Farmer-Grown Rice Genotypes in the Philippines

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We are a government corporate entity (Classification E) under the Department of Agriculture (DA). 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 our “Rice-Secure Philippines” vision, we want the Filipino rice farmers and the Philippine rice industry to be competitive through research for development work in our central and seven branch stations, including our satellite stations, coordinating with a network that comprises 60 members strategically located nationwide.

We have the following management certifications: ISO 9001:2015 (Quality) and ISO 14001:2015 (Environmental).

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The DA-Bureau of Agricultural Research (BAR) was created by virtue of Executive Order 116 signed in 1987 by President Corazon C. Aquino. Under this EO, the government addressed the lack of coordination and integration of agriculture research and development among the existing bureaus, councils, and agencies by creating BAR under the Research, Training, and Extension Group. BAR’s specific mandate to coordinate agricultural research was affirmed by EO 292, otherwise known as the Administrative Code of 1987. BAR’s specific mandate is to: “to ensure that all agricultural research is coordinated and undertaken for maximum utility to agriculture. It shall tap farmers, farmer organizations, and research institutions, especially the State Colleges and Universities, in the conduct of research for the use of the Ministry and its clientele, particularly the farmers/fishermen and other rural workers.”

In 1997, Republic Act 8435, a law also known as the Agriculture and Fisheries Modernization Act (AFMA), was enacted. This law, together with Executive Orders 127 & 338 affirmed the leading role of BAR in coordinating and managing agriculture and fisheries research and development (R&D). “Further expanded and strengthened the mandate of BAR by providing leadership in enhancing, consolidating and unifying the national and regional agriculture and fisheries research and development programs of the National Research and Development System in Agriculture and Fisheries (NaRDSAF)”.

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Contents

Figures

Chapter 1

Chapter 2

Chapter 3

Chapter 4

Chapter 5

Chapter 6

Chapter 7

Chapter 8

Tables

Chapter 1

Chapter 2

Chapter 3

Chapter 4

Chapter 5.

Foreword

In the Philippines, farmers select, plant, and maintain their own rice lines/varieties that thrive well in their areas. In spite of the proliferation and accessibility of recommended rice varieties, about 15% of the farmers have adopted unclassified seeds since 1992. In some areas, these farmers' rice lines/varieties have been reported as better than varieties released by the National Seed Industry Council (NSIC). Yet, information on and documentation of such seeds have not been established.

The farmers' preference for indigenous varieties is influenced by their own cultural and management practices and selection criteria such as resistance to certain pests and diseases, eating quality, and ready availability of such materials in the locality. Seeds are acquired through seed exchange with adjacent farms and communities or produced as a result of their meticulous observations and year-long trials in their respective farms.

This book documents the findings of the project "Collection and Evaluation of Farmers' Rice Lines in Irrigated and Rainfed Lowland Areas in the Philippines," which has explored, collected, and evaluated farmers' rice lines/varieties in irrigated and rainfed areas in the country for selection, phenotypic evaluation, and genetic characterization. It is hoped that these farmers' rice lines will become sources of important genes that may serve as excellent raw materials to achieve the goals of responding to future needs of rice improvement and charting the directions of national rice production programs.

SAILILA E. ABDULA, PhD
Project Principal Investigator
Former DA-PhilRice Executive Director

Message

In this interesting book, the authors will walk the avid reader through a Sherlock Holmes-like investigation of certain cultigens of rice with unknown or unclear origins but have anyway reached our farmers' hands for cultivation. The authors, coming from various disciplines, refer to such materials as "farmer-grown rice genotypes or FGRGs" as a consensus terminology as the various studies progressed to unravel the mystery.

In the seed industry world, meanwhile, seeds and seed lots can be buzzed around as 'copycats,' implying many negative connotations, from lacking originality to being outright unlawful. The tact of the book does not take off from this, however. A rigid discourse on the associated concept of "farmers' rights" is also sidestepped. Although the ramifications of FGRGs with respect to R&D and the industry conclude the book, the various dissections done by the different experts put the thrill to the whole narrative. The book is thus a fresh attempt at discreteness—the identification through characterization of such materials, some of which may have been truly generated by farmers.

Read on and judge for yourself.

JOHN C. DE LEON, PhD
Executive Director
DA-PhilRice

Acknowledgment

Indeed, it is an enormous pleasure to thank the institutions and research personnel who put their knowledge and commitment to the completion of this project: first, the Department of Agriculture-Bureau of Agricultural Research (DA-BAR) that invested in this research project to collect farmer-grown rice genotypes countrywide and determine how these collections could be useful in the industry; second, the Department of Agriculture- Philippine Rice Research Institute (DA-PhilRice) and staff who religiously collected data from farmers' fields and then wrote about them.

The project would not have come into place without the proponents led by Dr. Sailila E. Abdula, Mr. Aldrin Y. Cantila, Ms. Joanne Domingo-Caguiat, Mr. Xavier Greg I. Caguiat, Ms. Rhemilyn Z. Relado-Sevilla, Dr. Marissa V. Romero, Dr. Mary Ann U. Baradi, Mr. Andres L. Dela Cruz, Jr., Dr. Caesar Joventino M. Tado, Dr. Reynaldo C. Castro, Dr. Victoria C. Lapitan, and Mr. Abner T. Montecalvo—our sincere gratitude goes to them. We thank Mr. Jose Carlo A. Alarilla for painstakingly working on the photos. We are very grateful for the hard work and assistance of the chapter authors and their respective collaborators in each region.

Those who wrote about and actively participated in the project, their names are all written in each chapter, we thank them. Likewise, to the farmers, local goverment officials, and stakeholders from all regions, thank you very much for supporting and guiding us. Our deep appreciation goes to all of you. This book will be helpful to the Philippine rice industry because of the information obtained on these rices.

Let us continue to persevere to genuinely help our farmers, researchers, millers, stakeholders, and consumers to uplift their lives and make the Philippine rice industry more vibrant and thereby secure a bowl full of rice for every Filipino.

God bless us all.

NORVIE L. MANIGBAS, PhD
Project component lead
DA-PhilRice

Executive Summary

Over the years, farmers' cultivated rices have existed and have been planted in spite of the annual release of new varieties by the National Seed Industry Council (NSIC). Farmers have reasons to still use them. They have their own way of selecting what rice variety to plant, and they do not have easy access to certified and high-quality seeds. Based on feedback from development workers and local government units' agricultural extension workers (AEWs), there are cultivated rices not approved by the Philippine Seed Board (now the NSIC) in several rice communities. These cultivars can be called farmer-grown rice genotypes (FGRGs). Some of these genotypes are widely used by farmers in their respective localities and have been preserved for years, while others were introduced by fellow farmers from nearby barangays, municipalities, and provinces. Genotypes or varieties are often named after the person who introduced and brought them to the community. There were also claims that they got a few seeds from field days, conferences, and training. Some farmers and AEWs reported that certain genotypes in their areas were introduced by seed dealers and sales agents. Some of these genotypes could have been taken from yield trials and are not yet officially released as a variety. With many approved and released rice varieties in the Philippines, it is important to explore how these unclassified rices existed and why farmers continue to plant them.

Farmers save their own seeds for the next cropping or get them through seed exchange with other farmers. The farmers' genotypes/varieties that show good performance become popular, especially in areas where an informal seed system is dominant. Under such a system, farmers borrow or buy rice seeds from other farmers in the locality or from neighboring places. Rice seeds are moved without proper identification of the source and the name of the variety or genotype, thus creating a situation where farmers are obliged to give a different name or classification. This is where the problem emanates: farmers name the rice genotype after the place where it was bought or give it any name associated with the source or the rice characteristics. As a result, hundreds of rice genotypes flourish in the country with different names. More often, they can be similar to the NSIC-released varieties. As a guide, terminologies such as FGRGs, unclassified varieties/genotypes, and farmers' varieties or lines were used in this book interchangeably to mean genotypes collected in the field. To further understand the reasons for farmers' continuous use, studies were conducted to collect, characterize, and evaluate these rice genotypes. The rices came from different regions where they were meticulously characterized, evaluated in the field and laboratory, and analyzed in terms of phenotypic and genotypic constitution. Results of the analyses are described in this book.

CHAPTER 1

Rice Farming, Variety Improvement, Research, and Development in the Philippines

Norvie L. Manigbas

The use of appropriate or adapted varieties is one of the most important considerations in rice farming in the Philippines. It is a crucial guidepost used by farmers to ensure success in their rice production to generate income for the household. Farmers always want new varieties for planting even if most of them are not registered under Philippine laws. Farmers who are seed growers and who engage in farming are very strict in producing only released rice varieties because they are governed by the national seed quality certification system that certifies what they produce. It is also their way to take advantage of government programs on variety procurement. Only varieties officially released in the Philippines are allowed for crop insurance and other government-supported funding projects.

The variety of farmer-grown rice genotypes (FGRG) collected across the country is a clear manifestation of how important these varieties are to them. Majority of the farmers rely on their time-proven scheme of farmer-to-farmer seed exchange. Whatever is new and has been proven by a neighboring farmer to have better yield, good eating quality, and a high price in the market is kept and tested regardless of source.

FGRG have been continuously used and proven adapted to specific locations and environments because they were products of selection from previously released cultivars. These are tackled in the succeeding chapters on their genetic similarities and morphological characteristics. Farmers often name the rice in many ways such as after the person (e.g. Domeng for Sinandomeng, Ryan rice, Imelda rice, etc.) from whom they acquired the material; place (e.g. Mindoro rice, Vietnam rice, Kinavite, etc.) where they got it; major characteristics and yield performance (e.g. Aerobic rice, 75 days or Speed 75, 7 tonner, etc.); color of grains (e.g. Kapula, Red rice, Red 18, etc.), letter and/or number combination (e.g. DCL-300, 147-2, IL 29, etc.); and even strange names (e.g. Bisada, Bodo-Bodo, Chichong, etc.) - to name a few.

This chapter deals on the scenarios of where rice is grown, not only FGRG but also rice in general; glimpse on the Philippine rice industry; problems and opportunities in rice production; variety improvement; and development and extension.

Rice ecosystem

The rice ecosystem is composed of two main classifications based on water regime, dry and wet land (Figure 1). Under the dry land ecosystem are the upland and rainfed environments. Wetland rice is composed of the irrigated lowland, upland irrigated (i.e., mountain terraced paddy fields), and deepwater or medium deepwater. At present, based on National Cooperative Test (NCT) data of released varieties in 2018, average yield of upland rice is still low at 2-3 t/ha and that of rainfed rice is 3-4 t/ha. Under the irrigated lowland ecosystem, yields average 6-8 t/ha but as much as 12 t/ha can be attained from both hybrids and inbreds. Some irrigated and rainfed environments are often subjected to drought, salinity, high and low

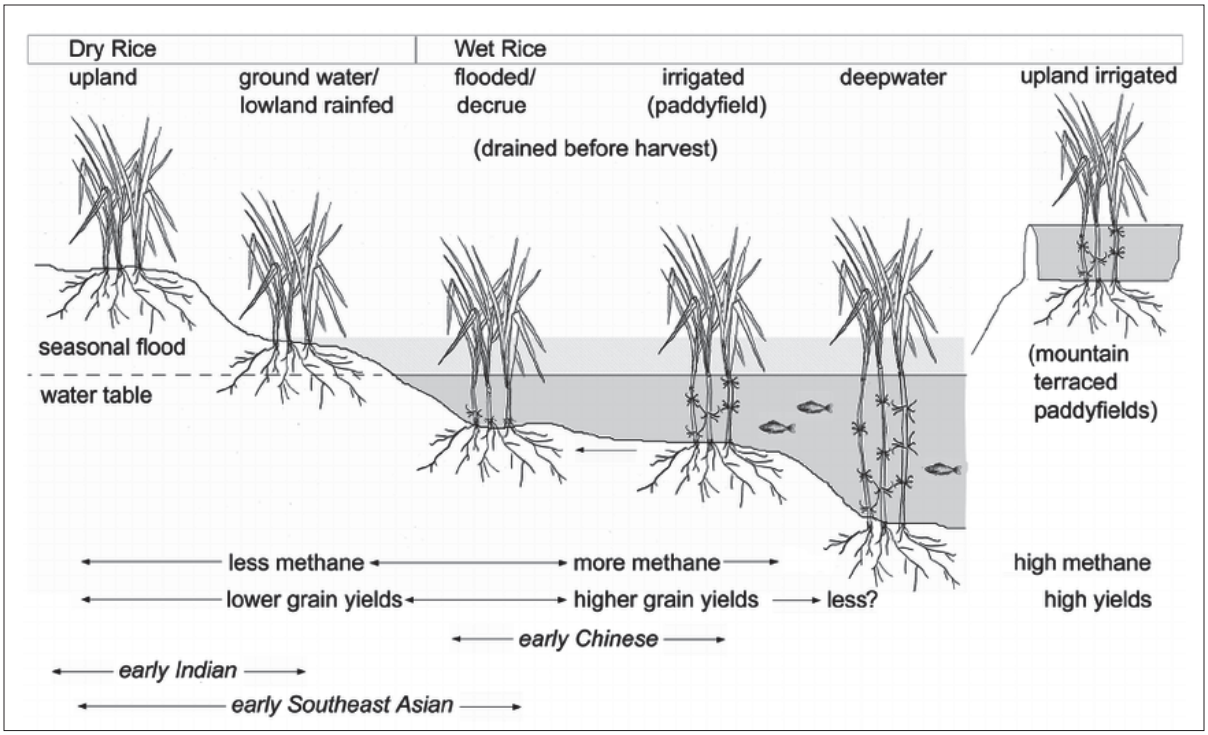

Figure 1. Schematic diagram of rice ecosystem (accessed through Google photos of rice ecosystem; June 3, 2019).

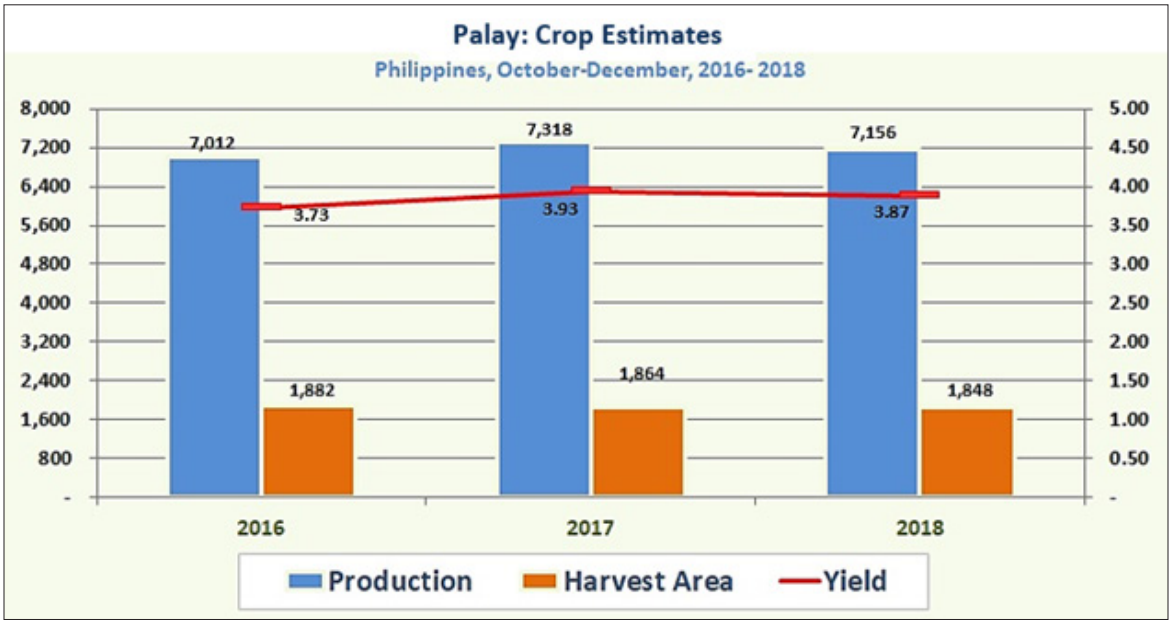

Figure 2. Palay production, harvest area, and yield in 2016-2018 (Philippine Statistics Authority [PSA] Report, June 2019).

temperatures, and submergence, depending on location in the country, which can significantly reduce yield by as much as 60-70%. Deepwater rice area in the Philippines is very small. Most of it are either fish areas or marshlands in Luzon and Mindanao that are important because they are the main source of their rice.

Rice production, imports, and exports

The Philippines is the ninth largest rice producer in the world, accounting for 2.8% of global rice production. It has been reported that the country is also the world's largest rice importer in 2010. Its arable land is 5.4 million (M) ha. The rice area harvested has expanded from nearly 3.8 M ha in 1995 to about 4.4 M ha in 2010, and 71% of rice production came from irrigated areas (ricepedia.org/philippines; accessed 2019). According to 2019 Philippine Statistics Authority (PSA) data, the country's *palay* production in October-December 2018, was 7.156 M metric tons (mt), lower than the previous year's 7.318 mt (2.2% decrease). Harvest area contracted by 16,000 ha from the 2017 level of 1,864,000 ha. Yield per hectare dropped from 3.93 mt in 2017 to 3.87 mt in 2018 (Figure 2). There were substantial decrements in output in Cagayan Valley (0.15 M mt) and Ilocos Region (0.13 M mt). Reduction in harvest area was largest in the BARMM, followed by Ilocos Region, Bicol Region, and CALABARZON. Production in 2018 at 19.07 M mt declined slightly by 1.1% compared with the 2017 output. Similarly, harvest area and yield were less by 0.2% and 0.9% than their respective levels in the previous year.

PSA (2019) further reported that Philippine rice imports from nine rice-supplying trade partners in 2018 cost US$736.6 M (Table 1). The value of rice imports expanded by 65.1% since 2014 when rice purchases cost $446.2 million. Over the years, imported rice expense more than doubled (up to 105.9%) from $357.7 M in 2017 to 736.6 M in 2018 (http://www.philippinesaroundtheworld.com/philippines-rice-imports-by-country, 2019). Asian countries accounted for more than 99% of the Philippines' imported rice bill in 2018. There were two exceptions though: $9,000 worth of rice came from Spain and another $8,000 worth was shipped from Italy.

Despite the huge rice imports, the Philippines shipped, after 40 years, 35 mt of rice consisting of 15 mt of organic black rice and 20 mt of aromatic long-grained rice to Dubai in May 2013 (PhilRice, 2013). The last recorded rice export was in 1973. The black rice was produced by farmers from the Don Bosco Foundation for Sustainable Development, Inc. in North Cotabato and the long-grained Jasponica rice of SL Agritech was produced by farmers in Talavera, Nueva Ecija. There were, however, unpublished reports that organized organic rice farmers in Bohol and Benguet were exporting pigmented traditional rice to the USA.

Table 1. Countries that supplied rice to the Philippines in 2018 (PSA, 2019).

Country	Value (US$)	Percent
Thailand	355.2 million	48.2
Vietnam	280.7 million	38.1
India	45.1 million	6.1
China	30.7 million	4.2
Pakistan	21.3 million	2.9
Myanmar	3.5 million	0.5
Cambodia	48,000	0.007
Spain	9,000	0.001
Italy	8,000	0.001

Problems and opportunities in rice farming

New rice farming technologies are available and have been proven effective by research conducted by the International Rice Research Institute, University of the Philippines Los Baños, and the DA-PhilRice. Collaborative undertakings are still being done with major agencies of the Department of Agriculture and with state universities and colleges to address problems and concerns in rice production in the country. One of the most challenging problems that farmers face today is the occurrence of environmental stresses brought about by the changing global climate. It was reported in December 2018 (www.rappler.com/newsbreak/.../history-rice-crisis-philippines) in Mindanao that local rice production dropped to 17% due to drought and rice tungro virus. Flooding caused by typhoons during monsoon seasons during the reproductive stage of the crop can cause severe yield loss. Drought and high temperature during the dry season have similar effects on yield.

Arida (2009) reported several problems besetting the rice industry in the country: high cost of inputs, low price of *palay*, lack of capital, labor problem, lack of postharvest facilities, incidence of pests and diseases, and inadequate irrigation system. Other concerns are lack of capital for inputs and occurrence of pests and diseases that significantly affect production during the wet season. The irrigation system is also a significant factor for the dry and wet seasons. This implies that an increase in these factors would considerably reduce

output. Further, it was reported that the high cost of inputs could lead to an increase in output due to the farmers' efficient use of inputs such as fertilizer and pesticides. The low *palay* price is also a problem as farmers who can get more yield face difficulty in postharvest handling due to unavailability of facilities, thus forcing them to sell their produce at a low price. These problems are still being addressed at present.

Given all the problems facing rice farming in the Philippines, several ways have been identified to address these challenges. Newly developed technologies have to reach farmers in the community. Manigbas and Badajos (2018) expressed the need to use strategies to enhance the capacity of farmers and their community, particularly those with limited financial resources. Farmers have to be empowered so they can take control over their production. Training of farmers, in partnership with researchers and local government units, must be done in order to advance sustainable agriculture.

New approaches have to be explored so that farmers themselves can work together to achieve their goal of increased productivity and income. One success story involved the implementation of a program on multiplication and distribution of high-quality seeds to farmers, especially those who could not afford to buy them. The strategy was a partnership among the funding agency, government agencies, farmers' cooperatives and associations, and the local government unit. Farmers are lent high-quality seeds of the variety they choose at the start of the planting season and they return the equivalent cash of the seeds to the cooperative after harvest. The amount generated becomes the seed money (self-help fund) of the cooperative from which members can borrow to help finance their farm operations and buy new farm machinery and tools. Capacity enhancement through farmers' training on new rice production practices, field days, meetings, and consultations at each site are conducted to increase farmers' knowledge of new technologies. The farmers are now selling their *palay* to the cooperative at a higher price and the cooperative gets a good price from millers. Some farmer cooperatives mill their farmer-members' harvest and sell these to malls and direct markets at premium and special prices. In this way, farmers are assured of a good income and a chance to compete in the world market.

Agri-entrepreneurship controlled by a farmers' group/association is one key approach that can empower them and improve their livelihood and income. This is done through the previously described collective approach. In this new era of rice farming and trade liberalization, farmers should be able to compete in local and international markets. Critical is the use of high-quality seeds and production technologies developed or promoted by DA-PhilRice such as the PalayCheck system, the Leaf Color Chart, the Minus-One-Element-Technique, the Rice Crop Manager, e-technologies (electronic) through cellphone applications for ease in accessing information and guides to farming, mechanization, postharvest technologies, milling, packaging, and marketing. These should be in the mainstream of farming in the Philippines instituted by the farmers themselves.

The battle in marketing is not for *palay* anymore but for high-quality packaged milled rice that can be sold in different types, depending on milling quality, as regular, premium, and special rice. Farmers and consumers both benefit from the reasonable and affordable cost of products in the national and international markets. Many good prospects and opportunities exist and they should start in the community of farms. Farmers need to organize themselves and develop their products in such a way that they can compete in the world market.

Rice breeding and research

Rice research has long been conducted by government agencies and non-government organizations and many studies have achieved significant results, but rice farming has not progressed fast enough in the Philippines. We have been left behind by our neighbors in Southeast Asia in terms of rice exports. Workman (2018) reported that the Philippines ranked 79th among the world's top exporters of rice, with a value of US$470,000, which is only 0.002% of total rice exports. India, being number one, is worth US$7.4 billion, contributing 30.1% of total rice exports. Thailand is ranked second, worth US$5.6 billion with 22.7% contribution. Vietnam is number 3 (US$2.2 billion; 9% of total rice exports); Cambodia, number 10, (US$375.2 million; 1.5% of total rice exports), and Myanmar, ranked 11 (US$333.3 million: 1.4% contribution) (www.worldstopexports.com/rice-exports-country). Looking at these data alone, it can be surmised that the Philippines is among the top-ranked importing countries in the world.

Research has been continuing on improving and creating new rice varieties that are climate-resilient, both for inbreds and hybrids. Manigbas et al. (2020) indicated that the breeding strategy that PhilRice is implementing is now anchored in Agriculture 4.0. The aim is to revolutionize the varietal development system of the Philippines by leveraging available technology to navigate the difficult terrains grappling with the rice

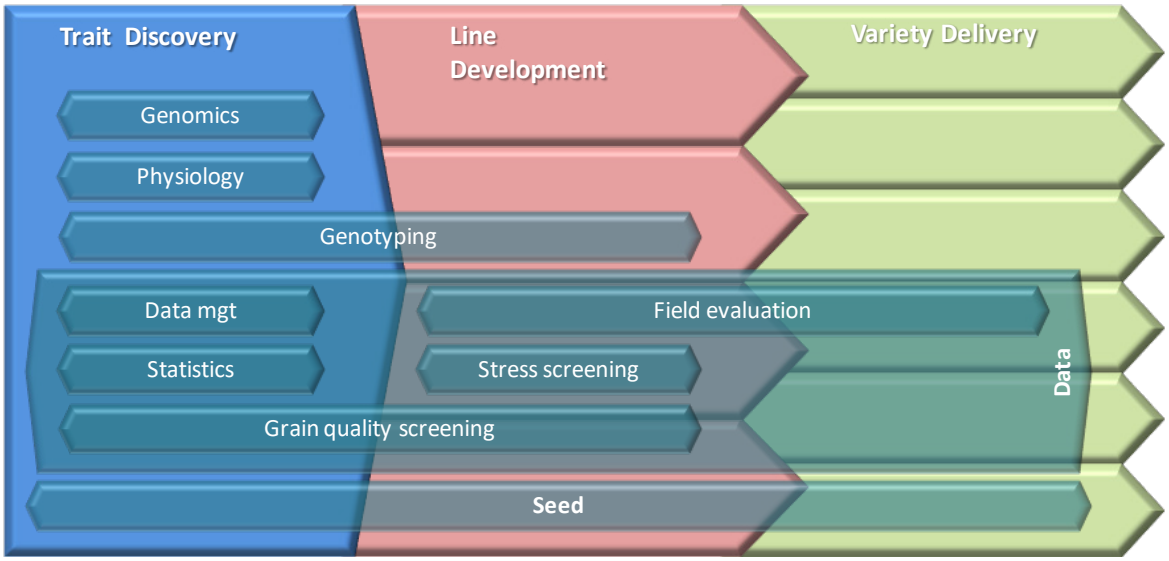

Figure 3. A simplified overview of the variety development workflow from design through development to delivery (Manigbas et al, 2020).

industry at present and in the future. There is a need for a stronger and more cohesive variety development structure to keep up with the needs of the times as well as to meet global challenges. Rice breeders are tasked to come up with new rice varieties that can double the current yields, are climate-resilient, pest- and disease-resistant, palatable, and nutritious.

One of the new approaches in rice improvement research is working closely with specific units at DA-PhilRice and getting involved in a wide array of disciplines such as genetic resources, crop protection, agronomy and physiology, rice chemistry, socio-economics, business development, molecular biology, and genetics. Stakeholders, millers, and market participants also need to be involved to stand a better chance at being successful in raising the yield frontier in both experimental farms and farmers' fields and in gaining acceptability among consumers. A panel of senior breeders and consultants held workshops to discuss the incorporation of new breeding techniques and methods for a more efficient implementation of their breeding programs.

The Plant Breeding and Biotechnology Division (PBBD) takes an industry-inspired paradigm with three major components: trait discovery, line development, and variety delivery (Figure 3). Trait discovery covers basic concepts and new breeding techniques, application of high-throughput molecular markers, novel gene discovery, stress tolerance and resistance, statistical methods, and rice physiology and quality. Line development takes care of hybridization, generation advance, multilocation tests, technology optimization, and application of combined breeding methods. The variety delivery component includes product characterization, upscaling, promotion, and providing customer support systems.

Rice development and extension

In March 2019, a new era on rice development and extension has begun with the conceptualization of the Rice Competitiveness Enhancement Fund (RCEF) as an answer to the Philippines' rice industry problem. DA-PhilRice (2019, unpublished report) stated that RCEF is one provision of Republic Act 11203 to improve rice farmers' competitiveness and increase their income amidst the liberalization of the Philippine rice trade policy that replaced quantitative restrictions on rice imports with tariff. Further, RCEF is intended to complement and supplement existing projects and activities of the Philippine Department of Agriculture's (DA) National Rice Program (NRP) and primary agencies such as the DA-PhilRice, Philippine Center for Postharvest Development and Mechanization, Agricultural Training Institute, Bureau of Plant Industry, with the Technical Education and Skills Development Authority as the technical working group (TWG). The TWG is supported by other relevant agencies such as the local government units (LGUs), regional field offices of the DA, National Irrigation Administration, Land Bank and Development Bank of the Philippines.

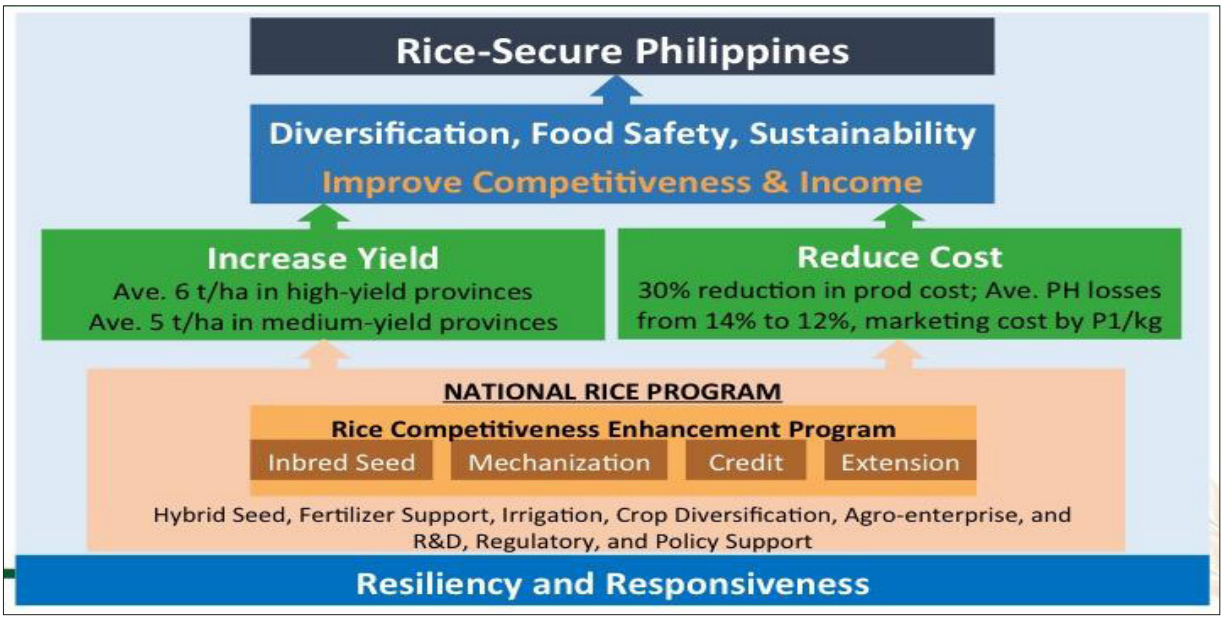

Figure 4. Alignment of the Rice Competitiveness Enhancement Program to the National Rice Program and the Philippine Rice Industry Roadmap (Unpublished report; Philrice, 2019). Date accessed: January 2020.

Figure 5. Workers distribute high-quality certified seeds under RCEF seed program (courtesy of PhilRice photobank).

RCEF has four key components: 1) rice farm machinery and equipment; 2) rice seed development, propagation, and promotion; 3) expanded rice credit assistance; and 4) rice extension services, which shall be implemented in an integrated manner and are consistent with the Philippine Rice Industry Roadmap (PRIR) (Figure 4).

The PhilRice vision of 'Rice Secure Philippines' aims to increase average yield to 6 t/ha in high-yielding provinces and to 5 t/ha in medium yielding provinces by 2024. It also targets a decrease in production cost by 30% and a reduction of postharvest losses to 12%, thereby cutting marketing cost by PhP1/kg. The goal is to increase rice farming income by 50%. With these strategies and with better implementation by a well-orchestrated machinery under the DA, the country can regain its reputation as one of the top rice producers in Southeast Asia.

In March 2021, RCEF-Seed Program delivered 1.68 M bags of inbred certified seeds to 674,400 farmers in 948 municipalities in the country, hitting 98.5% of the program's target (Figure 5) (https://da.gov.ph). It was reported that the first two years of implementation of the Rice Tariffication Law (RTL) that created RCEF, allowed farmers to produce additional harvests, averaging 400 kg/ha or roughly eight cavans (at 50 kg each), equivalent to an additional income of PhP7,000 per hectare. This shows that with the use of certified seeds, adoption of modern technologies, and mechanizing land preparation, crop establishment and harvesting, farmers could attain incremental yields. With the continued strong support of the local government units LGUs), it is expected that seed deliveries will be enhanced in the coming planting seasons.

The distribution of high-quality certified seeds of recommended varieties in each region was done chiefly in partnership with LGUs. Farmers registered in their respective municipalities under the Registry System for Basic Sectors in Agriculture (RSBSA) and rice cooperatives and associations accredited by the DA are given free seeds.

Along with the distribution of seeds to farmer recipients, there are training programs for farmers and agricultural technologists conducted by DA-PhilRice

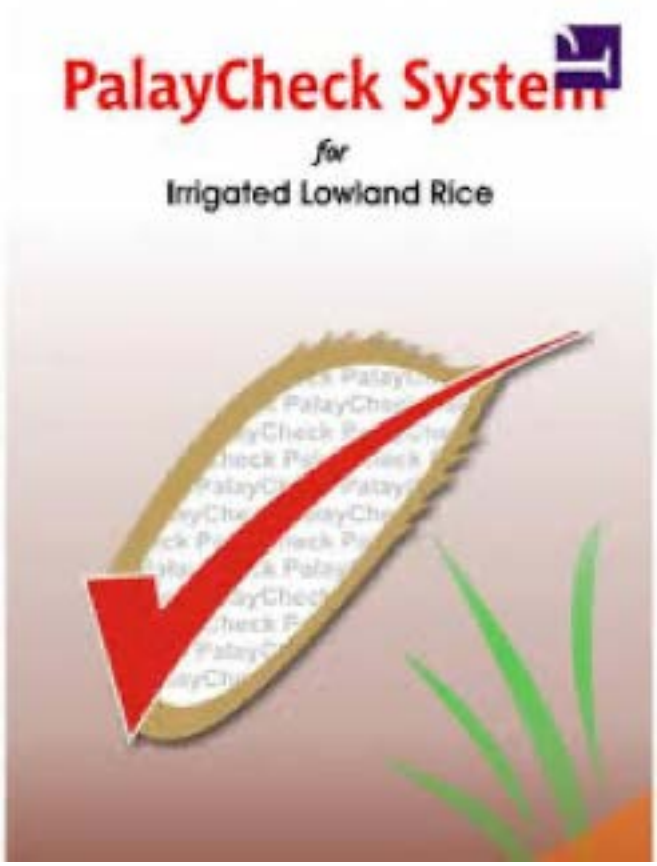

Figure 6. The PalayCheck System booklet for irrigated lowland rice (courtesy of PhilRice photobank).

and the DA-Agricultural Training Institute. The training aims to develop the farmers' diagnostic and technical skills in managing their farms and incorporating new techniques in rice production practices. DA-PhilRice (2020) reported that, aside from these training programs, RCEF-RESP (Rice Extension Services Program) also distributed production guides to farmer-beneficiaries. About 400,000 farmers have already received the guide on modern rice farming during the seed distribution activities.

In June 2020, under the extension program of RCEF, DA-PhilRice distributed the leaflet "Gabay sa Makabagong Pagpapalayan," along with seeds given to the farmers. This guide material contains recommended agricultural practices from seedbed preparation, sowing of inbred certified rice seeds, land preparation, fertilizer application to harvesting. The PalayCheck System booklet (Figure 6) was also distributed to technical workers and agricultural technologists. This system is a dynamic set of rice crop management practices that guides farmers and agricultural workers in rice production by providing key check elements. Several versions of the booklet explaining the concepts, principles, and key checks have already been published in different local languages.

Rice technologies continue to improve through research and development (R&D). The vision 'Toward a Rice-Secure Philippines' stated in the Philippine Rice Industry Roadmap 2030, is a challenge to rice R&D in increasing production, reducing cost, enhancing resiliency, increasing competitiveness, and ensuring safety and nutrition (DA-PhilRice, 2018). It is hoped that the local rice industry in the next decades becomes favorable for growth and development for future generations.

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CHAPTER

2

Farmer-Grown Rice Genotypes Collected in Different Regions in the Philippines

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Rice is the Filipinos' main staple. Problems at the national level arise with ripple effects in almost all aspects of the society when there are problems in rice production. Farmers and the rice varieties used form the foundation of rice production in the country. Rice genotypes play a crucial role in achieving optimum yield including tolerance to major biotic and abiotic stresses. The success of the entire rice industry depends largely on the rice genotypes used. This chapter focuses on rice genotypes used by farmers from the vast collection of unclassified genotypes that did not pass through the formal seed system.

The genotype consists of the intrinsic genes present in an organism. It is distinguished from phenotype (observable physical appearance), which is more complex since it is the result of genotype plus environment and genotype-environment interaction. However, genotype is used in this book to represent a Farmer-Grown Rice Genotype (FGRG) or a variety of rice. Regardless of assumptions that there could be duplicates among the FGRG collected, each FGRG is treated as one rice genotype. Genotype names are results of branding or marketing strategies and some were just labels that would attract farmers' attention and curiosity. Thus, there is a need to explore, collect, and document irrigated and rainfed rice farmers' varieties including the basis for their selection and continuous use.

Table 1 shows the major crops in percentage of distribution of production by region. In total, *palay* production was just second to sugarcane with almost 10,000 metric tons (mt) difference. Luzon dominates production at almost 60% of the total 19,276.3mt in 2017, trailed by Mindanao with 22.10% and Visayas with 18.17%. In terms of regional *palay* production, Central Luzon topped the list with 18.86% in Luzon, Western Visayas with 11.57% in Visayas, and SOCCSKSARGEN with 6.85% in Mindanao. Nationally, Central Luzon (18.86%) was on top while Central Visayas was at the bottom (1.69%).

Farmer-grown rice genotypes collection

Rice-growing areas are assumed to coincide with the locations of accredited seed growers, both in business perspective and practical reasons. Seed growers are the main source of seeds for both commercial and as seed production areas by farmers, cooperatives and other industry players that depend on high quality and registered seeds. Their accreditation is also part of an assurance for protection in case of natural calamity that the use of registered varieties would warrant the grant of indemnity from the Philippine Crop Insurance Corporation. In recent years, however, there were still reported 'rice varieties' that became popular to some extent or even notorious among many farmers. These could be called farmer-grown rice genotypes (FGRG). This chapter focuses primarily on the documentation

Table 1. Major crops: Percentage of distribution of production by region in the Philippines, 2017.

