2018
NATIONAL RICE R&D HIGHLIGHTS

GENETIC RESOURCES
DIVISION

PHILRICE

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GENETIC RESOURCES

Division Head: Jonathan M. Niones

EXECUTIVE SUMMARY

Genetic Resources Division was envisioned to help strengthen PhilRice' internal capability on germplasm collection, conservation, management, utilization, and seed health and quality assurance in support to rice breeding and development of high-yielding varieties and as well as PhilRice seed production for seed growers and farmers. With this goal, GRD operates in major project components including 1) germplasm conservation, characterization, and distribution; 2) evaluation for biotic stresses and grain quality; and 3) seed health and quality testing at the PhilRice seed production.

The Division handles the PhilRice Genebank, which conserves diverse rice genetic resources that may have inherent genes for key traits such as high yield, good eating quality, pest and disease resistance, and tolerance to abiotic stresses; and the Seed Technology Unit, which conducts internal field inspection and grow-out test to ensure the genetic purity of the seed production at PhilRice-CES.

Division's major accomplishments include the collection and conservation of new genetic resources, characterization, regeneration and evaluation of collections/ accessions, and responding to seed and data requests. Germplasm Management System (GEMS) database management system was enhanced and improved. The Division also ensured seed health and quality.

CONSERVATION, CHARACTERIZATION, DISTRIBUTION, AND PROTECTION OF RICE GERMPLASM RESOURCES

MC Ferrer

PhilRice Genebank serves as the national repository of rice germplasm. GRD follows international standards on various processes, which include registration of incoming (new) germplasm collections, preparation of seed and panicle files (for seed verification/identity), seed cleaning, viability test, slow drying of seeds to achieve 6% seed moisture content (MC), and packaging in standard foil packets for storage in medium term (active collections) and duplicated in long term (base collection) storage facilities. To keep these valuable materials alive, regeneration is implemented to maintain their viability and genetic integrity. Characterization is also conducted to establish the identity of each accession. Rice germplasm is also efficiently harnessed and properly assessed through agro-morphological characterization to identify potential donors for use as parents in breeding and produce quality traits of the varieties. To support the utilization of genetic resources, GRD regulates the release of seeds that can be used in research, breeding methods, and rice genetic improvements with Standard Material Transfer Agreements (SMTAs) that define the terms and conditions for use of germplasm agreed upon between PhilRice and receiving party and vice versa.

GRD collecting mission prioritizes the underrepresented provinces and tribal areas. Thirty-two underrepresented provinces were selected for 2016-2022 collecting activity. In 2018, 533 rice germplasm was collected, in which 322 are TRVs, 125 farmers' line, 50 breeding lines, 32 advance/improved cultivars, and 2 are wild rice relatives. North Cotabato has the greatest number of collections (123), followed by Negros Occidental (98), Sarangani (85), Nueva Ecija (40), and South Cotabato (30). The two wild rice relatives namely: *Oryza minuta* and *Oryza meyeriana* were collected in Brgy. Balian, Pangil, Laguna and Brgy. Magballo, Kabankalan City, Negros Occidental, respectively. To date, PhilRice genebank currently holds 16,724 collections and 7,129 of which are assigned as accessions, identifying them as unique among the registered collections.

Exactly 934 seed stocks from year 1991-2013 were regenerated in 2018. However, only 400 entries produced enough (<400g) seeds, while 405 insufficient (>100g). An average increase of 30% in viability were noted after regeneration of old seed stocks. Based from seed inventory, 5% increase in total number of accessions with available seeds for distribution were obtained from 2017 to 2018 regeneration. At present, there are 3,565 accessions at PhilRice Genebank available for seed distribution with high seed stocks (>400g) and have high viability (>85%).

