance of adopting better farming practices especially in proper nutrient management," she testified.

COMMUNITY SEED BANKING

Marangas farmers who participated in FFS formed the Marangas Upland Rice Organization (MURO), in line with URDP's strategy of organizing a farmers' group that would maintain the established CSB in the uplands. Out of 131 seed banks established across the country, MURO's CSB is one of the most successful.

Through lecture-discussions on the concepts, strategies, and management of a CSB, MURO members internalized the essence of community-building. They learned and worked together.

JAYSON C. BERTO

Through the CSB setup, MURO farmers produced, managed, and preserved traditional varieties such as *tipak*, *milagrosa*, and *budong*.

"We teach our members how to prolong the quality of traditional seeds through proper storage to secure them from pests," said Allan Bobon, 50, current MURO president.

In 2013, DA-MIMAROPA built a concrete warehouse where MURO farmers stored their seeds. PhilRice contributed the *green superv bag*, a special kind of rice bag that keeps the seeds viable.

"For farmers from far-flung areas, we taught them how to properly store seeds in their respective households," Bobon added.

By ensuring the quality and purity of seeds, MURO farmers were delighted to witness how their seeds exhibited high germination rate.

Meanwhile, the URDP protocol for CSB follows a 1:1.5 repayment scheme. For instance, if one member borrows 40 kg of seeds, s/he is expected to return 60 kg in the warehouse after harvest. In this way, the community is secured with seeds for the next cropping season. If there is surplus, farmers from neighboring barangays are benefited.

SUSTAINING THE CSB

Diestro and Bobon admit that sustaining the CSB is quite a challenge especially on payment collection and marketing their produce as it is purchased at the same price as the lowland rice.

But with the high milling recovery and good eating quality of traditional rice, MURO farmers find gratification in eating their own harvest, thereby ensuring that no household member even gets hungry.

"CSB has opened the minds of upland farmers to facilitating seed exchange among the members. This ensured a sustainable source of seeds given that the government would not provide them with seeds forever," said Maria Teresa Carido, focal person for upland rice of DA-MIMAROPA.

The CSB model also solidifies the basic foundations of upland rice farmers, who are being organized. Other than being a rice-farming community, Marlo Montero helped MURO to establish an innovative community-managed savings mechanism.

"It's like a small bank, which you brought to the community and where farmer-members can make credit and savings for their investments in farming inputs or personal needs," Montero described the mechanism.

With CSB, upland farmers facilitated their seed access and raised farming productivity. But above all, farmers learned what it means to be a community — a key factor in sustaining food and livelihood security.

Meanwhile, Carido emphasized that for CSB to be sustainable, support of the local government unit is integral.

"It should not stop at seed distribution and training programs. There should also be continuous monitoring activities," Carido concluded. •

> **We used to follow our traditional ways of farming in the uplands. But after participating in FFS, we saw the importance of adopting better farming practices especially in proper nutrient management.**
>
> - **Ms. Eva Gualon**, upland farmer

VOXPOP

FREDIERICK M. SALUDEZ and DONNA CRIS P. CORPUZ

WHY DO YOU USE HIGH-QUALITY SEEDS?

We use certified seeds to ensure good harvest, minimize pests and diseases, and for better quality of crops.

-Joseph Likigan, 44, Kalinga

I use certified seeds because they increase my yield. They have high market prices because of their purity and quality.

-Sisenando Pasco, 48, Quezon

I always use certified seeds because they are pure, of high quality, have good germination, and most of all, high-yielding.

-Recto Codera, 60, Northern Samar

I use our own-bred varieties of seeds because I can easily evaluate their quality, and of course, their potential harvest.

-Rexie Padilla, 37, South Cotabato

I use certified seeds because they can guarantee healthy and uniform growth of crops, and ensure high percentage of harvest.

-Judith P. Econar, 48, Compostela Valley

LITO LOMBRES

LORETO BINUYA

THE REWARDS OF USING QUALITY SEEDS

CHRISTINA A. FREDILES

Both Mang Lito Lombres, 55, and Mang Loreto Binuya, 73, of Aurora were still on cloud nine after harvest. Thanks to quality seeds from accredited seed growers. They did not leave their fields empty-handed.

Since the mid-1970s, Mang Lito of Baler has been exchanging seeds with his fellow rice farmers, preferring seeds that yield high, of course.