Region*	Palay	Corn	Coconut	Sugarcane
PHILIPPINES ('000 mt)	**19,276.3**	**7,914.9**	**14,049.1**	**29,286.9**
LUZON (%)	**59.73**	**42.91**	**25.79**	**11.54**
Cordillera Region	2.31	3.07	0.01	0.08
Ilocos Region	9.71	7.03	0.31	0.07
Cagayan Valley	13.78	23.22	0.53	1.56
Central Luzon	18.86	3.27	0.76	2.86
CALABARZON	2.13	1.17	11.03	6.13
MIMAROPA	6.02	1.53	5.50	-
Bicol Region	6.93	3.63	7.66	0.84
VISAYAS (%)	**18.17**	**6.59**	**14.15**	**68.70**
Western Visayas	11.57	3.81	3.33	57.91
Central Visayas	1.69	1.85	3.08	9.51
Eastern Visayas	4.91	0.93	7.74	1.27
MINDANAO (%)	**22.10**	**50.50**	**60.06**	**19.76**
Zamboanga Peninsula	3.63	2.96	12.10	a/
Northern Mindanao	3.87	16.26	12.86	15.67
Davao Region	2.25	3.24	13.43	1.38
SOCCSKSARGEN	6.85	15.88	6.68	2.34
Caraga Region	2.50	1.52	5.56	a/
BARMM	3.00	10.63	9.42	0.38

*CALABARZON-Cavite, Laguna, Batangas, Rizal, Quezon; MIMAROPA-Mindoro, Marinduque, Romblon, Palawan; SOCCSKSARGEN-South Cotabato, Cotabato, Sultan Kudarat, Sarangani, General Santos City.

a/Less than 0.005 Source: PSA

*Note same with Table 2

of the collecting missions conducted in several rice-growing regions in the Philippines, and could be divided based on the area of responsibility (AOR) of each PhilRice branch station. Most of the FGRG were collected in farmers' fields, cooperatives, and seed growers in close coordination with partner local government units (LGU) at the regional, provincial, municipal, and barangay levels.

Some 335 FGRG were collected in 39 provinces under 15 regions. Luzon collection had the most FGRG with 46%, Mindanao with 42%, and Visayas with 11%. Region 13 or Caraga Region topped the list with 21% followed by SOCCSKSARGEN (16%) and Cagayan Valley (15%); Zamboanga Peninsula and Northern Mindanao had the least at 1%. It is noted that most of the FGRG collected in Caraga came from one farmer (82%). Most FGRG also match the top producing regions: Region 3 in Luzon, Region 6 in Visayas, and Region 12 in Mindanao. Among the limitations of the project is the nil collection from Bangsamoro Autonomous Region in Muslim Mindanao (BARMM) and National Capital Region (NCR) (Table 2).

Two FGRG dominated Luzon, Visayas, and Mindanao as common materials across various regions: DESTINY from: Bacolor, Pampanga (Coll. No. 16042); Mabinay, Negros Oriental (No. 16094); Cauayan, Negros Occidental (No. 16093); and Polomolok, South Cotabato (No. 15502). The other FGRG is DOUBLE DIAMOND from: Luna, Apayao (No. 16498); San Gabriel, La Union (No. 16507); Canlaon City, Negros Oriental (No. 16078); and M'lang, North Cotabato (No. 15942)

Pairwise comparison between islands was conducted to see some common FGRG being planted by farmers. Between Luzon and Visayas, two FGRG were recorded: MILAGROSA and SINANDOMENG; Between Luzon and Mindanao, four: ANGELICA, MAHARLIKA, RED RICE, and ZAMBOANGA; between Visayas and Mindanao, two were recorded: M3 and RED 18.

Common FGRG were also recorded and compared within islands. Twelve out of 14 were recorded for Luzon: 75 DAYS, AEROBIC RICE, BLONDE, BULAW, BURDAGOL, DIAMOND X, DREAM RICE, GANAR, JAPANIRI, JASMIN, R5, and UP & DOWN. Three FGRG were exclusive for Visayas: MIRACLE, ROSANA, and VIETNAM. Mindanao had the most (16) exclusively planted FGRG: ARIGATO, BISADA, DCL-300, EL GRANDE, INDEX 6, INDIAN RICE, INDONESIAN RICE, IRIG, MALAYSIAN RICE, MORYO-MORYO, OFFSPRING, PEDRO, S-14, SAMPAGUITA,

Table 2. Summary of FGRGs collected per region in the Philippines.

Region	Name*	Total Number	Percentage
1	Ilocos Region	21	6%
2	Cagayan Valley	50	15%
3	Central Luzon	24	7%
4A	CALABARZON	6	2%
4B	MIMAROPA	25	7%
5	Bicol Region	18	5%
6	Western Visayas	6	2%
7	Central Visayas	25	7%
8	Eastern Visayas	8	2%
9	Zamboanga Peninsula	3	1%
10	Northern Mindanao	10	3%
11	Davao Region	5	1%
12	SOCCSKSARGEN	52	16%
13	Caraga Region	70	21%
CAR	Cordillera Administrative Region	12	4%

SINANDOMING, and ZAMBOANGA RICE. These observations could indicate which island needs more focus and massive IEC campaigns on the use of certified seeds.

DIAMOND X (11%) topped the most commonly planted FGRG in Luzon, followed by BULAW (4%) and BURDAGOL (3%). In Visayas, tied at 2% were DESTINY, M3, MILAGROSA, MIRACLE, ROSANA, and VIETNAM. SAMPAGUITA (3%) topped the list in Mindanao among the 16 commonly planted FGRG.

Within and between regional collections were also analyzed to identify common FGRG being planted. The information could provide insights on a possible distribution system and develop an intervention plan that could address provincial, regional, and national levels in terms of campaigns and eventual policy development and security.

FGRG that were collected separately or together in one site could be genetically different from each other. These assumptions are important in the analyses done in this chapter. Further analyses as presented in the other chapters would focus on the similarities and differences of the entries.

Some of the rice genotypes were selections from existing released varieties and were essentially derived varieties (EDV) while others were released varieties that were named uniquely to drum up marketability. Ideally, FGRG in its truest sense means that farmers took the initiative to develop their own preferred varieties for their own consumption, which could be based on eating quality and ability to withstand local biotic and abiotic stresses.

FGRGs collected from Cordillera and Ilocos Regions

The Batac branch, the Dryland Agriculture Research Center of PhilRice, collected and documented FGRG in the irrigated and rainfed lowland areas of the five provinces it covers (Ilocos Norte, Ilocos Sur and La Union in Region 1; and Apayao and Abra in Cordillera. Both regions are located in Northwest Luzon. Region 1 comprises four provinces (Ilocos Norte/Sur, La Union, and Pangasinan) and bounded to the west by the West Philippine Sea and by the Cordillera Mountain Range to the east. It has a Type 1 climate, with two distinct seasons: dry (DS) and wet (WS). The DS is from November to April; WS in May to October. The most important crops are rice, tobacco, and vegetables. In 2002, three provinces (Ilocos Norte/Sur, and La Union) had a total farm area of 109,967 ha or 40.63% of the total area of farms in the Region (www.psa.gov.ph).

The 33 FGRG were collected and documented from 2016 to 2018. From the irrigated rice ecosystem were eight genotypes from Ilocos Norte; seven from Ilocos Sur; and six each from Apayao, Abra, and La Union. DOUBLE DIAMOND, JASMIN, and 75 DAYS dominated the list with two entries each (Table 3).

Table 3. FGRGs collected from Ilocos (Region 1) and Cordillera Administrative Region (CAR).

No.	Collection No.	Name	Town	Province	Region
1	15664	90 Days	Pidigan	Abra	CAR
2	16495	Inamid	Sallapadan	Abra	CAR
3	16505	C4	Bucay	Abra	CAR
4	16506	Hi-noon	Bucay	Abra	CAR
5	16512	Magnolia	Peñarrubia	Abra	CAR
6	16513	B5	Lagayan	Abra	CAR
7	16497	Vietnam Rice	Luna	Apayao	CAR
8	16498	Double Diamond	Luna	Apayao	CAR
9	16502	Belina 219	Luna	Apayao	CAR
10	16503	Masigasig 88	Luna	Apayao	CAR
11	16508	San Jose	Kabugao	Apayao	CAR
12	16514	Tudy-Tudy	Luna	Apayao	CAR
13	15665	Señorita	Dingras	Ilocos Norte	Ilocos
14	15694	Goliath	Dingras	Ilocos Norte	Ilocos
15	15695	Chinese Rice	Dingras	Ilocos Norte	Ilocos
16	16499	75 Days	Burgos	Ilocos Norte	Ilocos
17	16509	75 Days	Pasuquin	Ilocos Norte	Ilocos
18	16510	Diamond X	Pagudpud	Ilocos Norte	Ilocos
19	16515	Janjanong	Pagudpud	Ilocos Norte	Ilocos
20	16517	V5	Marcos	Ilocos Norte	Ilocos
21	15659	Balaki	Sugpon	Ilocos Sur	Ilocos
22	15661	Jasmin	Alilem	Ilocos Sur	Ilocos
23	15662	Jasmin	Sugpon	Ilocos Sur	Ilocos
24	15663	Sinandomeng	Alilem	Ilocos Sur	Ilocos
25	15666	Pokpoklo	Alilem	Ilocos Sur	Ilocos
26	15667	Sinanlang-ang	Alilem	Ilocos Sur	Ilocos
27	16511	Ryan Rice	Cabugao	Ilocos Sur	Ilocos
28	15657	Aerobic Rice	San Gabriel	La Union	Ilocos
29	15660	Burdagol	San Gabriel	La Union	Ilocos
30	16496	RJ 40	San Gabriel	La Union	Ilocos
31	16501	Tabuk	San Gabriel	La Union	Ilocos
32	16504	Triple 2	San Gabriel	La Union	Ilocos
33	16507	Double Diamond	San Gabriel	La Union	Ilocos

FGRGs collected from Cagayan Valley (Region 2)

Cagayan Valley is the Philippines' second top rice-producing region in terms of area planted and harvested. Sprawled on the northeastern part of mainland Luzon, it is the fourth largest region with five provinces: Batanes, Cagayan, Isabela, Quirino, and Nueva Vizcaya. It is bounded by the Pacific Ocean to the east, by Nueva Ecija to the south, by Quezon to the southeast, and the mountain ranges of Caraballo and Cordillera to the west. Its Cagayan River is the country's longest river with a drainage area of approximately 27,000 square kilometers (www.region02.nia.gov.ph), and serves as the main irrigation source of 177,069 ha of rice fields (www.region02.nia.gov.ph). It has a Type 2 climate with two seasons – the wet from May to October, and dry from November to April. It is the top corn producer in the country and second in rice.

Fifty FGRG were collected in three provinces as shown in Table 4: 29 from Isabela, 11 from Cagayan, and 10 from Nueva Vizcaya. Quirino had no FGRG collection because all the documented entries were identified as traditional rice varieties (TRV). DIAMOND X dominated the list with 12% followed by JAPANIRI with 6%.

Certain FGRG listed had identical names as known by farmers but they differed phenotypically. The reasons for using them were also different.

Table 4. FGRGs collected from Cagayan Valley (Region 2).

No.	Collection No.	Name	Town	Province
1	15577	JFD 300 Plus	Iguig	Cagayan
2	15578	R-Danny	Iguig	Cagayan
3	15579	Green Super Rice NO.8	Amulung	Cagayan
4	15580	Japaniri	Amulung	Cagayan
5	15581	Diamond X	Alcala	Cagayan
6	15582	Maharlika	Alcala	Cagayan
7	15945	Zamboanga	Claveria	Cagayan
8	15952	Angelica	Claveria	Cagayan
9	15953	Red Rice	Claveria	Cagayan
10	15957	Red Rice	Claveria	Cagayan
11	16076	Diamond X	Iguig	Cagayan
12	15552	Universal Rice	Burgos	Isabela
13	15553	JDF 300 Plus	Burgos	Isabela
14	15554	711	Burgos	Isabela
15	15555	Japaniri	Tumauini	Isabela
16	15556	Top Rice	Tumauini	Isabela
17	15557	Triple 3	Roxas	Isabela
18	15558	Super Diamond	Quezon	Isabela
19	15559	Super Kaloy (Vietnam Rice)	Quezon	Isabela
20	15560	Diamond X	Quezon	Isabela
21	15561	Diamond X	Mallig	Isabela
22	15562	High Rice	Delfin Albano	Isabela
23	15563	Diamond X	Delfin Albano	Isabela
24	15564	Supper Diamond X	Delfin Albano	Isabela
25	15565	IL29	Delfin Albano	Isabela
26	15566	46	San Manuel	Isabela
27	15567	401	San Manuel	Isabela
28	15570	Dream Rice	Burgos	Isabela
29	15571	Excel Rice	Cabatuan	Isabela
30	15572	Genetics	Cabatuan	Isabela
31	15573	AS 411	Cabatuan	Isabela
32	15574	Belena 215	Cabatuan	Isabela
33	15575	Dream Rice	Cabatuan	Isabela
34	15576	Diamond V	Cauayan City	Isabela
35	15583	Belena 205	Cabatuan	Isabela
36	16060	Juan Rice	Cabatuan	Isabela
37	16061	Winner Rice	Cauayan City	Isabela
38	16062	Diamond X	Cauayan City	Isabela
39	16063	Ganador	San Manuel	Isabela
40	16064	Japaniri	Quezon	Isabela
41	16065	GSR	Bagabag	Nueva Vizcaya
42	16067	Pukpuklo	Dupax Del Norte	Nueva Vizcaya
43	16068	Imelda Rice	Villaverde	Nueva Vizcaya
44	16069	Bongkitan	Villaverde	Nueva Vizcaya
45	16070	Cargil	Villaverde	Nueva Vizcaya
46	16071	Wag-wag Pino	Villaverde	Nueva Vizcaya
47	16072	Raminad	Villaverde	Nueva Vizcaya
48	16073	Wag-Wag	Villaverde	Nueva Vizcaya
49	16074	R5	Villaverde	Nueva Vizcaya
50	16075	Improved 222	Bayombong	Nueva Vizcaya

Majority of FGRG users were identified to be from Isabela, at 68% of the total from Region 2. The high number is associated with the large area planted to rice and high number of seed growers producing, and sellers distributing the FGRG in the province. Nueva Vizcaya has 19% of the collection, and 13% for Cagayan.

FGRGs collected from Central Luzon (Region 3)

Central Luzon, the top rice-producing region and dubbed as "The Rice Granary of the Philippines", consists of seven provinces: Aurora, Bataan, Bulacan, Nueva Ecija, Pampanga, Tarlac, and Zambales. Expectedly, most of the farmers in this region would adopt the proven rice technologies, which include the use of certified seeds that passed through the formal seed system by the National Seed Industry Council. Despite the presence and active technology promotion and dissemination of DA-PhilRice in the region, the non-registered rice varieties or FGRG proliferate.

The June 2016 to March 2018 collection of FGRG started in close coordination with the provinces, municipalities, and barangays within the area of responsibility of DA-PhilRice. Majority of the rice-growing areas were surveyed. In cases of inconsistent data from LGU, these were directly validated with seed growers, cooperatives, and individual farmers. Some samples were freely given while others were sold at PhP50/kg. Data gathered included passport information indicating the names of farmers, names of genotypes, and the reasons for cultivation. At least 2kg of seeds collected were placed in individual net bags with shipping tags for proper identification and to avoid their physical mixture.

A total of 24 FGRG were collected in irrigated areas, mostly from Bulacan (22%) and Nueva Ecija (22%); Aurora and Tarlac both had the least at 9%. This could be due to the small number of seed growers in these provinces and stronger promotion of various popular seeds. Bigger farmlands mean more varieties. Seldom observed was the use of a single variety in a big farmland. Most of these FGRG were only used for second cropping in one to two-season plantings (Table 5).

Table 5. FGRGs collected from Central Luzon (Region 3).

No.	Collection No.	Name	Town	Province
1	15960	Bulaw (Super 60)	Baler	Aurora
2	15958	Bulaw	San Luis	Aurora
3	15589	GSR 8	Balanga City	Bataan
4	15591	REALINE	Balanga City	Bataan
5	15592	Triple 1	Balanga City	Bataan
6	15512	Diamond X	San Ildefonso	Bulacan
7	15513	IL-29	San Ildefonso	Bulacan
8	15514	Diamond XX (Double Diamond)	San Ildefonso	Bulacan
9	15515	GSR 2	San Ildefonso	Bulacan
10	15517	Triple R	San Ildefonso	Bulacan
11	15963	Optimus	Aliaga	Nueva Ecija
12	15969	Combat	Carranglan	Nueva Ecija
13	15970	Global Super Rice	Carranglan	Nueva Ecija
14	15976	GSR 12	Cuyapo	Nueva Ecija
15	15977	Lawin	Nampicuan	Nueva Ecija
16	16042	Destiny	Bacolor	Pampanga
17	16041	Milagrosa Selection	Mexico	Pampanga
18	16040	Aerobic	Porac	Pampanga
19	16043	Lakatan	Sta. Rita	Pampanga
20	15635	Aerobic Rice	San Jose	Tarlac
21	15636	Diamond X	San Jose	Tarlac
22	15599	R5	Iba	Zambales
23	15605	Milagrosa	Masinloc	Zambales
24	15606	Diamond X	Santa Cruz	Zambales

FGRGs collected from CALABARZON (Region 4A) and MIMAROPA (Region 4B)

CALABARZON is composed of five provinces: Cavite, Laguna, Batangas, Rizal, and Quezon with a total rice area of 32,661 ha. MIMAROPA also has five provinces: Oriental/Occidental Mindoro, Marinduque, Romblon, and Palawan with a total rice area of 31,521 ha (PSA, 2017). Both regions are in the southwestern Tagalog areas. The identification of rice genotypes was facilitated by the offices of provincial/ municipal agriculturist.

One FGRG was collected from Laguna (17%), and five from Quezon (83%). The collection for Region 4A did not represent all provinces since areas far from seed producers and those with expected more FGRG were prioritized (Table 6).

A total of 25 FGRG were collected from Palawan (68%) and Romblon (32%). Narra, Palawan had the most FGRG planted due mainly to grain quality and adaptability to the farmers' fields (Table 6).

Table 6. FGRGs collected from CALABARZON (Region 4A) and MIMAROPA (Region 4B).

No.	Collection No.	Name	Town	Province	Region
1	15883	Early David	Calauan	Laguna	4A
2	16190	Malaya	Lucena City	Quezon	4A
3	16192	Pino 45	Lucena City	Quezon	4A
4	16193	Minadre	Lucena City	Quezon	4A
5	16194	Pinolo	Lucban	Quezon	4A
6	16195	Intan/Miracle	Lucban	Quezon	4A
7	15885	Best Rice	Quezon	Palawan	4B
8	15886	Mestiza	Quezon	Palawan	4B
9	15888	Tanaka	Narra	Palawan	4B
10	15889	Diamond X	Narra	Palawan	4B
11	15890	I8 (VN)	Narra	Palawan	4B
12	15891	1561	Narra	Palawan	4B
13	15892	Burdagol	Narra	Palawan	4B
14	15893	Kinadoy (puti)	Narra	Palawan	4B
15	15894	Dash 9	Narra	Palawan	4B
16	15895	129	Narra	Palawan	4B
17	15896	Triple 8	Narra	Palawan	4B
18	15897	Kinadoy (bulik)	Narra	Palawan	4B
19	16185	Rc Bato	Roxas	Palawan	4B
20	16187	Atong	Rizal (Marcos)	Palawan	4B
21	16188	Azor 5	Rizal (Marcos)	Palawan	4B
22	16189	Unknown 5	Rizal (Marcos)	Palawan	4B
23	16203	Daling-Daling	Rizal (Marcos)	Palawan	4B
24	15876	Unknown	Odiongan	Romblon	4B
25	15877	Up & Down	Looc	Romblon	4B
26	15878	Unknown Var 2	Odiongan	Romblon	4B
27	15879	Unknown Var 3	Looc	Romblon	4B
28	15881	RC 85	Alcantara	Romblon	4B
29	15882	Malagkit (Exotic)	Odiongan	Romblon	4B
30	16196	Up & Down	Looc	Romblon	4B
31	16198	Unknown 1 (80 DAYS)	Looc	Romblon	4B

FGRGs collected from Bicol Region (Region 5) and Eastern Visayas (Region 8)

The Bicol Region is made up of six provinces: Albay, Camarines Norte/Sur, Sorsogon, Catanduanes, and Masbate, with a total rice area of 123,629 ha (PSA, 2017). Camarines Sur has the largest area planted to rice, then Albay and Sorsogon.

Eastern Visayas comprises Samar Island (Northern, Western, and Eastern Samar); Leyte Island (Leyte and Southern Leyte); and Biliran island province with a total rice area of 100,940 ha. Leyte has the largest rice area, trailed by Northern, Western, and Eastern Samar.

Collections were done in three provinces of Region 5 and two provinces in Region 8 from November 2016 to March 2018. The activities were fully coordinated with the offices of the provincial, municipal or city agriculturist in the area. The municipal agriculturists helped identify the barangays and farmers from whom the collection was advisable.

A total of 18 FGRG were collected from five Camarines Sur towns (50%), one Sorsogon locality (22%), and three municipalities of Albay. Eight FGRG were collected from three municipalities and one city in Samar (6), and one town in Leyte (2) (Table 7).

Table 7. FGRGs collected from Bicol Region (Region 5) and Eastern Visayas Region (Region 8).

No.	Collection No.	Name	Town	Province	Region
1	15650	Ganar	Tiwi	Albay	5
2	15651	Bulaw	Camalig	Albay	5
3	15838	(Guinobat) Siroma	Tabaco City	Albay	5
4	16033	Bulaw	Malinao	Albay	5
5	16034	Bulaw (white)	Malinao	Albay	5
6	15654	Blonde	Nabua	Camarines Sur	5
7	15655	Bolao	Ocampo	Camarines Sur	5
8	15839	Bulaw	Libmanan	Camarines Sur	5
9	15841	Speed 75	Libmanan	Camarines Sur	5
10	15843	Binokayo	Pamplona	Camarines Sur	5
11	15844	75	Pamplona	Camarines Sur	5
12	15845	Burdagol	Pamplona	Camarines Sur	5
13	16037	Blonde	Minalabac	Camarines Sur	5
14	16038	Ganar	Minalabac	Camarines Sur	5
15	15652	Red Rice	Sorsogon City	Sorsogon	5
16	15653	Black Rice	Sorsogon City	Sorsogon	5
17	15837	Unknown	Castilla	Sorsogon	5
18	16035	Kinavite	Castilla	Sorsogon	5
19	15850	M3	Tanauan	Leyte	8
20	15851	Mindanao	Tanauan	Leyte	8
21	15846	Gifts 12	Basey	Samar	8
22	15847	Kapula	Santa Rita	Samar	8
23	15848	Sinandomeng	Santa Rita	Samar	8
24	15849	Saigon	Santa Rita	Samar	8
25	16030	Kamansing	Jiabong	Samar	8
26	16032	Caber	Calbayog City	Samar	8

FGRGs Collected from Western Visayas (Region 6) and Central Visayas (Region 7)

Rainfed and irrigated rice areas in both regions include mountainous, sloping, rolling, and flat lands in remote and urban communities. All collected rice genotypes are not NSIC or PSB-approved varieties. Region 6 is home to six provinces: Aklan, Antique, Capiz, Guimaras, Iloilo, and Negros Occidental; Region 7 has four: Bohol, Cebu, Negros Oriental, and Siquijor. Region 6 is the third largest rice-producing region in the Philippines with 219,312 ha, 206,262 ha, and 210,079 ha in 2016, 2017, and 2018, respectively. Region 7 had a total rice area harvested of 34,489 ha in 2016; 47,292 ha in 2017; and 43,426 ha in 2018 (https://psa.gov.ph/sites). FGRG were collected mostly from the rainfed and irrigated rice ecosystems of Negros Occidental/Oriental, and Bohol.

Thirty-one genotypes were used by rice farmers in Negros and Bohol Islands. Twenty-five FGRG came from Central Visayas, and six from Western Visayas particularly in Negros Occidental's Bago City (2), San Carlos City (1), Ilog (2), and Cauayan (1). The 25 FGRG from Central Visayas were collected from seven towns in three provinces. Negros Oriental had the most FGRG (83%); Bohol (4%) had the least specifically in Batuan, Bilar, and Dagohoy. Only one FGRG was collected from Argao in Cebu. The 20 FGRG from Negros Oriental were collected in Bayawan City (3), Canlaon City (3), Bais City (3), Tayasan (2), and Mabinay (9). Mabinay had the most FGRG (45%) while Tayasan (2%) had the least (Table 8).

Table 8. FGRGs collected from Western Visayas (Region 6) and Central Visayas (Region 7).

No.	Collection No.	Name	Town	Province	Region
1	16096	Kayopo	Bilar	Bohol	7
2	16097	Kadato	Bilar	Bohol	7
3	16098	66 Puwa	Batuan	Bohol	7
4	16099	Katago	Dagohoy	Bohol	7
5	15625	Basmati	Argao	Cebu	7
6	16077	Vietnam	Canlaon City	Negros Oriental	7
7	16078	Double Diamond	Canlaon City	Negros Oriental	7
8	16079	Milagrosa	Canlaon City	Negros Oriental	7
9	16080	Mestisa	Bais City	Negros Oriental	7
10	16081	Kaimpas	Bais City	Negros Oriental	7
11	16082	Mashaw	Bais City	Negros Oriental	7
12	16083	Regom	Tayasan	Negros Oriental	7
13	16086	Red 18	Mabinay	Negros Oriental	7
14	16087	M3	Mabinay	Negros Oriental	7
15	16089	Rosana	Mabinay	Negros Oriental	7
16	16090	Borit	Mabinay	Negros Oriental	7
17	16091	Urab	Mabinay	Negros Oriental	7
18	16094	Destiny	Mabinay	Negros Oriental	7
19	16095	Los Baños	Mabinay	Negros Oriental	7
20	16100	Milagrosa	Mabinay	Negros Oriental	7
21	16294	Masbate	Bayawan City	Negros Oriental	7
22	16295	Super Nini	Bayawan City	Negros Oriental	7
23	16296	Soper Nini	Mabinay	Negros Oriental	7
24	16297	Miracle	Tayasan	Negros Oriental	7
25	16537	Nitoy	Bayawan City	Negros Oriental	7
26	16084	Miracle	Bago City	Negros Occidental	6
27	16085	Dalagang Bukid	Bago City	Negros Occidental	6
28	16088	Vietnam	San Carlos City	Negros Occidental	6
29	16092	Rosana	Ilog	Negros Occidental	6
30	16093	Destiny	Cauayan	Negros Occidental	6
31	16538	7 Tonner	Ilog	Negros Occidental	6

FGRGs collected from Zamboanga Peninsula (Region 9) and SOCCSKSARGEN (Region 12)

A total of 55 FGRG were collected in Region 12 (52) and Region 9 (3). North Cotabato had 27, South Cotabato had 26, while Zamboanga City had three FGRG. The collected FGRG point to the magnitude of utilization and promotion of certified rice seeds in the areas. Most farmers used FGRG because they are high-yielding and with good eating quality. Collecting FGRG, therefore, supports the healthy seed systems in the country. Collection activities were limited by the peace and order situation in Mindanao.

FGRG collected in North Cotabato came from seven towns: Magpet (3), Makilala (6), Midsayap (1), M'lang (6), President Roxas (4), Tulunan (6), and Pigcawayan (1). That Midsayap has only few FGRG is due to its hosting the PhilRice Branch Station that supplies plenty of Registered Seeds. FGRG in South Cotabato came from five areas: Banga (5), General Santos City (4), Polomolok (4), Santo Niño (2), and Surallah (11) (Table 9).

Table 9. FGRGs collected from Zamboanga Peninsula and SOCCSKSARGEN (Region 12).

No.	Collection No.	Name	Town	Province	Region
1	15457	3-Million	Magpet	North Cotabato	12
2	15505	Kulapo	Magpet	North Cotabato	12
3	16329	3 Million	Magpet	North Cotabato	12
4	15455	Index 6	Makilala	North Cotabato	12
5	15456	Dash-12	Makilala	North Cotabato	12
6	15458	M-41	Makilala	North Cotabato	12
7	16310	Index 6	Makilala	North Cotabato	12
8	16317	M 41	Makilala	North Cotabato	12
9	16335	Dash 12	Makilala	North Cotabato	12
10	15507	Tito-Tito	Midsayap	North Cotabato	12
11	15938	Malaysian Rice	M'Lang	North Cotabato	12
12	15942	Double Diamond	M'Lang	North Cotabato	12
13	16302	Bugos	M'Lang	North Cotabato	12
14	16321	Malaysian Rice	M'Lang	North Cotabato	12
15	16333	Double Diamond	M'Lang	North Cotabato	12
16	16334	Platoon X	M'Lang	North Cotabato	12
17	15459	Bodidoy	President Roxas	North Cotabato	12
18	15508	S-14	President Roxas	North Cotabato	12
19	16305	S-14	President Roxas	North Cotabato	12

Table 9. (continuation)

No.	Collection No.	Name	Town	Province	Region
20	16314	Yanam	President Roxas	North Cotabato	12
21	15504	El Grande	Tulunan	North Cotabato	12
22	15506	Zamboanga Rice	Tulunan	North Cotabato	12
23	15941	Arigato	Tulunan	North Cotabato	12
24	16300	Zamboanga Rice	Tulunan	North Cotabato	12
25	16303	El Grande	Tulunan	North Cotabato	12
26	16318	Arigato	Tulunan	North Cotabato	12
27	16330	USA	Pigcawayan	North Cotabato	12
28	15939	Index-2	Banga	South Cotabato	12
29	15940	Indonesian Rice	Banga	South Cotabato	12
30	16301	Index 2	Banga	South Cotabato	12
31	16315	M3-Banga	Banga	South Cotabato	12
32	16332	Indonesian Rice	Banga	South Cotabato	12
33	15495	HR400	Gen. Santos City	South Cotabato	12
34	15496	M3 Barako	Gen. Santos City	South Cotabato	12
35	16313	M3-Barako	Gen. Santos City	South Cotabato	12
36	16322	HR-400	Gen. Santos City	South Cotabato	12
37	15500	Sampaguita	Polomolok	South Cotabato	12
38	15502	Destiny	Polomolok	South Cotabato	12
39	16308	Sampaguita	Polomolok	South Cotabato	12
40	16325	ML	Polomolok	South Cotabato	12
41	15503	Indian Rice	Santo Nino	South Cotabato	12
42	16324	Indian Rice	Santo Nino	South Cotabato	12
43	15497	Pedro	Surallah	South Cotabato	12
44	15498	Sinandoming	Surallah	South Cotabato	12
45	15499	M3	Surallah	South Cotabato	12
46	15501	Offspring	Surallah	South Cotabato	12
47	16298	Pedro	Surallah	South Cotabato	12
48	16307	Offspring	Surallah	South Cotabato	12
49	16316	Señorita Pilit	Surallah	South Cotabato	12
50	16319	Elon-Elon	Surallah	South Cotabato	12
51	16331	Botoy-Botoy	Surallah	South Cotabato	12
52	16428	M3 (Surallah)	Surallah	South Cotabato	12
53	16304	Palay Chu	Zamboanga City	Zamboanga del Sur	9
54	16323	Chichong	Zamboanga City	Zamboanga del Sur	9
55	16418	R.I.300	Zamboanga City	Zamboanga del Sur	9

FGRGs collected from Northern Mindanao (Region 10), Davao (Region 11), and Caraga (Region 13)

After due coordination and consultations with the partners, rice areas were visited and farmers were individually interviewed. The project was accorded tremendous support from farmers, the local government agriculturists, and some non-government organizations. Thus, more than a hundred farmers' unclassified rice lines were collected in PhilRice Agusan's area of responsibility.

Collection and documentation were conducted in provinces where planting of FGRG proliferated as reported by the provincial agriculture personnel and other partners. The FGRG locations were diverse. In the major rice-growing provinces of Mindanao (Bukidnon, Agusan Del Sur, Surigao Del Sur, Davao De Oro, and Davao del Norte), lot of accredited seed growers are active. On the other hand, no seed grower was identified in Misamis Oriental where less rice is grown.

Collection was properly timed due to the asynchronous planting practices of farmers across the covered area. Caraga Region contributed 93% of all collections, followed by Regions 10 and 11. Santa Josefa (70%) in Agusan Del Sur had the most FGRG across all towns and provinces in the three regions.

Seven FGRG were collected from Valencia City in Bukidnon. Davao Region's five FGRG came from Davao De Oro, Davao Del Norte, and Davao del Sur. Caraga Region's 70 FGRG came from Agusan Del Norte/Sur (64) and Surigao Del Sur (6). In Agusan Del Norte, where PhilRice Agusan is situated, only two FGRG were collected from RT Romualdez. Surigao Del Sur had six: San Miguel (2) and Tago (4). Three Agusan Del Sur towns contributed the most FGRG from Prosperidad (3), Santa Josefa (57), and Bunuan (2). Most of the FGRG collected in Caraga Region came from a farmer-scientist who practiced organic farming and breeding. He was part of the MASIPAG Organization before. Most of the lines were collected in Regions 10 and 11 where seed growers are far. Most farmers in Davao De Oro are far from seed growers, and thus, traders dictated what varieties to plant and where to get them (Table 10).

Table 10. FGRGs collected from Northern Mindanao (Region 10), Davao Region (Region 11), and Caraga (Region 13).

No.	Collection No.	Name	Town	Province	Region
1	15954	Moryo-Moryo	RT Romualdez	Agusan del Norte	13
2	16424	Moryo-Moryo	RT Romualdez	Agusan del Norte	13
3	16431	Tara Rice	Bunawan	Agusan del Sur	13
4	16435	Totong	Bunawan	Agusan del Sur	13
5	15944	Red Rice	Prosperidad	Agusan del Sur	13
6	15955	Bodo-Bodo	Prosperidad	Agusan del Sur	13
7	16437	Barako 64	Prosperidad	Agusan del Sur	13
8	16336	Abangay	Santa Josefa	Agusan del Sur	13
9	16337	Angelica	Santa Josefa	Agusan del Sur	13
10	16338	Angelo I	Santa Josefa	Agusan del Sur	13
11	16339	Bisada	Santa Josefa	Agusan del Sur	13
12	16340	BES I	Santa Josefa	Agusan del Sur	13
13	16341	BWSI-3B	Santa Josefa	Agusan del Sur	13
14	16342	BWS-WY	Santa Josefa	Agusan del Sur	13
15	16343	BWSI-4R	Santa Josefa	Agusan del Sur	13
16	16344	BWS-6W	Santa Josefa	Agusan del Sur	13
17	16345	BWS3-3B	Santa Josefa	Agusan del Sur	13
18	16346	BWSI-4B	Santa Josefa	Agusan del Sur	13
19	16347	Bisada	Santa Josefa	Agusan del Sur	13
20	16348	C4 Tysan	Santa Josefa	Agusan del Sur	13
21	16349	Carovan	Santa Josefa	Agusan del Sur	13
22	16351	Diwata	Santa Josefa	Agusan del Sur	13
23	16352	Dahili	Santa Josefa	Agusan del Sur	13
24	16353	EC3	Santa Josefa	Agusan del Sur	13
25	16354	EC2	Santa Josefa	Agusan del Sur	13
26	16356	Jasmine R	Santa Josefa	Agusan del Sur	13
27	16357	Kaolob	Santa Josefa	Agusan del Sur	13
28	16358	Kamoros	Santa Josefa	Agusan del Sur	13
29	16360	L2B2 VI	Santa Josefa	Agusan del Sur	13
30	16361	M90 SG	Santa Josefa	Agusan del Sur	13
31	16362	Manisi	Santa Josefa	Agusan del Sur	13
32	16364	M108-1	Santa Josefa	Agusan del Sur	13
33	16365	M31-VF	Santa Josefa	Agusan del Sur	13
34	16366	Mango Singket	Santa Josefa	Agusan del Sur	13
35	16367	M420-1	Santa Josefa	Agusan del Sur	13
36	16370	M5-BD	Santa Josefa	Agusan del Sur	13
37	16371	M105-R	Santa Josefa	Agusan del Sur	13
38	16372	M126-1	Santa Josefa	Agusan del Sur	13
39	16373	Minoning	Santa Josefa	Agusan del Sur	13
40	16374	Mindoro-5R	Santa Josefa	Agusan del Sur	13
41	16375	Mindoro	Santa Josefa	Agusan del Sur	13
42	16376	NTPSA-1	Santa Josefa	Agusan del Sur	13
43	16377	Pandan 1	Santa Josefa	Agusan del Sur	13
44	16378	Pandan 2	Santa Josefa	Agusan del Sur	13
45	16379	Pangasinan	Santa Josefa	Agusan del Sur	13
46	16380	Pilit Carabao	Santa Josefa	Agusan del Sur	13
47	16382	PK P2-6	Santa Josefa	Agusan del Sur	13
48	16383	PILI-RG	Santa Josefa	Agusan del Sur	13
49	16384	PKP Dwarf	Santa Josefa	Agusan del Sur	13
50	16385	Panaka	Santa Josefa	Agusan del Sur	13
51	16386	RG17-K	Santa Josefa	Agusan del Sur	13
52	16387	San Carlos	Santa Josefa	Agusan del Sur	13
53	16388	SNC-13	Santa Josefa	Agusan del Sur	13
54	16389	Sanip- R	Santa Josefa	Agusan del Sur	13

Table 10. (continuation)

No.	Collection No.	Name	Town	Province	Region
55	16390	Salket	Santa Josefa	Agusan del Sur	13
56	16391	SNR-2	Santa Josefa	Agusan del Sur	13
57	16392	Tres Marias	Santa Josefa	Agusan del Sur	13
58	16393	Tanura	Santa Josefa	Agusan del Sur	13
59	16394	TAP 1	Santa Josefa	Agusan del Sur	13
60	16395	XOR	Santa Josefa	Agusan del Sur	13
61	16396	147-2	Santa Josefa	Agusan del Sur	13
62	16397	169-2	Santa Josefa	Agusan del Sur	13
63	16399	216	Santa Josefa	Agusan del Sur	13
64	16400	112-4	Santa Josefa	Agusan del Sur	13
65	15400	Barako	San Miguel	Surigao del Sur	13
66	15401	Super DX	San Miguel	Surigao del Sur	13
67	15402	DCL-300	Tago	Surigao del Sur	13
68	15403	Irig	Tago	Surigao del Sur	13
69	16419	DCL-300	Tago	Surigao del Sur	13
70	16420	Irig	Tago	Surigao del Sur	13
71	16326	Sampaguita	Compostela	Davao De Oro	11
72	16327	Bodo-Bodo	Compostela	Davao De Oro	11
73	16306	White Tonner	Nabunturan	Davao De Oro	11
74	15948	Sampaguita	Asuncion	Davao del Norte	11
75	16320	RV8	Magsaysay	Davao del Sur	11
76	15946	Pilit	Valencia City	Bukidnon	10
77	16429	Thailand Rice	Valencia City	Bukidnon	10
78	16433	RTS 11-B	Valencia City	Bukidnon	10
79	16434	RTS 13	Valencia City	Bukidnon	10
80	16436	Inbred-300	Valencia City	Bukidnon	10
81	15943	Inbred-300	Valencia City	Bukidnon	10
82	15950	RTS-11-A	Valencia City	Bukidnon	10
83	16421	RTS-12-B	Valencia City	Bukidnon	10
84	16427	Red 18	Balingasag	Misamis Oriental	10
85	16422	Zamboanga	Claveria	Misamis Oriental	10

Farmers' preference of traits and insights of their rice varieties

The regions have their respective preferences in terms of rice genotypes to plant owing to socio-cultural variations and inherited norms from previous generations. The reasons behind their preferences were categorized into: maturity, grain quality, stress resistance, grain shape, fertilizer requirements, and yield.

At the national level, eating quality (24%), high-yielding (16%), and good germination (10%) traits were the top three reasons why farmers used particular FGRG. Regions had similarities and differences in their preferences. Regions 3, 5, and 12 matched the national preferences. Regions 4-A, 4-B, 8, and 13 included resistance to pests as main reason for preferring an FGRG. Resistance to lodging was noted as one top reason in Regions 6, 8, and 13; early-maturing trait was noted in Regions 1, 5, and 9. High tillering ability was one top reason for Region 3. Regions 2, 11, 13, and 14 recorded 'requires less fertilizer' as one reason for using a particular FGRG (Table 11).