Moreover, postharvest data of 706 entries established in 2017 WS were gathered. Variations in characters were observed in rice collections. Some of the traditional rice varieties exhibited interesting characteristics such as short plant height, long panicle, and early maturity. In the current study, *Kamahalan* has the shortest plant height among the traditional rice varieties characterized; *Kintuman* exhibited longest panicle (>42cm); while early maturity (117 days) was observed on *Katlon Bulan, Capulungan, Kawatil, Inaporaonon, Kabulan, Kalinayan, Kinamuros, Malandi, Minarugon, Tepak, Super Pilit,* and *Malido*.

Conservation is not limited to attaining and physically possessing the materials but also includes ensuring their existence under viable conditions and their original genetic characteristics intact. Thus, a detailed inventory system comprising seed stocks' information on storage conditions such as seedlot, viability, volume, and storage locations are managed through an in-house software, Genebank Database System (GEMS). GEMS contains updated rice germplasm data: passport data (531 new collections), grain quality data (147 collections/accessions), characterization data (1,066 collections/ accessions), zinc evaluation data (1,218 collections/accessions), and pest and diseases data (623 BPH and GLH, 276 Stemborer, 906 Blast, 590 BLB and ShB, 890 Tungro). SMTA was issued to protect intellectual properties or rights over the rice varieties provided to clients. PhilRice MTA-Germplasm Under Development (PMTA-GUD) was attached to the SMTA for additional conditions on the transfer of breeding lines.

Registration consents were also acquired for 72 TRVs from farmers and municipal and provincial agriculturists throughout the country. Documents of the 32 TRVs were submitted to Bureau of Plant Industry for application. Moreover, complete photo documentation of 60 TRVs at three developmental stages were done before cataloguing. These documents recognize Farmers Rights and ensure protection on the TRVs origin and ownership.

Agreement among PhilRice, NCIP, and the local government of Sarangani was signed for the Sarangani Rice (SaTRice) project. Eighty-five TRVs were collected in Sarangani province from municipalities of Malapatan (46), Malungon (21), and Alabel (18). These agreements protect Indigenous People Rights.

Collecting and Acquisition of New Germplasm Materials

TE Mananghaya, MC Ferrer, JBM Alvariño, RP Mallari, MCV Newingham, MD Duldulao, DO Alfonso, JR Castro, JMZ Nombrere, and JM Niones

TRVs served as the foundation in the development of new rice varieties (IRRI, 1998). As such, they are collected and conserved while their genetic wealth are explored to facilitate the discovery of novel traits carrying rare and valuable genes including resistance to biotic and biotic stress, adaptability, and nutritional quality for present and future utilization. From January to November 2018, 531 rice germplasm was collected. Out of this collection, 322 are TRVs; 125, farmers' line; 50, breeding lines; and 32, advance/improved cultivars. North Cotabato has the most number of collections (123), followed by Negros Occidental (98), Sarangani (85), Nueva Ecija (40), and South Cotabato (30).

Collection, Characterization, Evaluation, and Conservation of Wild Rice Relatives in the Philippines

XGI Caguiat, MAM Rañeses, MC Ferrer, DO Alfonso, RM Bulatao, JC Santiago, and J Jamago

Wild rice species in the Philippines is important for rice breeders as they can draw genes from them that can help new rice varieties to adapt to adverse environments. Thus, this study aimed to conserve the wild rice relatives in the Philippines. This year, *Oryza minuta* and *Oryza meyeriana* were collected in Brgy. Balian, Pangil, Laguna and in Brgy. Magballo, Kabankalan City, Negros Occidental, respectively. *O. minuta* was found on a swamp alongside the houses while *O. meyeriana* along the roadside. Seeds and leaf samples per population were collected and brought in the PhilRice Genebank for conservation and further evaluation. Collecting and conserving *O. minuta* is significant because their availability may be at risk in the future because of rapid population growth and widespread land clearing.