It was only in 2000 when he started planting seeds he bought from accredited seed growers. He recalls that at first, he was hesitant to sow only 40-kg seeds for a hectare as he used to sow 150 kg. He still gave it a try; the seeds were given for free, after all.

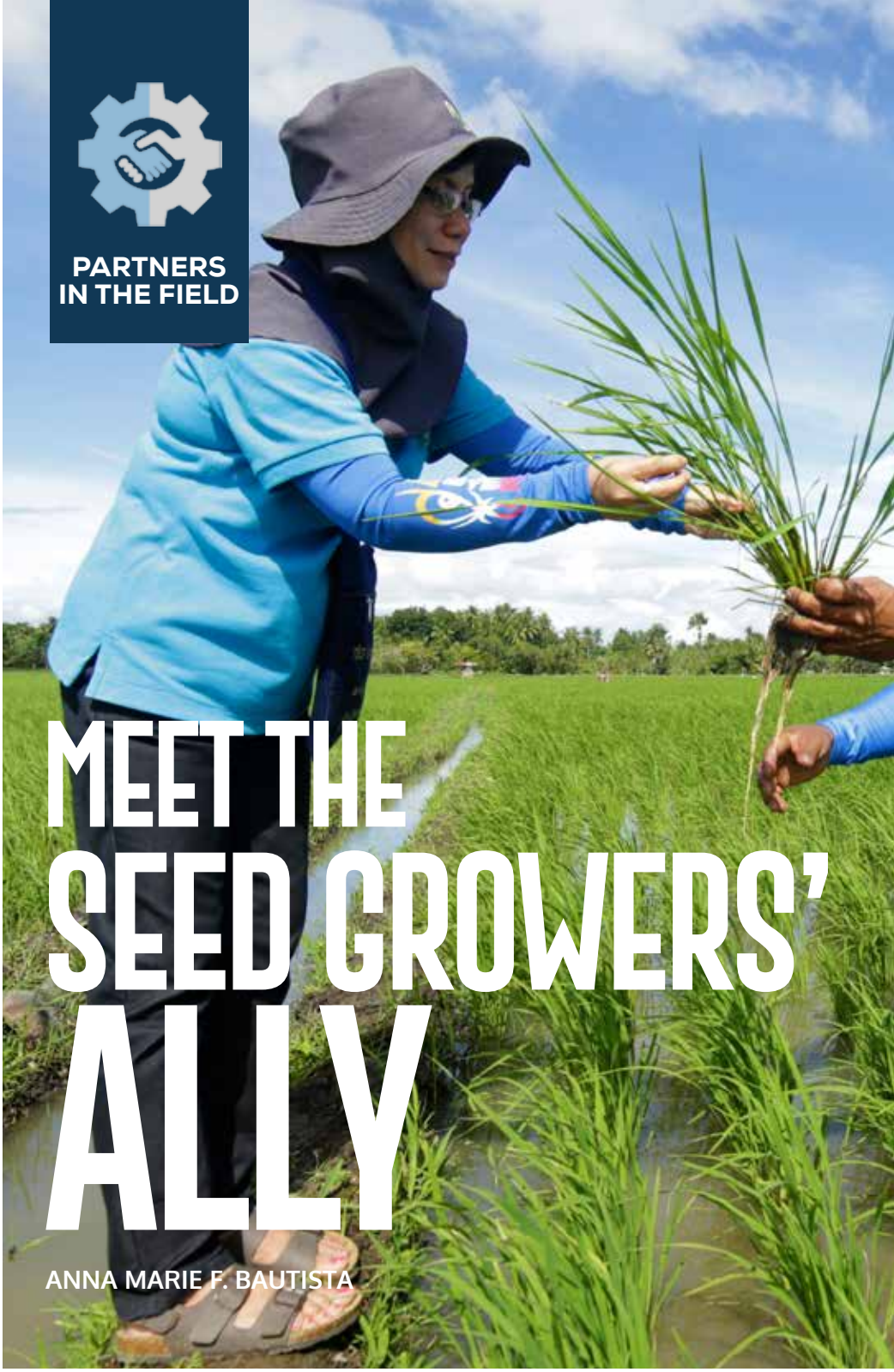
One of Mang Lito's favorite rice varieties is NSIC Rc 222. It never dawned on him that with it, he could harvest more than 5t/ha. During his barter days, he contented himself with 3 t/ha harvest.