Rice adaptation and adoption

Rice adaptation and adoption are two processes that could decide the success of rice production in a particular location. These concepts provide the possible situation on how the rice genotypes would perform in a particular farming environment. Rice adoption in agriculture means the use of technologies or practices that are promoted either by government or non-government organizations to help farmers (Varma, 2019). On the other hand, rice adaptation means the ability of a variety to get used to the environment in the farm. Most adaptation studies involved testing the performance of rice varieties in new ecosystems and sometimes with the occurrence of stresses (Sengxua et al., 2017). Most of the FGRG collected that were repeatedly used are accompanied with certain cultivation recommendations from the farmers. However, almost all FGRG were short-lived, tried for either one or two seasons then replaced by registered varieties due mainly to unavailability of seeds, loss of purity, and their failure to adapt to the farmers' field conditions. Although 1,897 rice varieties were registered from 1955 to 2019 (https://www.nseedcouncil.bpinsicpvpo.com.ph/), many genotypes that belong to FGRG were most likely similar to the released varieties that are discussed in succeeding chapters.

Cultivation, management, and climate-resilient technologies

The Philippines has four different types of climate. Cultivation and management depend on the climate type. Type 1 climate has two pronounced wet and dry seasons: dry from November to April; wet during the rest of the year. This covers the western parts of Luzon, Mindoro, Negros, and Palawan. Type 2 climate has no dry season with very pronounced rainfall from November to January. The areas covered are Catanduanes, Sorsogon, eastern part of Albay, eastern and northern parts of Camarines Norte/Sur, a great portion of the eastern part of Quezon, eastern part of Leyte, and a large portion of eastern Mindanao. Type 3 climate has seasons not very pronounced, relatively dry from November to April and wet during the rest of the year. Areas covered are western parts of Cagayan,

Table 11. Farmers' perspective of using their varieties from different regions in the country.

Reason for using rice line/variety (%)	Region														
	1	2	3	4A&4B	5	6	8	9	10	11	12	13	14	Total	%
Eating quality	47	15	38	30	18	17	14	37	11	11	14	10	45	307	24
High-yielding	26	52	14	17	12	10	5	0	9	9	18	8	32	212	16
Good germination	3	6	14	0	13	14	18	13	11	14	10	9	0	125	10
High-milling recovery	0	3	6	7	12	8	3	38	11	9	5	9	0	111	9
Early-maturing	15	2	10	3	13	10	8	12	7	7	9	5	4	105	8
Resistant to lodging	3	4	0	6	10	14	15	0	9	5	8	11	0	85	7
Resistant to pests	0	4	0	18	4	10	15	0	7	5	7	9	0	79	6
Resistant to drought	0	0	0	8	4	10	12	0	9	9	9	7	5	73	6
Requires less fertilizer	3	6	0	0	4	2	3	0	6	13	4	9	9	59	5
High tillers	3	4	14	0	2	0	1	0	4	6	9	8	0	51	4
Long grains	0	4	0	0	8	5	6	0	6	5	4	7	0	45	3
Heavy grains	0	0	4	0	0	0	0	0	10	7	3	8	5	37	3
Aromatic	0	0	0	11	0	0	0	0	0	0	0	0	0	11	1

Isabela, Nueva Vizcaya, eastern portion of Mountain Province, southern Quezon, Bondoc Peninsula, Masbate, Romblon, northeast Panay, eastern Negros, central and southern Cebu, parts of northern Mindanao, and most of eastern Palawan. Type 4 climate has rainfall more or less evenly distributed throughout the year. The areas covered are Batanes, northeastern Luzon, western Camarines Norte and Camarines Sur, Albay, eastern Mindoro, Marinduque, western Leyte, northern Negros, and most of central, eastern, and southern Mindanao. Most of the rice genotypes were being cultivated in the irrigated lowland ecosystem with two seasons, the dry and wet (http://duckduckbro.com/2018/07/planting-calendar-for-the-philippines/).

Availability of climate-smart and resilient rice varieties is one of the key factors that could help cope with climate change. Included in the collection of FGRG was the use of drought-tolerant varieties. Approximately 8% of the farmer-sources of rice genotypes selected this trait as the main reason for choosing the particular FGRG. Unfortunately, farmers were not given adequate support for the use of FGRG, which could have been different had they used climate-smart released varieties. Some 16 released varieties registered with the National Seed Industry Council (NSIC) are suitable for drought-prone areas. Government and private company technicians took time and resources to develop these varieties for the benefit of farmers. One main reason for using FGRG that are supposedly climate-smart is the inaccessibility.

Branding and the name game in rice genotypes

It has been proven that people believe in the power of popularity. More often, products being sold in the market or anywhere else are focused on marketing. Since certain brands are more widely known and marketable, and successfully make income for producers, others follow by adapting or using the same brand both literally and figuratively. Dinorado, for instance, commands a high premium price as milled rice. Millers and traders therefore label their rice as Dinorado. This is an example of literally using the same name or brand. Figuratively, producers and sellers vouch on equivalency such as declaring that what they offer is similar to or even superior to an existing popular variety. They often resort to using obvious adjectives in naming a genotype such as DOUBLE DIAMOND or SUPER 222. In analyzing the naming of the FGRG collected in the farmers' fields, at least four major categories are observed: registered rice-like, popular names, name of person or place, and special traits.

FGRG named as registered rice-like resemble more or less the name of existing PSB or NSIC-registered rice varieties such as C-4, 46, 260, 401, IMPROVED 222, SUPER 60, HYBRID 64, and RED 64. This naming trend could suggest that these rice genotypes are either equivalent to or better than their counterparts. Another type of naming is the use of popular names that depict a vision of the implication of using these FGRG such as: MASIGASIG 88 (high-yielding); BASMATI (premium rice from India); JASMIN (best rice variety in Thailand); GOLIATH (biblical character of a gigantic entity); MASAGANA (prolific harvest); DREAM RICE and DESTINY (bountiful harvest and financial gains). Another way of naming FGRG is using the name of a person or place which is typical of traditional rice varieties stored in the DA-PhilRice Genebank. This naming could be traced to the source of seeds. Names of places include: CHINESE RICE, INDIAN RICE, INDONESIAN RICE, LAO-PDR, LOS BAÑOS, MASBATE, MALAYSIAN RICE, MINDORO RICE, and MINDORO-5R SAIGON, SAN JOSE, THAILAND RICE, USA, VIETNAM RICE, VIETNAM, ZAMBALES, ZAMBOANGA, and ZAMBOANGA RICE. Examples of names of people include: AMOR, ANGELICA, ANGELO I, BELINA, DOÑA CITA, IMELDA RICE, KENNEDY, PEDRO, R-DANNY, RENIE, ROSANA, RYAN RICE, SINANDOMENG, and SYAMCY. Lastly, special traits of FGRG are highlighted based on their supposedly good phenotype, which include: 7-TONNER, 75 DAYS, 90 DAYS, BROWN RICE, BLONDE, and MALAGKIT. Other categories include combination of at least two of these types and letter-number codes like IL29 and SI33, which could be derived from a developer or source nursery of a breeding institute.

CONCLUSION

Farmers will keep an amount of seeds from their present harvest as planting material for the succeeding cropping season if they perceive them as having high yield, good eating quality and germination. FGRG also proliferate because of the inaccessibility of rice seeds and unavailability of high-quality seeds. Choosing their preferred rice varieties may happen when they save their own seeds, procure and/or exchange seed materials with their neighboring communities. Their preferences stand out in choosing their varieties. In conclusion, the project significantly contributed in knowing the origins of the farmers' rice genotypes whenever these are duplicated. It also gives ideas and data to all researchers and policymakers regarding unclassified rice lines and their utilization.

RECOMMENDATIONS

The proliferation of FGRGs or unregistered rice genotypes could be due to the absence of policies and laws that penalize people who develop, promote, sell or even use them. It is recommended to continue monitoring these genotypes in farmers' fields and seed centers. There are reasons why farmers use FGRG. Rice breeders should look into the unique traits of these FGRGs to gain insights on designing location-specific rice breeding programs. A strong policy is needed both at the regional and municipal levels in the form of resolutions that will aggressively promote the use of registered seeds, and a system to penalize seed growers or any entity that sells, spreads, and cultivates FGRG. Extension workers should also be pro-active in monitoring these FGRG especially in top-producing areas.

It is further recommended that these genotypes be analyzed and characterized to check if they are unique, NSIC- and PSB-released, or promising lines that were collected during field testing. Farmers will continue utilizing FGRGs especially if these varieties will perform well. These farmers' rice genotypes may have distinct qualities, thus, further research on this topic is still needed.

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Acknowledgment

Catalogue of Representative FGRG

Lead Contributors:

Norvie L. Manigbas	Photo-documentation
Xavier Greg I. Caguiat	National collection lead
Marilyn C. Ferrer	Agro-morphological characterization
Marissa V. Romero	Grain quality analysis
Joanne D. Caguiat & John Oscar S. Enriquez	DNA Fingerprinting

FGRG COLLECTIONS FROM CORDILLERA AND REGION 1

90 DAYS

Abra
Collection No.15664

90 DAYS-15664	
% Genetic Similarity	Other Genotypes
99.53	75 DAYS (16509)
94.42	PSB Rc 10
93.75	NSIC Rc 120
92.45	NSIC Rc 420
92.34	NSIC Rc 294

Grain Quality Traits

Milling Recovery (%)
- Brown Rice : 79.0 (F)
- Milled Rice : 71.5 (Pr)
- Head Rice : 49.2 (G1)

Physical Attributes
- Grain Length (mm) : 6.2 (M)
- Grain Shape : 2.9 (I)
- Chalky Grains (%) : 3.0 (G1)

Physicochemical Properties
- Amylose Content (%) : 20.0 (I)
- Gelatinization Temperature : 4.0 (I)
- Crude Protein Content (%) : 6.7

Agronomic Characteristics

Plant Height (cm) : 102.4
Heading Days After Seeding : 85
Maturity Days After Seeding : 115
Basal Leaf Sheath Color : 1 (Green)
Anthocyanin Coloration : 0 (Absent)
Leaf Blade Pubescence : 3 (Pubescent)
Auricle Color : 2 (Yellowish green)
Collar Color : 2 (Light green)
Awn Distribution : 0 (None)
Panicle Exsertion : 7 (Moderately well exserted)
Lodging Resistance : 9 (Very strong)
Leaf Senescence : 5 (Intermediate)
Panicle Shattering : 5 (Moderate)
Endosperm Type : 1 (Non-glutinous)

INAMID

Abra
Collection No.16495

INAMID-16495	
% Genetic Similarity	Other Genotypes
99.99	TABUK (16501)
99.99	DOUBLE DIAMOND (16507)
99.98	DOUBLE DIAMOND (16078)
99.98	1561 (15891)
99.98	NSIC Rc 218

Grain Quality Traits

Milling Recovery (%)
- Brown Rice : 76.7 (F)
- Milled Rice : 69.3 (G1)
- Head Rice : 54.5 (G1)

Physical Attributes
- Grain Length (mm) : 6.8 (L)
- Grain Shape : 3.1 (S)
- Chalky Grains (%) : 4.2 (G1)

Physicochemical Properties
- Amylose Content (%) : 17.4 (I)
- Gelatinization Temperature : 5.2 (L)
- Crude Protein Content (%) : 6.5

Agronomic Characteristics

Plant Height (cm) : 129.8
Heading Days After Seeding : 104
Maturity Days After Seeding : 134
Basal Leaf Sheath Color : 1 (Green)
Anthocyanin Coloration : 0 (Absent)
Leaf Blade Pubescence : 3 (Pubescent)
Auricle Color : 2 (Yellowish green)
Collar Color : 2 (Light green)
Awn Distribution : 2 (Upper quarter only)
Panicle Exsertion : 5 (Just exserted)
Lodging Resistance : 5 (Intermediate)
Leaf Senescence : 5 (Intermediate)
Panicle Shattering : 5 (Moderate)
Endosperm Type : 1 (Non-glutinous)

C4

Abra
Collection No. 16505

C4-16505	
% Genetic Similarity	Other Genotypes
99.98	KINAVITE (16035)
98.16	NSIC Rc 138
97.80	DIAMOND X (16062)
96.63	UNKNOWN VAR 2 (15878)
96.47	DIAMOND X (16510)

Grain Quality Traits

Milling Recovery (%)
- Brown Rice : 79.8 (G)
- Milled Rice : 71.8 (Pr)
- Head Rice : 45.2 (G2)

Physical Attributes
- Grain Length (mm) : 6.7 (L)
- Grain Shape : 3.1 (S)
- Chalky Grains (%) : 8.7 (G2)

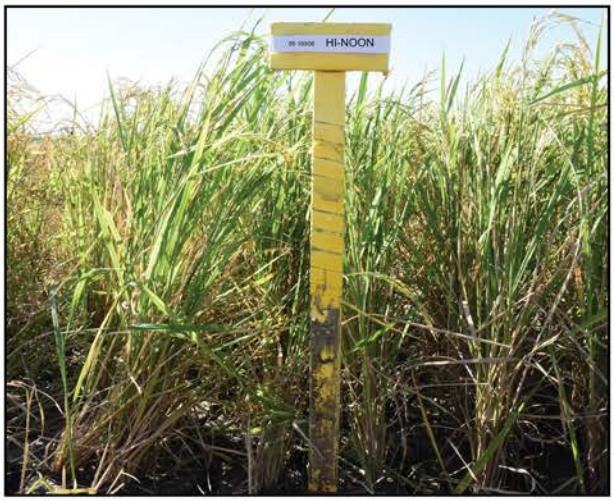
Physicochemical Properties
- Amylose Content (%) : 24.1 (H)
- Gelatinization Temperature : 7.0 (L)
- Crude Protein Content (%) : 6.6

Agronomic Characteristics

Plant Height (cm) : 106.9
Heading Days After Seeding : 96
Maturity Days After Seeding : 126
Basal Leaf Sheath Color : 1 (Green)
Anthocyanin Coloration : 0 (Absent)
Leaf Blade Pubescence : 3 (Pubescent)
Auricle Color : 2 (Yellowish green)
Collar Color : 2 (Light green)
Awn Distribution : 2 (Upper quarter only)
Panicle Exsertion : 5 (Just exserted)
Lodging Resistance : 9 (Very strong)
Leaf Senescence : 5 (Intermediate)
Panicle Shattering : 5 (Moderate)
Endosperm Type : 1 (Non-glutinous)

HI-NOON

Abra
Collection No. 16506



HI-NOON-16506	
% Genetic Similarity	Other Genotypes
98.34	PUKPUKLO (16067)
98.34	POKPOKLO (15666)
96.88	BURDAGOL (15660)
95.87	XOR (16395)
95.24	DIWATA (16351)

Grain Quality Traits

Milling Recovery (%)
- Brown Rice : 75.6 (F)
- Milled Rice : 68.5 (G1)
- Head Rice : 41.8 (G2)

Physical Attributes
- Grain Length (mm) : 5.3 (Sh)
- Grain Shape : 2.2 (I)
- Chalky Grains (%) : 3.4 (G1)

Physicochemical Properties
- Amylose Content (%) : 22.0 (I)
- Gelatinization Temperature : 3.7 (I/HI)
- Crude Protein Content (%) : 8.5

Agronomic Characteristics

Plant Height (cm) : 121.9
Heading Days After Seeding : 104
Maturity Days After Seeding : 134
Basal Leaf Sheath Color : 1 (Green)
Anthocyanin Coloration : 0 (Absent)
Leaf Blade Pubescence : 3 (Pubescent)
Auricle Color : 2 (Yellowish green)
Collar Color : 2 (Light green)
Awn Distribution : 0 (None)
Panicle Exsertion : 5 (Just exserted)
Lodging Resistance : 1 (Very weak)
Leaf Senescence : 5 (Intermediate)
Panicle Shattering : 5 (Moderate)
Endosperm Type : 1 (Non-glutinous)

MAGNOLIA

Abra
Collection No. 16512

MAGNOLIA-16512	
% Genetic Similarity	Other Genotypes
94.13	DIAMOND X (16510)
93.70	SOPER NINI (16296)
93.66	PANDAN 1 (16377)
93.25	BWSI-4R (16343)
92.70	PSB Rc 10

Grain Quality Traits

Milling Recovery (%)
- Brown Rice : 77.1 (F)
- Milled Rice : 70.8 (Pr)
- Head Rice : 18.6 (aa)

Physical Attributes
- Grain Length (mm) : 6.6 (L)
- Grain Shape : 2.6 (I)
- Chalky Grains (%) : 1.9 (Pr)

Physicochemical Properties
- Amylose Content (%) : 13.2 (L)
- Gelatinization Temperature : 5.9 (L)
- Crude Protein Content (%) : 6.7

Agronomic Characteristics

Plant Height (cm) : 120.2
Heading Days After Seeding : 91
Maturity Days After Seeding : 121
Basal Leaf Sheath Color : 1 (Green)
Anthocyanin Coloration : 0 (Absent)
Leaf Blade Pubescence : 3 (Pubescent)
Auricle Color : 2 (Yellowish green)
Collar Color : 2 (Light green)
Awn Distribution : 2 (Upper quarter only)
Panicle Exsertion : 5 (Just exserted)
Lodging Resistance : 9 (Very strong)
Leaf Senescence : 5 (Intermediate)
Panicle Shattering : 5 (Moderate)
Endosperm Type : 1 (Non-glutinous)

B5

Abra
Collection No. 16513

B5-16513	
% Genetic Similarity	Other Genotypes
94.62	UP & DOWN (15877)
93.85	V5 (16517)
93.84	M5-BD (16370)
93.84	NSIC Rc 148
93.56	DIAMOND X (16510)

Grain Quality Traits

Milling Recovery (%)
- Brown Rice : 78.2 (F)
- Milled Rice : 70.5 (Pr)
- Head Rice : 47.6 (G2)

Physical Attributes
- Grain Length (mm) : 6.6 (L)
- Grain Shape : 3.1 (S)
- Chalky Grains (%) : 2.6 (G1)

Physicochemical Properties
- Amylose Content (%) : 15.2 (L)
- Gelatinization Temperature : 5.9 (L)
- Crude Protein Content (%) : 6.7

Agronomic Characteristics

Plant Height (cm) : —
Heading Days After Seeding : 90
Maturity Days After Seeding : 120
Basal Leaf Sheath Color : 1 (Green)
Anthocyanin Coloration : 0 (Absent)
Leaf Blade Pubescence : 3 (Pubescent)
Auricle Color : 2 (Yellowish green)
Collar Color : 2 (Light green)
Awn Distribution : 0 (None)
Panicle Exsertion : 5 (Just exserted)
Lodging Resistance : 3 (Weak)
Leaf Senescence : 5 (Intermediate)
Panicle Shattering : 5 (Moderate)
Endosperm Type : 1 (Non-glutinous)

VIETNAM RICE

Apayao
Collection No. 16497

VIETNAM RICE-16497	
% Genetic Similarity	Other Genotypes
99.89	DOUBLE DIAMOND (16498)
99.81	DOUBLE DIAMOND X (15959)
99.69	JAPANIRI (16064)
99.46	AS 411 (15573)
99.41	75 (15844)

Grain Quality Traits

Milling Recovery (%)
- Brown Rice : 75.2 (F)
- Milled Rice : 66.3 (G1)
- Head Rice : 51.5 (G1)

Physical Attributes
- Grain Length (mm) : 6.7 (L)
- Grain Shape : 3.2 (S)
- Chalky Grains (%) : 6.7 (G2)

Physicochemical Properties
- Amylose Content (%) : 11.8 (L)
- Gelatinization Temperature : 2.5 (H/HI)
- Crude Protein Content (%) : 7.2

Agronomic Characteristics

Plant Height (cm) : 123.5
Heading Days After Seeding : 83
Maturity Days After Seeding : 113
Basal Leaf Sheath Color : 1 (Green)
Anthocyanin Coloration : 0 (Absent)
Leaf Blade Pubescence : 3 (Pubescent)
Auricle Color : 2 (Yellowish green)
Collar Color : 2 (Light green)
Awn Distribution : 0 (None)
Panicle Exsertion : 5 (Just exserted)
Lodging Resistance : 7 (Strong)
Leaf Senescence : 5 (Intermediate)
Panicle Shattering : 5 (Moderate)
Endosperm Type : 1 (Non-glutinous)

DOUBLE DIAMOND

Apayao
Collection No.16498

DOUBLE DIAMOND-16498	
% Genetic Similarity	Other Genotypes
99.92	DOUBLE DIAMOND X (15959)
99.89	VIETNAM RICE (16497)
99.80	JAPANIRI (16064)
99.50	AS 411 (15573)
99.48	75 (15844)

Grain Quality Traits

Milling Recovery (%)
- Brown Rice : 75.9 (F)
- Milled Rice : 67.1 (G1)
- Head Rice : 53.2 (G1)

Physical Attributes
- Grain Length (mm) : 6.5 (M)
- Grain Shape : 3.0 (I)
- Chalky Grains (%) : 6.7 (G2)

Physicochemical Properties
- Amylose Content (%) : 11.6 (L)
- Gelatinization Temperature : 2.0 (H)
- Crude Protein Content (%) : 7.3

Agronomic Characteristics

Plant Height (cm) : 118.2
Heading Days After Seeding : 83
Maturity Days After Seeding : 113
Basal Leaf Sheath Color : 1 (Green)
Anthocyanin Coloration : 0 (Absent)
Leaf Blade Pubescence : 3 (Pubescent)
Auricle Color : 2 (Yellowish green)
Collar Color : 2 (Light green)
Awn Distribution : 0 (None)
Panicle Exsertion : 7 (Moderately well exserted)
Lodging Resistance : 5 (Intermediate)
Leaf Senescence : 5 (Intermediate)
Panicle Shattering : 5 (Moderate)
Endosperm Type : 1 (Non-glutinous)

BELINA 219

Apayao
Collection No.16502

BELINA 219-16502	
% Genetic Similarity	Other Genotypes
100.00	BELENA 215 (15574)
91.15	216 (16399)
90.96	3-MILLION (15457)
90.96	ABANGAY (16336)
90.94	KAMOROS (16358)

Grain Quality Traits

Milling Recovery (%)
- Brown Rice : 76.9 (F)
- Milled Rice : 69.7 (G1)
- Head Rice : 59.9 (Pr)

Physical Attributes
- Grain Length (mm) : 5.9 (M)
- Grain Shape : 2.5 (I)
- Chalky Grains (%) : 9.1 (G2)

Physicochemical Properties
- Amylose Content (%) : 16.0 (L)
- Gelatinization Temperature : 6.0 (L)
- Crude Protein Content (%) : 5.4

Agronomic Characteristics

Plant Height (cm) : 117.3
Heading Days After Seeding : 92
Maturity Days After Seeding : 122
Basal Leaf Sheath Color : 1 (Green)
Anthocyanin Coloration : 0 (Absent)
Leaf Blade Pubescence : 3 (Pubescent)
Auricle Color : 2 (Yellowish green)
Collar Color : 2 (Light green)
Awn Distribution : 0 (None)
Panicle Exsertion : 5 (Just exserted)
Lodging Resistance : 5 (Intermediate)
Leaf Senescence : 5 (Intermediate)
Panicle Shattering : 5 (Moderate)
Endosperm Type : 1 (Non-glutinous)

MASIGASIG 88

Apayao
Collection No.16503

MASIGASIG 88-16503	
% Genetic Similarity	Other Genotypes
100.00	IL-29 (15513)
100.00	SUPER DIAMOND (15558)
100.00	MESTIZA (15886)
100.00	BELENA 205 (15583)
100.00	DESTINY (16093)
100.00	COMBAT (15969)
100.00	GSR 12 (15976)
100.00	TOP RICE (15556)
100.00	DREAM RICE (15570)

Grain Quality Traits

Milling Recovery (%)
- Brown Rice : 78.8 (F)
- Milled Rice : 69.7 (G1)
- Head Rice : 52.4 (G1)

Physical Attributes
- Grain Length (mm) : 6.7 (L)
- Grain Shape : 3.2 (S)
- Chalky Grains (%) : 11.8 (G3)

Physicochemical Properties
- Amylose Content (%) : 23.0 (H)
- Gelatinization Temperature : 4.4 (I)
- Crude Protein Content (%) : 7.8

Agronomic Characteristics

Plant Height (cm) : 105.2
Heading Days After Seeding : 105
Maturity Days After Seeding : 135
Basal Leaf Sheath Color : 1 (Green)
Anthocyanin Coloration : 0 (Absent)
Leaf Blade Pubescence : 3 (Pubescent)
Auricle Color : 2 (Yellowish green)
Collar Color : 2 (Light green)
Awn Distribution : 0 (None)
Panicle Exsertion : 7 (Moderately well exserted)
Lodging Resistance : 7 (Strong)
Leaf Senescence : 5 (Intermediate)
Panicle Shattering : 5 (Moderate)
Endosperm Type : 1 (Non-glutinous)

SAN JOSE

Apayao
Collection No. 16508

SAN JOSE-16508	
% Genetic Similarity	Other Genotypes
94.25	DIAMOND X (16510)
94.10	NSIC Rc 298
93.68	PSB Rc 10
93.63	IR 64
92.60	216 (16399)

Grain Quality Traits

Milling Recovery (%)
- Brown Rice : 77.5 (F)
- Milled Rice : 69.4 (G1)
- Head Rice : 62.2 (Pr)

Physical Attributes
- Grain Length (mm) : 7.0 (L)
- Grain Shape : 3.4 (S)
- Chalky Grains (%) : 2.5 (G1)

Physicochemical Properties
- Amylose Content (%) : 22.9 (H)
- Gelatinization Temperature : 4.2 (I)
- Crude Protein Content (%) : 7.5

Agronomic Characteristics

Plant Height (cm) : 120.0
Heading Days After Seeding : 92
Maturity Days After Seeding : 122
Basal Leaf Sheath Color : 1 (Green)
Anthocyanin Coloration : 0 (Absent)
Leaf Blade Pubescence : 3 (Pubescent)
Auricle Color : 2 (Yellowish green)
Collar Color : 2 (Light green)
Awn Distribution : 2 (Upper quarter only)
Panicle Exsertion : 5 (Just exserted)
Lodging Resistance : 3 (Weak)
Leaf Senescence : 5 (Intermediate)
Panicle Shattering : 5 (Moderate)
Endosperm Type : 1 (Non-glutinous)

TUDY-TUDY

Apayao
Collection No.16514

TUDY-TUDY-16514	
% Genetic Similarity	Other Genotypes
100.00	NSIC Rc 122
96.60	JANJANONG (16515)
94.51	ANGELICA (16337)
93.88	SAIGON (15849)
93.60	216 (16399)

Grain Quality Traits

Milling Recovery (%)
- Brown Rice : 77.1 (F)
- Milled Rice : 65.2 (G1)
- Head Rice : 40.1 (G2)

Physical Attributes
- Grain Length (mm) : 6.8 (L)
- Grain Shape : 3.2 (S)
- Chalky Grains (%) : 18.9 (aa)

Physicochemical Properties
- Amylose Content (%) : 18.4 (I)
- Gelatinization Temperature : 3.9 (I/HI)
- Crude Protein Content (%) : 6.0

Agronomic Characteristics

Plant Height (cm) : 118
Heading Days After Seeding : 105
Maturity Days After Seeding : 120
Basal Leaf Sheath Color : 1 (Green)
Anthocyanin Coloration : 0 (Absent)
Leaf Blade Pubescence : 3 (Pubescent)
Auricle Color : 2 (Yellowish green)
Collar Color : 2 (Light green)
Awn Distribution : 0 (None)
Panicle Exsertion : 5 (Just exserted)
Lodging Resistance : 9 (Very strong)
Leaf Senescence : 5 (Intermediate)
Panicle Shattering : 5 (Moderate)
Endosperm Type : 1 (Non-glutinous)

SENORITA

Ilocos Norte
Collection No. 15665

SENORITA-15665	
% Genetic Similarity	Other Genotypes
94.41	UP & DOWN (15877)
94.37	DIAMOND X (16510)
94.26	EXCEL RICE (15571)
94.26	BWS-6W (16344)
93.75	NSIC Rc 148

Grain Quality Traits

Milling Recovery (%)
- Brown Rice : 79.7 (F)
- Milled Rice : 71.6 (Pr)
- Head Rice : 53.8 (G1)

Physical Attributes
- Grain Length (mm) : 6.3 (M)
- Grain Shape : 3.0 (I)
- Chalky Grains (%) : 2.1 (G1)

Physicochemical Properties
- Amylose Content (%) : 22.2 (H)
- Gelatinization Temperature : 4.1 (I)
- Crude Protein Content (%) : 7.0

Agronomic Characteristics

Plant Height (cm) : 130.6
Heading Days After Seeding : 91
Maturity Days After Seeding : 121
Basal Leaf Sheath Color : 1 (Green)
Anthocyanin Coloration : 0 (Absent)
Leaf Blade Pubescence : 3 (Pubescent)
Auricle Color : 2 (Yellowish green)
Collar Color : 2 (Light green)
Awn Distribution : 0 (None)
Panicle Exsertion : 5 (Just exserted)
Lodging Resistance : 3 (Weak)
Leaf Senescence : 7 (Late)
Panicle Shattering : 3 (Low)
Endosperm Type : 1 (Non-glutinous)

GOLIATH

Ilocos Norte
Collection No.15694

GOLIATH-15694	
% Genetic Similarity	Other Genotypes
99.44	SAMPAGUITA (15948)
99.44	DIAMOND XX (DOUBLE DIAMOND) (15514)
99.44	DOUBLE DIAMOND (15942)
99.44	SUPER KALOY (VIETNAM RICE) (15559)
99.44	UNKNOWN 5 (16189)
99.44	ZAMBOANGA (15945)
99.44	DIAMOND X (15889)
99.44	DOUBLE DIAMOND (MLANG) (16333)
99.44	MILAGROSA (15605)
99.44	ZAMBOANGA (16422)

Grain Quality Traits

Milling Recovery (%)
- Brown Rice : 78.4 (F)
- Milled Rice : 69.6 (G1)
- Head Rice : 62.5 (Pr)

Physical Attributes
- Grain Length (mm) : 6.9 (L)
- Grain Shape : 3.0 (I)
- Chalky Grains (%) : 3.8 (G1)

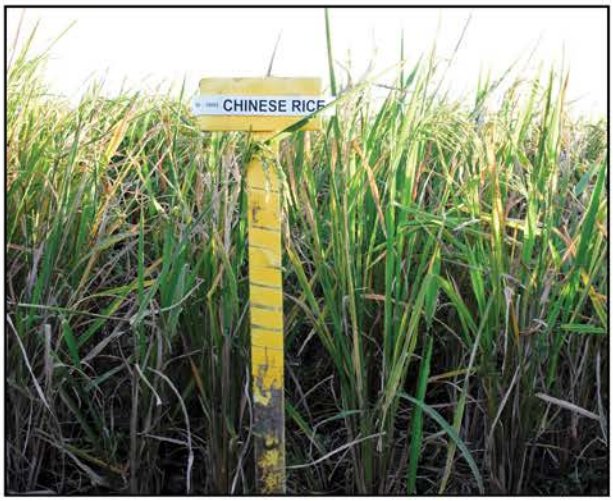
Physicochemical Properties
- Amylose Content (%) : 15.7 (L)
- Gelatinization Temperature : 4.8(I/L)
- Crude Protein Content (%) : 7.8

Agronomic Characteristics

- Plant Height (cm) : 130.8
- Heading Days After Seeding : 100
- Maturity Days After Seeding : 130
- Basal Leaf Sheath Color : 1 (Green)
- Anthocyanin Coloration : 0 (Absent)
- Leaf Blade Pubescence : 3 (Pubescent)
- Auricle Color : 2 (Yellowish green)
- Collar Color : 2 (Light green)
- Awn Distribution : 0 (None)
- Panicle Exsertion : 7 (Moderately well-exserted)
- Lodging Resistance : 7 (Strong)
- Leaf Senescence : 5 (Intermediate)
- Panicle Shattering : 5 (Moderate)
- Endosperm Type : 1 (Non-glutinous)

CHINESE RICE

Ilocos Norte
Collection No. 15695



CHINESE RICE-15695	
% Genetic Similarity	Other Genotypes
88.97	I8 (VN) (15890)
88.46	NTPSA-1 (16376)
88.22	ABANGAY (16336)
88.17	ROSANA (16089)
88.13	216 (16399)

Grain Quality Traits

Milling Recovery (%)
- Brown Rice : 80.7 (G)
- Milled Rice : 73.2 (Pr)
- Head Rice : 59.9 (Pr)

Physical Attributes
- Grain Length (mm) : 6.8 (L)
- Grain Shape : 3.0 (I)
- Chalky Grains (%) : 3.6 (G1)

Physicochemical Properties
- Amylose Content (%) : 20.5 (I)
- Gelatinization Temperature : 6.0 (L)
- Crude Protein Content (%) : 9.2

Agronomic Characteristics

Plant Height (cm) : 115.6
Heading Days After Seeding : 85
Maturity Days After Seeding : 115
Basal Leaf Sheath Color : 2 (Green with purple lines)
Anthocyanin Coloration : 3 (Weak)
Leaf Blade Pubescence : 3 (Pubescent)
Auricle Color : 2 (Yellowish green)
Collar Color : 2 (Light green)
Awn Distribution : 0 (None)
Panicle Exsertion : 5 (Just exserted)
Lodging Resistance : 5 (Intermediate)
Leaf Senescence : 5 (Intermediate)
Panicle Shattering : 5 Moderate)
Endosperm Type : 2 (Intermediate)

75 DAYS

Ilocos Norte
Collection No.16499

75 DAYS-16499	
% Genetic Similarity	Other Genotypes
100.00	JASMIN (15662)
99.87	NSIC Rc 160
96.53	JANJANONG (16515)
95.81	216 (16399)
92.66	OFFSPRING (15501)

Grain Quality Traits

Milling Recovery (%)
- Brown Rice : 78.4 (F)
- Milled Rice : 71.8 (Pr)
- Head Rice : 63.4 (Pr)

Physical Attributes
- Grain Length (mm) : 6.4 (M)
- Grain Shape : 3.0 (I)
- Chalky Grains (%) : 1.1 (Pr)

Physicochemical Properties
- Amylose Content (%) : 19.6 (I)
- Gelatinization Temperature : 3.8 (I/HI)
- Crude Protein Content (%) : 8.8

Agronomic Characteristics

Plant Height (cm) :
Heading Days After Seeding : 92
Maturity Days After Seeding : 122
Basal Leaf Sheath Color : 1 (Green)
Anthocyanin Coloration : 0 (Absent)
Leaf Blade Pubescence : 3 (Pubescent)
Auricle Color : 2 (Yellowish green)
Collar Color : 2 (Light green)
Awn Distribution : 0 (None)
Panicle Exsertion : 7 (Moderately well exserted)
Lodging Resistance : 9 (Very strong)
Leaf Senescence : 5 (Intermediate)
Panicle Shattering : 5 (Moderate)
Endosperm Type : 1 (Non-glutinous)

75 DAYS

Ilocos Norte
Collection No. 16509

75 DAYS-16509	
% Genetic Similarity	Other Genotypes
99.53	90 DAYS (15664)
95.44	PSB Rc 10
93.63	NSIC Rc 420
93.60	NSIC Rc 120
93.33	DIAMOND X (16510)

Grain Quality Traits

Milling Recovery (%)
- Brown Rice : 78.3 (F)
- Milled Rice : 65.9 (G1)
- Head Rice : 39.5 (G2)

Physical Attributes
- Grain Length (mm) : 6.7 (L)
- Grain Shape : 3.1 (S)
- Chalky Grains (%) : 8.1 (G2)

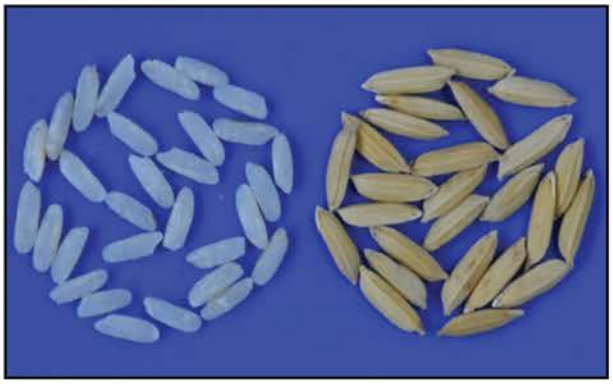
Physicochemical Properties
- Amylose Content (%) : 21.1 (I)
- Gelatinization Temperature : 4.8 (I)
- Crude Protein Content (%) : 7.2

Agronomic Characteristics

Plant Height (cm) : 95.1
Heading Days After Seeding : 82
Maturity Days After Seeding : 112
Basal Leaf Sheath Color : 1 (Green)
Anthocyanin Coloration : 0 (Absent)
Leaf Blade Pubescence : 3 (Pubescent)
Auricle Color : 2 (Yellowish green)
Collar Color : 2 (Light green)
Awn Distribution : 0 (None)
Panicle Exsertion : 7 (Moderately well exserted)
Lodging Resistance : 7 (Strong)
Leaf Senescence : 5 (Intermediate)
Panicle Shattering : 5 (Moderate)
Endosperm Type : 1 (Non-glutinous)

DIAMOND X

Ilocos Norte
Collection No.16510



DIAMOND X-16510	
% Genetic Similarity	Other Genotypes
99.35	INAMID (16495)
99.34	TABUK (16501)
99.34	UNKNOWN VAR 3 (15879)
99.34	DOUBLE DIAMOND (16507)
99.34	SAMPAGUITA (16308)

Grain Quality Traits

Milling Recovery (%)
- Brown Rice : 75.8 (F)
- Milled Rice : 68.0 (G1)
- Head Rice : 60.6 (Pr)

Physical Attributes
- Grain Length (mm) : 7.0 (L)
- Grain Shape : 3.1 (S)
- Chalky Grains (%) : 6.4 (G2)

Physicochemical Properties
- Amylose Content (%) : 17.2 (I)
- Gelatinization Temperature : 5.4 (I/L)
- Crude Protein Content (%) : 6.5

Agronomic Characteristics

Plant Height (cm) : 124.6
Heading Days After Seeding : 92
Maturity Days After Seeding : 122
Basal Leaf Sheath Color : 1 (Green)
Anthocyanin Coloration : 0 (Absent)
Leaf Blade Pubescence : 3 (Pubescent)
Auricle Color : 2 (Yellowish green)
Collar Color : 2 (Light green)
Awn Distribution : 0 (None)
Panicle Exsertion : 5 (Just exserted)
Lodging Resistance : 7 (Strong)
Leaf Senescence : 5 (Intermediate)
Panicle Shattering : 5 (Moderate)
Endosperm Type : 1 (Non-glutinous)

JANJANONG

Ilocos Norte
Collection No. 16515

JANJANONG-16515	
% Genetic Similarity	Other Genotypes
96.61	NSIC Rc 122
96.61	216 (16399)
96.60	TUDY-TUDY (16514)
96.54	NSIC Rc 160
96.54	JASMIN (15662)

Grain Quality Traits

Milling Recovery (%)
- Brown Rice : 77.1 (F)
- Milled Rice : 68.2 (G1)
- Head Rice : 55.0 (G1)

Physical Attributes
- Grain Length (mm) : 7.1 (L)
- Grain Shape : 3.3 (S)
- Chalky Grains (%) : 4.8 (G1)

Physicochemical Properties
- Amylose Content (%) : 19.9 (I)
- Gelatinization Temperature : 5.2 (L/I)
- Crude Protein Content (%) : 8.0

Agronomic Characteristics

Plant Height (cm) : 112.4
Heading Days After Seeding : 91
Maturity Days After Seeding : 121
Basal Leaf Sheath Color : 1 (Green)
Anthocyanin Coloration : 0 (None)
Leaf Blade Pubescence : 3 (Pubescent)
Auricle Color : 2 (Yellowish green)
Collar Color : 2 (Light green)
Awn Distribution : 0 (None)
Panicle Exsertion : 5 (Just exserted)
Lodging Resistance : 9 (Very strong)
Leaf Senescence : 5 (Intermediate)
Panicle Shattering : 5 Moderate)
Endosperm Type : 1 (Non-glutinous)