Regeneration and Conservation of Rice Germplasm

MC Ferrer, JM Niones, MD Duldulao, JMZ Nombrere, JR Castro, and DO Alfonso

Ex-situ conservation provides a safe storage system for these germplasm materials under optimal storage conditions that is efficiently managed and accessible to users. Presently, PhilRice Genebank had conserved 16,724 collection of rice germplasm. This study aimed to conserve rice germplasm resource for medium- and long-term storage and rejuvenate low stocks and low viability rice germplasm for conservation and distribution. There were 934 entries selected for regeneration in 2018 DS. Result showed that only 908 germinated while 905 produced more than 100g seeds. An average increase of 30% in viability were noted after regeneration of old seed stocks, however, only 50% produced enough seeds (<400g).

Germplasm Inventory

MC Ferrer, MD Duldulao, JR Castro, JMZNombrere, DO Alfonso, and JM Niones

There were 2,000 accessions/collections with 4,932 packets handled in seed inventory. However, only 2,000 accessions/collections have enough seeds and high viability, which are readily available for distribution. Regeneration was scheduled for the 24 accessions/collections that have high seed stocks amount but with low viability; and for 430 have low seed stocks but high viability. On the other hand, 1 accession has low stock and low viability, which needs to be prioritized in the next regeneration plan to ensure survival. Results from this study will be an indispensable guide to ensure the preservation of the germplasm's genetic integrity and sufficiency of viable stocks.

Germplasm Characterization

MC Ferrer, MD Duldulao, DO Alfonso, JR Castro, JMZ Nombrere, MAM Reneses, JC Santiago, XGI Caguiat, and JMNiones

Assessing agro-morphological diversity among rice germplasms is important in genetic resources management and crop improvement. Discovery of desirable traits

from TRVs and incorporating these traits in rice breeding efforts would greatly benefit rice farmers to mitigate effect and better manage rice production in changing environmental conditions. This study aimed to provide information on morphological characterization of TRVs used to establish each accession's genetic identity, identify varieties with desirable traits for direct utilization and potential donors for crop improvement, and assess the extent of genetic diversity of the collections. Morpho-agronomy was characterized using 58 traits and following the standard descriptors list for cultivated rice. Variations in characters were observed based on multivariate statistical analysis. Results showed that several TRVs possess desirable traits that may use for direct utilization or as parental in rice improvement programs.

Germplasm Distribution and Information Management

JM Niones, MD Duldulao, MC Ferrer, MCV Newingham, and JMZ Nombrere

Efficient utilization of germplasm must be properly characterized, evaluated, and documented in a workable database system so that germplasm carrying desired characteristics could be easily retrieved and used in breeding programs. This study is conducted to maintain an accurate, reliable, and up-to-date rice germplasm information stored in the central database of PhilRice Genebank called GEMS (Germplasm Management System). GEMS database run as a stand-alone database focused for internal use in the Genebank operations and act as the central repository of all integrated data on passport, morpho-agronomic characterization, grain quality, pests, diseases, and abiotic stress reactions. It also supports Genebank's day-to-day operations from seed registration, inventories, and monitoring of quantity and quality of seeds; therefore, guiding regeneration and distribution. Rice germplasm data are continually uploaded in the GEMS database. To bridge the gap of under-utilized germplasm, PhilRice Genebank continuously provides seeds to breeders, researchers, and other stakeholders. Most germplasm were utilized in breeding and genetic studies (72%), farmers' adaptability trials (4%), special rice project (11%), and undergraduate theses (13%).

Plant Varietal Registration and Photo documentation of PhilRice Traditional Rice Collections

JBM Alvariño, JM Niones, TE Mananghaya, MC Ferrer, and MD Duldulao

Photo documentation helps researchers, farmers, and other users extract immediate and elicit information about TRVs characteristics. This photographic data can be used to illustrate scientific papers, plant guides, field guides or other products (Brunken et. al, 2008) and can be accessed online to help identify plant variety in the field (Dressler et. al, 2014). Moreover, varietal registration of the TRVs gives a defensive protection against claims of its origin and ownership by an individual or foreign entity. This entails an exclusive right to the community on the utilization and commercialization of the TRV. Photo documentation of 60 TRVs were completed on three developmental stages. Fifty out of 60 TRVs are set for cataloguing. From January-November 2018, registration consents were acquired for 72 TRVs from farmers and municipal and provincial agriculturists throughout the country. There were 32 TRVs submitted to Bureau of Plant Industry for application.