In 2012, he went back to producing his own seeds after he attended a training on producing quality seeds of modern rice varieties through the community seed banking (CSB) setup. With CSB, farmers were assured of the quality of the seeds that they exchanged with their fellow farmers. Regrettably, typhoons devastated their farms resulting in poor-quality seeds. The farmers started to lose their interest in the use of CSB seeds. Thus, he went back to accessing seeds from seed growers.

Meanwhile, Mang Loreto of Maria Aurora, a retired US navy sailor, only plants seeds from accredited seed growers whose products undergo a rigorous process of purification. He harvested 7.2 t/ha from NSIC Rc 152, netting P50,000 with P25,000 average capital.

Mang Lito and Mang Loreto believe that quality seeds play an important role in achieving high yield but they also recognize the importance of proper crop management practices. Indeed, their hard work paid off. Their stories beacon hope on other farmers that high yield is a puzzle not difficult to solve as long as they don't take the use of quality seeds for granted. •

PARTNERS IN THE FIELD



MEET THE SEED GROWERS' ALLY

ANNA MARIE F. BAUTISTA

Producing quality rice seeds is a crucial task in helping rice farmers achieve farm security. It requires skills, dedication, and unfailing commitment to quality starting at the field level. This highlights the role of field inspectors in being one with seed growers in ensuring the quality of their produce.

This was realized by Federico Eblasin, a seed grower from Sta. Cruz, Laguna. Even with a 20-year record as a seed producer, he still believes that he has a lot to learn, and be under the umbrella of one of his trusted field inspectors, Delia Cabutihan.

"I chose to become a seed grower because there is income here. However, the road I tread in having my seeds certified by the National Seed Quality Control Services (NSQCS) is a challenging one. It's good to have Ma'am Delia who guides me through the way," Eblasin declares.

SEED INSPECTOR

Delia, a 59-year-old deputized field inspector also from Sta. Cruz, has been serving rice seed growers for more than 17 years now. A creative way to describe her is to spell out the letters of her name through adjectives that well-represent her traits as an effective inspector— Dedicated, Encouraging, Lively, Industrious, and Approachable!

Every season, Cabutihan inspects Eblasin's farm and nine other seed growers in Sta. Cruz, Pagsanjan, and Pila in Laguna. In one cropping alone, she has to visit each farm three times and be persistent in giving recommendations to ensure that the standards are properly complied with. More so, she goes beyond the number of visits when the need arises.

Cabutihan is devoted to delivering what is expected from her. Like a hawk hunting for a prey to devour, she is also keen on scanning farmers' fields to ensure that off-types, weeds, and diseased plants are removed from the field before the seeds are harvested and sent for laboratory tests.

"There are instances when the farmers reason out that off-types can be removed before their harvest. But I keep on reminding them that it is better to prevent problems from worsening," Cabutihan counters.

QUALITY SEEDS, QUALITY SERVICE

She also promotes continuous learning among seed growers and herself. She makes sure she doesn't miss any single retooling workshop organized for deputized field inspectors. She motivates farmers and seed growers to keep attending trainings, seminars, and field schools whenever possible.

"Ma'am Delia is good at reminding me about the status of my farm, especially in managing it. Every year and every season, I get to learn some tips in dealing with the crops and making sure that my produce passes the evaluation," Eblasin notes.

Cabutihan also exudes a kind of energy that is not hostaged by her age. Fieldwork may not be kind to her all

Delia Cabutihan discussing with Federico Eblasin during field inspection.

JAYSON C. BERTO

the time, but she looks enthusiastic and radiant in doing the task.

For Antonio Visitacion, agricultural program coordinating officer in Laguna, Cabutihan is an epitome of a hardworking deputized field inspector.

"In Laguna where seed production is more challenging during the wet season owing to uncertain rainfall patterns, the need for an industrious field inspector is highlighted. Thankfully, we have Delia who is good at coordinating closely with the seed growers," Visitacion is gladdened.

COMMITTED TO QUALITY

Furthermore, Cabutihan is just one call away! Seed growers can easily approach her for their concerns. In Cabutihan's mind, being approachable is a good trait to possess to be effective in communicating with the seed growers. While she has these characteristics, Cabutihan is still facing challenges at work. Good thing, these obstacles also give her motivation to strive harder.

According to Visitacion, seed growers in Laguna harvest only 50-80 bags per hectare on the average; not enough to supply seeds to neighboring provinces in CALABARZON. Hence, they have to import certified seeds from Isabela. Influencing the minds of the seed growers is also a challenging work for Cabutihan.