V5

Ilocos Norte
Collection No.16517

V5-16517	
% Genetic Similarity	Other Genotypes
95.46	DIAMOND X (16510)
95.08	216 (16399)
94.85	M5-BD (16370)
94.72	NSIC Rc 294
94.61	NSIC Rc 420

Grain Quality Traits

Milling Recovery (%)
- Brown Rice : 79.3 (F)
- Milled Rice : 70.0 (G1)
- Head Rice : 57.6 (Pr)

Physical Attributes
- Grain Length (mm) : 6.6 (L)
- Grain Shape : 3.0 (I)
- Chalky Grains (%) : 4.1 (G1)

Physicochemical Properties
- Amylose Content (%) : 18.3 (I)
- Gelatinization Temperature : 5.0 (I/L)
- Crude Protein Content (%) : 8.9

Agronomic Characteristics

- Plant Height (cm) : 124.4
- Heading Days After Seeding : 83
- Maturity Days After Seeding : 113
- Basal Leaf Sheath Color : 1 (Green)
- Anthocyanin Coloration : 0 (Absent)
- Leaf Blade Pubescence : 3 (Pubescent)
- Auricle Color : 2 (Yellowish green)
- Collar Color : 2 (Light green)
- Awn Distribution : 0 (None)
- Panicle Exsertion : 7 (Moderately well exserted)
- Lodging Resistance : 3 (Weak)
- Leaf Senescence : 5 (Intermediate)
- Panicle Shattering : 5 (Moderate)
- Endosperm Type : 1 (Non-glutinous)

BALAKI

Ilocos Sur
Collection No. 15659

BALAKI-15659	
% Genetic Similarity	Other Genotypes
100.00	PSB Rc 9
100.00	AEROBIC RICE (15657)
97.21	NSIC Rc 25
94.88	AEROBIC RICE (15635)
94.81	NSIC Rc 23

Grain Quality Traits

Milling Recovery (%)
- Brown Rice : 77.5 (F)
- Milled Rice : 69.9 (G1)
- Head Rice : 57.4 (G1)

Physical Attributes
- Grain Length (mm) : 5.8 (M)
- Grain Shape : 2.3 (I)
- Chalky Grains (%) : 20.4 (aa)

Physicochemical Properties
- Amylose Content (%) : 17.7 (I)
- Gelatinization Temperature : 2.3 (H/HI)
- Crude Protein Content (%) : 6.6

Agronomic Characteristics

Plant Height (cm) : 146.5
Heading Days After Seeding : 91
Maturity Days After Seeding : 121
Basal Leaf Sheath Color : 3 (Light purple)
Anthocyanin Coloration : 5 (Medium)
Leaf Blade Pubescence : 3 (Pubescent)
Auricle Color : 2 (Yellowish green)
Collar Color : 4 (Purple lines)
Awn Distribution : 0 (None)
Panicle Exsertion : 5 (Just exserted)
Lodging Resistance : 9 (Very strong)
Leaf Senescence : 5 (Intermediate)
Panicle Shattering : 3 (Low)
Endosperm Type : 1 (Non-glutinous)

JASMIN

Ilocos Sur
Collection No.15661

JASMIN-15661	
% Genetic Similarity	Other Genotypes
97.92	3-MILLION (15457)
97.00	SENORITA PILIT (16316)
96.06	ROSANA (16089)
95.66	BODO-BODO (AGUSAN) (16327)
95.50	INBRED-300 (16436)
95.50	BWSI-4R (16343)

Grain Quality Traits

Milling Recovery (%)
- Brown Rice : 79.7 (F)
- Milled Rice : 72.4 (Pr)
- Head Rice : 43.4 (G2)

Physical Attributes
- Grain Length (mm) : 7.3 (L)
- Grain Shape : 2.8 (I)
- Chalky Grains (%) : 6.2 (G2)

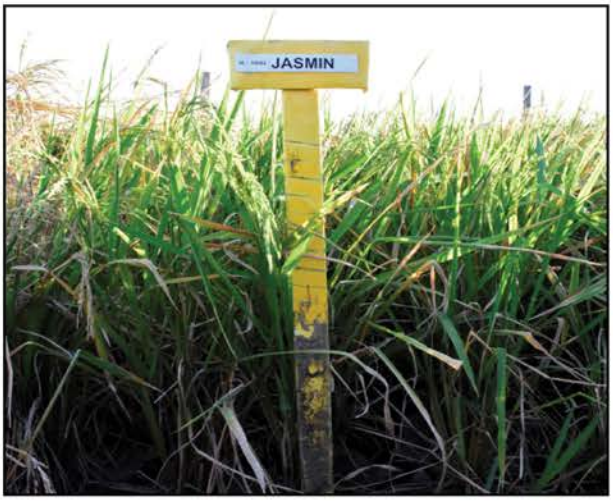
Physicochemical Properties
- Amylose Content (%) : 15.4 (L)
- Gelatinization Temperature : 4.0 (I)
- Crude Protein Content (%) : 6.7

Agronomic Characteristics

Plant Height (cm) : 117.7
Heading Days After Seeding : 91
Maturity Days After Seeding : 121
Basal Leaf Sheath Color : 1 (Green)
Anthocyanin Coloration : 0 (Absent)
Leaf Blade Pubescence : 3 (Pubescent)
Auricle Color : 2 (Yellowish green)
Collar Color : 2 (Light green)
Awn Distribution : 0 (None)
Panicle Exsertion : 3 (Partly exserted)
Lodging Resistance : 5 (Intermediate)
Leaf Senescence : 5 (Intermediate)
Panicle Shattering : 5 (Moderate)
Endosperm Type : 1 (Non-glutinous)

JASMIN

Ilocos Sur
Collection No. 15662



JASMIN-15662	
% Genetic Similarity	Other Genotypes
100.00	75 DAYS (16499)
99.87	NSIC Rc 160
96.54	JANJANONG (16515)
95.83	216 (16399)
92.67	OFFSPRING (15501)

Grain Quality Traits

Milling Recovery (%)
- Brown Rice : 79.4 (F)
- Milled Rice : 70.1 (Pr)
- Head Rice : 58.1 (Pr)

Physical Attributes
- Grain Length (mm) : 7.0 (L)
- Grain Shape : 3.2 (S)
- Chalky Grains (%) : 3.1 (G1)

Physicochemical Properties
- Amylose Content (%) : 14.7 (L)
- Gelatinization Temperature : 5.8 (I/L)
- Crude Protein Content (%) : 6.7

Agronomic Characteristics

- Plant Height (cm) : 108.8
- Heading Days After Seeding : 91
- Maturity Days After Seeding : 121
- Basal Leaf Sheath Color : 1 (Green)
- Anthocyanin Coloration : 0 (Absent)
- Leaf Blade Pubescence : 3 (Pubescent)
- Auricle Color : 2 (Yellowish green)
- Collar Color : 2 (Light green)
- Awn Distribution : 2 (Upper quarter only)
- Panicle Exsertion : 5 (Just exserted)
- Lodging Resistance : 5 (Intermediate)
- Leaf Senescence : 5 (Intermediate)
- Panicle Shattering : 5 (Moderate)
- Endosperm Type : 1 (Non-glutinous)

SINANDOMENG

Ilocos Sur
Collection No.15663

SINANDOMENG-15663	
% Genetic Similarity	Other Genotypes
100.00	SINANLANG-ANG (15667)
100.00	SINANDOMENG (15848)
95.93	(GUINOBAT) SIROMA (15838)
93.33	ROSANA (16089)
92.84	ABANGAY (16336)

Grain Quality Traits

Milling Recovery (%)
- Brown Rice : 79.2 (F)
- Milled Rice : 70.7 (G1)
- Head Rice : 56.4 (G1)

Physical Attributes
- Grain Length (mm) : 6.5 (M)
- Grain Shape : 2.6 (I)
- Chalky Grains (%) : 11.1 (G3)

Physicochemical Properties
- Amylose Content (%) : 21.5 (I)
- Gelatinization Temperature : 4.0 (I)
- Crude Protein Content (%) : 6.7

Agronomic Characteristics

- Plant Height (cm) : 114.4
- Heading Days After Seeding : 92
- Maturity Days After Seeding : 122
- Basal Leaf Sheath Color : 1 (Green)
- Anthocyanin Coloration : 0 (Absent)
- Leaf Blade Pubescence : 3 (Pubescent)
- Auricle Color : 2 (Yellowish green)
- Collar Color : 2 (Light green)
- Awn Distribution : 0 (None)
- Panicle Exsertion : 7 (Moderately well exserted)
- Lodging Resistance : 7 (Strong)
- Leaf Senescence : 5 (Intermediate)
- Panicle Shattering : 5 (Moderate)
- Endosperm Type : 2 (Intermediate)

POKPOKLO

Ilocos Sur
Collection No.15666

POKPOKLO-15666	
% Genetic Similarity	Other Genotypes
100.00	PUKPUKLO (16067)
98.34	HI-NOON (16506)
95.29	BURDAGOL (15660)
94.49	ROSANA (16089)
94.04	DIWATA (16351)

Grain Quality Traits

Milling Recovery (%)
- Brown Rice : 78.5 (F)
- Milled Rice : 70.0 (G1)
- Head Rice : 63.8 (Pr)

Physical Attributes
- Grain Length (mm) : 5.6 (M)
- Grain Shape : 2.2 (I)
- Chalky Grains (%) : 8.1 (G2)

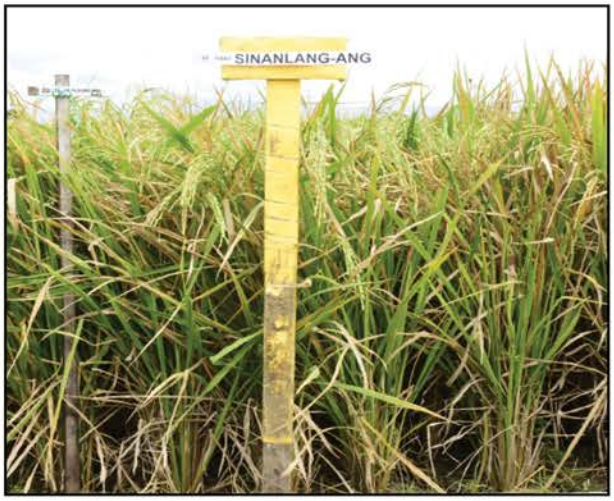
Physicochemical Properties
- Amylose Content (%) : 21.0 (I)
- Gelatinization Temperature : 4.4 (I)
- Crude Protein Content (%) : 7.1

Agronomic Characteristics

- Plant Height (cm) : 155.2
- Heading Days After Seeding : 141
- Maturity Days After Seeding : 125
- Basal Leaf Sheath Color : 1 (Green)
- Anthocyanin Coloration : 0 (Absent)
- Leaf Blade Pubescence : 2 (Intermediate)
- Auricle Color : 2 (Yellowish green)
- Collar Color : 2 (Light green)
- Awn Distribution : 0 (None)
- Panicle Exsertion : 5 (Just exserted)
- Lodging Resistance : 1 (Very weak)
- Leaf Senescence : 5 (Intermediate)
- Panicle Shattering : 3 (Low)
- Endosperm Type : 2 (Intermediate)

SINANLANG-ANG

Ilocos Sur
Collection No. 15667



SINANLANG-ANG-15667	
% Genetic Similarity	Other Genotypes
100.00	SINANDOMENG (15848)
100.00	SINANDOMENG (15663)
95.93	(GUINOBAT) SIROMA (15838)
93.33	ROSANA (16089)
92.84	ABANGAY (16336)

Grain Quality Traits

Milling Recovery (%)
- Brown Rice : 78.4 (F)
- Milled Rice : 69.0 (G1)
- Head Rice : 53.7 (G1)

Physical Attributes
- Grain Length (mm) : 6.5 (M)
- Grain Shape : 2.7 (I)
- Chalky Grains (%) : 20.5 (aa)

Physicochemical Properties
- Amylose Content (%) : 21.6 (I)
- Gelatinization Temperature : 4.4 (I)
- Crude Protein Content (%) : 6.6

Agronomic Characteristics

Plant Height (cm) : 129.6
Heading Days After Seeding : 91
Maturity Days After Seeding : 121
Basal Leaf Sheath Color : 1 (Green)
Anthocyanin Coloration : 0 (Absent)
Leaf Blade Pubescence : 3 (Pubescent)
Auricle Color : 2 (Yellowish green)
Collar Color : 2 (Light green)
Awn Distribution : 0 (None)
Panicle Exsertion : 7 (Moderately well exserted)
Lodging Resistance : 5 (Intermediate)
Leaf Senescence : 5 (Intermediate)
Panicle Shattering : 5 (Moderate)
Endosperm Type : 1 (Non-glutinous)

RYAN RICE

Ilocos Sur
Collection No.16511

RYAN RICE-16511	
% Genetic Similarity	Other Genotypes
90.69	KAPULA (15847)
90.55	DIAMOND X (16510)
90.08	INBRED-300 (16436)
90.07	ABANGAY (16336)
90.03	216 (16399)

Grain Quality Traits

Milling Recovery (%)
- Brown Rice : 78.9 (F)
- Milled Rice : 70.3 (Pr)
- Head Rice : 54.2 (G1)

Physical Attributes
- Grain Length (mm) : 7.0 (L)
- Grain Shape : 3.3 (S)
- Chalky Grains (%) : 6.1 (G2)

Physicochemical Properties
- Amylose Content (%) : 13.0 (L)
- Gelatinization Temperature : 5.7 (L/I)
- Crude Protein Content (%) : 7.3

Agronomic Characteristics

Plant Height (cm) : —
Heading Days After Seeding : 91
Maturity Days After Seeding : 121
Basal Leaf Sheath Color : 1 (Green)
Anthocyanin Coloration : 0 (Absent)
Leaf Blade Pubescence : 3 (Pubescent)
Auricle Color : 2 (Yellowish green)
Collar Color : 2 (Light green)
Awn Distribution : 2 (Upper quarter only)
Panicle Exsertion : 5 (Just exserted)
Lodging Resistance : 9 (Very strong)
Leaf Senescence : 5 (Intermediate)
Panicle Shattering : 5 (Moderate)
Endosperm Type : 1 (Non-glutinous)

AEROBIC RICE

La Union
Collection No.15657

AEROBIC RICE-15657	
% Genetic Similarity	Other Genotypes
100.00	BALAKI (15659)
100.00	PSB Rc 9
97.21	NSIC Rc 25
94.87	AEROBIC RICE (15635)
94.81	NSIC Rc 23

Grain Quality Traits

Milling Recovery (%)
- Brown Rice : 78.0 (F)
- Milled Rice : 72.3 (Pr)
- Head Rice : 52.1 (G1)

Physical Attributes
- Grain Length (mm) : 6.0 (M)
- Grain Shape : 2.3 (I)
- Chalky Grains (%) : 7.1 (G2)

Physicochemical Properties
- Amylose Content (%) : 20.2 (I)
- Gelatinization Temperature : 4.0 (I)
- Crude Protein Content (%) : 9.7

Agronomic Characteristics

Plant Height (cm) : 123.2
Heading Days After Seeding : 97
Maturity Days After Seeding : 127
Basal Leaf Sheath Color : 1 (Green)
Anthocyanin Coloration : 0 (Absent)
Leaf Blade Pubescence : 3 (Pubescent)
Auricle Color : 2 (Yellowish green)
Collar Color : 2 (Light green)
Awn Distribution : 0 (None)
Panicle Exsertion : 7 (Moderately well exserted)
Lodging Resistance : 5 (Intermediate)
Leaf Senescence : 5 (Intermediate)
Panicle Shattering : 5 (Moderate)
Endosperm Type : 1 (Non-glutinous)

BURDAGOL

La Union
Collection No.15660

BURDAGOL-15660	
% Genetic Similarity	Other Genotypes
96.88	HI-NOON (16506)
96.52	XOR (16395)
95.30	PUKPUKLO (16067)
95.29	POKPOKLO (15666)
95.05	DIWATA (16351)

Grain Quality Traits

Milling Recovery (%)
- Brown Rice : 78.4 (F)
- Milled Rice : 71.5 (Pr)
- Head Rice : 56.9 (G1)

Physical Attributes
- Grain Length (mm) : 6.4 (M)
- Grain Shape : 2.8 (I)
- Chalky Grains (%) : 4.9 (G1)

Physicochemical Properties
- Amylose Content (%) : 20.3 (I)
- Gelatinization Temperature : 3.7 (HI/I)
- Crude Protein Content (%) : 7.9

Agronomic Characteristics

Plant Height (cm) : 147.3
Heading Days After Seeding : 111
Maturity Days After Seeding : 141
Basal Leaf Sheath Color : 3 (Light purple)
Anthocyanin Coloration : 5 (Medium)
Leaf Blade Pubescence : 3 (Pubescent)
Auricle Color : 2 (Yellowish green)
Collar Color : 4 (Purple lines)
Awn Distribution : 0 (None)
Panicle Exsertion : 5 (Just exserted)
Lodging Resistance : 9 (Very strong)
Leaf Senescence : 7 (Late)
Panicle Shattering : 5 (Moderate)
Endosperm Type : 1 (Non-glutinous)

RJ 40

La Union
Collection No. 16496

RJ 40-16496	
% Genetic Similarity	Other Genotypes
99.93	M3 BARAKO (15496)
99.93	M3-BARAKO (16313)
94.76	DASH 12 (16335)
94.54	DIAMOND X (16510)
94.27	SUPER DX (16425)

Grain Quality Traits

Milling Recovery (%)
- Brown Rice : 77.6 (F)
- Milled Rice : 68.4 (G1)
- Head Rice : 45.7 (G2)

Physical Attributes
- Grain Length (mm) : 6.9 (L)
- Grain Shape : 2.7 (I)
- Chalky Grains (%) : 12.3 (G3)

Physicochemical Properties
- Amylose Content (%) : 22.1 (H)
- Gelatinization Temperature : 4.3 (I)
- Crude Protein Content (%) : 7.6

Agronomic Characteristics

Plant Height (cm) : 128.6
Heading Days After Seeding : 91
Maturity Days After Seeding : 121
Basal Leaf Sheath Color : 1 (Green)
Anthocyanin Coloration : 0 (Absent)
Leaf Blade Pubescence : 3 (Pubescent)
Auricle Color : 2 (Yellowish green)
Collar Color : 2 (Light green)
Awn Distribution : 0 (None)
Panicle Exsertion : 7 (Moderately well exserted)
Lodging Resistance : 7 (Strong)
Leaf Senescence : 5 (Intermediate)
Panicle Shattering : 5 (Intermediate)
Endosperm Type : 2 (Intermediate)

TABUK

La Union
Collection No. 16501

TABUK-16501	
% Genetic Similarity	Other Genotypes
100.00	DOUBLE DIAMOND (16507)
100.00	1561 (15891)
100.00	NSIC Rc 218
100.00	SAMPAGUITA (16308)
100.00	SAMPAGUITA (AGUSAN) (16326)
100.00	UNKNOWN VAR 3 (15879)
100.00	DOUBLE DIAMOND (16078)
100.00	DIAMOND V (15576)
100.00	SAMPAGUITA (15500)
100.00	DESTINY (15502)

Grain Quality Traits

Milling Recovery (%)
- Brown Rice : 78.2 (F)
- Milled Rice : 69.9 (G1)
- Head Rice : 60.6 (Pr)

Physical Attributes
- Grain Length (mm) : 7.1 (L)
- Grain Shape : 3.1 (S)
- Chalky Grains (%) : 1.9 (Pr)

Physicochemical Properties
- Amylose Content (%) : 16.0 (L)
- Gelatinization Temperature : 6.0 (L)
- Crude Protein Content (%) : 6.8

Agronomic Characteristics

Plant Height (cm) : 118.0
Heading Days After Seeding : 92
Maturity Days After Seeding : 122
Basal Leaf Sheath Color : 1 (Green)
Anthocyanin Coloration : 0 (Absent)
Leaf Blade Pubescence : 3 (Pubescent)
Auricle Color : 2 (Yellowish green)
Collar Color : 2 (Light green)
Awn Distribution : 0 (None)
Panicle Exsertion : 5 (Just exserted)
Lodging Resistance : 9 (Very strong)
Leaf Senescence : 5 (Intermediate)
Panicle Shattering : 5 (Moderate)
Endosperm Type : 1 (Non-glutinous)

TRIPLE 2

La Union
Collection No.16504

TRIPLE 2-16504	
% Genetic Similarity	Other Genotypes
96.46	TRIPLE 3 (15557)
96.14	AZOR 5 (16188)
95.17	KAMANSING (16030)
95.12	M3 (SURALLAH) (16428)
95.11	M3 (15499)
95.11	TITO-TITO (15507)

Grain Quality Traits

Milling Recovery (%)
- Brown Rice : 78.2 (F)
- Milled Rice : 70.3 (Pr)
- Head Rice : 58.0 (Pr)

Physical Attributes
- Grain Length (mm) : 6.6 (L)
- Grain Shape : 3.0 (I)
- Chalky Grains (%) : 5.2 (G2)

Physicochemical Properties
- Amylose Content (%) : 21.8 (I)
- Gelatinization Temperature : 4.0 (I)
- Crude Protein Content (%) : 7.8

Agronomic Characteristics

Plant Height (cm) : 126.0
Heading Days After Seeding : 92
Maturity Days After Seeding : 113
Basal Leaf Sheath Color : 1 (Green)
Anthocyanin Coloration : 0 (Absent)
Leaf Blade Pubescence : 3 (Pubescent)
Auricle Color : 2 (Yellowish green)
Collar Color : 2 (Light green)
Awn Distribution : 0 (None)
Panicle Exsertion : 5 (Just exserted)
Lodging Resistance : 9 (Very strong)
Leaf Senescence : 5 (Intermediate)
Panicle Shattering : 5 (Moderate)
Endosperm Type : 1 (Non-glutinous)

DOUBLE DIAMOND

La Union
Collection No. 16507

DOUBLE DIAMOND-16507	
% Genetic Similarity	Other Genotypes
100.00	TABUK (16501)
100.00	1561 (15891)
100.00	DOUBLE DIAMOND (16078)
100.00	UNKNOWN VAR 3 (15879)
100.00	SAMPAGUITA (15500)
100.00	NSIC Rc 218
100.00	SAMPAGUITA (16308)
100.00	DIAMOND V (15576)
100.00	SAMPAGUITA (AGUSAN) (16326)
100.00	DESTINY (15502)

Grain Quality Traits

Milling Recovery (%)
- Brown Rice : 75.9 (F)
- Milled Rice : 67.5 (G1)
- Head Rice : 56.3 (G1)

Physical Attributes
- Grain Length (mm) : 6.9 (L)
- Grain Shape : 3.0 (I)
- Chalky Grains (%) : 2.9 (G1)

Physicochemical Properties
- Amylose Content (%) : 15.8 (L)
- Gelatinization Temperature : 6.0 (L)
- Crude Protein Content (%) : 6.5

Agronomic Characteristics

Plant Height (cm) : 120.5
Heading Days After Seeding : 104
Maturity Days After Seeding : 134
Basal Leaf Sheath Color : 1 (Green)
Anthocyanin Coloration : 0 (Absent)
Leaf Blade Pubescence : 3 (Pubescent)
Auricle Color : 2 (Yellowish green)
Collar Color : 2 (Light green)
Awn Distribution : 2 (Upper quarter only)
Panicle Exsertion : 5 (Just exserted)
Lodging Resistance : 5 (Intermediate)
Leaf Senescence : 5 (Intermediate)
Panicle Shattering : 5 (Moderate)
Endosperm Type : 1 (Non-glutinous)

FGRG COLLECTIONS FROM REGION 2

JFD 300 PLUS

Cagayan
Collection No.15577

JFD 300 PLUS-15577	
% Genetic Similarity	Other Genotypes
94.14	INDONESIAN RICE (16332)
94.05	MALAYSIAN RICE (16321)
94.04	DCL-300 (16419)
94.04	DCL-300 (15402)
94.04	JDF 300 PLUS (15553)
94.04	INBRED 300 (15943)

Grain Quality Traits

Milling Recovery (%)
- Brown Rice : 78.0 (F)
- Milled Rice : 71.3 (Pr)
- Head Rice : 60.6 (Pr)

Physical Attributes
- Grain Length (mm) : 7.0 (L)
- Grain Shape : 3.0 (I)
- Chalky Grains (%) : 7.5 (G2)

Physicochemical Properties
- Amylose Content (%) : 20.3 (I)
- Gelatinization Temperature : 3.6 (HI/I)
- Crude Protein Content (%) : 7.3

Agronomic Characteristics

Plant Height (cm) : 113.9
Heading Days After Seeding : 83
Maturity Days After Seeding : 113
Basal Leaf Sheath Color : 1 (Green)
Anthocyanin Color : 0 (Absent)
Leaf Blade Pubescence : 3 (Pubescent)
Auricle Color : 2 (Yellowish green)
Collar Color : 2 (Light green)
Awn Distribution : 3 (Upper half only)
Panicle Exsertion : 5 (Just exserted)
Lodging Resistance : 7 (Strong)
Leaf Senescence : 5 (Intermediate)
Panicle Shattering : 5 (Moderate)
Endosperm Type : 2 (Intermediate)

R-DANNY

Cagayan
Collection No.15578

R-DANNY-15578	
% Genetic Similarity	Other Genotypes
94.61	GLOBAL SUPER RICE (15970)
94.57	BEST RICE (15885)
94.32	DIAMOND X (15563)
94.19	NSIC Rc 222
94.16	DIAMOND (15840)

Grain Quality Traits

Milling Recovery (%)
- Brown Rice : 78.2 (F)
- Milled Rice : 70.1 (Pr)
- Head Rice : 57.7 (Pr)

Physical Attributes
- Grain Length (mm) : 7.2 (L)
- Grain Shape : 3.3 (S)
- Chalky Grains (%) : 5.5 (G2)

Physicochemical Properties
- Amylose Content (%) : 21.2 (I)
- Gelatinization Temperature : 4.4 (I)
- Crude Protein Content (%) : 6.9

Agronomic Characteristics

Plant Height (cm) : 123.1
Heading Days After Seeding : 91
Maturity Days After Seeding : 121
Basal Leaf Sheath Color : 1 (Green)
Anthocyanin Color : 0 (Absent)
Leaf Blade Pubescence : 3 (Pubescent)
Auricle Color : 2 (Yellowish green)
Collar Color : 2 (Light green)
Awn Distribution : 4 (Upper three quarters only)
Panicle Exsertion : 7 (Moderately well exserted)
Lodging Resistance : 7 (Strong)
Leaf Senescence : 5 (Intermediate)
Panicle Shattering : 5 (Moderate)
Endosperm Type : 1 (Non-glutinous)

GREEN SUPER RICE NO.8

Cagayan
Collection No. 15579

GREEN SUPER RICE NO.8-15579	
% Genetic Similarity	Other Genotypes
99.52	GSR (16065)
99.51	NSIC Rc 480
95.99	GSR 2 (15515)
93.49	TARA RICE (16431)
92.62	LUZVIMINDA (16328)
91.20	DIAMOND X (16510)

Grain Quality Traits

Milling Recovery (%)
- Brown Rice : 78.5 (F)
- Milled Rice : 71.1 (Pr)
- Head Rice : 63.5 (Pr)

Physical Attributes
- Grain Length (mm) : 6.8 (L)
- Grain Shape : 3.5 (S)
- Chalky Grains (%) : 3.5 (G1)

Physicochemical Properties
- Amylose Content (%) : 15.7 (L)
- Gelatinization Temperature : 5.5(I/L)
- Crude Protein Content (%) : 9.1

Agronomic Characteristics

Plant Height (cm) : 113.8
Heading Days After Seeding : 91
Maturity Days After Seeding : 121
Basal Leaf Sheath Color : 1 (Green)
Anthocyanin Color : 0 (Absent)
Leaf Blade Pubescence : 3 (Pubescent)
Auricle Color : 2 (Yellowish green)
Collar Color : 2 (Light green)
Awn Distribution : 1 (Tip only)
Panicle Exsertion : 7 (Moderately well exserted)
Lodging Resistance : 5 (Intermediate)
Leaf Senescence : 7 (Late)
Panicle Shattering : 3 (Low)
Endosperm Type : 1 (Non-glutinous)

JAPANIRI

Cagayan
Collection No. 15580

JAPANIRI-15580	
% Genetic Similarity	Other Genotypes
91.44	216 (16399)
90.99	ABANGAY (16336)
90.98	AZOR 5 (16188)
90.85	KAMOROS (16358)
90.70	3-MILLION (15457)

Grain Quality Traits

Milling Recovery (%)
- Brown Rice : 79.5 (F)
- Milled Rice : 71.4 (Pr)
- Head Rice : 53.5 (G1)

Physical Attributes
- Grain Length (mm) : 6.6 (L)
- Grain Shape : 2.7 (I)
- Chalky Grains (%) : 5.0 (G2)

Physicochemical Properties
- Amylose Content (%) : 17.3 (I)
- Gelatinization Temperature : 4.3 (I)
- Crude Protein Content (%) : 9.0

Agronomic Characteristics

Plant Height (cm) : 145.1
Heading Days After Seeding : 91
Maturity Days After Seeding : 121
Basal Leaf Sheath Color : 1 (Green)
Anthocyanin Color : 0 (Absent)
Leaf Blade Pubescence : 3 (Pubescent)
Auricle Color : 2 (Yellowish green)
Collar Color : 2 (Light green)
Awn Distribution : 0 (None)
Panicle Exsertion : 9 (Well exserted)
Lodging Resistance : 3 (Weak)
Leaf Senescence : 5 (Intermediate)
Panicle Shattering : 5 (Moderate)
Endosperm Type : 2 (Intermediate)

MAHARLIKA

Cagayan
Collection No.15582

MAHARLIKA-15582	
% Genetic Similarity	Other Genotypes
97.05	PSB Rc 82
93.43	DIAMOND X (16510)
93.32	PSB Rc 10
93.27	GLOBAL SUPER RICE (15970)
92.71	OFFSPRING (16307)

Grain Quality Traits

Milling Recovery (%)
- Brown Rice : 77.9 (F)
- Milled Rice : 71.2 (Pr)
- Head Rice : 64.7 (Pr)

Physical Attributes
- Grain Length (mm) : 7.0 (L)
- Grain Shape : 3.2 (S)
- Chalky Grains (%) : 5.0 (G2)

Physicochemical Properties
- Amylose Content (%) : 23.1 (H)
- Gelatinization Temperature : 5.6 (I/L)
- Crude Protein Content (%) : 6.7

Agronomic Characteristics

- Plant Height (cm) : 111.2
- Heading Days After Seeding : 102
- Maturity Days After Seeding : 132
- Basal Leaf Sheath Color : 1 (Green)
- Anthocyanin Color : 0 (Absent)
- Leaf Blade Pubescence : 3 (Pubescent)
- Auricle Color : 2 (Yellowish green)
- Collar Color : 2 (Light green)
- Awn Distribution : 0 (None)
- Panicle Exsertion : 5 (Just exserted)
- Lodging Resistance : 9 (Very strong)
- Leaf Senescence : 5 (Intermediate)
- Panicle Shattering : 5 (Moderate)
- Endosperm Type : 1 (Non-glutinous)

ZAMBOANGA

Cagayan
Collection No.15945

ZAMBOANGA-15945	
% Genetic Similarity	Other Genotypes
100.00	DOUBLE DIAMOND (MLANG) (16333)
100.00	SAMPAGUITA (15948)
100.00	DIAMOND XX (DOUBLE DIAMOND) (15514)
100.00	DOUBLE DIAMOND (15942)
100.00	UNKNOWN 5 (16189)
100.00	MILAGROSA (15605)
100.00	DIAMOND X (15889)
100.00	SUPER KALOY (VIETNAM RICE) (15559)
100.00	ZAMBOANGA (16422)

Grain Quality Traits

Milling Recovery (%)
- Brown Rice : 78.3 (F)
- Milled Rice : 69.7 (G1)
- Head Rice : 56.3 (G1)

Physical Attributes
- Grain Length (mm) : 6.9 (L)
- Grain Shape : 2.9 (I)
- Chalky Grains (%) : 4.0 (G1)

Physicochemical Properties
- Amylose Content (%) : 17.3 (L)
- Gelatinization Temperature : 6.7 (L)
- Crude Protein Content (%) : 7.8

Agronomic Characteristics

Plant Height (cm) : 119.9
Heading Days After Seeding : 93
Maturity Days After Seeding : 123
Basal Leaf Sheath Color : 1 (Green)
Anthocyanin Color : 0 (Absent)
Leaf Blade Pubescence : 3 (Pubescent)
Auricle Color : 2 (Yellowish green)
Collar Color : 2 (Light green)
Awn Distribution : 0 (None)
Panicle Exsertion : 5 (Just exserted)
Lodging Resistance : 7 (Strong)
Leaf Senescence : 5 (Intermediate)
Panicle Shattering : 5 (Moderate)
Endosperm Type : 1 (Non-glutinous)

ANGELICA

Cagayan
Collection No. 15952

ANGELICA-15952	
% Genetic Similarity	Other Genotypes
91.75	DIAMOND X (16510)
91.16	PSB Rc 10
90.51	ABANGAY (16336)
90.48	KAMOROS (16358)
89.99	216 (16399)

Grain Quality Traits

Milling Recovery (%)
- Brown Rice : 79.1 (F)
- Milled Rice : 71.8 (Pr)
- Head Rice : 32.7 (G3)

Physical Attributes
- Grain Length (mm) : 6.6 (L)
- Grain Shape : 2.7 (I)
- Chalky Grains (%) : 8.5 (G2)

Physicochemical Properties
- Amylose Content (%) : 19.7 (I)
- Gelatinization Temperature : 6.2 (L)
- Crude Protein Content (%) : 6.2

Agronomic Characteristics

Plant Height (cm) : 123.8
Heading Days After Seeding : 98
Maturity Days After Seeding : 128
Basal Leaf Sheath Color : 1 (Green)
Anthocyanin Coloration : 0 (Absent)
Leaf Blade Pubescence : 3 (Pubescent)
Auricle Color : 2 (Yellowish green)
Collar Color : 2 (Light green)
Awn Distribution : 0 (None)
Panicle Exsertion : 7 (Moderately well exserted)
Lodging Resistance : 3 (Weak)
Leaf Senescence : 5 (Intermediate)
Panicle Shattering : 5 (Moderate)
Endosperm Type : 1 (Non-glutinous)

RED RICE

Cagayan
Collection No. 15953

RED RICE-15953	
% Genetic Similarity	Other Genotypes
99.71	RED 18 (16427)
92.26	PSB Rc 10
91.86	DIAMOND X (16510)
91.83	216 (16399)
91.57	NSIC Rc 420

Grain Quality Traits

Milling Recovery (%)
- Brown Rice : 76.6 (F)
- Milled Rice : 68.3 (G1)
- Head Rice : 51.9 (G1)

Physical Attributes
- Grain Length (mm) : 7.0 (L)
- Grain Shape : 3.2 (S)
- Chalky Grains (%) : 1.9 (Pr)

Physicochemical Properties
- Amylose Content (%) : 19.1 (I)
- Gelatinization Temperature : 4.6 (I/L)
- Crude Protein Content (%) : 9.1

Agronomic Characteristics

Plant Height (cm) : 125.9
Heading Days After Seeding : 91
Maturity Days After Seeding : 121
Basal Leaf Sheath Color : 1 (Green)
Anthocyanin Color : 0 (Absent)
Leaf Blade Pubescence : 3 (Pubescent)
Auricle Color : 2 (Yellowish green)
Collar Color : 2 (Light green)
Awn Distribution : 0 (None)
Panicle Exsertion : 7 (Moderately well exserted)
Lodging Resistance : 7 (Strong)
Leaf Senescence : 5 (Intermediate)
Panicle Shattering : 5 (Moderate)
Endosperm Type : 1 (Non-glutinous)

RED RICE

Cagayan
Collection No.15957

RED RICE-15957	
% Genetic Similarity	Other Genotypes
90.54	ABANGAY (16336)
90.12	216 (16399)
89.54	KAMOROS (16358)
89.28	DIAMOND X (16510)
88.98	JASMIN (15661)

Grain Quality Traits

Milling Recovery (%)
- Brown Rice : 76.7 (F)
- Milled Rice : 68.7 (G1)
- Head Rice : 60.0 (Pr)

Physical Attributes
- Grain Length (mm) : 6.8 (L)
- Grain Shape : 3.0 (S)
- Chalky Grains (%) : 0.9 (Pr)

Physicochemical Properties
- Amylose Content (%) : 19.0 (I)
- Gelatinization Temperature : 4.4 (I)
- Crude Protein Content (%) : 8.3

Agronomic Characteristics

Plant Height (cm) : 131.9
Heading Days After Seeding : 92
Maturity Days After Seeding : 122
Basal Leaf Sheath Color : 2 (Green with purple lines)
Anthocyanin Color : 3 (Weak)
Leaf Blade Pubescence : 3 (Pubescent)
Auricle Color : 2 (Yellowish green)
Collar Color : 2 (Light green)
Awn Distribution : 1 (Tip only)
Panicle Exsertion : 5 (Just exserted)
Lodging Resistance : 7 (Strong)
Leaf Senescence : 5 (Intermediate)
Panicle Shattering : 5 (Moderate)
Endosperm Type : 1 (Non-glutinous)

DIAMOND X

Cagayan
Collection No. 16076

DIAMOND X-16076	
% Genetic Similarity	Other Genotypes
98.47	MAHARLIKA (16311)
98.43	EL GRANDE (16303)
97.22	EL GRANDE (15504)
95.85	EXCEL RICE (15571)
95.84	BWS-6W (16344)

Grain Quality Traits

Milling Recovery (%)
- Brown Rice : 77.3 (F)
- Milled Rice : 67.8 (G3)
- Head Rice : 52.5 (G1)

Physical Attributes
- Grain Length (mm) : 6.9 (L)
- Grain Shape : 3.1 (S)
- Chalky Grains (%) : 2.7 (G1)

Physicochemical Properties
- Amylose Content (%) : 19.3 (I)
- Gelatinization Temperature : 4.9 (I/L)
- Crude Protein Content (%) : 9.1

Agronomic Characteristics

Plant Height (cm) : 112.2
Heading Days After Seeding : 91
Maturity Days After Seeding : 121
Basal Leaf Sheath Color : 1 (Green)
Anthocyanin Color : 0 (Absent)
Leaf Blade Pubescence : 3 (Pubescent)
Auricle Color : 2 (Yellowish green)
Collar Color : 2 (Light green)
Awn Distribution : 1 (Tip only)
Panicle Exsertion : 7 (Moderately well exserted)
Lodging Resistance : 7 (Strong)
Leaf Senescence : 5 (Intermediate)
Panicle Shattering : 5 (Moderate)
Endosperm Type : 1 (Non-glutinous)

UNIVERSAL RICE

Isabela
Collection No.15552

UNIVERSAL RICE-15552	
% Genetic Similarity	Other Genotypes
96.99	GANAR (15650)
96.99	DESTINY (16042)
96.93	MESTIZA (15886)
96.93	MASIGASIG 88 (16503)
96.93	IL-29 (15513)

Grain Quality Traits

Milling Recovery (%)
- Brown Rice : 78.9 (F)
- Milled Rice : 70.7 (Pr)
- Head Rice : 61.1 (Pr)

Physical Attributes
- Grain Length (mm) : 6.9 (L)
- Grain Shape : 3.3 (S)
- Chalky Grains (%) : 1.6 (Pr)

Physicochemical Properties
- Amylose Content (%) : 23.6 (H)
- Gelatinization Temperature : 4.4 (I/L)
- Crude Protein Content (%) : 7.1