Conservation of Sarangani Traditional Rice Germplasm (Satrice)

TE Mananghaya, JM Niones, MC Ferrer, JBM Alvariño, MD Duldulao,JMZ Nombrere, DO Alfonso, MCV Newingham, and JR Castro

Sarangani province is composed of diverse communities and about half of its population are indigenous people. The National Commission on Indigenous (NCIP) People-Sarangani strictly complies with R.A 8371 or the Indigenous People's Right Act of 1998 (IPRA law) ensuring that projects uphold the welfare of IP communities. Community consultations were conducted in which six of seven municipalities in Sarangani through the Municipal Tribal Councils (MTC) gave their resolutions of support. Currently, memorandum of agreement among local government of Sarangani, PhilRice, and NCIP was forged. From June to November 2018, 85 TRVs were collected in Sarangani. . The most number of TRVs were obtained from Malapatan (46 germplasm) followed by Malungon and Alabel with 21 and 18 germplasm, respectively. There were 142 germplasm samples collected from Environmental Conservation and Protection Center (ECPC) in Sarangani . The most number of TRVs were collected from Malapatan (42), followed by Alabel (32), Glan (22), Maitum (13), Malungon (12), Maasim (5), and Kiamba (3). Moreover, 13 TRVs showed no origin.

EVALUATION OF RICE GERMPLASM FOR BIOTIC AND ABIOTIC STRESSES, GRAIN QUALITY, AND PHYTOCHEMICALS

XGI Caguiat

The PhilRice Genebank is considered as one of the international repositories of rice genetic resources and holds 16,724 collection. It conserves a diverse pool of rice germplasm collected from different parts of the country particularly from the upland areas. These germplasms possess desirable genes that serve as building blocks for the development of improved and new rice varieties. They may also have inherent genes for key traits such as high yield, good eating quality, pest and disease resistance, and tolerance to abiotic stresses. Identifying promising rice germplasm with useful traits is critical in rice improvement programs.

Rice germplasm that could help address constraints in rice production such as climate change is also identified. It is necessary to continuously evaluate the rice germplasm in the Genebank. This will also help put in more value to the collection and aid in the better database for future.

Evaluation of PhilRice Germplasm Collection for Biotic Stresses

JP Rillon, GC Santiago, SE Santiago, and KMB Guarin

There is a need to identify TRVs that would offer resistant reactions to harmful pests as they can serve as parent source for new resistant lines. This study evaluated 712 germplasm accessions from PhilRice Genebank for resistance against blast, bacterial leaf blight, sheath blight, brown planthopper, green leafhopper, and stemborer. Resistance to blast was noted in 412 germplams accessions while intermediate reactions was recorded in 113 accessions. For bacterial leaf blight, 132 accessions showed resistance while 262 accessions had intermediate resistance. No resistant reaction was noted for sheath blight though 229 accessions were observed to have intermediate reactions. Three accessions were resistant to tungro while 5 accessions have intermediate reactions. A very low insect stemborer pressure was generally observed at vegetative stage in dry and wet seasons. Majority of the entries were intermediate to BPH and GLH under screenhouse condition.

Evaluation of PhilRice Germplasm Collection for Grain Quality

AV Morales, XGI Caguiat, MC Ferrer, EH Bandonill, RD Camus, and JJMC Avila

Grain quality evaluation plays an important role in the rice breeding program. As such, accessions were screened and derived data were incorporated in a database to serve as basis for selecting parental materials. This year, 437 rice germplasm accessions were screened for grain quality. Majority of the samples have good grain quality with

high milling recovery, low amount of chalky grains, long to medium grain length, slender to intermediate grain shape, and intermediate amylose content. Twenty-eight waxy samples also had good grain quality.