"Some seed growers are stubborn in following recommendations. I have to be more strict in implementing the seed certification rules so that they improve even at the field level," Cabutihan maintains.

She also works double-time during the wet season when growers face problems in drying seeds owing to erratic rainfall. At times, this causes the seeds to fail the germination test in the laboratory – a pain she has to endure.

Nevertheless, Cabutihan's commitment makes the certification process easier for Eblasin and other seed growers who anticipate every harvest with optimism, as long as they continue listening to her. "I wish for Ma'am Delia to always have a healthy body so that she could still help us and other seed growers who need her guidance. After all, we barely experienced failing in field and laboratory inspection, thanks to her," Eblasin says with a smile.

According to Josephine Malabanan, NSQCS Assistant Chief and head of the Seed Certification Section, there are over 993 deputized seed inspectors in the country who conduct thorough inspection and recommend proper roguing or removal of off-types, weeds, and diseased plants in the seed growers' fields.

"Field inspection is primary in maintaining the genetic purity and identity of the rice seeds. After all, we aim to improve the competitiveness of our rice farmers through the use of high-quality certified seeds at all times," said Malabanan. •

EXPERT'S CORNER

BIOSAFETY BEHIND GOLDEN RICE

DR. REYNANTE L. ORDONIO
Molecular Plant Breeder and Healthier Rice Project Leader

As we aim for food security, producing enough, affordable, and accessible foods for consumers is our battlecry. More to this is to ensure that these foods are of high quality, safe, and nutritious.

NOT ONLY QUANTITY BUT ALSO QUALITY

A combination of different agricultural technologies and strategies has to be explored and utilized to achieve food security. Among these technologies, perhaps the most powerful yet the most controversial is the use of modern biotechnology or genetic engineering. With this, genes from one species can be transferred to another to create organisms with a novel combination of genes, refered to as *genetically modified organism* (GMO).

Because of the unlimited combinations of genes that can be integrated into an organism, genetic engineering has a great potential for use in rice research for designing plants with higher yield, better quality in terms of increased resistance to insect pests and diseases, improved tolerance to environmental stresses, effective nutrient uptake, shorter breeding time, enhanced nutritional value, etc.

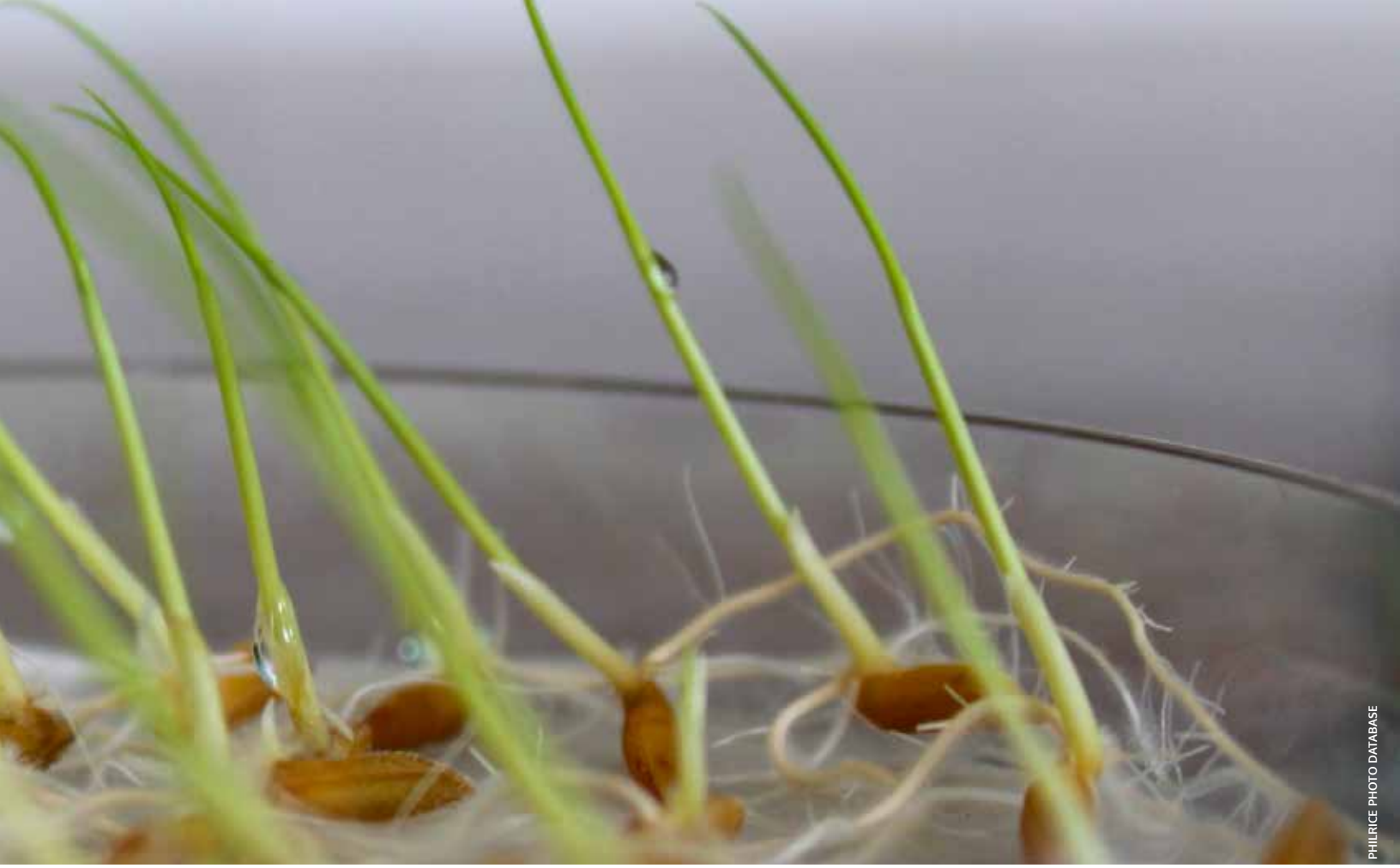
One of PhilRice's efforts in promoting better nutrition among Filipinos is the Healthier Rice Project. This revolves around the development of a genetically modified rice with high beta carotene, also known as Golden Rice (GR), and its future biofortifications to address Vitamin A, iron, and zinc deficiencies in the country.