Agronomic Characteristics

Plant Height (cm) : 124.5
Heading Days After Seeding : 92
Maturity Days After Seeding : 122
Basal Leaf Sheath Color : 1 (Green)
Anthocyanin Color : 0 (Absent)
Leaf Blade Pubescence : 3 (Pubescent)
Auricle Color : 2 (Yellowish green)
Collar Color : 2 (Light green)
Awn Distribution : 0 (None)
Panicle Exsertion : 7 (Moderately well exserted)
Lodging Resistance : 9 (Very strong)
Leaf Senescence : 5 (Intermediate)
Panicle Shattering : 5 (Moderate)
Endosperm Type : 1 (Non-glutinous)

JDF 300 PLUS

Isabela
Collection No. 15553

JDF 300 PLUS-15553	
% Genetic Similarity	Other Genotypes
100.00	INBRED 300 (15943)
100.00	DCL-300 (15402)
100.00	DCL-300 (16419)
99.98	MALAYSIAN RICE (16321)
99.81	MALAYSIAN RICE (15938)
99.81	INDONESIAN RICE (15940)

Grain Quality Traits

Milling Recovery (%)
- Brown Rice : 76.9 (F)
- Milled Rice : 70.2 (Pr)
- Head Rice : 56.7 (G1)

Physical Attributes
- Grain Length (mm) : 6.6 (L)
- Grain Shape : 2.9 (I)
- Chalky Grains (%) : 1.8 (Pr)

Physicochemical Properties
- Amylose Content (%) : 17.9 (I)
- Gelatinization Temperature : 4.0 (I)
- Crude Protein Content (%) : 7.7

Agronomic Characteristics

Plant Height (cm) : 118.3
Heading Days After Seeding : 83
Maturity Days After Seeding : 113
Basal Leaf Sheath Color : 1 (Green)
Anthocyanin Color : 0 (Absent)
Leaf Blade Pubescence : 3 (Pubescent)
Auricle Color : 2 (Yellowish green)
Collar Color : 2 (Light green)
Awn Distribution : 3 (Upper half only)
Panicle Exsertion : 5 (Just exserted)
Lodging Resistance : 7 (Strong)
Leaf Senescence : 5 (Intermediate)
Panicle Shattering : 5 (Moderate)
Endosperm Type : 2 (Intermediate)

711

Isabela
Collection No.15554

711-15554	
% Genetic Similarity	Other Genotypes
94.72	OPTIMUS (15963)
92.11	DIAMOND X (16510)
92.07	216 (16399)
92.06	NSIC Rc 420
91.81	I8 (VN) (15890)

Grain Quality Traits

Milling Recovery (%)
- Brown Rice : 78.4 (F)
- Milled Rice : 70.6 (Pr)
- Head Rice : 36.6 (G3)

Physical Attributes
- Grain Length (mm) : 7.5mm (EL)
- Grain Shape : 3.0 (I)
- Chalky Grains (%) : 8.8 (G2)

Physicochemical Properties
- Amylose Content (%) : 20.7 (I)
- Gelatinization Temperature : 4.4 (I)
- Crude Protein Content (%) : 6.5

Agronomic Characteristics

- Plant Height (cm) : 135.0
- Heading Days After Seeding : 83
- Maturity Days After Seeding : 113
- Basal Leaf Sheath Color : 1 (Green)
- Anthocyanin Coloration : 0 (Absent)
- Leaf Blade Pubescence : 3 (Pubescent)
- Auricle Color : 2 (Yellowish green)
- Collar Color : 2 (Light green)
- Awn Distribution : 2 (Upper quarter only)
- Panicle Exsertion : 5 (Just exserted)
- Lodging Resistance : 9 (Very strong)
- Leaf Senescence : 5 (Intermediate)
- Panicle Shattering : 5 (Moderate)
- Endosperm Type : 2 (Intermediate)

JAPANIRI

Isabela
Collection No.15555

JAPANIRI-15555	
% Genetic Similarity	Other Genotypes
100.00	CARGIL (16070)
98.91	KULAPO (15505)
93.37	V5 (16517)
92.08	3-MILLION (15457)
91.78	216 (16399)

Grain Quality Traits

Milling Recovery (%)
- Brown Rice : 78.1 (F)
- Milled Rice : 69.7 (G1)
- Head Rice : 53.5 (G1)

Physical Attributes
- Grain Length (mm) : 6.4 (M)
- Grain Shape : 3.0 (I)
- Chalky Grains (%) : 2.4 (G1)

Physicochemical Properties
- Amylose Content (%) : 25.3 (H)
- Gelatinization Temperature : 4.2 (I/L)
- Crude Protein Content (%) : 6.1

Agronomic Characteristics

Plant Height (cm) : 116.2
Heading Days After Seeding : 91
Maturity Days After Seeding : 121
Basal Leaf Sheath Color : 1 (Green)
Anthocyanin Color : 0 (Absent)
Leaf Blade Pubescence : 3 (Pubescent)
Auricle Color : 2 (Yellowish green)
Collar Color : 2 (Light green)
Awn Distribution : 0 (Absent)
Panicle Exsertion : 5 (Just exserted)
Lodging Resistance : 7 (Strong)
Leaf Senescence : 5 (Intermediate)
Panicle Shattering : 5 (Moderate)
Endosperm Type : 2 (Intermediate)

TOP RICE

Isabela
Collection No. 15556

TOP RICE-15556	
% Genetic Similarity	Other Genotypes
100.00	MESTIZA (15486)
100.00	IL-39 (15513)
100.00	SUPER DIAMOND (15558)
100.00	BELENA 205 (15583)
100.00	COMBAT (15968)
100.00	DESTINY (16093)
100.00	MASIGASIG 88 (16503)
100.00	GSR 12 (15976)
100.00	DREAM RICE (15570)

Grain Quality Traits

Milling Recovery (%)
- Brown Rice : 79.6 (F)
- Milled Rice : 71.2 (Pr)
- Head Rice : 55.2 (G1)

Physical Attributes
- Grain Length (mm) : 6.8 (L)
- Grain Shape : 3.3 (S)
- Chalky Grains (%) : 5.4 (G2)

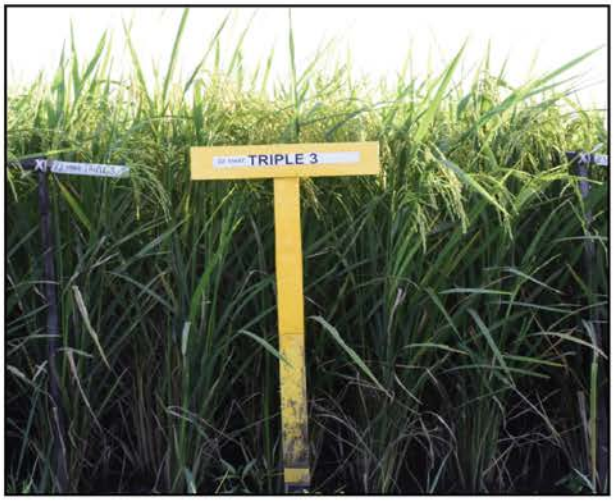
Physicochemical Properties
- Amylose Content (%) : 24.0 (H)
- Gelatinization Temperature : 4.0 (I)
- Crude Protein Content (%) : 6.3

Agronomic Characteristics

Plant Height (cm) : 123.2
Heading Days After Seeding : 93
Maturity Days After Seeding : 123
Basal Leaf Sheath Color : 1 (Green)
Anthocyanin Color : 0 (Absent)
Leaf Blade Pubescence : 3 (Pubescent)
Auricle Color : 2 (Yellowish green)
Collar Color : 2 (Light green)
Awn Distribution : 0 (None)
Panicle Exsertion : 7 (Moderately well exserted)
Lodging Resistance : 9 (Very strong)
Leaf Senescence : 5 (Intermediate)
Panicle Shattering : 5 (Moderate)
Endosperm Type : 1 (Non-glutinous)

TRIPLE 3

Isabela
Collection No. 15557



TRIPLE 3-15557	
% Genetic Similarity	Other Genotypes
98.52	KAMANSING (16030)
98.50	M3 (SURALLAH) (16428)
98.47	TITO-TITO (15507)
98.46	M3 (15499)
98.19	AZOR 5 (16188)

Grain Quality Traits

Milling Recovery (%)
- Brown Rice : 78.3 (F)
- Milled Rice : 69.5 (G1)
- Head Rice : 59.3 (Pr)

Physical Attributes
- Grain Length (mm) : 6.3 (M)
- Grain Shape : 3.0 (I)
- Chalky Grains (%) : 0.9 (Pr)

Physicochemical Properties
- Amylose Content (%) : 19.6 (I)
- Gelatinization Temperature : 2.8 (H/HI/I)
- Crude Protein Content (%) : 7.0

Agronomic Characteristics

Plant Height (cm) : 114.4
Heading Days After Seeding : 92
Maturity Days After Seeding : 122
Basal Leaf Sheath Color : 1 (Green)
Anthocyanin Coloration : 0 (Absent)
Leaf Blade Pubescence : 3 (Pubescent)
Auricle Color : 2 (Yellowish green)
Collar Color : 2 (Light green)
Awn Distribution : 0 (None)
Panicle Exsertion : 5 (Just exserted)
Lodging Resistance : 9 (Very strong)
Leaf Senescence : 5 (Intermediate)
Panicle Shattering : 5 (Moderate)
Endosperm Type : 1 (Non-glutinous)

SUPER DIAMOND

Isabela
Collection No.15558

SUPER DIAMOND-15558	
% Genetic Similarity	Other Genotypes
100.00	IL-29 (15513)
100.00	MASIGASIG 88 (16503)
100.00	MESTIZA (15886)
100.00	BELENA 205 (15583)
100.00	GSR 12 (15976)
100.00	COMBAT (15969)
100.00	DESTINY (16093)
100.00	TOP RICE (15556)
100.00	DREAM RICE (15570)

Grain Quality Traits

Milling Recovery (%)
- Brown Rice : 78.5 (F)
- Milled Rice : 69.6 (G1)
- Head Rice : 51.0 (G1)

Physical Attributes
- Grain Length (mm) : 7.0 (L)
- Grain Shape : 3.3 (S)
- Chalky Grains (%) : 4.2 (G1)

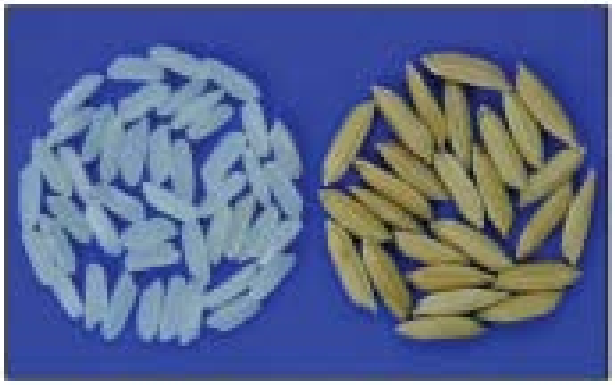
Physicochemical Properties
- Amylose Content (%) : 23.8 (I)
- Gelatinization Temperature : 4.1 (I)
- Crude Protein Content (%) : 6.6

Agronomic Characteristics

Plant Height (cm) : 126.0
Heading Days After Seeding : 92
Maturity Days After Seeding : 122
Basal Leaf Sheath Color : 1 (Green)
Anthocyanin Coloration : 0 (Absent)
Leaf Blade Pubescence : 3 (Pubescent)
Auricle Color : 2 (Yellowish green)
Collar Color : 2 (Light green)
Awn Distribution : 2 (Upper quarter only)
Panicle Exsertion : 7 (Moderately well exserted)
Lodging Resistance : 9 (Very strong)
Leaf Senescence : 5 (Intermediate)
Panicle Shattering : 5 (Moderate)
Endosperm Type : 1 (Non-glutinous)

SUPER KALOY (VIETNAM RICE)

Isabela
Collection No. 15559



SUPER KALOY (VIETNAM RICE)-15559	
% Genetic Similarity	Other Genotypes
100.00	[illegible]
100.00	MAGROSA (15608)
100.00	[illegible]
100.00	[illegible]
100.00	[illegible]
100.00	[illegible]
100.00	[illegible]
100.00	[illegible]
100.00	[illegible]

Grain Quality Traits

Milling Recovery (%)
- Brown Rice : 77.7 (F)
- Milled Rice : 69.2 (G1)
- Head Rice : 53.5 (G1)

Physical Attributes
- Grain Length (mm) : 7.0 (L)
- Grain Shape : 3.0 (I)
- Chalky Grains (%) : 1.5 (Pr)

Physicochemical Properties
- Amylose Content (%) : 15.7 (L)
- Gelatinization Temperature : 5.9 (I/L)
- Crude Protein Content (%) : 6.1

Agronomic Characteristics

Plant Height (cm) : 121.5
Heading Days After Seeding : 91
Maturity Days After Seeding : 121
Basal Leaf Sheath Color : 1 (Green)
Anthocyanin Color : 0 (Absent)
Leaf Blade Pubescence : 3 (Pubescent)
Auricle Color : 2 (Yellowish green)
Collar Color : 2 (Light green)
Awn Distribution : 2 (Upper quarter only)
Panicle Exsertion : 5 (Just exserted)
Lodging Resistance : 9 (Very strong)
Leaf Senescence : 5 (Intermediate)
Panicle Shattering : 5 (Moderate)
Endosperm Type : 1 (Non-glutinous)

DIAMOND X

Isabela
Collection No.15560

DIAMOND X-15560	
% Genetic Similarity	Other Genotypes
97.31	BEST RICE (15885)
97.19	GANADOR (16063)
97.12	GANAR (15650)
97.11	DESTINY (16042)
97.05	COMBAT (15969)

Grain Quality Traits

Milling Recovery (%)
- Brown Rice : 79.2 (F)
- Milled Rice : 71.8 (Pr)
- Head Rice : 58.9 (Pr)

Physical Attributes
- Grain Length (mm) : 7.0 (L)
- Grain Shape : 3.2 (S)
- Chalky Grains (%) : 1.9 (Pr)

Physicochemical Properties
- Amylose Content (%) : 22.1 (H)
- Gelatinization Temperature : 4.1 (I)
- Crude Protein Content (%) : 6.5

Agronomic Characteristics

Plant Height (cm) : 118.3
Heading Days After Seeding : 104
Maturity Days After Seeding : 134
Basal Leaf Sheath Color : 1 (Green)
Anthocyanin Color : 0 (Absent)
Leaf Blade Pubescence : 3 (Pubescent)
Auricle Color : 2 (Yellowish green)
Collar Color : 2 (Light green)
Awn Distribution : 0 (None)
Panicle Exsertion : 7 (Moderately well exserted)
Lodging Resistance : 7 (Strong)
Leaf Senescence : 5 (Intermediate)
Panicle Shattering : 5 (Moderate)
Endosperm Type : 1 (Non-glutinous)

DIAMOND X

Isabela
Collection No. 15561

DIAMOND X-15561	
% Genetic Similarity	Other Genotypes
95.20	MALAYA (16190)
95.12	SUPER DIAMOND (15558)
95.11	BELENA 205 (15583)
95.11	TOP RICE (15556)
95.11	GSR 12 (15976)

Grain Quality Traits

Milling Recovery (%)
- Brown Rice : 79.2 (F)
- Milled Rice : 70.3 (Pr)
- Head Rice : 47.5 (G2)

Physical Attributes
- Grain Length (mm) : 7.0 (L)
- Grain Shape : 3.2 (S)
- Chalky Grains (%) : 7.0 (G2)

Physicochemical Properties
- Amylose Content (%) : 22.0 (I)
- Gelatinization Temperature : 4.1 (I)
- Crude Protein Content (%) : 8.7

Agronomic Characteristics

Plant Height (cm) : 119.1
Heading Days After Seeding : 104
Maturity Days After Seeding : 134
Basal Leaf Sheath Color : 1 (Green)
Anthocyanin Color : 0 (Absent)
Leaf Blade Pubescence : 3 (Pubescent)
Auricle Color : 2 (Yellowish green)
Collar Color : 2 (Light green)
Awn Distribution : 1 (Tip only)
Panicle Exsertion : 7 (Moderately well exserted)
Lodging Resistance : 9 (Very strong)
Leaf Senescence : 5 (Intermediate)
Panicle Shattering : 5 (Moderate)
Endosperm Type : 1 (Non-glutinous)

HIGH RICE

Isabela
Collection No. 15562

HIGH RICE-15562	
% Genetic Similarity	Other Genotypes
93.90	NSIC Rc 420
92.84	DIAMOND X (16510)
92.72	DIAMOND X (16062)
92.22	NSIC Rc 222
91.88	216 (16309)

Grain Quality Traits

Milling Recovery (%)
- Brown Rice : 78.8 (F)
- Milled Rice : 70.3 (Pr)
- Head Rice : 59.3 (Pr)

Physical Attributes
- Grain Length (mm) : 6.6 (L)
- Grain Shape : 3.1 (S)
- Chalky Grains (%) : 8.8 (G2)

Physicochemical Properties
- Amylose Content (%) : 21.6 (I)
- Gelatinization Temperature : 4.0 (I)
- Crude Protein Content (%) : 6.7

Agronomic Characteristics

Plant Height (cm) : 100.6
Heading Days After Seeding : 83
Maturity Days After Seeding : 113
Basal Leaf Sheath Color : 1 (Green)
Anthocyanin Color : 0 (Absent)
Leaf Blade Pubescence : 3 (Pubescent)
Auricle Color : 2 (Yellowish green)
Collar Color : 2 (Light green)
Awn Distribution : 1 (Tip only)
Panicle Exsertion : 5 (Just exserted)
Lodging Resistance : 7 (Strong)
Leaf Senescence : 5 (Intermediate)
Panicle Shattering : 5 (Moderate)
Endosperm Type : 1 (Non-glutinous)

DIAMOND X

Isabela
Collection No.15563

DIAMOND X-15563	
% Genetic Similarity	Other Genotypes
96.01	UNIVERSAL RICE (15552)
95.99	DIAMOND (15840)
95.59	LAWIN (15977)
95.40	NSIC Rc 222
95.20	MALAYA (16190)

Grain Quality Traits

Milling Recovery (%)
- Brown Rice : 78.9 (F)
- Milled Rice : 70.7 (Pr)
- Head Rice : 50.1 (G1)

Physical Attributes
- Grain Length (mm) : 7.1 (L)
- Grain Shape : 3.4 (S)
- Chalky Grains (%) : 7.6 (G2)

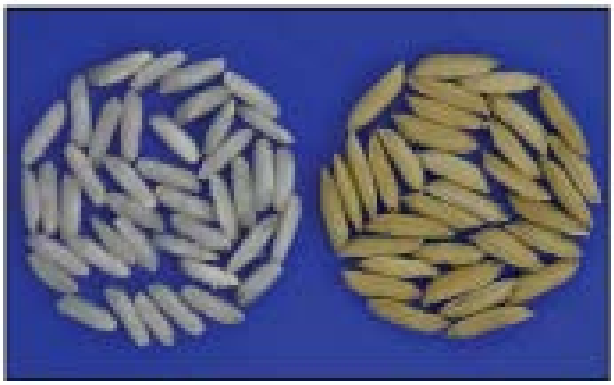
Physicochemical Properties
- Amylose Content (%) : 23.1 (H)
- Gelatinization Temperature : 4.2 (I)
- Crude Protein Content (%) : 6.9

Agronomic Characteristics

Plant Height (cm) : 112.1
Heading Days After Seeding : 104
Maturity Days After Seeding : 134
Basal Leaf Sheath Color : 1 (Green)
Anthocyanin Color : 0 (Absent)
Leaf Blade Pubescence : 3 (Pubescent)
Auricle Color : 2 (Yellowish green)
Collar Color : 2 (Light green)
Awn Distribution : 0 (None)
Panicle Exsertion : 7 (Moderately well exserted)
Lodging Resistance : 9 (Very strong)
Leaf Senescence : 5 (Intermediate)
Panicle Shattering : 5 (Moderate)
Endosperm Type : 1 (Non-glutinous)

SUPPER DIAMOND X

Isabela
Collection No.15564



SUPPER DIAMOND X-15564	
% Genetic Similarity	Other Genotypes
87.61	216 (16309)
87.09	ABANGAY (16336)
87.07	NSIC Rc 420
86.60	KAOLOB (16357)
86.41	JANJANONG (16515)

Grain Quality Traits

Milling Recovery (%)
- Brown Rice : 78.2 (F)
- Milled Rice : 70.8 (Pr)
- Head Rice : 61.7 (Pr)

Physical Attributes
- Grain Length (mm) : 7.3 (L)
- Grain Shape : 3.5 (S)
- Chalky Grains (%) : 7.7 (G2)

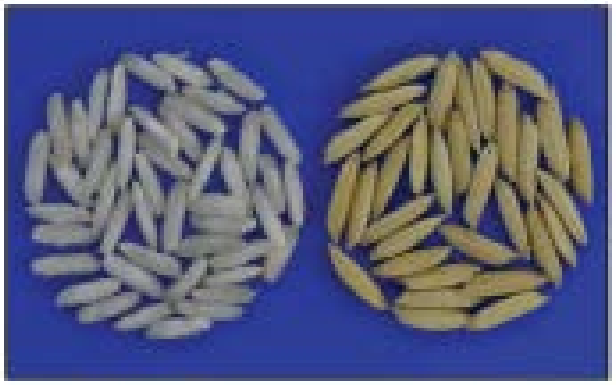
Physicochemical Properties
- Amylose Content (%) : 24.6 (H)
- Gelatinization Temperature : 4.4 (I/L)
- Crude Protein Content (%) : 6.8

Agronomic Characteristics

Plant Height (cm) : 121.5
Heading Days After Seeding : 92
Maturity Days After Seeding : 122
Basal Leaf Sheath Color : 1 (Green)
Anthocyanin Color : 0 (Absent)
Leaf Blade Pubescence : 3 (Pubescent)
Auricle Color : 2 (Yellowish green)
Collar Color : 2 (Light green)
Awn Distribution : 0 (None)
Panicle Exsertion : 7 (Moderately well exserted)
Lodging Resistance : 9 (Very strong)
Leaf Senescence : 5 (Intermediate)
Panicle Shattering : 5 (Moderate)
Endosperm Type : 1 (Non-glutinous)

1L29

Isabela
Collection No. 15565



1L29-15565 % Genetic Similarity	Other Genotypes
99.59	COMBAT (15959)
99.58	SUPER DIAMOND (15558)
99.58	BELENA 205 (15583)
99.57	MESTIZA (15886)
99.57	TOP RICE (15856)
99.57	IL-29 (15913)
99.57	GSR 12 (15976)
99.57	DESTINY (16099)
99.57	MASIGASIG 88 (16503)

Grain Quality Traits

Milling Recovery (%)
- Brown Rice : 79.1 (F)
- Milled Rice : 72.1 Pr)
- Head Rice : 61.9 (Pr)

Physical Attributes
- Grain Length (mm) : 6.9 (L)
- Grain Shape : 3.3 (S)
- Chalky Grains (%) : 3.4 (G1)

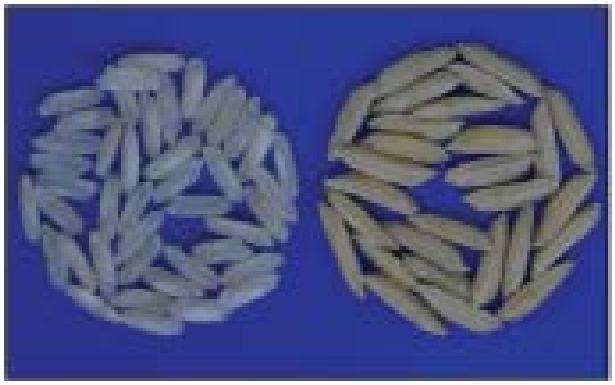
Physicochemical Properties
- Amylose Content (%) : 25.5 (H)
- Gelatinization Temperature : 4.3 (L)
- Crude Protein Content (%) : 6.0

Agronomic Characteristics

Plant Height (cm) : 116.0
Heading Days After Seeding : 96
Maturity Days After Seeding : 126
Basal Leaf Sheath Color : 1 (Green)
Anthocyanin Coloration : 0 (Absent)
Leaf Blade Pubescence : 3 (Pubescent)
Auricle Color : 2 (Yellowish green)
Collar Color : 2 (Light green)
Awn Distribution : 0 (None)
Panicle Exsertion : 5 (Just exserted)
Lodging Resistance : 9 (Very strong)
Leaf Senescence : 5 (Intermediate)
Panicle Shattering : 5 (Moderate)
Endosperm Type : 1 (Non-glutinous)

46

Isabela
Collection No. 15566



46-15566	
% Genetic Similarity	Other Genotypes
100.00	401 (15567)
92.16	PSB Rc 10
91.67	NSIC Rc 420
91.43	DIAMOND X (16510)
91.24	216 (16309)

Grain Quality Traits

Milling Recovery (%)
- Brown Rice : 76.9 (F)
- Milled Rice : 70.7 (Pr)
- Head Rice : 59.5 (Pr)

Physical Attributes
- Grain Length (mm) : 7.0 (L)
- Grain Shape : 3.2 (S)
- Chalky Grains (%) : 12.4 (G3)

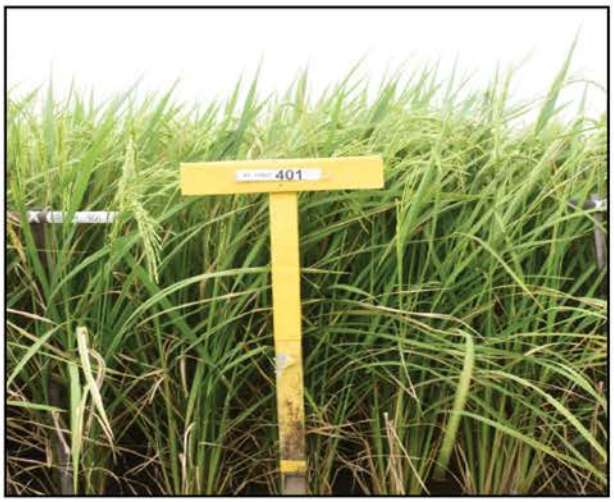
Physicochemical Properties
- Amylose Content (%) : 26.3 (H)
- Gelatinization Temperature : 7.0 (L)
- Crude Protein Content (%) : 6.9

Agronomic Characteristics

Plant Height (cm) : 136.1
Heading Days After Seeding : 106
Maturity Days After Seeding : 136
Basal Leaf Sheath Color : 1 (Green)
Anthocyanin Coloration : 0 (Absent)
Leaf Blade Pubescence : 3 (Pubescent)
Auricle Color : 2 (Yellowish green)
Collar Color : 2 (Light green)
Awn Distribution : 2 (Upper quarter only)
Panicle Exsertion : 7 (Moderately well exserted)
Lodging Resistance : 5 (Intermediate)
Leaf Senescence : 5 (Intermediate)
Panicle Shattering : 5 (Moderate)
Endosperm Type : 1 (Non-glutinous)

401

Isabela
Collection No.15567



401-15567	
% Genetic Similarity	Other Genotypes
100.00	46 (15566)
92.15	PSB Rc 10
91.66	NSIC Rc 420
91.42	DIAMOND X (16510)
91.24	216 (16399)

Grain Quality Traits

Milling Recovery (%)
- Brown Rice : 76.7 (F)
- Milled Rice : 71.7 (Pr)
- Head Rice : 59.4 (Pr)

Physical Attributes
- Grain Length (mm) : 6.9 (L)
- Grain Shape : 3.1 (S)
- Chalky Grains (%) : 12.4 (G3)

Physicochemical Properties
- Amylose Content (%) : 24.2 (H)
- Gelatinization Temperature : 7.0 (L)
- Crude Protein Content (%) : 6.4

Agronomic Characteristics

Plant Height (cm) : 135.3
Heading Days After Seeding : 100
Maturity Days After Seeding : 130
Basal Leaf Sheath Color : 1 (Green)
Anthocyanin Coloration : 0 (Absent)
Leaf Blade Pubescence : 3 (Pubescent)
Auricle Color : 2 (Yellowish green)
Collar Color : 2 (Light green)
Awn Distribution : 3 (Upper half only)
Panicle Exsertion : 7 (Moderately well exserted)
Lodging Resistance : 9 (Very strong)
Leaf Senescence : 5 (Intermediate)
Panicle Shattering : 5 (Moderate)
Endosperm Type : 2 (Intermediate)

DREAM RICE

Isabela
Collection No.15570

DREAM RICE-15570	
% Genetic Similarity	Other Genotypes
100.00	SUPER DIAMOND (15558)
100.00	IL-29 (15513)
100.00	BELENA 205 (15583)
100.00	MESTIZA (15886)
100.00	GSR 12 (15976)
100.00	TOP RICE (15556)
100.00	DESTINY (16093)
100.00	COMBAT (15969)
100.00	MASIGASIG 88 (16503)

Grain Quality Traits

Milling Recovery (%)
- Brown Rice : 79.5 (F)
- Milled Rice : 72.6 (Pr)
- Head Rice : 60.8 (Pr)

Physical Attributes
- Grain Length (mm) : 7.0 (L)
- Grain Shape : 3.3 (S)
- Chalky Grains (%) : 4.3 (G1)

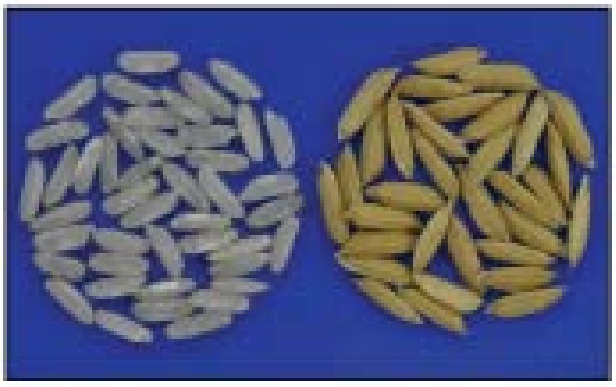
Physicochemical Properties
- Amylose Content (%) : 25.4 (H)
- Gelatinization Temperature : 4.2 (I)
- Crude Protein Content (%) : 6.8

Agronomic Characteristics

Plant Height (cm) : 132.0
Heading Days After Seeding : 97
Maturity Days After Seeding : 127
Basal Leaf Sheath Color : 1 (Green)
Anthocyanin Color : 0 (Absent)
Leaf Blade Pubescence : 3 (Pubescent)
Auricle Color : 2 (Yellowish green)
Collar Color : 2 (Light green)
Awn Distribution : 0 (None)
Panicle Exsertion : 7 (Moderately well exserted)
Lodging Resistance : 1 (Very weak)
Leaf Senescence : 7 (Late)
Panicle Shattering : 5 (Moderate)
Endosperm Type : 1 (Non-glutinous)

EXCEL RICE

Isabela
Collection No.15571



EXCEL RICE-15571	
% Genetic Similarity	Other Genotypes
99.99	BWS-DW (16344)
97.85	UP & DOWN (15877)
97.19	MAHARLIKA (16311)
97.15	NSIC Rc 148
96.75	EL GRANDE (16303)

Grain Quality Traits

Milling Recovery (%)
- Brown Rice : 77.5 (F)
- Milled Rice : 70.2 (Pr)
- Head Rice : 51.6 (G1)

Physical Attributes
- Grain Length (mm) : 6.6 (L)
- Grain Shape : 3.1 (S)
- Chalky Grains (%) : 7.8 (G2)

Physicochemical Properties
- Amylose Content (%) : 22.1 (H)
- Gelatinization Temperature : 5.4 (I/L)
- Crude Protein Content (%) : 7.1

Agronomic Characteristics

Plant Height (cm) : 125.6
Heading Days After Seeding : 95
Maturity Days After Seeding : 125
Basal Leaf Sheath Color : 1 (Green)
Anthocyanin Color : 0 (Absent)
Leaf Blade Pubescence : 3 (Pubescent)
Auricle Color : 2 (Yellowish green)
Collar Color : 2 (Light green)
Awn Distribution : 0 (None)
Panicle Exsertion : 7 (Moderately well exserted)
Lodging Resistance : 5 (Intermediate)
Leaf Senescence : 7 (Late)
Panicle Shattering : 5 (Moderate)
Endosperm Type : 1 (Non-glutinous)

GENETICS

Isabela
Collection No.15572

GENETICS-15572	
% Genetic Similarity	Other Genotypes
97.40	1L29 (15565)
97.35	LAWIN (15977)
97.03	DIAMOND X (15512)
97.02	MESTIZA (15886)
97.02	SUPER DIAMOND (15558)

Grain Quality Traits

Milling Recovery (%)
- Brown Rice : 78.7 (F)
- Milled Rice : 71.0 (Pr)
- Head Rice : 61.3 (Pr)

Physical Attributes
- Grain Length (mm) : 7.1 (L)
- Grain Shape : 3.3 (S)
- Chalky Grains (%) : 7.4 (G2)

Physicochemical Properties
- Amylose Content (%) : 25.8 (H)
- Gelatinization Temperature : 4.1 (I/L)
- Crude Protein Content (%) : 6.6

Agronomic Characteristics

Plant Height (cm) : 117.3
Heading Days After Seeding : 100
Maturity Days After Seeding : 130
Basal Leaf Sheath Color : 1 (Green)
Anthocyanin Color : 0 (Absent)
Leaf Blade Pubescence : 3 (Pubescent)
Auricle Color : 2 (Yellowish green)
Collar Color : 2 (Light green)
Awn Distribution : 0 (None)
Panicle Exsertion : 7 (Moderately well exserted)
Lodging Resistance : 7 (Strong)
Leaf Senescence : 7 (Late)
Panicle Shattering : 5 (Moderate)
Endosperm Type : 1 (Non-glutinous)

AS 411

Isabela
Collection No.15573

AS 411-15573	
% Genetic Similarity	Other Genotypes
99.88	75 (15844)
99.50	DOUBLE DIAMOND (16498)
99.46	VIETNAM RICE (16497)
99.46	DOUBLE DIAMOND X (15959)
99.35	JAPANIRI (16064)

Grain Quality Traits

Milling Recovery (%)
- Brown Rice : 74.7 (P)
- Milled Rice : 66.3 (G1)
- Head Rice : 56.7 (G1)

Physical Attributes
- Grain Length (mm) : 6.7 (L)
- Grain Shape : 3.1 (S)
- Chalky Grains (%) : 5.4 (G2)

Physicochemical Properties
- Amylose Content (%) : 15.7 (L)
- Gelatinization Temperature : 2.5 (H/HI/I)
- Crude Protein Content (%) : 6.8

Agronomic Characteristics

Plant Height (cm) : 108.0
Heading Days After Seeding : 85
Maturity Days After Seeding : 115
Basal Leaf Sheath Color : 1 (Green)
Anthocyanin Coloration : 0 (Absent)
Leaf Blade Pubescence : 3 (Pubescent)
Auricle Color : 2 (Yellowish green)
Collar Color : 2 (Light green)
Awn Distribution : 0 (None)
Panicle Exsertion : 7 (Moderately well exserted)
Lodging Resistance : 9 (Very strong)
Leaf Senescence : 7 (Late)
Panicle Shattering : 5 (Moderate)
Endosperm Type : 1 (Non-glutinous)

BELENA 215

Isabela
Collection No.15574

BELENA 215-15574	
% Genetic Similarity	Other Genotypes
100.00	BELINA 219 (16502)
91.16	216 (16399)
90.97	3-MILLION (15457)
90.96	ABANGAY (16336)
90.93	KAMOROS (16358)

Grain Quality Traits

Milling Recovery (%)
- Brown Rice : 79.1 (F)
- Milled Rice : 70.0 (Pr)
- Head Rice : 48.4 (G1)

Physical Attributes
- Grain Length (mm) : 6.1 (M)
- Grain Shape : 2.6 (I)
- Chalky Grains (%) : 16.9 (aa)

Physicochemical Properties
- Amylose Content (%) : 15.7 (L)
- Gelatinization Temperature : 6.0 (L)
- Crude Protein Content (%) : 6.1

Agronomic Characteristics

Plant Height (cm) : 120.9
Heading Days After Seeding : 98
Maturity Days After Seeding : 128
Basal Leaf Sheath Color : 1 (Green)
Anthocyanin Color : 0 (Absent)
Leaf Blade Pubescence : 3 (Pubescent)
Auricle Color : 2 (Yellowish green)
Collar Color : 2 (Light green)
Awn Distribution : 0 (None)
Panicle Exsertion : 7 (Moderately well exserted)
Lodging Resistance : 5 (Intermediate)
Leaf Senescence : 5 (Intermediate)
Panicle Shattering : 5 (Moderate)
Endosperm Type : 1 (Non-glutinous)

DREAM RICE

Isabela
Collection No. 15575

DREAM RICE-15570	
% Genetic Similarity	Other Genotypes
98.58	GANAR (15650)
98.58	DESTINY (16042)
98.52	SUPER DIAMOND (15558)
98.52	BELENA 205 (15583)
98.52	GSR 12 (15976)

Grain Quality Traits

Milling Recovery (%)
- Brown Rice : 79.7 (F)
- Milled Rice : 71.1 (Pr)
- Head Rice : 55.8 (Pr)

Physical Attributes
- Grain Length (mm) : 6.9 (L)
- Grain Shape : 3.2 (S)
- Chalky Grains (%) : 7.1 (G2)

Physicochemical Properties
- Amylose Content (%) : 23.1 (H)
- Gelatinization Temperature : 4.3 (I)
- Crude Protein Content (%) : 8.2

Agronomic Characteristics

Plant Height (cm) : 105.7
Heading Days After Seeding : 104
Maturity Days After Seeding : 134
Basal Leaf Sheath Color : 1 (Green)
Anthocyanin Color : 0 (Absent)
Leaf Blade Pubescence : 3 (Pubescent)
Auricle Color : 2 (Yellowish green)
Collar Color : 2 (Light green)
Awn Distribution : 0 (None)
Panicle Exsertion : 7 (Moderately well exserted)
Lodging Resistance : 9 (Very strong)
Leaf Senescence : 5 (Intermediate)
Panicle Shattering : 5 (Moderate)
Endosperm Type : 1 (Non-glutinous)

DIAMOND V

Isabela
Collection No. 15576

DIAMOND V-15576	
% Genetic Similarity	Other Genotypes
100.00	NSIC Rc 218
100.00	SAMPAGUITA (AGUSAN) (16329)
100.00	SAMPAGUITA (18358)
100.00	1561 (15891)
100.00	SAMPAGUITA (15600)
100.00	UNKNOWN VAR 3 (16879)
100.00	DESTINY (15602)
100.00	TABUK (16601)
100.00	DOUBLE DIAMOND (16560)

Grain Quality Traits

Milling Recovery (%)
- Brown Rice : 77.5 (F)
- Milled Rice : 71.0 (Pr)
- Head Rice : 61.6 (Pr)

Physical Attributes
- Grain Length (mm) : 7.0 (L)
- Grain Shape : 3.1 (S)
- Chalky Grains (%) : 4.0 (G1)

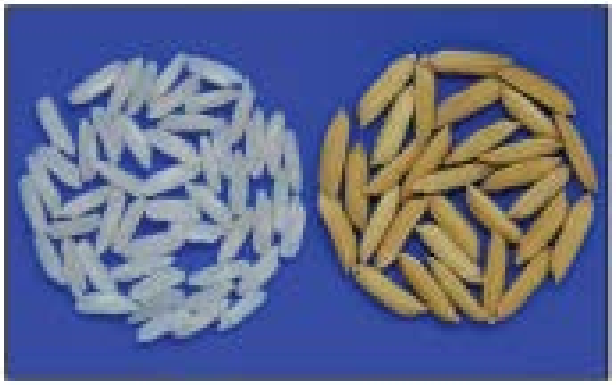
Physicochemical Properties
- Amylose Content (%) : 15.7 (L)
- Gelatinization Temperature : 6.1 (L)
- Crude Protein Content (%) : 5.7