Evaluation of Germplasm Materials in Response to Progressive Drought Stress

JM Niones, RR Suralta, and MCJ Cabral

This study aimed to identify, characterize, and evaluate germplasm collections as potential source of tolerance trait to drought stress. There were 1,011 germplasm collections subjected to mass drought screening under drought field condition. Establishment was done in 2018 DS in a 5 rows x 5 hills per entry with 20x20cm space between rows and hills. Four cycles of drought were implemented, which occurred during 31 DAT (maximum tillering stage), 40 DAT (panicle initiation stage), 59 DAT (reproductive stage), and 82 DAT (late reproductive stage). Among these, 139 germplasm performed better than the check varieties NSIC Rc 222, PSB Rc 14 and IR 64 after four cycles of drought. Eleven collections yielded more than 3t/ha: PRRI002923 PUINOLAGO (3898kg/ha), PRRI003377 CABANGI (3893kg/ha), RAELINE 4 (3534kg/ha), PRRI001808 DECOLA (3471kg/ha), PRRI003358 MARAGAYA (3459kg/ha), PRRI003410 BASILANIN (3336kg/ha), RAELINE 8 (3188kg/ha), PRRI002937 KINANDANG PUTI (3168kg/ha), PRRI004812 RED TONNER (3038kg/ha), PRRI001188 PSB Rc68 (3025kg/ha), and PRRI001312 PLB 628 (3013kg/ha). Maturity of these germplasm ranged from 103-120 days after sowing. Further screening of the 11 identified germplasm using the line source sprinkler system is needed to verify the tolerance and characterize the root system under different soil moisture intensities.

Evaluation of Rice Germplasm for Submergence and Salinity Stress

JC Santiago, MAM Rañeses, RD Buluran

Salinity and submergence stresses are a serious threat to sustainable rice growth, quality, and productivity. Genebank rice germplasm were subjected to salinity and submergence stress under glass house and water tank facility conditions to evaluate their phenotypic tolerance and response in both stresses. FL478 and IR29 were used as salinity tolerant and susceptible check germplasms while FR13A and IR42 were used as submergence tolerant and susceptible parameters. Scoring of materials were done for stress tolerance using modified standard evaluation system (SES) of IRRI. Eighty traditional rice germplasms were found to be susceptible to submergence stress. Meanwhile, of the 333 rice germplasms screened for salinity stress, 2 germplasms emerged as highly tolerant (PR34358-5-POKKALI-AC-37 M5R-15-Dr93 Saline and TCCP266-1-3B-10-2-1).

Evaluation of Rice Germplasm for Zinc Deficiency Tolerance in Caraga Region

HA Jimenez, JB Culiao, JD Tangog, GF Estoy, Jr., JM Niones, and XGI Caguiat

This study aimed to evaluate germplasm materials with tolerance to soil zinc deficiency. Of 700 rice germplasm entries screened, 115 (16.43%) accessions were identified with tolerance to soil zinc deficiency with good to excellent phenotypic performance. Meanwhile, 180 (25.14%) rice germplasm accession were identified with moderately tolerance to soil zinc deficiency with good phenotypic performance. Furthermore, 138 (19.71%) had intermediate tolerance to soil zinc deficiency. The study also found that 92 (13.14%) of the rice germplasm accessions are moderately susceptible to zinc deficiency while 40 (5.71%) are susceptible to zinc deficiency.

Evaluation of Rice Germplasm for Rice Tungro Resistance at PhilRice Midsayap

PS Torreña and KMB Abejar

The study aimed to provide information on the field reactions of PhilRice germplasm materials with resistance to rice tungro virus. There were 925 entries sown; however, 145 entries did not germinate. TN1 was planted ahead of the entries to serve as spreader rows and IR 64 served as susceptible check. A very low population of green leafhoppers and no rice tungro-infected plants were recorded in the experimental area and in the adjacent fields. The condition resulted to no tungro infection among the germplasm entries at 45 days after transplanting.