SAFETY MATTERS

GMOs worldwide are governed by a stringent biosafety regulatory process starting from their development to commercialization. The biosafety procedure involves a series of checkpoints to ensure that GMOs or their by-products will meet the expected level of safety to health and the environment. Going through this procedure doesn't mean that GMOs have higher risks as even ordinary foods such as peanuts, milks, melons, breads, and shrimps can cause harm as sources of allergens. In fact, GMOs can even be a lot safer because of this strict biosafety process.

Golden Rice itself had to go through a series of rigorous testing and regulatory procedures. To ensure that GR is safe for the environment and health, candidate PSB Rc 82 GR lines (planting material) were subjected to confined field-testing (CFT1) in isolated/fenced areas for at least 2 cropping seasons in 3 different locations in the Philippines in 2015. During the tests, any discrepancy or variation from the original variety in terms of appearance or agromorphological characteristics, and any unusual disease, pest, or weed incidence at the sites were carefully assessed.

The DOST-Biosafety Committee (DOST-BC) that provides overall supervision along with scientist representatives and members of the local community who jointly form the Institutional Biosafety Committee of each site, ensure that biosafety guidelines are followed.


PHILRICE PHOTO DATABASE

Ultimately, we expect that Golden Rice will not only pass biosafety regulations but also be proven efficacious in fighting Vitamin A deficiency, the real reason for its conception.

Among these guidelines is preventing the intentional or unintentional release of viable seeds or plants from the site, and the proper disposal or transport of transgenic materials.

After finishing CFT2 in 2016, the 5 best-performing lines are to be forwarded to a season of field trials under the supervision of the DA-Bureau of Plant Industry, following Joint Department Circular No. 1 Series of 2016 pertaining to the handling and use, transboundary movement, release, and management of GMOs. Aside from DA and DOST, this circular now also involves the Departments of Health, Environment & Natural Resources, and Interior & Local Government. This collaborative assessment further ensures the safety of Golden Rice.