Agronomic Characteristics

Plant Height (cm) : 116.4
Heading Days After Seeding : 104
Maturity Days After Seeding : 134
Basal Leaf Sheath Color : 1 (Green)
Anthocyanin Color : 0 (Absent)
Leaf Blade Pubescence : 3 (Pubescent)
Auricle Color : 2 (Yellowish green)
Collar Color : 2 (Light green)
Awn Distribution : 1 (Tip only)
Panicle Exsertion : 5 (Just exserted)
Lodging Resistance : 9 (Very strong)
Leaf Senescence : 5 (Intermediate)
Panicle Shattering : 5 (Moderate)
Endosperm Type : 1 (Non-glutinous)

BELENA 205

Isabela
Collection No. 15583



BELENA 205-15583 % Genetic Similarity	Other Genotypes
100.00	IL-29 (15513)
100.00	MESTIZA (15586)
100.00	SUPER DIAMOND (15558)
100.00	COMBAT (15969)
100.00	DESTINY (16093)
100.00	MAGIGABIG 88 (16503)
100.00	TOP RICE (15556)
100.00	GSR 12 (15978)
100.00	DREAM RICE (15570)

Grain Quality Traits

Milling Recovery (%)
- Brown Rice : 78.7 (F)
- Milled Rice : 72.2 (Pr)
- Head Rice : 61.4 (Pr)

Physical Attributes
- Grain Length (mm) : 6.8 (L)
- Grain Shape : 3.2 (S)
- Chalky Grains (%) : 7.3 (G2)

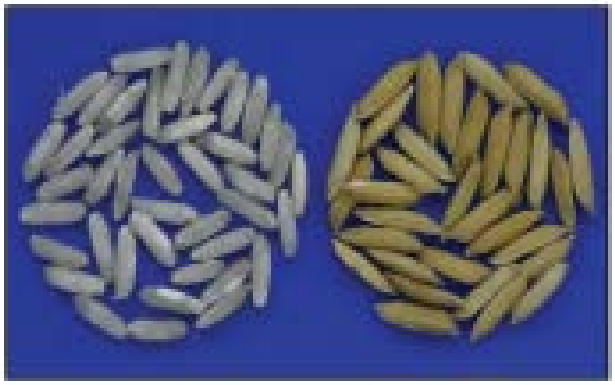
Physicochemical Properties
- Amylose Content (%) : 25.4 (H)
- Gelatinization Temperature : 4.0 (I)
- Crude Protein Content (%) : 6.6

Agronomic Characteristics

Plant Height (cm) : 127.3
Heading Days After Seeding : 98
Maturity Days After Seeding : 128
Basal Leaf Sheath Color : 1 (Green)
Anthocyanin Color : 0 (Absent)
Leaf Blade Pubescence : 3 (Pubescent)
Auricle Color : 2 (Yellowish green)
Collar Color : 2 (Light green)
Awn Distribution : 0 (None)
Panicle Exsertion : 7 (Moderately well exserted)
Lodging Resistance : 5 (Intermediate)
Leaf Senescence : 5 (Intermediate)
Panicle Shattering : 5 (Moderate)
Endosperm Type : 1 (Non-glutinous)

JUAN RICE

Isabela
Collection No. 16060



JUAN RICE-16060	
% Genetic Similarity	Other Genotypes
95.75	PSB Rc 10
94.29	NSIC Rc 294
93.90	MORYO-MORYO (16424)
93.82	DIAMOND X (16519)
93.39	NSIC Rc 222

Grain Quality Traits

Milling Recovery (%)
- Brown Rice : 78.2 (F)
- Milled Rice : 70.8 (Pr)
- Head Rice : 59.8 (Pr)

Physical Attributes
- Grain Length (mm) : 6.9 (L)
- Grain Shape : 3.1 (S)
- Chalky Grains (%) : 5.1 (G2)

Physicochemical Properties
- Amylose Content : 19.2 (I)
- Gelatinization Temperature : 4.2 (I)
- Crude Protein Content (%) : 7.7

Agronomic Characteristics

Plant Height (cm) : 121.8
Heading Days After Seeding : 91
Maturity Days After Seeding : 121
Basal Leaf Sheath Color : 1 (Green)
Anthocyanin Color : 0 (Absent)
Leaf Blade Pubescence : 3 (Pubescent)
Auricle Color : 2 (Yellowish green)
Collar Color : 2 (Light green)
Awn Distribution : 0 (None)
Panicle Exsertion : 5 (Just exserted)
Lodging Resistance : 5 (Intermediate)
Leaf Senescence : 5 (Intermediate)
Panicle Shattering : 5 (Moderate)
Endosperm Type : 1 (Non-glutinous)

WINNER RICE

Isabela
Collection No. 16061

WINNER RICE-16061	
% Genetic Similarity	Other Genotypes
97.26	LAWIN (15977)
97.19	DESTINY (16042)
97.19	GANAR (15650)
97.08	MESTIZA (15886)
97.08	IL-29 (15513)

Grain Quality Traits

Milling Recovery (%)
- Brown Rice : 78.1 (F)
- Milled Rice : 70.8 (Pr)
- Head Rice : 59.1 (Pr)

Physical Attributes
- Grain Length (mm) : 6.8 (L)
- Grain Shape : 3.1 (S)
- Chalky Grains (%) : 9.5 (G2)

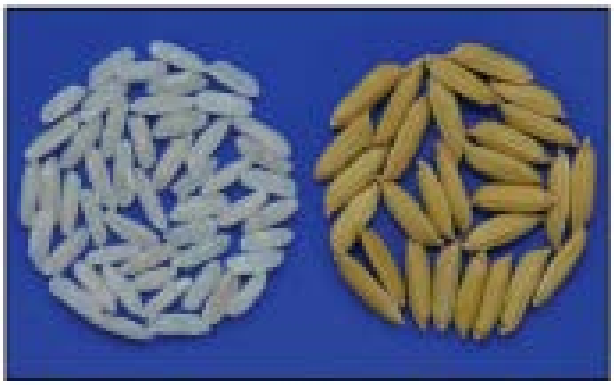
Physicochemical Properties
- Amylose Content (%) : 22.4 (H)
- Gelatinization Temperature : 4.7 (I/L)
- Crude Protein Content (%) : 6.1

Agronomic Characteristics

- Plant Height (cm) : 136.9
- Heading Days After Seeding : 92
- Maturity Days After Seeding : 122
- Basal Leaf Sheath Color : 1 (Green)
- Anthocyanin Color : 0 (Absent)
- Leaf Blade Pubescence : 3 (Pubescent)
- Auricle Color : 2 (Yellowish green)
- Collar Color : 2 (Light green)
- Awn Distribution : 0 (None)
- Panicle Exsertion : 7 (Moderately well exserted)
- Lodging Resistance : 5 (Intermediate)
- Leaf Senescence : 5 (Intermediate)
- Panicle Shattering : 5 (Moderate)
- Endosperm Type : 1 (Non-glutinous)

DIAMOND X

Isabela
Collection No.16062



DIAMOND X-16062	
% Genetic Similarity	Other Genotypes
98.80	NSIC Rc 218
98.20	DIAMOND X (16510)
97.81	KINAVITE (16035)
97.80	C-4 (16508)
97.53	NSIC Rc 138

Grain Quality Traits

Milling Recovery (%)
- Brown Rice : 38.8 (P)
- Milled Rice : 35.3 (G3)
- Head Rice : 29.8 (aa)

Physical Attributes
- Grain Length (mm) : 7.1 (L)
- Grain Shape : 3.2 (S)
- Chalky Grains (%) : 1.3 (Pr)

Physicochemical Properties
- Amylose Content (%) : 18.4 (I)
- Gelatinization Temperature : 4.6 (I/L)
- Crude Protein Content (%) : 10.1

Agronomic Characteristics

Plant Height (cm) : 125.4
Heading Days After Seeding : 92
Maturity Days After Seeding : 122
Basal Leaf Sheath Color : 1 (Green)
Anthocyanin Color : 0 (Absent)
Leaf Blade Pubescence : 3 (Pubescent)
Auricle Color : 2 (Yellowish green)
Collar Color : 2 (Light green)
Awn Distribution : 0 (None)
Panicle Exsertion : 5 (Just exserted)
Lodging Resistance : 7 (Strong)
Leaf Senescence : 5 (Intermediate)
Panicle Shattering : 5 (Moderate)
Endosperm Type : 1 (Non-glutinous)

GANADOR

Isabela
Collection No. 16063

GANADOR-16063	
% Genetic Similarity	Other Genotypes
98.73	DESTINY (16042)
98.73	GANAR (15650)
98.71	COMBAT (15969)
98.70	SUPER DIAMOND (15558)
98.70	IL-29 (15513)

Grain Quality Traits

Milling Recovery (%)
- Brown Rice : 76.1 (F)
- Milled Rice : 65.5 (G1)
- Head Rice : 49.5 (G1)

Physical Attributes
- Grain Length (mm) : 7.1 (L)
- Grain Shape : 3.3 (S)
- Chalky Grains (%) : 7.1 (G2)

Physicochemical Properties
- Amylose Content (%) : 23.3 (H)
- Gelatinization Temperature : 4.9 (I/L)
- Crude Protein Content (%) : 7.0

Agronomic Characteristics

Plant Height (cm) : 110.2
Heading Days After Seeding : 91
Maturity Days After Seeding : 121
Basal Leaf Sheath Color : 1 (Green)
Anthocyanin Color : 0 (Absent)
Leaf Blade Pubescence : 3 (Pubescent)
Auricle Color : 2 (Yellowish green)
Collar Color : 2 (Light green)
Awn Distribution : 2 (Upper quarter only)
Panicle Exsertion : 7 (Moderately well exserted)
Lodging Resistance : 9 (Very strong)
Leaf Senescence : 5 (Intermediate)
Panicle Shattering : 5 (Moderate)
Endosperm Type : 1 (Non-glutinous)

JAPANIRI

Isabela
Collection No.16064

JAPANIRI-16064	
% Genetic Similarity	Other Genotypes
99.80	DOUBLE DIAMOND (16498)
99.69	VIETNAM RICE (16497)
99.69	DOUBLE DIAMOND X (15959)
99.35	AS 411 (15573)
99.25	75 (15844)

Grain Quality Traits

Milling Recovery (%)
- Brown Rice : 73.1 (P)
- Milled Rice : 63.3 (G2)
- Head Rice : 52.3 (G1)

Physical Attributes
- Grain Length (mm) : 6.8 (L)
- Grain Shape : 3.1 (S)
- Chalky Grains (%) : 3.3 (G1)

Physicochemical Properties
- Amylose Content (%) : 12.9 (L)
- Gelatinization Temperature : 2.2 (H/I)
- Crude Protein Content (%) : 7.4

Agronomic Characteristics

- Plant Height (cm) : 122.2
- Heading Days After Seeding : 78
- Maturity Days After Seeding : 108
- Basal Leaf Sheath Color : 1 (Green)
- Anthocyanin Color : 0 (Absent)
- Leaf Blade Pubescence : 3 (Pubescent)
- Auricle Color : 2 (Yellowish green)
- Collar Color : 2 (Light green)
- Awn Distribution : 0 (Absent)
- Panicle Exsertion : 7 (Moderately well exserted)
- Lodging Resistance : 3 (Weak)
- Leaf Senescence : 5 (Intermediate)
- Panicle Shattering : 5 (Moderate)
- Endosperm Type : 1 (Non-glutinous)

GSR

Nueva Vizcaya
Collection No.16065

GSR-16065	
% Genetic Similarity	Other Genotypes
99.63	NSIC Rc 480
99.52	GREEN SUPER RICE NO.8 (15579)
95.58	GSR 2 (15515)
93.23	TARA RICE (16431)
92.83	LUZVIMINDA (16328)

Grain Quality Traits

Milling Recovery (%)
- Brown Rice : 77.8 (F)
- Milled Rice : 68.4 (G1)
- Head Rice : 40.6 (G2)

Physical Attributes
- Grain Length (mm) : 6.9 (L)
- Grain Shape : 3.3 (S)
- Chalky Grains (%) : 2.2 (G1)

Physicochemical Properties
- Amylose Content (%) : 13.7 (L)
- Gelatinization Temperature : 6.3 (L)
- Crude Protein Content (%) : 6.7

Agronomic Characteristics

Plant Height (cm) : 101.1
Heading Days After Seeding : 91
Maturity Days After Seeding : 121
Basal Leaf Sheath Color : 1 (Green)
Anthocyanin Color : 0 (Absent)
Leaf Blade Pubescence : 3 (Pubescent)
Auricle Color : 2 (Yellowish green)
Collar Color : 2 (Light green)
Awn Distribution : 0 (None)
Panicle Exsertion : 5 (Just exserted)
Lodging Resistance : 9 (Very strong)
Leaf Senescence : 5 (Intermediate)
Panicle Shattering : 5 (Moderate)
Endosperm Type : 1 (Non-glutinous)

PUKPUKLO

Nueva Vizcaya
Collection No. 16067

PUKPUKLO-16067	
% Genetic Similarity	Other Genotypes
100.00	POKPOKLO (15666)
98.34	HI-NOON (16506)
95.30	BURDAGOL (15660)
94.51	ROSANA (16089)
94.06	DIWATA (16351)

Grain Quality Traits

Milling Recovery (%)
- Brown Rice : 76.1 (F)
- Milled Rice : 68.1 (G1)
- Head Rice : 51.8 (Pr)

Physical Attributes
- Grain Length (mm) : 5.7 (M)
- Grain Shape : 2.3 (I)
- Chalky Grains (%) : 5.8 (G2)

Physicochemical Properties
- Amylose Content (%) : 19.4% (I)
- Gelatinization Temperature : 3.7 (HI/I)
- Crude Protein Content (%) : 7.9

Agronomic Characteristics

Plant Height (cm) : 148.1
Heading Days After Seeding : 100
Maturity Days After Seeding : 130
Basal Leaf Sheath Color : 1 (Green)
Anthocyanin Color : 0 (Absent)
Leaf Blade Pubescence : 3 (Pubescent)
Auricle Color : 2 (Yellowish green)
Collar Color : 2 (Light green)
Awn Distribution : 0 (None)
Panicle Exsertion : 7 (Moderately well exserted)
Lodging Resistance : 1 (Very weak)
Leaf Senescence : 7 (Late)
Panicle Shattering : 5 (Moderate)
Endosperm Type : 1 (Non-glutinous)

IMELDA RICE

Nueva Vizcaya
Collection No.16068

IMELDA RICE-16068	
% Genetic Similarity	Other Genotypes
94.03	R5 (16074)
93.21	JASMIN (15661)
92.82	SENORITA PILIT (16316)
92.68	PILIT (15946)
92.55	DIAMOND X (16510)

Grain Quality Traits

Milling Recovery (%)
- Brown Rice : 78.2 (F)
- Milled Rice : 68.3 (G1)
- Head Rice : 53.1 (G1)

Physical Attributes
- Grain Length (mm) : 6.7 (L)
- Grain Shape : 3.1 (S)
- Chalky Grains (%) : 3.3 (G1)

Physicochemical Properties
- Amylose Content (%) : 20.0 (I)
- Gelatinization Temperature : 5.2 (I/L)
- Crude Protein Content (%) : 6.7

Agronomic Characteristics

Plant Height (cm) : 137.1
Heading Days After Seeding : 104
Maturity Days After Seeding : 134
Basal Leaf Sheath Color : 1 (Green)
Anthocyanin Color : 0 (Absent)
Leaf Blade Pubescence : 3 (Pubescent)
Auricle Color : 2 (Yellowish green)
Collar Color : 2 (Light green)
Awn Distribution : 2 (Upper quarter only)
Panicle Exsertion : 5 (Just exserted)
Lodging Resistance : 7 (Strong)
Leaf Senescence : 5 (Intermediate)
Panicle Shattering : 5 (Moderate)
Endosperm Type : 3 (Glutinous)

BONGKITAN

Nueva Vizcaya
Collection No. 16069

BONGKITAN-16069	
% Genetic Similarity	Other Genotypes
80.40	MALAGKIT (EXOTIC) (15882)
78.11	PILIT CARABAO (16380)
75.83	TRES MARIAS (16392)
72.38	MILAGROSA SELECTION (16041)
66.55	PILI-RG (16383)

Grain Quality Traits

Milling Recovery (%)
- Brown Rice : 73.9 (P)
- Milled Rice : 67.1 (G1)
- Head Rice : 59.0 (Pr)

Physical Attributes
- Grain Length (mm) : 5.6 (M)
- Grain Shape : 2.0 (B)
- Chalky Grains (%) : 3.4 (G1)

Physicochemical Properties
- Amylose Content (%) : 0.9 (W)
- Gelatinization Temperature : 6.7 (L)
- Crude Protein Content (%) : 7.7

Agronomic Characteristics

Plant Height (cm) : 158.9
Heading Days After Seeding : 89
Maturity Days After Seeding : 119
Basal Leaf Sheath Color : 2 (Green with purple lines)
Anthocyanin Color : 3 (Weak)
Leaf Blade Pubescence : 3 (Pubescent)
Auricle Color : 2 (Yellowish green)
Collar Color : 2 (Light green)
Awn Distribution : 0 (None)
Panicle Exsertion : 7 (Moderately well exserted)
Lodging Resistance : 7 (Strong)
Leaf Senescence : 5 (Intermediate)
Panicle Shattering : 3 (Low)
Endosperm Type : 3 (Glutinous)

CARGIL

Nueva Vizcaya
Collection No.16070

CARGIL-16070	
% Genetic Similarity	Other Genotypes
100.00	JAPANIRI (15555)
98.91	KULAPO (15505)
93.36	V5 (16517)
92.08	3-MILLION (15457)
91.78	216 (16399)

Grain Quality Traits

Milling Recovery (%)
- Brown Rice : 38.8 (P)
- Milled Rice : 34.9 (G3)
- Head Rice : 31.6 (G3)

Physical Attributes
- Grain Length (mm) : 6.2 (M)
- Grain Shape : 2.9 (I)
- Chalky Grains (%) : 2.0 (Pr)

Physicochemical Properties
- Amylose Content (%) : 23.6 (H)
- Gelatinization Temperature : 5.2 (I/L)
- Crude Protein Content (%) : 9.3

Agronomic Characteristics

Plant Height (cm) : 130.4
Heading Days After Seeding : 98
Maturity Days After Seeding : 128
Basal Leaf Sheath Color : 1 (Green)
Anthocyanin Color : 0 (Absent)
Leaf Blade Pubescence : 3 (Pubescent)
Auricle Color : 2 (Yellowish green)
Collar Color : 2 (Light green)
Awn Distribution : 0 (None)
Panicle Exsertion : 7 (Moderately well exserted)
Lodging Resistance : 3 (Weak)
Leaf Senescence : 5 (Intermediate)
Panicle Shattering : 5 (Moderate)
Endosperm Type : 1 (Non-glutinous)

WAG-WAG PINO

Nueva Vizcaya
Collection No.16071

WAG-WAG PINO-16071	
% Genetic Similarity	Other Genotypes
92.81	RAMINAD (16072)
91.78	KAMOROS (16358)
91.38	ABANGAY (16336)
91.00	NTPSA-1 (16376)
90.60	3-MILLION (15457)

Grain Quality Traits

Milling Recovery (%)
- Brown Rice : 76.3 (F)
- Milled Rice : 69.3 (G1)
- Head Rice : 55.3 (G1)

Physical Attributes
- Grain Length (mm) : 5.9 (M)
- Grain Shape : 2.5 (I)
- Chalky Grains (%) : 5.2 (G2)

Physicochemical Properties
- Amylose Content (%) : 22.9 (H)
- Gelatinization Temperature : 6.0 (L)
- Crude Protein Content (%) : 8.3

Agronomic Characteristics

Plant Height (cm) : —
Heading Days After Seeding : 112
Maturity Days After Seeding : 142
Basal Leaf Sheath Color : 1 (Green)
Anthocyanin Color : 0 (Absent)
Leaf Blade Pubescence : 3 (Pubescent)
Auricle Color : 2 (Yellowish green)
Collar Color : 2 (Light green)
Awn Distribution : 0 (None)
Panicle Exsertion : 9 (Well exserted)
Lodging Resistance : 9 (Very strong)
Leaf Senescence : 5 (Intermediate)
Panicle Shattering : 5 (Moderate)
Endosperm Type : 1 (Non-glutinous)

RAMINAD

Nueva Vizcaya
Collection No. 16072

RAMINAD-16072	
% Genetic Similarity	Other Genotypes
92.81	WAG-WAG PINO (16071)
92.45	KAMOROS (16358)
92.38	ABANGAY (16336)
91.62	NTPSA-1 (16376)
91.15	JASMIN (15661)

Grain Quality Traits

Milling Recovery (%)
- Brown Rice : 76.1 (F)
- Milled Rice : 68.0 (G1)
- Head Rice : 60.9 (Pr)

Physical Attributes
- Grain Length (mm) : 5.6 (M)
- Grain Shape : 2.4 (I)
- Chalky Grains (%) : 3.0 (G1)

Physicochemical Properties
- Amylose Content (%) : 22.9 (H)
- Gelatinization Temperature : 5.8 (I/L)
- Crude Protein Content (%) : 9.0

Agronomic Characteristics

Plant Height (cm) : 145.2
Heading Days After Seeding : 89
Maturity Days After Seeding : 119
Basal Leaf Sheath Color : 1 (Green)
Anthocyanin Color : 0 (Absent)
Leaf Blade Pubescence : 3 (Pubescent)
Auricle Color : 2 (Yellowish green)
Collar Color : 2 (Light green)
Awn Distribution : 0 (None)
Panicle Exsertion : 9 (Well exserted)
Lodging Resistance : 5 (Intermediate)
Leaf Senescence : 5 (Intermediate)
Panicle Shattering : 3 (Low)
Endosperm Type : 1 (Non-glutinous)

WAG-WAG

Nueva Vizcaya
Collection No. 16073

WAG-WAG-16073	
% Genetic Similarity	Other Genotypes
93.87	NTPSA-1 (16376)
93.72	ABANGAY (16336)
93.66	MINDORO (16375)
93.47	EC2 (16354)
93.38	PKPDWARF (16384)

Grain Quality Traits

Milling Recovery (%)
- Brown Rice : 76.4 (F)
- Milled Rice : 69.2 (G1)
- Head Rice : 66.1 (Pr)

Physical Attributes
- Grain Length (mm) : 5.6 (M)
- Grain Shape : 2.6 (I)
- Chalky Grains (%) : 4.2 (G1)

Physicochemical Properties
- Amylose Content (%) : 23.0 (H)
- Gelatinization Temperature : 5.4 (I/L)
- Crude Protein Content (%) : 7.8

Agronomic Characteristics

Plant Height (cm) : 173.3
Heading Days After Seeding : 107
Maturity Days After Seeding : 137
Basal Leaf Sheath Color : 1 (Green)
Anthocyanin Color : 0 (Absent)
Leaf Blade Pubescence : 3 (Pubescent)
Auricle Color : 2 (Yellowish green)
Collar Color : 2 (Light green)
Awn Distribution : 0 (None)
Panicle Exsertion : 7 (Moderately well exserted)
Lodging Resistance : 3 (Weak)
Leaf Senescence : 5 (Intermediate)
Panicle Shattering : 5 (Moderate)
Endosperm Type : 1 (Non-glutinous)

R5

Nueva Vizcaya
Collection No.16074

R5-16074	
% Genetic Similarity	Other Genotypes
94.03	IMELDA RICE (16068)
93.08	ABANGAY (16336)
92.77	3-MILLION (15457)
92.75	JASMIN (15661)
92.64	SENORITA PILIT (16316)

Grain Quality Traits

Milling Recovery (%)
- Brown Rice : 76.6 (F)
- Milled Rice : 69.9 (G1)
- Head Rice : 57.5 (Pr)

Physical Attributes
- Grain Length (mm) : 5.8 (M)
- Grain Shape : 2.3 (I)
- Chalky Grains (%) : 1.4 (Pr)

Physicochemical Properties
- Amylose Content (%) : 0.4 (W)
- Gelatinization Temperature : 6.0 (L)
- Crude Protein Content (%) : 8.6

Agronomic Characteristics

Plant Height (cm) : 155.9
Heading Days After Seeding : 105
Maturity Days After Seeding : 135
Basal Leaf Sheath Color : 1 (Green)
Anthocyanin Color : 0 (Absent)
Leaf Blade Pubescence : 3 (Pubescent)
Auricle Color : 2 (Yellowish green)
Collar Color : 2 (Light green)
Awn Distribution : 3 (Upper half only)
Panicle Exsertion : 7 (Moderately well exserted)
Lodging Resistance : 7 (Strong)
Leaf Senescence : 5 (Intermediate)
Panicle Shattering : 5 (Moderate)
Endosperm Type : 3 (Glutinous)

IMPROVED 222

Nueva Vizcaya
Collection No. 16075

IMPROVED 222-16075	
% Genetic Similarity	Other Genotypes
95.28	NSIC Rc 222
95.09	DIAMOND X (16510)
94.61	UP & DOWN (15877)
94.49	EXCEL RICE (15571)
94.46	BWS-6W (16344)

Grain Quality Traits

Milling Recovery (%)
- Brown Rice : 74.8 (P)
- Milled Rice : 63.9 (G2)
- Head Rice : 36.5 (G3)

Physical Attributes
- Grain Length (mm) : 6.6 (L)
- Grain Shape : 3.1 (S)
- Chalky Grains (%) : 9.2 (G2)

Physicochemical Properties
- Amylose Content (%) : 22.3(H)
- Gelatinization Temperature : 5.0 (I)
- Crude Protein Content (%) : 8.9

Agronomic Characteristics

Plant Height (cm) : 124.7
Heading Days After Seeding : 95
Maturity Days After Seeding : 125
Basal Leaf Sheath Color : 1 (Green)
Anthocyanin Color : 0 (Absent)
Leaf Blade Pubescence : 3 (Pubescent)
Auricle Color : 2 (Yellowish green)
Collar Color : 2 (Light green)
Awn Distribution : 0 (None)
Panicle Exsertion : 7 (Moderately well exserted)
Lodging Resistance : 7 (Strong)
Leaf Senescence : 7 (Late)
Panicle Shattering : 5 (Moderate)
Endosperm Type : 2 (Intermediate)

FGRG COLLECTIONS FROM REGION 3

BULAW (SUPER 60)

Aurora
Collection No.15960

BULAW (SUPER 60)-15960	
% Genetic Similarity	Other Genotypes
100.00	BULAW (15958)
97.82	Rc BATO (16185)
97.47	BULAW (15839)
97.42	BULAW (15651)
97.36	BULAW (WHITE) (16034)

Grain Quality Traits

Milling Recovery (%)
- Brown Rice : 73.4 (P)
- Milled Rice : 65.2 (G1)
- Head Rice : 49.3 (G1)

Physical Attributes
- Grain Length (mm) : 5.8 (M)
- Grain Shape : 2.8 (I)
- Chalky Grains (%) : 0.1 (Pr)

Physicochemical Properties
- Amylose Content : 20.4 (I)
- Gelatinization Temperature : 4.8 (I)
- Crude Protein Content (%) : 11.4

Agronomic Characteristics

Plant Height (cm) : 125.3
Heading Days After Seeding : 90
Maturity Days After Seeding : 120
Basal Leaf Sheath Color : 1 (Green)
Anthocyanin Color : 0 (Absent)
Leaf Blade Pubescence : 3 (Pubescent)
Auricle Color : 2 (Yellowish green)
Collar Color : 2 (Light green)
Awn Distribution : 0 (None)
Panicle Exsertion : 7 (Moderately well-exserted)
Lodging Resistance : 1 (Very weak)
Leaf Senescence : 5 (Intermediate)
Panicle Shattering : 5 (Moderate)
Endosperm Type : 1 (Non-glutinous)

BULAW

Aurora
Collection No. 15958

BULAW-15958	
% Genetic Similarity	Other Genotypes
100.00	BULAW (SUPER 60) (15960)
97.82	Rc BATO (16185)
97.47	BULAW (15839)
97.42	BULAW (15651)
97.36	BULAW (WHITE) (16034)

Grain Quality Traits

Milling Recovery (%)
- Brown Rice : 75.1 (P)
- Milled Rice : 66.9 (G1)
- Head Rice : 53.4 (G1)

Physical Attributes
- Grain Length (mm) : 5.9 (M)
- Grain Shape : 2.7 (I)
- Chalky Grains (%) : 1.3 (Pr)

Physicochemical Properties
- Amylose Content (%) : 21.4 (I)
- Gelatinization Temperature : 5.0 (I)
- Crude Protein Content (%) : 8.6

Agronomic Characteristics

Plant Height (cm) : 120.8
Heading Days After Seeding : 90
Maturity Days After Seeding : 120
Basal Leaf Sheath Color : 1 (Green)
Anthocyanin Color : 0 (Absent)
Leaf Blade Pubescence : 3 (Pubescent)
Auricle Color : 2 (Yellowish green)
Collar Color : 2 (Light green)
Awn Distribution : 0 (None)
Panicle Exsertion : 7 (Moderately well-exserted)
Lodging Resistance : 1 (Very weak)
Leaf Senescence : 7 (Late)
Panicle Shattering : 5 (Moderate)
Endosperm Type : 1 (Non-glutinous)

GSR 8

Bataan
Collection No. 15589

GSR 8-15589	
% Genetic Similarity	Other Genotypes
95.06	LUZVIMINDA (16328)
94.49	DIAMOND X (16510)
92.86	IR 64
92.81	NSIRC Rc 298
92.67	216 (16399)

Grain Quality Traits

Milling Recovery (%)
- Brown Rice : 79.0 (F)
- Milled Rice : 70.0 (G1)
- Head Rice : 49.7 (G1)

Physical Attributes
- Grain Length (mm) : 6.9 (L)
- Grain Shape : 3.1 (S)
- Chalky Grains (%) : 4.0 (G1)

Physicochemical Properties
- Amylose Content (%) : 19.5 (I)
- Gelatinization Temperature : 4.4 (I)
- Crude Protein Content (%) : 8.0

Agronomic Characteristics

Plant Height (cm) : 104.4
Heading Days After Seeding : 83
Maturity Days After Seeding : 113
Basal Leaf Sheath Color : 1 (Green)
Anthocyanin Color : 0 (Absent)
Leaf Blade Pubescence : 3 (Pubescent)
Auricle Color : 2 (Yellowish green)
Collar Color : 2 (Light green)
Awn Distribution : 2 (Upper quarter only)
Panicle Exsertion : 7 (Moderately well exserted)
Lodging Resistance : 7 (Strong)
Leaf Senescence : 5 (Intermediate)
Panicle Shattering : 5 (Moderate)
Endosperm Type : 1 (Non-glutinous)

REALINE

Bataan
Collection No. 15591

REALINE-15591	
% Genetic Similarity	Other Genotypes
98.48	DASH 12 (16335)
97.10	DASH-12 (15456)
95.22	M 41 (16317)
95.20	DIAMOND X (16510)
95.11	UP & DOWN (15877)

Grain Quality Traits

Milling Recovery (%)
- Brown Rice : 78.9 (F)
- Milled Rice : 71.8 (Pr)
- Head Rice : 55.8 (G1)

Physical Attributes
- Grain Length (mm) : 6.3 (M)
- Grain Shape : 2.8 (I)
- Chalky Grains (%) : 3.9 (G1)

Physicochemical Properties
- Amylose Content (%) : 20.5 (I)
- Gelatinization Temperature : 4.3 (I)
- Crude Protein Content (%) : 7.0

Agronomic Characteristics

Plant Height (cm) : 116.5
Heading Days After Seeding : 91
Maturity Days After Seeding : 121
Basal Leaf Sheath Color : 1 (Green)
Anthocyanin Color : 0 (Absent)
Leaf Blade Pubescence : 3 (Pubescent)
Auricle Color : 2 (Yellowish green)
Collar Color : 2 (Light green)
Awn Distribution : 3 (Upper half only)
Panicle Exsertion : 7 (Moderately well exserted)
Lodging Resistance : 9 (Very strong)
Leaf Senescence : 7 (Late)
Panicle Shattering : 5 (Moderate)
Endosperm Type : 1 (Non-glutinous)

TRIPLE 1

Bataan
Collection No.15592

TRIPLE 1-15592	
% Genetic Similarity	Other Genotypes
97.72	LAWIN (15977)
97.61	GANAR (15650)
97.61	DESTINY (16042)
97.57	COMBAT (15969)
97.57	SUPER DIAMOND (15558)

Grain Quality Traits

Milling Recovery (%)
- Brown Rice : 80.4 (G)
- Milled Rice : 72.8 (Pr)
- Head Rice : 54.2 (G1)

Physical Attributes
- Grain Length (mm) : 7.1 (L)
- Grain Shape : 3.2 (S)
- Chalky Grains (%) : 5.8 (G2)

Physicochemical Properties
- Amylose Content (%) : 22.7 (H)
- Gelatinization Temperature : 4.8 (I)
- Crude Protein Content (%) : 7.6

Agronomic Characteristics

Plant Height (cm) : 124.3
Heading Days After Seeding : 92
Maturity Days After Seeding : 122
Basal Leaf Sheath Color : 1 (Green)
Anthocyanin Color : 0 (Absent)
Leaf Blade Pubescence : 3 (Pubescent)
Auricle Color : 2 (Yellowish green)
Collar Color : 2 (Light green)
Awn Distribution : 2 (Upper quarter only)
Panicle Exsertion : 5 (Just exserted)
Lodging Resistance : 9 (Very strong)
Leaf Senescence : 5 (Intermediate)
Panicle Shattering : 5 (Moderate)
Endosperm Type : 2 (Intermediate)

DIAMOND X

Bulacan
Collection No. 15512

DIAMOND X-15512	
% Genetic Similarity	Other Genotypes
98.57	SUPER DIAMOND (15558)
98.57	BELENA 205 (15583)
98.57	GSR 12 (15976)
98.57	DESTINY (16093)
98.57	TOP RICE (15556)

Grain Quality Traits

Milling Recovery (%)
- Brown Rice : 79.5 (F)
- Milled Rice : 71.6 (Pr)
- Head Rice : 45.9 (G2)

Physical Attributes
- Grain Length (mm) : 7.1 (L)
- Grain Shape : 3.3 (S)
- Chalky Grains (%) : 3.9 (G1)

Physicochemical Properties
- Amylose Content (%) : 23.2 (H)
- Gelatinization Temperature : 4.1 (I/L)
- Crude Protein Content (%) : 6.8

Agronomic Characteristics

Plant Height (cm) : 114.2
Heading Days After Seeding : 104
Maturity Days After Seeding : 134
Basal Leaf Sheath Color : 1 (Green)
Anthocyanin Color : 0 (Absent)
Leaf Blade Pubescence : 3 (Pubescent)
Auricle Color : 2 (Yellowish green)
Collar Color : 2 (Light green)
Awn Distribution : 0 (None)
Panicle Exsertion : 7 (Moderately well exserted)
Lodging Resistance : 9 (Very strong)
Leaf Senescence : 5 (Intermediate)
Panicle Shattering : 5 (Moderate)
Endosperm Type : 2 (Intermediate)

IL-29

Bulacan
Collection No.15513

IL-29-15513	
% Genetic Similarity	Other Genotypes
100.00	MESTIZA (15886)
100.00	SUPER DIAMOND (15558)
100.00	BELENA 205 (15583)
100.00	MASIGASIG 88 (16503)
100.00	DESTINY (16093)
100.00	COMBAT (15969)
100.00	TOP RICE (15556)
100.00	GSR 12 (15976)
100.00	DREAM RICE (15570)

Grain Quality Traits

Milling Recovery (%)
- Brown Rice : 79.1 (F)
- Milled Rice : 70.5 (Pr)
- Head Rice : 31.3 (G3)

Physical Attributes
- Grain Length (mm) : 7.0 (L)
- Grain Shape : 3.3 (S)
- Chalky Grains (%) : 4.6 (G1)

Physicochemical Properties
- Amylose Content (%) : 23.4 (H)
- Gelatinization Temperature : 4.0 (I)
- Crude Protein Content (%) : 7.0

Agronomic Characteristics

Plant Height (cm) : 127.1
Heading Days After Seeding : 97
Maturity Days After Seeding : 127
Basal Leaf Sheath Color : 1 (Green)
Anthocyanin Color : 0 (Absent)
Leaf Blade Pubescence : 3 (Pubescent)
Auricle Color : 2 (Yellowish green)
Collar Color : 2 (Light green)
Awn Distribution : 1 (Tip only)
Panicle Exsertion : 7 (Moderately well exserted)
Lodging Resistance : 7 (Strong)
Leaf Senescence : 7 (Late)
Panicle Shattering : 5 (Moderate)
Endosperm Type : 1 (Non-glutinous)

DIAMOND XX (DOUBLE DIAMOND)

Bulacan
Collection No.15514

DIAMOND XX (DOUBLE DIAMOND)-15514	
% Genetic Similarity	Other Genotypes
100.00	SAMPAGUITA (15948)
100.00	SUPER KALOY (VIETNAM RICE) (15559)
100.00	DOUBLE DIAMOND (15942)
100.00	UNKNOWN 5 (16189)
100.00	DOUBLE DIAMOND (MLANG) (16333)
100.00	ZAMBOANGA (15945)
100.00	DIAMOND X (15889)
100.00	MILAGROSA (15605)
100.00	ZAMBOANGA (16422)

Grain Quality Traits

Milling Recovery (%)
- Brown Rice : 77.4 (F)
- Milled Rice : 69.5 (G1)
- Head Rice : 62.5 (Pr)

Physical Attributes
- Grain Length (mm) : 7.0 (L)
- Grain Shape : 3.0 (S)
- Chalky Grains (%) : 2.1 (G1)

Physicochemical Properties
- Amylose Content (%) : 18.6 (I)
- Gelatinization Temperature : 5.4 (I/L)
- Crude Protein Content (%) : 6.6

Agronomic Characteristics

- Plant Height (cm) : 113.2
- Heading Days After Seeding : 110
- Maturity Days After Seeding : 140
- Basal Leaf Sheath Color : 1 (Green)
- Anthocyanin Color : 0 (Absent)
- Leaf Blade Pubescence : 3 (Pubescent)
- Auricle Color : 2 (Yellowish green)
- Collar Color : 2 (Light green)
- Awn Distribution : 2 (Upper quarter only)
- Panicle Exsertion : 5 (Just exserted)
- Lodging Resistance : 5 (Intermediate)
- Leaf Senescence : 5 (Intermediate)
- Panicle Shattering : 5 (Moderate)
- Endosperm Type : 1 (Non-glutinous)

GSR 2

Bulacan
Collection No.15515

GSR 2-15515	
% Genetic Similarity	Other Genotypes
95.99	GREEN SUPER RICE NO.8 (15579)
95.58	GSR (16065)
95.49	NSIC Rc 480
95.05	TARA RICE (16431)
92.05	LUZVIMINDA (16328)

Grain Quality Traits

Milling Recovery (%)
- Brown Rice : 77.6 (F)
- Milled Rice : 70.4 (Pr)
- Head Rice : 52.3 (G1)

Physical Attributes
- Grain Length (mm) : 6.6 (L)
- Grain Shape : 3.0 (I)
- Chalky Grains (%) : 1.7 (Pr)

Physicochemical Properties
- Amylose Content (%) : 15.7 (L)
- Gelatinization Temperature : 6.6 (L)
- Crude Protein Content (%) : 6.6