DNA CONSERVATION AND GENETIC CHARACTERIZATION OF PHIRICE GERMPLASM ACCESSIONS

TE Mananghaya

DNA banking is complementary for ex-situ and in-situ conservation. It is also used in establishing the genetic identity and profile of traditional rice varieties to prevent exploitation and illegal claims. Moreover, DNA fingerprinting helps eliminate duplication and mismatch in the PhilRice Genebank germplasm accession. Aside from morphological characterization generated in the Genebank, genetic information and genomic sequence information are also necessary to improve genetic crop.

DNA quality and quantity were checked twice a year using spectrophotometer to ensure the integrity of the DNA stock. Rice germplasm accessions were also characterized at the molecular level.

DNA conservation of important rice germplasm accessions

TE Mananghaya, MC Ferrer, RP Mallari, JBM Alvariño, MD Duldulao, and JM Niones

There were 1,425 DNA samples from traditional varieties collected across the country and stored at PhilRice Genebanks either for short or long term. The absorbance of double stranded (dsDNA) DNA ranged from 1.7 to 2-2ug and had low standard deviation (0.6 and 0.2) indicating that the data is close to each other and does not have huge outlier. This implies that the extraction method used is good and that human error is minimal. Barcode documentation will be implemented in future activities.

DNA Fingerprinting of Selected Rice Germplasm Using Simple Tandem Repeats (STR) Markers

TE Mananghaya, RP Mallari, VG Dalusong, MC Ferrer, JBM Alvariño, MD Duldulao, JM Niones, and LR Hipolito

Molecular characterization is conducted to verify the identity of TRVs with similar names and phenotypic characteristics. As such, this study aimed to establish the genetic identity and DNA fingerprints of TRVs using STR markers.

Good quality DNA was extracted from 952 TRVs and genotyped using 16 STR markers. Generated genotypes were used for genetic diversity analysis using NTYSYS spc v.20 and Powermarker v.3.25 for the marker analysis. Results showed high PIC value of 0.7449 and low similarity coefficient of 0.12 with 2 major clusters. One hundred sixty-one alleles were identified from the population. The samples imply high genetic diversity.

Molecular Characterization of Gene Pool Using Functional Markers

JBM Alvariño, JM Niones, TE Mananghaya, RP Mallari, VG Dalusong, and MPB Castillo

Around 15,000 rice germplasm accessions composed of released TRVs, mutant lines, elite breeding lines, and cultivars from other countries are deposited at PhilRice Genebank. There were 449 germplasm characterized in the 2018 DS for drought resistance with RM511 as check. Of them, 21 TRVs were identified to carry genes with at least three traits. Four hundred eleven germplasms were characterized in 2018 WS. Eight hundred sixty traditional rice varieties were characterized using 8 functional markers for Bacterial Leaf Blight (Xa4 and Xa21), submergence (SC3 and ART5), and fragrance (multiplex PCR marker) gene.

Complete Genomic DNA Sequencing of Selected Philippine Traditional Varieties for In Silico Gene Discovery

XGI Caguiat, RP Mallari, TE Mananghaya, JM Niones, LM Perez

This study aimed to utilize the application of next-generation sequencing to discover new genes among selected Philippine traditional rice accessions. Genomic DNA of three selected TRVs (Malay 2, Binato, and Arabon) were sequenced using Ion Photon technology. The bioinformatics pipeline for rice was used to generate variant calls. Base reads ranged from 82 million bases (Arabon) to 23 billion bases (Malay 2). GC content was at 40-41%. However, alternative for the use of Ion Photon may be explored for sequence reads of more than 50% due to the single-end nature of the sequence generated. Thus, it is recommended to use paired-end and more advance sequencing equipment for future researches.

SEED QUALITY ASSURANCE OF PHILRICE SEED STOCK

SR Brena

GRD's Seed Technology Unit inspects and assesses fields to ensure genetic purity of seeds produced at PhilRice-CES. Seed purity and viability testing are also routine activities, which serve as the Institute's internal control on determining the quality of seed produced after harvest and during storage. This may include carry over seed lots of previous cropping and buffer stocks.