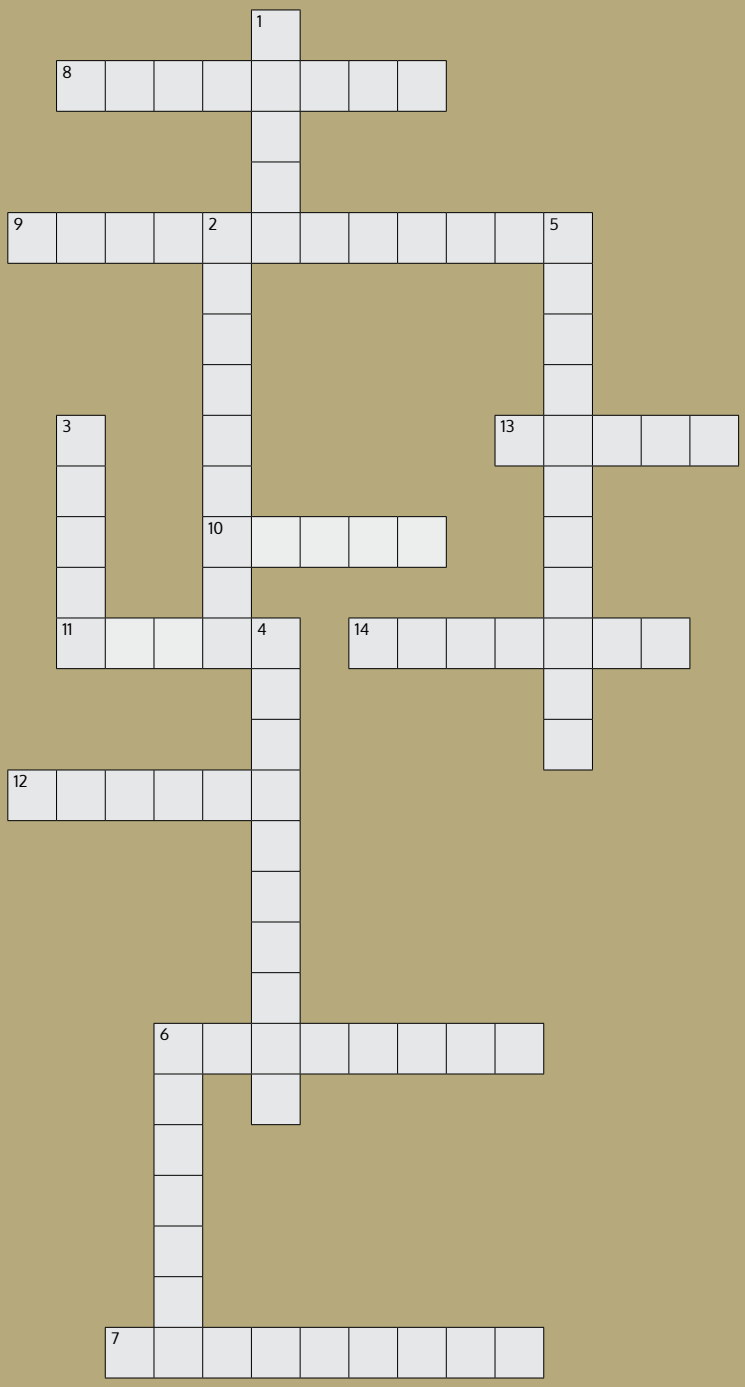
The edible parts or grains of GMOs also need to be assesed for safety and suitability for food, feed, and processing (FFP). For this purpose, Codex Alimentarius guidelines on food safety are being implemented for evaluating their equivalence to their conventional counterparts (means "as safe as") in terms of their molecular and chemical compositions. The molecular aspect includes information about the sources of the genes and how they were used, along with their biochemical implications.

The proteins produced by the foreign genes must not be toxic nor allergenic, and must not have unintended effects. Compositional data in terms of nutrients, bioactive non-nutrients, antinutrients, toxicants, contaminants, and other potentially useful and dangerous elements must also be analyzed to identify deviations from the norm. In the case of GR, the level and bioavailability of beta-carotene were also analyzed. So far, the Food Standards Australia New Zealand has found that GR has no public health or safety concerns or issues. This means that Golden Rice is as safe as ordinary rice.

Once the technology has passed the rest of the biosafety procedures, only then will it be approved by government for commercialization. Ultimately, we expect that Golden Rice will not only pass biosafety regulations but also be proven efficacious in fighting Vitamin A deficiency, the real reason for its conception. **– with reports from Jungie Q. Amacanin**

CROSSWORD PUZZLE

REUEL A. MARAMARA



Vertical

1 A machine used for removing excess grain moisture through the help of heat or air.

2 Quality seeds of high germination and vigor usually free from disease and damage; derived from registered seeds.

3 Any plant or vegetation that robs agricultural crops of water, nutrients, and space thereby reducing their yield; any plant growing at the wrong place and time.