Agronomic Characteristics

Plant Height (cm) : 96.5
Heading Days After Seeding : 83
Maturity Days After Seeding : 113
Basal Leaf Sheath Color : 1 (Green)
Anthocyanin Color : 0 (Absent)
Leaf Blade Pubescence : 3 (Pubescent)
Auricle Color : 2 (Yellowish green)
Collar Color : 2 (Light green)
Awn Distribution : 0 (None)
Panicle Exsertion : 5 (Just exserted)
Lodging Resistance : 7 (Strong)
Leaf Senescence : 5 (Intermediate)
Panicle Shattering : 5 (Moderate)
Endosperm Type : 1 (Non-glutinous)

TRIPLE R

Bulacan
Collection No. 15517

TRIPLE R-15517	
% Genetic Similarity	Other Genotypes
95.57	LAWIN (15977)
95.52	NSIC Rc 222
95.44	1L29 (15565)
95.00	UNIVERSAL RICE (15552)
94.94	GANAR (15650)

Grain Quality Traits

Milling Recovery (%)
- Brown Rice : 78.8 (F)
- Milled Rice : 69.6 (G1)
- Head Rice : 40.6 (G2)

Physical Attributes
- Grain Length (mm) : 6.9 (L)
- Grain Shape : 3.1 (S)
- Chalky Grains (%) : 4.4 (G1)

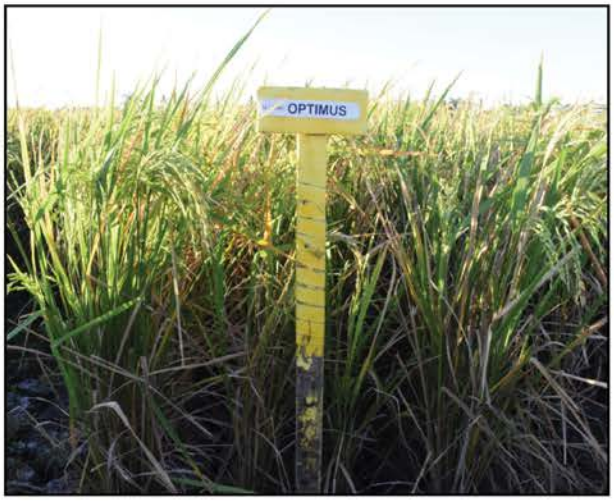
Physicochemical Properties
- Amylose Content (%) : 21.5 (I)
- Gelatinization Temperature : 4.7 (I/L)
- Crude Protein Content (%) : 8.7

Agronomic Characteristics

Plant Height (cm) : 126.3
Heading Days After Seeding : 93
Maturity Days After Seeding : 123
Basal Leaf Sheath Color : 1 (Green)
Anthocyanin Color : 0 (Absent)
Leaf Blade Pubescence : 3 (Pubescent)
Auricle Color : 2 (Yellowish green)
Collar Color : 2 (Light green)
Awn Distribution : 0 (None)
Panicle Exsertion : 7 (Moderately well exserted)
Lodging Resistance : 5 (Intermediate)
Leaf Senescence : 5 (Intermediate)
Panicle Shattering : 5 (Moderate)
Endosperm Type : 1 (Non-glutinous)

OPTIMUS

Nueva Ecija
Collection No. 15963



OPTIMUS-15963	
% Genetic Similarity	Other Genotypes
94.72	711 (15554)
94.26	PSB Rc 10
93.98	DIAMOND X (15512)
93.76	NSIC Rc 222
93.29	DIAMOND X (16510)

Grain Quality Traits

Milling Recovery (%)
- Brown Rice : 79.2 (F)
- Milled Rice : 69.2 (G1)
- Head Rice : 24.1 (aa)

Physical Attributes
- Grain Length (mm) : 6.8 (L)
- Grain Shape : 3.2 (S)
- Chalky Grains (%) : 6.5 (G2)

Physicochemical Properties
- Amylose Content (%) : 21.5 (I)
- Gelatinization Temperature : 5.3 (I/L)
- Crude Protein Content (%) : 8.8

Agronomic Characteristics

Plant Height (cm) : 132.1
Heading Days After Seeding : 91
Maturity Days After Seeding : 121
Basal Leaf Sheath Color : 1 (Green)
Anthocyanin Color : 0 (Absent)
Leaf Blade Pubescence : 3 (Pubescent)
Auricle Color : 2 (Yellowish green)
Collar Color : 2 (Light green)
Awn Distribution : 2 (Upper quarter only)
Panicle Exsertion : 7 (Moderately well exserted)
Lodging Resistance : 5 (Intermediate)
Leaf Senescence : 5 (Intermediate)
Panicle Shattering : 5 (Moderate)
Endosperm Type : 1 (Non-glutinous)

COMBAT

Nueva Ecija
Collection No. 15969

COMBAT-15969	
% Genetic Similarity	Other Genotypes
100.00	IL-29 (15513)
100.00	MESTIZA (15886)
100.00	SUPER DIAMOND (15558)
100.00	DESTINY (16093)
100.00	MASIGASIG 88 (16503)
100.00	BELENA 205 (15583)
100.00	TOP RICE (15556)
100.00	GSR 12 (15976)
100.00	DREAM RICE (15570)

Grain Quality Traits

Milling Recovery (%)
- Brown Rice : 75.7 (F)
- Milled Rice : 65.7 (G1)
- Head Rice : 49.2 (G1)

Physical Attributes
- Grain Length (mm) : 6.9 (L)
- Grain Shape : 3.2 (S)
- Chalky Grains (%) : 4.4 (G1)

Physicochemical Properties
- Amylose Content (%) : 25.3 (H)
- Gelatinization Temperature : 5.0 (I)
- Crude Protein Content (%) : 7.5

Agronomic Characteristics

Plant Height (cm) : 111.5
Heading Days After Seeding : 104
Maturity Days After Seeding : 134
Basal Leaf Sheath Color : 1 (Green)
Anthocyanin Color : 0 (Absent)
Leaf Blade Pubescence : 3 (Pubescent)
Auricle Color : 2 (Yellowish green)
Collar Color : 2 (Light green)
Awn Distribution : 5 (Whole length)
Panicle Exsertion : 7 (Moderately well exserted)
Lodging Resistance : 9 (Very strong)
Leaf Senescence : 5 (Intermediate)
Panicle Shattering : 5 (Moderate)
Endosperm Type : 1 (Non-glutinous)

GLOBAL SUPER RICE

Nueva Ecija
Collection No.15970

GLOBAL SUPER RICE-15970	
% Genetic Similarity	Other Genotypes
96.88	BEST RICE (15885)
96.60	SUPER DIAMOND (15558)
96.60	IL-29 (15513)
96.60	BELENA 205 (15583)
96.60	MALAYA (16190)

Grain Quality Traits

Milling Recovery (%)
- Brown Rice : 77.0 (F)
- Milled Rice : 67.6 (G1)
- Head Rice : 45.6 (G2)

Physical Attributes
- Grain Length (mm) : 7.0 (L)
- Grain Shape : 3.2 (S)
- Chalky Grains (%) : 4.1 (G1)

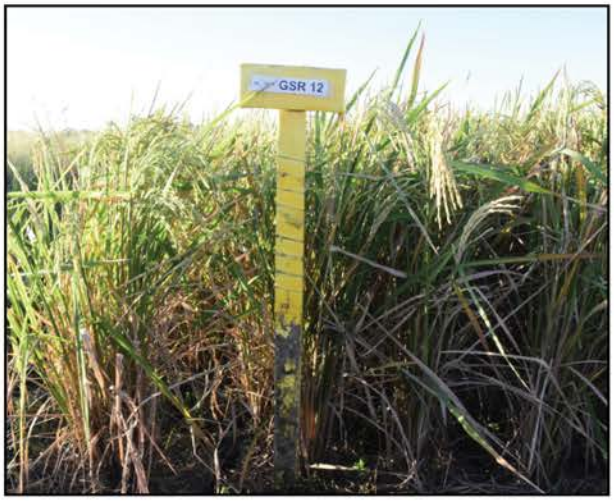
Physicochemical Properties
- Amylose Content (%) : 24.4 (H)
- Gelatinization Temperature : 4.8 (I)
- Crude Protein Content (%) : 7.7

Agronomic Characteristics

Plant Height (cm) : 128.7
Heading Days After Seeding : 97
Maturity Days After Seeding : 127
Basal Leaf Sheath Color : 1 (Green)
Anthocyanin Color : 0 (Absent)
Leaf Blade Pubescence : 3 (Pubescent)
Auricle Color : 2 (Yellowish green)
Collar Color : 2 (Light green)
Awn Distribution : 0 (None)
Panicle Exsertion : 7 (Moderately well exserted)
Lodging Resistance : 1 (Very weak)
Leaf Senescence : 7 (Late)
Panicle Shattering : 5 (Moderate)
Endosperm Type : 2 (Intermediate)

GSR 12

Nueva Ecija
Collection No. 15976



GSR 12-15976	
% Genetic Similarity	Other Genotypes
100.00	SUPER DIAMOND (15558)
100.00	IL-29 (15513)
100.00	MESTIZA (15886)
100.00	COMBAT (15969)
100.00	MASIGASIG 88 (16503)
100.00	BELENA 205 (15583)
100.00	DESTINY (16093)
100.00	TOP RICE (15556)
100.00	DREAM RICE (15570)

Grain Quality Traits

Milling Recovery (%)
- Brown Rice : 76.4 (F)
- Milled Rice : 64.9 (G2)
- Head Rice : 49.0 (G1)

Physical Attributes
- Grain Length (mm) : 6.9 (L)
- Grain Shape : 3.1 (S)
- Chalky Grains (%) : 10.1 (G3)

Physicochemical Properties
- Amylose Content (%) : 23.4 (H)
- Gelatinization Temperature : 5.8 (I/L)
- Crude Protein Content (%) : 7.2

Agronomic Characteristics

Plant Height (cm) : 115.4
Heading Days After Seeding : 104
Maturity Days After Seeding : 134
Basal Leaf Sheath Color : 1 (Green)
Anthocyanin Color : 0 (Absent)
Leaf Blade Pubescence : 3 (Pubescent)
Auricle Color : 2 (Yellowish green)
Collar Color : 2 (Light green)
Awn Distribution : 4 (Upper three quarters only)
Panicle Exsertion : 7 (Moderately well exserted)
Lodging Resistance : 9 (Very strong)
Leaf Senescence : 5 (Intermediate)
Panicle Shattering : 5 (Moderate)
Endosperm Type : 1 (Non-glutinous)

LAWIN

Nueva Ecija
Collection No.15977

LAWIN-15977	
% Genetic Similarity	Other Genotypes
98.53	COMBAT (15969)
98.53	SUPER DIAMOND (15558)
98.53	BELENA 205 (15583)
98.53	TOP RICE (15556)
98.53	GSR 12 (15976)

Grain Quality Traits

Milling Recovery (%)
- Brown Rice : 78.6 (F)
- Milled Rice : 69.1 (G1)
- Head Rice : 49.2 (G1)

Physical Attributes
- Grain Length (mm) : 6.9 (L)
- Grain Shape : 3.1 (S)
- Chalky Grains (%) : 8.3 (G2)

Physicochemical Properties
- Amylose Content (%) : 22.9 (H)
- Gelatinization Temperature : 4.8 (I/L)
- Crude Protein Content (%) : 8.9

Agronomic Characteristics

Plant Height (cm) : 121.6
Heading Days After Seeding : 91
Maturity Days After Seeding : 121
Basal Leaf Sheath Color : 1 (Green)
Anthocyanin Color : 0 (Absent)
Leaf Blade Pubescence : 3 (Pubescent)
Auricle Color : 2 (Yellowish green)
Collar Color : 2 (Light green)
Awn Distribution : 0 (None)
Panicle Exsertion : 7 (Moderately well exserted)
Lodging Resistance : 9 (Very strong)
Leaf Senescence : 5 (Intermediate)
Panicle Shattering : 5 (Moderate)
Endosperm Type : 2 (Intermediate)

DESTINY

Pampanga
Collection No.16042

DESTINY-16042	
% Genetic Similarity	Other Genotypes
100.00	GANAR (15650)
99.95	SUPER DIAMOND (15558)
99.95	BELENA 205 (15583)
99.95	IL-29 (15513)
99.95	MESTIZA (15886)

Grain Quality Traits

Milling Recovery (%)
- Brown Rice : 75.4 (F)
- Milled Rice : 64.4 (G2)
- Head Rice : 45.4 (G2)

Physical Attributes
- Grain Length (mm) : 6.9 (L)
- Grain Shape : 3.2 (S)
- Chalky Grains (%) : 8.9 (G2)

Physicochemical Properties
- Amylose Content (%) : 22.5 (H)
- Gelatinization Temperature : 4.6 (I)
- Crude Protein Content (%) : 7.7

Agronomic Characteristics

Plant Height (cm) : 120.2
Heading Days After Seeding : 104
Maturity Days After Seeding : 134
Basal Leaf Sheath Color : 1 (Green)
Anthocyanin Color : 0 (Absent)
Leaf Blade Pubescence : 3 (Pubescent)
Auricle Color : 2 (Yellowish green)
Collar Color : 2 (Light green)
Awn Distribution : 0 (None)
Panicle Exsertion : 7 (Moderately well exserted)
Lodging Resistance : 9 (Very strong)
Leaf Senescence : 5 (Intermediate)
Panicle Shattering : 5 (Moderate)
Endosperm Type : 1 (Non-glutinous)

MILAGROSA SELECTION

Pampanga
Collection No.16041

MILAGROSA SELECTION-16041	
% Genetic Similarity	Other Genotypes
76.86	TRES MARIAS (16392)
76.83	PILIT CARABAO (16380)
72.38	BONGKITAN (16069)
71.68	MALAGKIT (EXOTIC) (15882)
71.45	PILI-RG (16383)

Grain Quality Traits

Milling Recovery (%)
- Brown Rice : 75.8 (F)
- Milled Rice : 70.2 (G1)
- Head Rice : 56.9 (G1)

Physical Attributes
- Grain Length (mm) : 4.5 (Sh)
- Grain Shape : 2.0 (B)
- Chalky Grains (%) : 3.1 (G1)

Physicochemical Properties
- Amylose Content (%) : 19.4 (I)
- Gelatinization Temperature : 4.6 (I)
- Crude Protein Content (%) : 8.5

Agronomic Characteristics

Plant Height (cm) : 158.2
Heading Days After Seeding : 105
Maturity Days After Seeding : 135
Basal Leaf Sheath Color : 1 (Green)
Anthocyanin Color : 0 (Absent)
Leaf Blade Pubescence : 3 (Pubescent)
Auricle Color : 2 (Yellowish green)
Collar Color : 2 (Light green)
Awn Distribution : 0 (None)
Panicle Exsertion : 9 (Well exserted)
Lodging Resistance : 1 (Very weak)
Leaf Senescence : 5 (Intermediate)
Panicle Shattering : 5 (Moderate)
Endosperm Type : 2 (Intermediate)

AEROBIC

Pampanga
Collection No. 16040

AEROBIC-16040	
% Genetic Similarity	Other Genotypes
93.66	PSB Rc 9
93.65	BALAKI (15659)
93.64	AEROBIC RICE (15657)
93.40	PSB Rc 3
93.32	R5 (15599)

Grain Quality Traits

Milling Recovery (%)
- Brown Rice : 76.4 (F)
- Milled Rice : 68.0 (G1)
- Head Rice : 46.6 (G2)

Physical Attributes
- Grain Length (mm) : 6.2 (M)
- Grain Shape : 2.8 (I)
- Chalky Grains (%) : 26.0 (aa)

Physicochemical Properties
- Amylose Content (%) : 20.3 (I)
- Gelatinization Temperature : 4.3 (I/L)
- Crude Protein Content (%) : 7.0

Agronomic Characteristics

Plant Height (cm) : 155.8
Heading Days After Seeding : 98
Maturity Days After Seeding : 128
Basal Leaf Sheath Color : 1 (Green)
Anthocyanin Color : 0 (Absent)
Leaf Blade Pubescence : 3 (Pubescent)
Auricle Color : 2 (Yellowish green)
Collar Color : 2 (Light green)
Awn Distribution : 0 (None)
Panicle Exsertion : 7 (Moderately well-exserted)
Lodging Resistance : 3 (Weak)
Leaf Senescence : 5 (Intermediate)
Panicle Shattering : 5 (Moderate)
Endosperm Type : 2 (Intermediate)

LAKATAN

Pampanga
Collection No. 16043

LAKATAN-16043	
% Genetic Similarity	Other Genotypes
91.12	ABANGAY (16336)
90.81	SNR-2 (16391)
90.79	KAMOROS (16358)
90.58	SNC-13 (16388)
90.22	3-MILLION (15457)

Grain Quality Traits

Milling Recovery (%)
- Brown Rice : 69.9 (P)
- Milled Rice : 63.2 (G2)
- Head Rice : 38.5 (G3)

Physical Attributes
- Grain Length (mm) : 6.4 (M)
- Grain Shape : 3.0 (I)
- Chalky Grains (%) : 52.1 (aa)

Physicochemical Properties
- Amylose Content (%) : 11.1 (L)
- Gelatinization Temperature : 7.0 (L)
- Crude Protein Content (%) : 8.3

Agronomic Characteristics

Plant Height (cm) : 134.7
Heading Days After Seeding : 147
Maturity Days After Seeding : 177
Basal Leaf Sheath Color : 3 (Light purple)
Anthocyanin Color : 3 (Weak)
Leaf Blade Pubescence : 3 (Pubescent)
Auricle Color : 3 (Purple)
Collar Color : 3 (Purple)
Awn Distribution : 0 (None)
Panicle Exsertion : 9 (Well exserted)
Lodging Resistance : 9 (Very strong)
Leaf Senescence : 7 (Late)
Panicle Shattering : 5 (Moderate)
Endosperm Type : 1 (Non-glutinous)

AEROBIC RICE

Tarlac
Collection No.15635

AEROBIC RICE-15635	
% Genetic Similarity	Other Genotypes
99.84	NSIC Rc 23
99.37	DIAMOND X (15636)
94.88	BALAKI (15659)
94.88	PSB Rc 9
94.87	AEROBIC RICE (15657)

Grain Quality Traits

Milling Recovery (%)
- Brown Rice : 76.3 (F)
- Milled Rice : 66.9 (G1)
- Head Rice : 41.9 (G2)

Physical Attributes
- Grain Length (mm) : 6.4 (M)
- Grain Shape : 2.6 (I)
- Chalky Grains (%) : 13.9 (G3)

Physicochemical Properties
- Amylose Content (%) : 19.7 (I)
- Gelatinization Temperature : 3.8 (HI/I)
- Crude Protein Content (%) : 6.7

Agronomic Characteristics

Plant Height (cm) : 106.5
Heading Days After Seeding : 90
Maturity Days After Seeding : 120
Basal Leaf Sheath Color : 3 (Light purple)
Anthocyanin Color : 5 (Medium)
Leaf Blade Pubescence : 3 (Pubescent)
Auricle Color : 4 (Light purple)
Collar Color : 4 (Purple lines)
Awn Distribution : 0 (None)
Panicle Exsertion : 7 (Moderately well-exserted)
Lodging Resistance : 9 (Very strong)
Leaf Senescence : 7 (Late)
Panicle Shattering : 5 (Moderate)
Endosperm Type : 1 (Non-glutinous)

DIAMOND X

Tarlac
Collection No. 15636

DIAMOND X-15636	
% Genetic Similarity	Other Genotypes
99.78	NSIC Rc 23
99.37	AEROBIC RICE (15635)
94.43	BALAKI (15659)
94.43	AEROBIC RICE (15657)
94.43	PSB Rc 9

Grain Quality Traits

Milling Recovery (%)
- Brown Rice : 72.2 (P)
- Milled Rice : 65.9 (G1)
- Head Rice : 32.2 (G3)

Physical Attributes
- Grain Length (mm) : 6.6 (L)
- Grain Shape : 2.8 (I)
- Chalky Grains (%) : 5.3 (G2)

Physicochemical Properties
- Amylose Content (%) : 19.4 (I)
- Gelatinization Temperature : 4.3 (I/L)
- Crude Protein Content (%) : 8.3

Agronomic Characteristics

Plant Height (cm) : 102.4
Heading Days After Seeding : 82
Maturity Days After Seeding : 112
Basal Leaf Sheath Color : 3 (Light purple)
Anthocyanin Color : 5 (Medium)
Leaf Blade Pubescence : 3 (Pubescent)
Auricle Color : 5 (Purple lines)
Collar Color : 4 (Purple lines)
Awn Distribution : 1 (Tip only)
Panicle Exsertion : 5 (Just exserted)
Lodging Resistance : 9 (Very strong)
Leaf Senescence : 5 (Intermediate)
Panicle Shattering : 5 (Moderate)
Endosperm Type : 2 (Intermediate)

R5

Zambales
Collection No.15599

R5-15599	
% Genetic Similarity	Other Genotypes
99.89	PSB Rc 3
93.77	PINOLO (16194)
93.57	INTAN/MIRACLE (16195)
93.47	BALAKI (15659)
93.47	AEROBIC RICE (15657)

Grain Quality Traits

Milling Recovery (%)
- Brown Rice : 78.3 (F)
- Milled Rice : 70.5 (Pr)
- Head Rice : 61.0 (Pr)

Physical Attributes
- Grain Length (mm) : 6.5 (M)
- Grain Shape : 2.8 (I)
- Chalky Grains (%) : 3.8 (G1)

Physicochemical Properties
- Amylose Content (%) : 19.7 (I)
- Gelatinization Temperature : 2.5 (H/HI)
- Crude Protein Content (%) : 6.4

Agronomic Characteristics

Plant Height (cm) : 128.3
Heading Days After Seeding : 98
Maturity Days After Seeding : 128
Basal Leaf Sheath Color : 3 (Light purple)
Anthocyanin Color : 5 (Medium)
Leaf Blade Pubescence : 3 (Pubescent)
Auricle Color : 2 (Yellowish green)
Collar Color : 4 (Purple lines)
Awn Distribution : 0 (None)
Panicle Exsertion : 7 (Moderately well exserted)
Lodging Resistance : 9 (Very strong)
Leaf Senescence : 7 (Late)
Panicle Shattering : 5 (Moderate)
Endosperm Type : 1 (Non-glutinous)

MILAGROSA

Zambales
Collection No. 15605

MILAGROSA-15605	
% Genetic Similarity	Other Genotypes
100.00	ZAMBOANGA (15945)
100.00	SAMPAGUITA (15948)
100.00	DIAMOND XX (DOUBLE DIAMOND) (15514)
100.00	DOUBLE DIAMOND (15942)
100.00	DOUBLE DIAMOND (MLANG) (16333)
100.00	UNKNOWN 5 (16189)
100.00	DIAMOND X (15889)
100.00	SUPER KALOY (VIETNAM RICE) (15559)
100.00	ZAMBOANGA (16422)

Grain Quality Traits

Milling Recovery (%)
- Brown Rice : 77.4 (F)
- Milled Rice : 68.3 (G1)
- Head Rice : 37.4 (G3)

Physical Attributes
- Grain Length (mm) : 6.8 (L)
- Grain Shape : 3.0 (S)
- Chalky Grains (%) : 4.8 (G1)

Physicochemical Properties
- Amylose Content (%) : 15.7 (L)
- Gelatinization Temperature : 5.3 (I/L)
- Crude Protein Content (%) : 8.1

Agronomic Characteristics

Plant Height (cm) : 131.9
Heading Days After Seeding : 98
Maturity Days After Seeding : 128
Basal Leaf Sheath Color : 1 (Green)
Anthocyanin Color : 0 (Absent)
Leaf Blade Pubescence : 3 (Pubescent)
Auricle Color : 2 (Yellowish green)
Collar Color : 2 (Light green)
Awn Distribution : 0 (None)
Panicle Exsertion : 5 (Just exserted)
Lodging Resistance : 3 (Weak)
Leaf Senescence : 7 (Late)
Panicle Shattering : 5 (Moderate)
Endosperm Type : 1 (Non-glutinous)

DIAMOND X

Zambales
Collection No.15606

DIAMOND X-15606	
% Genetic Similarity	Other Genotypes
99.03	DIAMOND X (16510)
98.36	SAMPAGUITA (15948
98.36	DIAMOND XX (DOUBLE DIAMOND) (15514)
98.36	DOUBLE DIAMOND (15942
98.36	SUPER KALOY (VIETNAM RICE) (15559)

Grain Quality Traits

Milling Recovery (%)
- Brown Rice : 77.0 (F)
- Milled Rice : 70.6 (Pr)
- Head Rice : 38.7 (G3)

Physical Attributes
- Grain Length (mm) : 6.7 (L)
- Grain Shape : 2.9 (I)
- Chalky Grains (%) : 1.6 (Pr)

Physicochemical Properties
- Amylose Content (%) : 15.7 (L)
- Gelatinization Temperature : 6.0 (L)
- Crude Protein Content (%) : 6.4

Agronomic Characteristics

Plant Height (cm) : 122.8
Heading Days After Seeding : 93
Maturity Days After Seeding : 123
Basal Leaf Sheath Color : 1 (Green)
Anthocyanin Color : 0 (Absent)
Leaf Blade Pubescence : 3 (Pubescent)
Auricle Color : 2 (Yellowish green)
Collar Color : 2 (Light green)
Awn Distribution : 0 (None)
Panicle Exsertion : 5 (Just exserted)
Lodging Resistance : 5 (Intermediate)
Leaf Senescence : 5 (Intermediate)
Panicle Shattering : 5 (Moderate)
Endosperm Type : 1 (Non-glutinous)

FGRG COLLECTIONS FROM REGIONS 4A AND 4B

EARLY DAVID

Laguna
Collection No.15883

EARLY DAVID-15883	
% Genetic Similarity	Other Genotypes
93.42	JASMIN (15661)
93.13	INBRED-300 (16436)
92.84	DIAMOND X (16510)
92.77	ABANGAY (16336)
92.26	BWSI-4R (16343)

Grain Quality Traits

Milling Recovery (%)
- Brown Rice : 77.5 (F)
- Milled Rice : 69.3 (G1)
- Head Rice : 62.0 (Pr)

Physical Attributes
- Grain Length (mm) : 7.1 (L)
- Grain Shape : 3.1 (S)
- Chalky Grains (%) : 1.8 (Pr)

Physicochemical Properties
- Amylose Content (%) : 13.4 (L)
- Gelatinization Temperature : 3.8 (HI/I)
- Crude Protein Content (%) : 8.7

Agronomic Characteristics

Plant Height (cm) : 138.3
Heading Days After Seeding : 98
Maturity Days After Seeding : 128
Basal Leaf Sheath Color : 2 (Green with purple lines)
Anthocyanin Color : 3 (Weak)
Leaf Blade Pubescence : 3 (Pubescent)
Auricle Color : 3 (Purple)
Collar Color : 4 (Purple lines)
Awn Distribution : 3 (Upper half only)
Panicle Exsertion : 9 (Well exserted)
Lodging Resistance : 3 (Weak)
Leaf Senescence : 7 (late)
Panicle Shattering : 3 (Low)
Endosperm Type : 1 (Non-glutinous)

MALAYA

Quezon
Collection No.16190

MALAYA-16190	
% Genetic Similarity	Other Genotypes
99.17	TOP RICE (15556)
99.17	BELENA 205 (15583)
99.17	GSR 12 (15976)
99.17	DESTINY (16093)
99.17	SUPER DIAMOND (15558)

Grain Quality Traits

Milling Recovery (%)
- Brown Rice : 73.1 (P)
- Milled Rice : 64.7 (G2)
- Head Rice : 53.5 (G1)

Physical Attributes
- Grain Length (mm) : 6.8 (L)
- Grain Shape : 3.1 (S)
- Chalky Grains (%) : 3.96 (G1)

Physicochemical Properties
- Amylose Content (%) : 23.4 (H)
- Gelatinization Temperature : 5.0 (I)
- Crude Protein Content (%) : 5.9

Agronomic Characteristics

Plant Height (cm) : 115.8
Heading Days After Seeding : 97
Maturity Days After Seeding : 127
Basal Leaf Sheath Color : 1 (Green)
Anthocyanin Color : 0 (Absent)
Leaf Blade Pubescence : 3 (Pubescent)
Auricle Color : 2 (Yellowish green)
Collar Color : 2 (Light green)
Awn Distribution : 2 (Upper quarter only)
Panicle Exsertion : 7 (Moderately well exserted)
Lodging Resistance : 9 (Very strong)
Leaf Senescence : 5 (Intermediate)
Panicle Shattering : 5 (Moderate)
Endosperm Type : 2 (Intermediate)

PINO 45

Quezon
Collection No.16192

PINO 45-16192	
% Genetic Similarity	Other Genotypes
93.91	DIAMOND X (16510)
93.33	PSB Rc 10
93.07	NSIC Rc 420
92.67	NSIC Rc 294
92.28	216 (16399)

Grain Quality Traits

Milling Recovery (%)
- Brown Rice : 79.1 (F)
- Milled Rice : 71.7 (Pr)
- Head Rice : 47.1 (G2)

Physical Attributes
- Grain Length (mm) : 7.0 (L)
- Grain Shape : 3.1 (S)
- Chalky Grains (%) : 6.94 (G2)

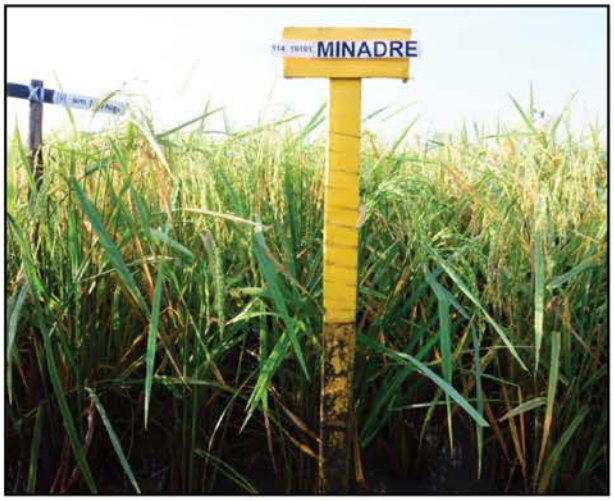
Physicochemical Properties
- Amylose Content (%) : 23.5 (H)
- Gelatinization Temperature : 5.3 (I/L)
- Crude Protein Content (%) : 6.0

Agronomic Characteristics

- Plant Height (cm) : 120.0
- Heading Days After Seeding : 91
- Maturity Days After Seeding : 121
- Basal Leaf Sheath Color : 1 (Green)
- Anthocyanin Color : 0 (Absent)
- Leaf Blade Pubescence : 3 (Pubescent)
- Auricle Color : 2 (Yellowish green)
- Collar Color : 2 (Light green)
- Awn Distribution : 0 (None)
- Panicle Exsertion : 7 (Moderately well exserted)
- Lodging Resistance : 7 (Strong)
- Leaf Senescence : 5 (Intermediate)
- Panicle Shattering : 5 (Moderate)
- Endosperm Type : 1 (Non-glutinous)

MINADRE

Quezon
Collection No. 16193



MINADRE-16193	
% Genetic Similarity	Other Genotypes
93.41	KAYOPO (16096)
92.51	NSIC Rc 420
92.12	216 (16399)
91.75	NTPSA-1 (16376)
91.44	KAMOROS (16358)

Grain Quality Traits

Milling Recovery (%)
- Brown Rice : 71.4 (P)
- Milled Rice : 64.6 (G2)
- Head Rice : 26.7 (aa)

Physical Attributes
- Grain Length (mm) : 6.2 (M)
- Grain Shape : 3.0 (I)
- Chalky Grains (%) : 1.22 (Pr)

Physicochemical Properties
- Amylose Content (%) : 20.9 (I)
- Gelatinization Temperature : 4.0 (I)
- Crude Protein Content (%) : 5.3

Agronomic Characteristics

Plant Height (cm) : —
Heading Days After Seeding : 91
Maturity Days After Seeding : 121
Basal Leaf Sheath Color : 1 (Green)
Anthocyanin Color : 0 (Absent)
Leaf Blade Pubescence : 3 (Pubescent)
Auricle Color : 2 (Yellowish green)
Collar Color : 2 (Light green)
Awn Distribution : 0 (None)
Panicle Exsertion : 5 (Just exserted)
Lodging Resistance : 7 (Strong)
Leaf Senescence : 5 (Intermediate)
Panicle Shattering : 5 (Moderate)
Endosperm Type : 1 (Non-glutinous)

PINOLO

Quezon
Collection No. 16194

PINOLO-16194	
% Genetic Similarity	Other Genotypes
93.89	PSB Rc 3
93.77	R5 (15599)
93.06	BURDAGOL (15892)
92.91	ABANGAY (16336)
92.85	3-MILLION (15457)

Grain Quality Traits

Milling Recovery (%)
- Brown Rice : 76.2 (F)
- Milled Rice : 68.9 (G1)
- Head Rice : 54.7 (G1)

Physical Attributes
- Grain Length (mm) : 6.8 (L)
- Grain Shape : 2.8 (I)
- Chalky Grains (%) : 0.4 (Pr)

Physicochemical Properties
- Amylose Content : 21.2 (I)
- Gelatinization Temperature : 5.0 (I)
- Crude Protein Content (%) : 5.8

Agronomic Characteristics

Plant Height (cm) : 130.6
Heading Days After Seeding : 93
Maturity Days After Seeding : 123
Basal Leaf Sheath Color : 1 (Green)
Anthocyanin Color : 0 (Absent)
Leaf Blade Pubescence : 3 (Pubescent)
Auricle Color : 2 (Yellowish green)
Collar Color : 2 (Light green)
Awn Distribution : 0 (None)
Panicle Exsertion : 7 (Moderately well exserted)
Lodging Resistance : 3 (Weak)
Leaf Senescence : 5 (Intermediate)
Panicle Shattering : 5 (Moderate)
Endosperm Type : 1 (Non-glutinous)

INTAN/MIRACLE

Quezon
Collection No. 16195

INTAN/MIRACLE-16195	
% Genetic Similarity	Other Genotypes
93.57	R5 (15599)
93.53	PSB Rc 3
92.17	BURDAGOL (15892)
92.06	3-MILLION (15457)
91.67	PINOLO (16194)

Grain Quality Traits

Milling Recovery (%)
- Brown Rice : 71.4 (P)
- Milled Rice : 64.8 (G2)
- Head Rice : 60.8 (Pr)

Physical Attributes
- Grain Length (mm) : 6.7 (L)
- Grain Shape : 2.5 (I)
- Chalky Grains (%) : 2.9 (G1)

Physicochemical Properties
- Amylose Content (%) : 20.5 (I)
- Gelatinization Temperature : 5.0 (I)
- Crude Protein Content (%) : 7.2

Agronomic Characteristics

Plant Height (cm) : 130.8
Heading Days After Seeding : 105
Maturity Days After Seeding : 135
Basal Leaf Sheath Color : 3 (Light purple)
Anthocyanin Color : 5 (Medium)
Leaf Blade Pubescence : 3 (Pubescent)
Auricle Color : 4 (Light purple)
Collar Color : 4 (Purple lines)
Awn Distribution : 1 (Tip only)
Panicle Exsertion : 7 (Moderately well exserted)
Lodging Resistance : 3 (Weak)
Leaf Senescence : 5 (Intermediate)
Panicle Shattering : 5 (Moderate)
Endosperm Type : 1 (Non-glutinous)

BEST RICE

Palawan
Collection No. 15885

BEST RICE-15885	
% Genetic Similarity	Other Genotypes
98.80	DESTINY (16042)
98.79	SUPER DIAMOND (15558)
98.79	BELENA 205 (15583)
98.79	MESTIZA (15886)
98.79	IL-29 (15513)
98.79	MASIGASIG 88 (16503)

Grain Quality Traits

Milling Recovery (%)
- Brown Rice : 79.8 (G)
- Milled Rice : 70.1 (Pr)
- Head Rice : 60.9 (Pr)

Physical Attributes
- Grain Length (mm) : 6.9 (L)
- Grain Shape : 3.3 (S)
- Chalky Grains (%) : 2.9 (G1)

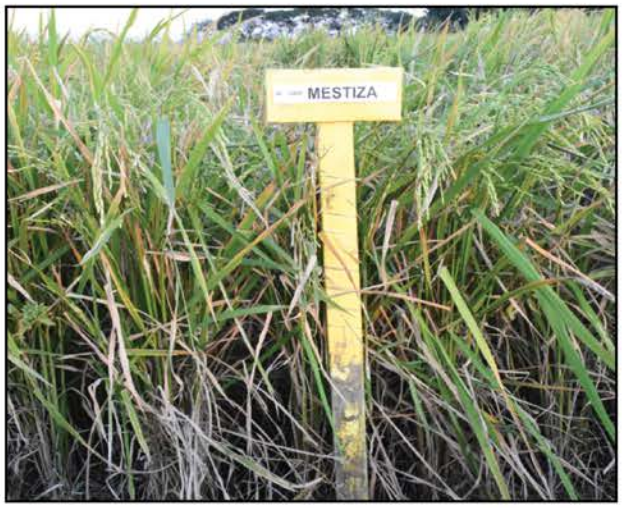
Physicochemical Properties
- Amylose Content (%) : 23.2 (H)
- Gelatinization Temperature : 6.0 (L)
- Crude Protein Content (%) : 6.8

Agronomic Characteristics

Plant Height (cm) : 120.3
Heading Days After Seeding : 95
Maturity Days After Seeding : 125
Basal Leaf Sheath Color : 1 (Green)
Anthocyanin Color : 0 (Absent)
Leaf Blade Pubescence : 3 (Pubescent)
Auricle Color : 2 (Yellowish green)
Collar Color : 2 (Light green)
Awn Distribution : 0 (None)
Panicle Exsertion : 7 (Moderately well-exserted)
Lodging Resistance : 7 (Strong)
Leaf Senescence : 7 (Late)
Panicle Shattering : 5 (Moderate)
Endosperm Type : 2 (Intermediate)

MESTIZA

Palawan
Collection No. 15886



MESTIZA-15886	
% Genetic Similarity	Other Genotypes
100.00	IL-29 (15513)
100.00	SUPER DIAMOND (15558)
100.00	MESTIZA (15886)
100.00	BELENA 205 (15583)
100.00	DESTINY (16093)
100.00	COMBAT (15969)
100.00	GSR 12 (15976)
100.00	TOP RICE (15556)
100.00	DREAM RICE (15570)

Grain Quality Traits

Milling Recovery (%)
- Brown Rice : 79.0 (F)
- Milled Rice : 68.4 (G1)
- Head Rice : 55.1 (G1)

Physical Attributes
- Grain Length (mm) : 7.0 (L)
- Grain Shape : 3.3 (S)
- Chalky Grains (%) : 7.0 (G2)

Physicochemical Properties
- Amylose Content (%) : 24.7 (H)
- Gelatinization Temperature : 5.0 (I)
- Crude Protein Content (%) : 6.8

Agronomic Characteristics

Plant Height (cm) : 116.4
Heading Days After Seeding : 105
Maturity Days After Seeding : 135
Basal Leaf Sheath Color : 1 (Green)
Anthocyanin Color : 0 (Absent)
Leaf Blade Pubescence : 3 (Pubescent)
Auricle Color : 2 (Yellowish green)
Collar Color : 2 (Light green)
Awn Distribution : 0 (None)
Panicle Exsertion : 7 (Moderately well exserted)
Lodging Resistance : 7 (Strong)
Leaf Senescence : 5 (Intermediate)
Panicle Shattering : 5 (Moderate)
Endosperm Type : 1 (Non-glutinous)

TANAKA

Palawan
Collection No. 15888

TANAKA-15888	
% Genetic Similarity	Other Genotypes
92.39	216 (16399)
91.86	DIAMOND X (16510)
91.85	ABANGAY (16336)
91.41	DAHILI (16352)
91.35	JASMIN (15661)