Generally, fields are inspected 20 days after transplanting, maximum tillering, on-set of flowering, and 2 weeks before harvesting. Although these are the prescribed inspection, rouging can be done at the sight of off-types in the field. The field under each seed class planted per variety was inspected in three replications. Under breeder seed production (BSP), 500 plants or 20 x 25 hills were pegged by bamboo sticks and inspected. However, under foundation seed (FSP) and registered seed production (RSP), 10,245 plants or 32 x 32 hills were pegged by bamboo sticks and inspected.

During 2018 WS, 20 varieties under BSP; 15, FSP; and 17, RSP were inspected. In the varietal purity testing, 500g sample were taken at random on a particular variety after different postharvest operations (after threshing, drying, and cleaning) to assess the presence mixtures. The determinants of off-types are grain shape, color, width, and presence and absence of awns. Varieties submitted for varietal purity were also tested using grow-out test to verify off-types found in the laboratory.

Based on results, all varieties may decrease their viability and vigor with the passing of time. However, some varieties may also decrease their viability due to their own characteristics. It also showed that varieties planted in the wet season take lesser time to germinate than varieties planted in the dry season.

Internal Field Inspection of Seed Production Areas

SR Brena and RC Ramos

Under BSP, NSIC Rc 420, NSIC Rc 478, NSIC Rc 470, NSIC Rc 468, NSIC Rc 472, and NSIC Rc 474 were rejected in 2018 DS due to too many mixtures observed. NSIC Rc 222 under RSP were also rejected due to different plant canopy orientation while NSIC Rc 222 produced as foundation seed was rejected to maturity. In 2018 WS, 20 varieties under BSP; 15, FSP; and 17, RSP were inspected. There were no varieties rejected under all seed classes inspected in this season.

Seed Testing of Buffer Stock and Carry Over Seed Lots

SR Brena, RC Ramos, and AGS Ferriol

Eight varieties harvested in 2017 WS and 15 varieties harvested in 2018 DS were tested using GOT. BS varieties harvested in 2017 WS and 2018 DS showed that the genetic purity before harvest in all varieties except NSIC Rc 218 and NSIC Rc 345 had 100% genetic purity. However, at post-harvest operations, the genetic purity using GOT showed that genetic purity was less than 100%. This showed that mechanical mixtures were observed through post-harvest operations.

GENETIC RESOURCES RESEARCH

JM Niones

Establishing a Philippine Rice Genetic Resources Network (PRiceNET)

MD Duldulao, JM Niones, MC Ferrer, XGI Caguiat, TE Mananghaya, MCV Newingham, and JBM Alvariño

PRiceNET aimed to establish a network of government, NGOs, and state universities and colleges (SUCs) involved in the conservation of Philippine traditional and farmer-bred rice varieties. This study focused on inventory of rice genetic resources conserved in-situ and ex-situ in accordance with the country's obligation as signatory and member of the Governing Body to the International Treaty on Plant Genetic Resources for Food and Agriculture (ITPGRFA). Institutions eligible for membership in PRiceNET are members of rice research for development network or willing to make rice germplasm under their jurisdiction available under the conditions stated in the Standard Material Transfer Agreement (SMTA). In this initiative, nine areas of collaboration were identified.

Characterization of Root elongation responses of Philippine Traditional Rice Varieties under N deficient conditions

JM Niones, MPB Castillo, JM Manangkil, and TE Mananghaya

Improvement of root system architecture (RSA) is an important trait to enhance water and nutrients uptakes from soil, resulting in improved grain yield. One thousand five hundred rice germplasms were screened for the maximum root length (MRL) at seedlings under deficient (5µM) and sufficient (500µM) concentration of NH4+. Under 5µM, 25 TRVs showed long roots with ARINGAY having the longest at 283mm under 5µM NH4+. Selected traditional rice varieties with high MRL and improved RSA are potential sources of root elongation genes in response to nitrogen deficiencies.

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

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

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

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