4 BPI-accredited person/organization who produces seeds.

5 The process of seed growing into seedling after a certain time of dormancy; sprouting.

6 A space or place used for storing inputs/ supplies.

Horizontal

6 A facility used for storing seeds to preserve genetic diversity and offer ready seeds to farmers.

7 Hybrid vigor; superior characteristics of any hybrid over its parents.

8 Rice R4D arm of the Department of Agriculture that helps develop high-yielding and cost-reducing technologies so farmers can produce enough rice for all Filipinos.

9 Agricultural practice of planting the same crop over and over again in the same area.

10 Plant or animal varieties bred through closely related parents; contain the same genetic make-up from parents; in plants, also called as open-pollinated varieties (OPV).

11 Matured ovules or grains of any plant ready for sowing/ planting.

12 Plant or animal varieties bred through two different parents; in rice, also called as mestisos; often outyield the parents; crossbred.

13 The totality of features and characteristics of a product or service that bear its ability to satisfy stated or implied needs (ISO 8402-1986); quality seeds pass the certification process.

14 Amount of a (agricultural) product; return of an investment; produce.

Answers
Vertical: 1)Dryer; 2)Certified; 3)Weeds; 4)Seed Grower; 5)Germination; 6)Storage
Horizontal: 6)Seed bank; 7)Heterosis; 8)PhilRice; 9)Monocropping; 10)Inbred; 11)Seeds; 12)Hybrid; 13)Quality; 14)Yield

STAFF EXTRAORDINAIRE

GETTING TO KNOW MORE OF PHILRICE R&D BRAINS

GLENN YALAO ILAR

Birthplace: Sinait, Ilocos Sur

Academic Profile:

- PhD in Development Studies (UP Los Baños)
- MS in Technology Management (UP Diliman)
- BS in Biology (Mariano Marcos State University)

Prior to earning his PhD, Ilar headed the Technology Management and Services Division in 2009-2010, and the Technology Marketing and Commercialization Center in 2011.

He specializes on knowledge management, technology acquisition and transfer, and evaluation of developmental projects and training.

He now leads the Rice Seed System Program, the Heirloom Rice Project, and the Science and Technology Model Farm on Rice and Rice-Based Farming Technology funded by DOST-PCAARRD.

IMELDA AVANZADO ARIDA

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Academic Profile:

- MS in Economics (Major in Quantitative Economics, UP Los Baños)
- BS in Agriculture Economics (Major in Agricultural Marketing and Prices, UP Los Baños)

Arida is one of the authors of the book *Comparative Efficiency of Rice Farming in Asia and in the Philippines* to be published this 2018. The book presents the current status of rice-farming efficiency in the country relative to five major rice producers in the world, namely, China, India, Indonesia, Thailand, and Vietnam.

She led the socioeconomic impact study on rice combine harvester proving that farmers who adopted the machine had higher income than non-users.

She currently pursues research on production economics, policy, and quantitative economics.

OFELIA CAMPANO MALONZO

Birthplace: Dingras, Ilocos Norte

Academic Profile:

- PhD in Extension Education (UP Los Baños)
- MS in Rural Development (Central Luzon State University)
- Masters in Public Management (Nueva Ecija University of Science and Technology)
- BS in Development Communication (Mariano Marcos State University), *cum laude*

Grounded on her expertise in program and technology management, she served as subject matter expert for published materials such as *Guide for Agricultural Extension Workers*, and *Guide in Implementing Farmers' Field School*. She also participated in international training programs on *Participatory Approach to Scaling-Up the Adoption of Submergence-Tolerant Rice in Thailand, and Agricultural Extension Planning and Management in Japan*

A Supervising SRS based in PhilRice Isabela, she now leads a project promoting rice and rice-based innovations in North East Luzon.

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RICE THROUGH YOUR EYES

PHOTO CONTEST BEST PHOTOS

PHOTOS IN THIS PHILRICE-SPONSORED CONTEST DESCRIBE, ELABORATE, AND EXPLAIN COMPLEX PROCESSES OF PHILRICE'S R&D ACTIVITIES, AND INCREASE PUBLIC AWARENESS AND APPRECIATION FOR RICE FARMING AND AGRICULTURE. THE CONTEST RAN FROM JUNE TO NOVEMBER 2017.

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