Grain Quality Traits

Milling Recovery (%)
- Brown Rice : 76.5 (F)
- Milled Rice : 67.4 (G1)
- Head Rice : 47.5 (G2)

Physical Attributes
- Grain Length (mm) : 7.1 (L)
- Grain Shape : 3.0 (I)
- Chalky Grains (%) : 8.0 (G2)

Physicochemical Properties
- Amylose Content (%) : 18.1 (I)
- Gelatinization Temperature : 4.0 (I)
- Crude Protein Content (%) : 7.8

Agronomic Characteristics

Plant Height (cm) : 120.3
Heading Days After Seeding : 104
Maturity Days After Seeding : 134
Basal Leaf Sheath Color : 1 (Green)
Anthocyanin Color : 0 (Absent)
Leaf Blade Pubescence : 3 (Pubescent)
Auricle Color : 2 (Yellowish green)
Collar Color : 2 (Light green)
Awn Distribution : 0 (None)
Panicle Exsertion : 7 (Moderately well exserted)
Lodging Resistance : 9 (Very strong)
Leaf Senescence : 5 (Intermediate)
Panicle Shattering : 5 (Moderate)
Endosperm Type : 1 (Non-glutinous)

DIAMOND X

Palawan
Collection No. 15889

DIAMOND X-15889	
% Genetic Similarity	Other Genotypes
100.00	ZAMBOANGA (15945)
100.00	MILAGROSA (15605)
100.00	SAMPAGUITA (15948)
100.00	DIAMOND XX (DOUBLE DIAMOND) (15514)
100.00	DOUBLE DIAMOND (15942)
100.00	DOUBLE DIAMOND (MLANG) (16333)
100.00	UNKNOWN 5 (16189)
100.00	SUPER KALOY (VIETNAM RICE) (15559)
100.00	ZAMBOANGA (16422)

Grain Quality Traits

Milling Recovery (%)
- Brown Rice : 77.8 (F)
- Milled Rice : 69.3 (G1)
- Head Rice : 56.6 (G1)

Physical Attributes
- Grain Length (mm) : 6.9 (L)
- Grain Shape : 3.1 (S)
- Chalky Grains (%) : 2.3 (G1)

Physicochemical Properties
- Amylose Content (%) : 14.6 (L)
- Gelatinization Temperature : 6.0 (L)
- Crude Protein Content (%) : 7.0

Agronomic Characteristics

Plant Height (cm) : 126.8
Heading Days After Seeding : 92
Maturity Days After Seeding : 122
Basal Leaf Sheath Color : 1 (Green)
Anthocyanin Color : 0 (Absent)
Leaf Blade Pubescence : 3 (Pubescent)
Auricle Color : 2 (Yellowish green)
Collar Color : 2 (Light green)
Awn Distribution : 0 (None)
Panicle Exsertion : 5 (Just exserted)
Lodging Resistance : 7 (Strong)
Leaf Senescence : 5 (Intermediate)
Panicle Shattering : 5 (Moderate)
Endosperm Type : 1 (Non-glutinous)

18 (VN)

Palawan
Collection No.15890

I8 (VN)-15890	
% Genetic Similarity	Other Genotypes
95.77	CABER (16032)
94.94	ROSANA (16089)
94.86	JASMIN (15661)
94.72	DIAMOND X (16510)
94.63	PSB Rc 10

Grain Quality Traits

Milling Recovery (%)
- Brown Rice : 78.5 (F)
- Milled Rice : 69.8 (Pr)
- Head Rice : 64.2 (Pr)

Physical Attributes
- Grain Length (mm) : 6.5 (M)
- Grain Shape : 3.1 (S)
- Chalky Grains (%) : 2.4 G1)

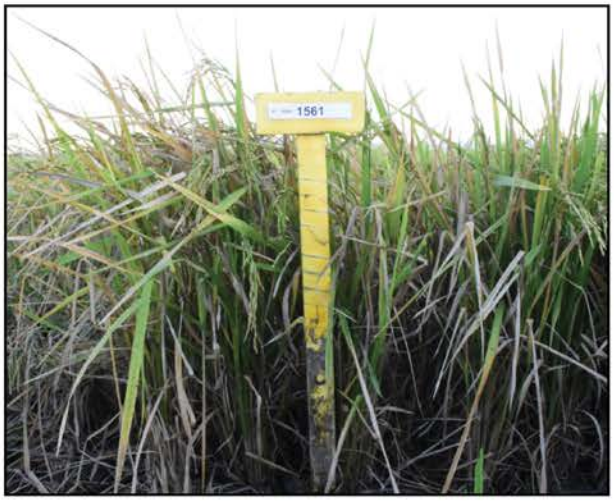
Physicochemical Properties
- Amylose Content (%) : 25.6 (H)
- Gelatinization Temperature : 5.0 (I)
- Crude Protein Content (%) : 6.5

Agronomic Characteristics

Plant Height (cm) : 92.5
Heading Days After Seeding : 92
Maturity Days After Seeding : 122
Basal Leaf Sheath Color : 1 (Green)
Anthocyanin Color : 0 (Absent)
Leaf Blade Pubescence : 3 (Pubescent)
Auricle Color : 2 (Yellowish green)
Collar Color : 2 (Light green)
Awn Distribution : 0 (None)
Panicle Exsertion : 5 (Just exserted)
Lodging Resistance : 5 (Intermediate)
Leaf Senescence : 5 (Intermediate)
Panicle Shattering : 5 (Moderate)
Endosperm Type : 2 (Intermediate)

1561

Palawan
Collection No. 15891



1561-15891	
% Genetic Similarity	Other Genotypes
100.00	DESTINY (15502)
100.00	DIAMOND V (15576)
100.00	SAMPAGUITA (15500)
100.00	NSIC Rc 218
100.00	UNKNOWN VAR 3 (15879)
100.00	SAMPAGUITA (AGUSAN) (16326)
100.00	SAMPAGUITA (16308)
100.00	TABUK (16501)
100.00	DOUBLE DIAMOND (16507)

Grain Quality Traits

Milling Recovery (%)
- Brown Rice : 77.3 (F)
- Milled Rice : 68.4 (G1)
- Head Rice : 60.7 (Pr)

Physical Attributes
- Grain Length (mm) : 6.3 (M)
- Grain Shape : 2.9 (I)
- Chalky Grains (%) : 7.1 (G2)

Physicochemical Properties
- Amylose Content (%) : 21.1 (I)
- Gelatinization Temperature : 6.3 (I/L)
- Crude Protein Content (%) : 7.4

Agronomic Characteristics

Plant Height (cm) : 121.2
Heading Days After Seeding : 91
Maturity Days After Seeding : 121
Basal Leaf Sheath Color : 1 (Green)
Anthocyanin Color : 0 (Absent)
Leaf Blade Pubescence : 3 (Pubescent)
Auricle Color : 2 (Yellowish green)
Collar Color : 2 (Light green)
Awn Distribution : 2 (Upper quarter only)
Panicle Exsertion : 5 (Just exserted)
Lodging Resistance : 9 (Very strong)
Leaf Senescence : 5 (Intermediate)
Panicle Shattering : 5 (Moderate)
Endosperm Type : 1 (Non-glutinous)

BURDAGOL

Palawan
Collection No.15892

BURDAGOL-15892	
% Genetic Similarity	Other Genotypes
96.41	NSIC Rc 288
95.68	BURDAGOL (15845)
94.83	ROSANA (16089)
94.60	3-MILLION (15457)
94.52	JASMIN (15661)

Grain Quality Traits

Milling Recovery (%)
- Brown Rice : 77.2 (F)
- Milled Rice : 69.0 (G1)
- Head Rice : 59.5 (Pr)

Physical Attributes
- Grain Length (mm) : 5.9 (M)
- Grain Shape : 2.4 (I)
- Chalky Grains (%) : 8.9 (G2)

Physicochemical Properties
- Amylose Content (%) : 23.7 (H)
- Gelatinization Temperature : 6.3 (I/L)
- Crude Protein Content (%) : 6.5

Agronomic Characteristics

Plant Height (cm) : 128.3
Heading Days After Seeding : 90
Maturity Days After Seeding : 120
Basal Leaf Sheath Color : 1 (Green)
Anthocyanin Color : 0 (Absent)
Leaf Blade Pubescence : 3 (Pubescent)
Auricle Color : 2 (Yellowish green)
Collar Color : 2 (Light green)
Awn Distribution : 0 (None)
Panicle Exsertion : 7 (Moderately well exserted)
Lodging Resistance : 7 (Strong)
Leaf Senescence : 7 (Late)
Panicle Shattering : 5 (Moderate)
Endosperm Type : 2 (Intermediate)

KINADOY (PUTI)

Palawan
Collection No. 15893

KINADOY (PUTI)-15893	
% Genetic Similarity	Other Genotypes
92.36	BURDAGOL (15845)
92.24	BURDAGOL (15892)
90.79	216 (16399)
90.55	ABANGAY (16336)
90.35	3-MILLION (15457)

Grain Quality Traits

Milling Recovery (%)
- Brown Rice : 77.0 (F)
- Milled Rice : 70.1 (Pr)
- Head Rice : 38.8 (G3)

Physical Attributes
- Grain Length (mm) : 6.2 (M)
- Grain Shape : 2.4 (I)
- Chalky Grains (%) : 8.9 (G2)

Physicochemical Properties
- Amylose Content (%) : 19.8 (I)
- Gelatinization Temperature : 4.1 (I)
- Crude Protein Content (%) : 7.8

Agronomic Characteristics

Plant Height (cm) : 130.7
Heading Days After Seeding : 83
Maturity Days After Seeding : 113
Basal Leaf Sheath Color : 1 (Green)
Anthocyanin Color : 0 (Absent)
Leaf Blade Pubescence : 3 (Pubescent)
Auricle Color : 2 (Yellowish green)
Collar Color : 2 (Light green)
Awn Distribution : 0 (None)
Panicle Exsertion : 7 (Moderately well exserted)
Lodging Resistance : 3 (Weak)
Leaf Senescence : 5 (Intermediate)
Panicle Shattering : 5 (Moderate)
Endosperm Type : 2 (Intermediate)

DASH 9

Palawan
Collection No.15894

DASH 9-15894	
% Genetic Similarity	Other Genotypes
92.60	ABANGAY (16336)
91.80	I8 (VN) (15890)
91.73	3-MILLION (15457)
91.48	JASMIN (15661)
91.32	ROSANA (16089)

Grain Quality Traits

Milling Recovery (%)
- Brown Rice : 76.8 (F)
- Milled Rice : 69.2 (G1)
- Head Rice : 60.0 (Pr)

Physical Attributes
- Grain Length (mm) : 6.0 (M)
- Grain Shape : 2.6 (I)
- Chalky Grains (%) : 2.5 (G1)

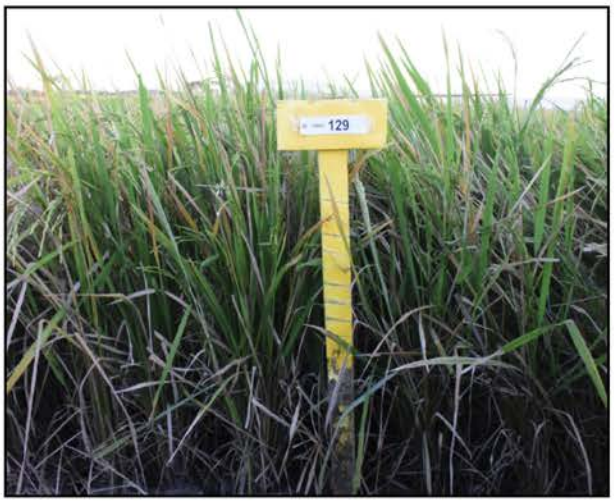
Physicochemical Properties
- Amylose Content (%) : 19.9 (I)
- Gelatinization Temperature : 4.0 (I)
- Crude Protein Content (%) : 7.6

Agronomic Characteristics

Plant Height (cm) : 148.7
Heading Days After Seeding : 126
Maturity Days After Seeding : 156
Basal Leaf Sheath Color : 1 (Green)
Anthocyanin Color : 0 (Absent)
Leaf Blade Pubescence : 3 (Pubescent)
Auricle Color : 2 (Yellowish green)
Collar Color : 2 (Light green)
Awn Distribution : 0 (None)
Panicle Exsertion : 7 (Moderately well exserted)
Lodging Resistance : 1 (Very weak)
Leaf Senescence : 5 (Intermediate)
Panicle Shattering : 5 (Moderate)
Endosperm Type : 2 (Intermediate)

129

Palawan
Collection No.15895



129-15895	
% Genetic Similarity	Other Genotypes
99.92	TRIPLE 8 (15896)
92.92	I8 (VN) (15890)
91.74	DIAMOND X (16510)
91.61	PSB Rc 10
90.71	NSIC Rc 420

Grain Quality Traits

Milling Recovery (%)
- Brown Rice : 77.5 (F)
- Milled Rice : 68.9 (G)
- Head Rice : 43.4 (G2)

Physical Attributes
- Grain Length (mm) : 6.6 (L)
- Grain Shape : 3.0 (I)
- Chalky Grains (%) : 4.0 (G1)

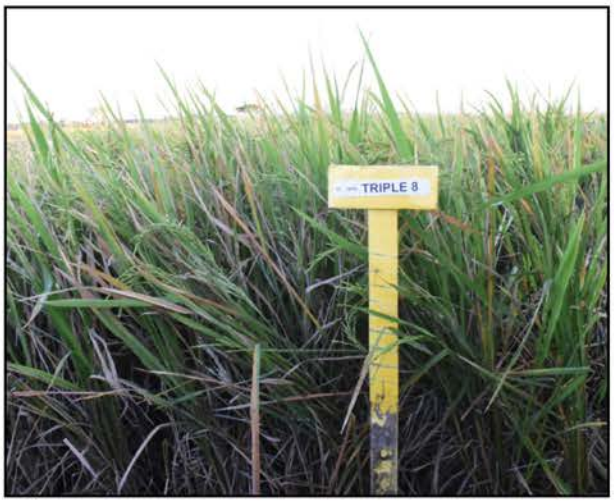
Physicochemical Properties
- Amylose Content : 24.5 (H)
- Gelatinization Temperature : 4.1 (HI/I)
- Crude Protein Content (%) : 6.4

Agronomic Characteristics

Plant Height (cm) : 114.0
Heading Days After Seeding : 92
Maturity Days After Seeding : 122
Basal Leaf Sheath Color : 1 (Green)
Anthocyanin Color : 0 (Absent)
Leaf Blade Pubescence : 3 (Pubescent)
Auricle Color : 2 (Yellowish green)
Collar Color : 2 (Light green)
Awn Distribution : 0 (None)
Panicle Exsertion : 7 (Moderately well exserted)
Lodging Resistance : 3 (Weak)
Leaf Senescence : 5 (Intermediate)
Panicle Shattering : 5 (Moderate)
Endosperm Type : 2 (Intermediate)

TRIPLE 8

Palawan
Collection No.15896



TRIPLE 8-15896	
% Genetic Similarity	Other Genotypes
99.92	129 (15895)
92.98	I8 (VN) (15890)
91.69	DIAMOND X (16510)
91.60	PSB Rc 10
90.65	NSIC Rc 420

Grain Quality Traits

Milling Recovery (%)
- Brown Rice : 78.2 (F)
- Milled Rice : 70.0 (G1)
- Head Rice : 41.4 (G2)

Physical Attributes
- Grain Length (mm) : 6.9 (L)
- Grain Shape : 2.9 (I)
- Chalky Grains (%) : 4.7 (G1)

Physicochemical Properties
- Amylose Content : 26.3 (H)
- Gelatinization Temperature : 3.7 (H/HI/I)
- Crude Protein Content (%) : 7.0

Agronomic Characteristics

Plant Height (cm) : 124.8
Heading Days After Seeding : 95
Maturity Days After Seeding : 125
Basal Leaf Sheath Color : 1 (Green)
Anthocyanin Color : 0 (Absent)
Leaf Blade Pubescence : 3 (Pubescent)
Auricle Color : 2 (Yellowish green)
Collar Color : 2 (Light green)
Awn Distribution : 0 (None)
Panicle Exsertion : 5 (Just exserted)
Lodging Resistance : 3 (Weak)
Leaf Senescence : 7 (Late)
Panicle Shattering : 5 (Moderate)
Endosperm Type : 1 (Non-glutinous)

KINADOY (BULIK)

Palawan
Collection No.15897

KINADOY (BULIK)-15897	
% Genetic Similarity	Other Genotypes
90.55	PSB Rc 10
90.06	I8 (VN) (15890)
89.59	KAMOROS (16358)
89.47	3-MILLION (15457)
89.25	JASMIN (15661)

Grain Quality Traits

Milling Recovery (%)
- Brown Rice : 78.3 (F)
- Milled Rice : 71.3 (Pr)
- Head Rice : 68.0 (Pr)

Physical Attributes
- Grain Length (mm) : 5.6 (M)
- Grain Shape : 2.4 (I)
- Chalky Grains (%) : 10.2 (G3)

Physicochemical Properties
- Amylose Content (%) : 24.9 (H)
- Gelatinization Temperature : 4.5 (I/L)
- Crude Protein Content (%) : 6.8

Agronomic Characteristics

- Plant Height (cm) : 122.3
- Heading Days After Seeding : 90
- Maturity Days After Seeding : 120
- Basal Leaf Sheath Color : 1 (Green)
- Anthocyanin Color : 0 (Absent)
- Leaf Blade Pubescence : 3 (Pubescent)
- Auricle Color : 2 (Yellowish green)
- Collar Color : 2 (Light green)
- Awn Distribution : 0 (None)
- Panicle Exsertion : 7 (Moderately well exserted)
- Lodging Resistance : 5 (Intermediate)
- Leaf Senescence : 5 (Intermediate)
- Panicle Shattering : 5 (Moderate)
- Endosperm Type : 2 (Intermediate)

Rc BATO

Palawan
Collection No. 16185

Rc BATO-16185	
% Genetic Similarity	Other Genotypes
99.59	BULAW (15839)
99.33	BULAW (WHITE) (16034)
98.50	BLONDE (15654)
97.83	BOLAO (15655)
97.82	BULAW (SUPER 60) (15960)

Grain Quality Traits

Milling Recovery (%)
- Brown Rice : 74.8 (P)
- Milled Rice : 65.7 (G1)
- Head Rice : 44.5 (G2)

Physical Attributes
- Grain Length (mm) : 6.3 (M)
- Grain Shape : 2.9 (I)
- Chalky Grains (%) : 1.5 (Pr)

Physicochemical Properties
- Amylose Content (%) : 20.3 (I)
- Gelatinization Temperature : 3.7 (I/HI)
- Crude Protein Content (%) : 6.9

Agronomic Characteristics

Plant Height (cm) : 113.8
Heading Days After Seeding : 83
Maturity Days After Seeding : 113
Basal Leaf Sheath Color : 1 (Green)
Anthocyanin Color : 0 (Absent)
Leaf Blade Pubescence : 3 (Pubescent)
Auricle Color : 2 (Yellowish green)
Collar Color : 2 (Light green)
Awn Distribution : 0 (None)
Panicle Exsertion : 7 (Moderately well exserted)
Lodging Resistance : 7 (Strong)
Leaf Senescence : 5 (Intermediate)
Panicle Shattering : 5 (Moderate)
Endosperm Type : 1 (Non-glutinous)

ATONG

Palawan
Collection No. 16187

ATONG-16187	
% Genetic Similarity	Other Genotypes
99.76	UNKNOWN VAR 2 (15878)
96.34	DIAMOND X (16062)
96.13	KINAVITE (16035)
96.11	C-4 (16505)
95.68	DIAMOND X (16510)

Grain Quality Traits

Milling Recovery (%)
- Brown Rice : 76.2 (F)
- Milled Rice : 68.6 (G1)
- Head Rice : 41.4 (G2)

Physical Attributes
- Grain Length (mm) : 6.8 (L)
- Grain Shape : 3.3 (S)
- Chalky Grains (%) : 2.12 (G1)

Physicochemical Properties
- Amylose Content (%) : 24.2 (H)
- Gelatinization Temperature : 7.0 (L)
- Crude Protein Content (%) : 5.8

Agronomic Characteristics

Plant Height (cm) : 105.0
Heading Days After Seeding : 90
Maturity Days After Seeding : 120
Basal Leaf Sheath Color : 1 (Green)
Anthocyanin Color : 0 (Absent)
Leaf Blade Pubescence : 3 (Pubescent)
Auricle Color : 2 (Yellowish green)
Collar Color : 2 (Light green)
Awn Distribution : 0 (None)
Panicle Exsertion : 5 (Just exserted)
Lodging Resistance : 5 (Intermediate)
Leaf Senescence : 5 (Intermediate)
Panicle Shattering : 5 (Moderate)
Endosperm Type : 1 (Non-glutinous)

AZOR 5

Palawan
Collection No.16188

AZOR 5-16188	
% Genetic Similarity	Other Genotypes
98.19	TRIPLE 3 (15557)
97.71	TITO-TITO (15507)
97.71	KAMANSING (16030)
97.70	M3 (SURALLAH) (16428)
97.69	M3 (15499)

Grain Quality Traits

Milling Recovery (%)
- Brown Rice : 76.6 (F)
- Milled Rice : 68.3 (G1)
- Head Rice : 42.2 (G2)

Physical Attributes
- Grain Length (mm) : 6.5 (M)
- Grain Shape : 2.9 (I)
- Chalky Grains (%) :12.48 G3)

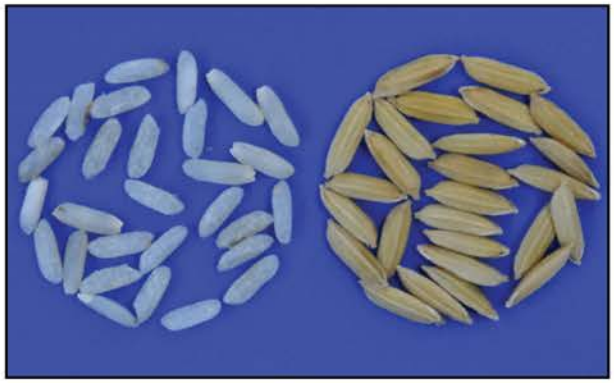
Physicochemical Properties
- Amylose Content (%) : 20.0 (I)
- Gelatinization Temperature : 4.2 (I)
- Crude Protein Content (%) : 6.0

Agronomic Characteristics

Plant Height (cm) : —
Heading Days After Seeding : 90
Maturity Days After Seeding : 120
Basal Leaf Sheath Color : 1 (Green)
Anthocyanin Color : 0 (Absent)
Leaf Blade Pubescence : 3 (Pubescent)
Auricle Color : 2 (Yellowish green)
Collar Color : 2 (Light green)
Awn Distribution : 0 (None)
Panicle Exsertion : 5 (Just exserted)
Lodging Resistance : 1 (Very weak)
Leaf Senescence : 5 (Intermediate)
Panicle Shattering : 5 (Moderate)
Endosperm Type : 2 (Intermediate)

UNKNOWN 5

Palawan
Collection No. 16189



UNKNOWN 5-16189	
% Genetic Similarity	Other Genotypes
100.00	DOUBLE DIAMOND (MLANG) (16333)
100.00	MILAGROSA (15605)
100.00	ZAMBOANGA (15945)
100.00	SUPER KALOY (VIETNAM RICE) (15559)
100.00	ZAMBOANGA (16422)
100.00	SAMPAGUITA (15948)
100.00	DIAMOND XX (DOUBLE DIAMOND) (15514)
100.00	DOUBLE DIAMOND (15942)
100.00	DIAMOND X (15889)

Grain Quality Traits

Milling Recovery (%)
- Brown Rice : 74.8 (P)
- Milled Rice : 67.0 (G1)
- Head Rice : 47.3 (G2)

Physical Attributes
- Grain Length (mm) : 6.9 (L)
- Grain Shape : 3.0 (I)
- Chalky Grains (%) : 3.54 (G2)

Physicochemical Properties
- Amylose Content (%) : 15.9 (L)
- Gelatinization Temperature : 6.0 (L)
- Crude Protein Content (%) : 5.2

Agronomic Characteristics

Plant Height (cm) : 117.6
Heading Days After Seeding : 92
Maturity Days After Seeding : 122
Basal Leaf Sheath Color : 1 (Green)
Anthocyanin Color : 0 (Absent)
Leaf Blade Pubescence : 3 (Pubescent)
Auricle Color : 2 (Yellowish green)
Collar Color : 2 (Light green)
Awn Distribution : 3 (Upper half only)
Panicle Exsertion : 5 (Just exserted)
Lodging Resistance : 7 (Strong)
Leaf Senescence : 5 (Intermediate)
Panicle Shattering : 5 (Moderate)
Endosperm Type : 1 (Non-glutinous)

DALING-DALING

Palawan
Collection No. 16203

DALING-DALING-16203	
% Genetic Similarity	Other Genotypes
96.22	DALAGANG BUKID (16085)
96.14	BARAKO 64 (16437)
95.89	216 (16399)
95.59	DIAMOND X (16510)
94.99	JASMIN (15661)

Grain Quality Traits

Milling Recovery (%)
- Brown Rice : 77.0 (F)
- Milled Rice : 69.2 (G1)
- Head Rice : 9.0 (aa)

Physical Attributes
- Grain Length (mm) : 7.1 (L)
- Grain Shape : 2.9 (I)
- Chalky Grains (%) : 10.6 (G3)

Physicochemical Properties
- Amylose Content (%) : 23.3 (H)
- Gelatinization Temperature : 5.0 (I)
- Crude Protein Content (%) : 7.0

Agronomic Characteristics

Plant Height (cm) : 122.9
Heading Days After Seeding : 93
Maturity Days After Seeding : 123
Basal Leaf Sheath Color : 1 (Green)
Anthocyanin Color : 0 (Absent)
Leaf Blade Pubescence : 3 (Pubescent)
Auricle Color : 2 (Yellowish green)
Collar Color : 2 (Light green)
Awn Distribution : 3 (Upper half only)
Panicle Exsertion : 7 (Moderately well exserted)
Lodging Resistance : 5 (Intermediate)
Leaf Senescence : 5 (Intermediate)
Panicle Shattering : 5 (Moderate)
Endosperm Type : 2 (Intermediate)

UNKNOWN

Romblon
Collection No. 15876

UNKNOWN-15876	
% Genetic Similarity	Other Genotypes
99.03	UNKNOWN 1 (80 DAYS) (16198)
98.94	RC 85 (15881)
93.83	DIAMOND X (16510)
93.04	UP & DOWN (15877)
93.03	216 (16399)

Grain Quality Traits

Milling Recovery (%)
- Brown Rice : 80.5 (G)
- Milled Rice : 72.9 (Pr)
- Head Rice : 51.4 (G1)

Physical Attributes
- Grain Length (mm) : 6.7 (L)
- Grain Shape : 2.7 (I)
- Chalky Grains (%) : 9.4 (G2)

Physicochemical Properties
- Amylose Content (%) : 19.0 (I)
- Gelatinization Temperature : 6.3 (I/L)
- Crude Protein Content (%) : 7.1

Agronomic Characteristics

Plant Height (cm) : 109.6
Heading Days After Seeding : 83
Maturity Days After Seeding : 113
Basal Leaf Sheath Color : 1 (Green)
Anthocyanin Color : 0 (Absent)
Leaf Blade Pubescence : 3 (Pubescent)
Auricle Color : 2 (Yellowish green)
Collar Color : 2 (Light green)
Awn Distribution : 0 (None)
Panicle Exsertion : 7 (Moderately well exserted)
Lodging Resistance : 7 (Strong)
Leaf Senescence : 5 (Intermediate)
Panicle Shattering : 5 (Moderate)
Endosperm Type : 2 (Intermediate)

UP & DOWN

Romblon
Collection No.15877

UP & DOWN-15877	
% Genetic Similarity	Other Genotypes
98.65	NSIC Rc 148
97.65	EXCEL RICE (15571)
97.64	M5-BD (16370)
97.63	BWS-6W (16344)
96.86	DIAMOND X (16510)

Grain Quality Traits

Milling Recovery (%)
- Brown Rice : 78.1 (F)
- Milled Rice : 69.0 (G1)
- Head Rice : 40.6 (G2)

Physical Attributes
- Grain Length (mm) : 6.7 (L)
- Grain Shape : 3.0 (I)
- Chalky Grains (%) : 8.5 (G2)

Physicochemical Properties
- Amylose Content (%) : 21.8 (I)
- Gelatinization Temperature : 3.0 (H/HI/L)
- Crude Protein Content (%) : 6.0

Agronomic Characteristics

Plant Height (cm) : 104.6
Heading Days After Seeding : 83
Maturity Days After Seeding : 113
Basal Leaf Sheath Color : 1 (Green)
Anthocyanin Color : 0 (Absent)
Leaf Blade Pubescence : 3 (Pubescent)
Auricle Color : 2 (Yellowish green)
Collar Color : 2 (Light green)
Awn Distribution : 0 (None)
Panicle Exsertion : 5 (Just exserted)
Lodging Resistance : 7 (Strong)
Leaf Senescence : 5 (Intermediate)
Panicle Shattering : 5 (Moderate)
Endosperm Type : 2 (Intermediate)

UNKNOWN VAR 2

Romblon
Collection No.15878

UNKNOWN VAR 2-15878	
% Genetic Similarity	Other Genotypes
99.76	ATONG (16187)
96.65	KINAVITE (16035)
96.63	DIAMOND X (16062)
96.63	C-4 (16505)
95.95	DIAMOND X (16510)

Grain Quality Traits

Milling Recovery (%)
- Brown Rice : 77.6 (F)
- Milled Rice : 69.2 (G1)
- Head Rice : 59.5 (Pr)

Physical Attributes
- Grain Length (mm) : 6.9 (L)
- Grain Shape : 3.3 (S)
- Chalky Grains (%) : 1.3 (Pr)

Physicochemical Properties
- Amylose Content (%) : 23.7 (H)
- Gelatinization Temperature : 4.0 (I)
- Crude Protein Content (%) : 6.1

Agronomic Characteristics

- Plant Height (cm) : 113.9
- Heading Days After Seeding : 92
- Maturity Days After Seeding : 122
- Basal Leaf Sheath Color : 1 (Green)
- Anthocyanin Color : 0 (Absent)
- Leaf Blade Pubescence : 3 (Pubescent)
- Auricle Color : 2 (Yellowish green)
- Collar Color : 2 (Light green)
- Awn Distribution : 0 (None)
- Panicle Exsertion : 5 (Just exserted)
- Lodging Resistance : 5 (Intermediate)
- Leaf Senescence : 5 (Intermediate)
- Panicle Shattering : 5 (Moderate)
- Endosperm Type : 1 (Non-glutinous)

UNKNOWN VAR 3

Romblon
Collection No. 15879

UNKNOWN VAR 3-15879	
% Genetic Similarity	Other Genotypes
100.00	DESTINY (15502)
100.00	NSIC Rc 218
100.00	1561 (15891)
100.00	DIAMOND V (15576)
100.00	SAMPAGUITA (AGUSAN) (16326)
100.00	SAMPAGUITA (15500)
100.00	SAMPAGUITA (16308)
100.00	TABUK (16501)
100.00	DOUBLE DIAMOND (16507)

Grain Quality Traits

Milling Recovery (%)
- Brown Rice : 78.0 (F)
- Milled Rice : 70.3 (Pr)
- Head Rice : 47.4 (G2)

Physical Attributes
- Grain Length (mm) : 7.0 (L)
- Grain Shape : 3.1 (S)
- Chalky Grains (%) : 1.5 (Pr)

Physicochemical Properties
- Amylose Content (%) : 13.5 (L)
- Gelatinization Temperature : 3.5 (HI/L)
- Crude Protein Content (%) : 5.9

Agronomic Characteristics

Plant Height (cm) : 118.3
Heading Days After Seeding : 92
Maturity Days After Seeding : 122
Basal Leaf Sheath Color : 1 (Green)
Anthocyanin Color : 0 (Absent)
Leaf Blade Pubescence : 3 (Pubescent)
Auricle Color : 2 (Yellowish green)
Collar Color : 2 (Light green)
Awn Distribution : 2 (Upper quarter only)
Panicle Exsertion : 5 (Just exserted)
Lodging Resistance : 7 (Strong)
Leaf Senescence : 5 (Intermediate)
Panicle Shattering : 5 (Moderate)
Endosperm Type : 1 (Non-glutinous)

RC 85

Romblon
Collection No.15881

RC 85-15881	
% Genetic Similarity	Other Genotypes
99.20	UNKNOWN 1 (80 DAYS) (16198)
98.94	UNKNOWN (15876)
93.92	DIAMOND X (16510)
92.95	UP & DOWN (15877)
92.84	216 (16399)

Grain Quality Traits

Milling Recovery (%)
- Brown Rice : 76.6 (F)
- Milled Rice : 68.0 (G1)
- Head Rice : 43.9 (G2)

Physical Attributes
- Grain Length (mm) : 6.6 (L)
- Grain Shape : 2.6 (I)
- Chalky Grains (%) : 16.9 (aa)

Physicochemical Properties
- Amylose Content (%) : 20.2 (I)
- Gelatinization Temperature : 4.1 (HI/I)
- Crude Protein Content (%) : 6.4

Agronomic Characteristics

- Plant Height (cm) : 115.0
- Heading Days After Seeding : 78
- Maturity Days After Seeding : 108
- Basal Leaf Sheath Color : 1 (Green)
- Anthocyanin Color : 0 (Absent)
- Leaf Blade Pubescence : 3 (Pubescent)
- Auricle Color : 2 (Yellowish green)
- Collar Color : 2 (Light green)
- Awn Distribution : 0 (None)
- Panicle Exsertion : 5 (Just exserted)
- Lodging Resistance : 7 (Strong)
- Leaf Senescence : 5 (Intermediate)
- Panicle Shattering : 5 (Moderate)
- Endosperm Type : 1 (Non-glutinous)

MALAGKIT (EXOTIC)

Romblon
Collection No.15882

MALAGKIT (EXOTIC)-15882	
% Genetic Similarity	Other Genotypes
81.47	PILIT CARABAO (16380)
80.40	BONGKITAN (16069)
79.20	TRES MARIAS (16392)
71.68	MILAGROSA SELECTION (16041)
64.70	PILI-RG (16383)

Grain Quality Traits

Milling Recovery (%)
- Brown Rice : 83.3 (G)
- Milled Rice : 75.7 (Pr)
- Head Rice : 70.7 (Pr)

Physical Attributes
- Grain Length (mm) : 6.2 (M)
- Grain Shape : 2.4 (I)
- Chalky Grains (%) : Opaque

Physicochemical Properties
- Amylose Content (%) : 3.8 (VL)
- Gelatinization Temperature : 2.7 (H/HI/I)
- Crude Protein Content (%) : 6.6

Agronomic Characteristics

Plant Height (cm) : 128.8
Heading Days After Seeding : —
Maturity Days After Seeding : —
Basal Leaf Sheath Color : 1 (Green)
Anthocyanin Color : 0 (Absent)
Leaf Blade Pubescence : 3 (Pubescent)
Auricle Color : 2 (Yellowish green)
Collar Color : 2 (Light green)
Awn Distribution : 0 (None)
Panicle Exsertion : 7 (Moderately well exserted)
Lodging Resistance : 7 (Strong)
Leaf Senescence : 5 (Intermediate)
Panicle Shattering : 5 (Moderate)
Endosperm Type : 3 (Glutinous)

UP & DOWN

Romblon
Collection No. 16196

UP & DOWN-16196	
% Genetic Similarity	Other Genotypes
94.51	NSIC Rc 294
94.19	PSB Rc 10
93.98	UP & DOWN (15877)
93.75	DIAMOND X (16510)
93.57	M5-BD (16370)

Grain Quality Traits

Milling Recovery (%)
- Brown Rice : 78.2 (F)
- Milled Rice : 73.0 (Pr)
- Head Rice : 68.0 (Pr)

Physical Attributes
- Grain Length (mm) : 6.6 (L)
- Grain Shape : 3.1 (S)
- Chalky Grains (%) : 4.22 (G1)

Physicochemical Properties
- Amylose Content (%) : 20.9 (I)
- Gelatinization Temperature : 4.3 (I)
- Crude Protein Content (%) : 8.7

Agronomic Characteristics

- Plant Height (cm) : 109.3
- Heading Days After Seeding : 83
- Maturity Days After Seeding : 113
- Basal Leaf Sheath Color : 1 (Green)
- Anthocyanin Color : 0 (Absent)
- Leaf Blade Pubescence : 3 (Pubescent)
- Auricle Color : 2 (Yellowish green)
- Collar Color : 2 (Light green)
- Awn Distribution : 3 (Upper half only)
- Panicle Exsertion : 5 (Just exserted)
- Lodging Resistance : 9 (Very strong)
- Leaf Senescence : 5 (Intermediate)
- Panicle Shattering : 5 (Moderate)
- Endosperm Type : 2 (Intermediate)

UNKNOWN 1 (80 DAYS)

Romblon
Collection No.16198

UNKNOWN 1 (80 DAYS)	
% Genetic Similarity	Other Genotypes
99.20	RC 85 (15881)
99.03	UNKNOWN (15876)
94.14	DIAMOND X (16510)
93.26	216 (16399)
93.15	UP & DOWN (15877)

Grain Quality Traits

Milling Recovery (%)
- Brown Rice : 76.8 (F)
- Milled Rice : 70.5 (Pr)
- Head Rice : 62.9 (Pr)

Physical Attributes
- Grain Length (mm) : 6.7 (L)
- Grain Shape : 2.7 (I)
- Chalky Grains (%) : 7.1 (G2)

Physicochemical Properties
- Amylose Content (%) : 19.3 (I)
- Gelatinization Temperature : 5.9 (L/I)
- Crude Protein Content (%) : 6.6

Agronomic Characteristics

Plant Height (cm) : 107.2
Heading Days After Seeding : 83
Maturity Days After Seeding : 113
Basal Leaf Sheath Color : 1 (Green)
Anthocyanin Color : 0 (Absent)
Leaf Blade Pubescence : 3 (Pubescent)
Auricle Color : 2 (Yellowish green)
Collar Color : 2 (Light green)
Awn Distribution : 0 (None)
Panicle Exsertion : 7 (Moderately well exserted)
Lodging Resistance : 7 (Strong)
Leaf Senescence : 5 (Intermediate)
Panicle Shattering : 5 (Moderate)
Endosperm Type : 2 (Intermediate)

FGRG COLLECTIONS FROM REGIONS 5 AND 8

GANAR

Albay
Collection No. 15650

GANAR-15650	
% Genetic Similarity	Other Genotypes
100.00	DESTINY (16042)
99.95	BELENA 205 (15583), SUPER DIAMOND (15558), MESTIZA (15886), TOP RICE (15556), COMBAT (15969), GSR 12 (15976), DESTINY (16093), IL-29 (15513), MASIGASIG 88 (16503), DREAM RICE (15570)

Grain Quality Traits

Milling Recovery (%)
- Brown Rice : 79.0 (F)
- Milled Rice : 71.3 (Pr)
- Head Rice : 53.0 (G1)

Physical Attributes
- Grain Length (mm) : 6.8 (L)
- Grain Shape : 3.2 (S)
- Chalky Grains (%) : 14.3 (G3)

Physicochemical Properties
- Amylose Content : 23.8 (H)
- Gelatinization Temperature : 5.1 (I/L)

Crude Protein Content (%) : 7.0

Agronomic Characteristics

Plant Height (cm) : 127.2
Heading Days After Seeding : 111
Maturity Days After Seeding : 141
Basal Leaf Sheath Color : 1 (Green)
Anthocyanin Color : 0 (Absent)
Leaf Blade Pubescence : 3 (Pubescent)
Auricle Color : 2 (Yellowish green)
Collar Color : 2 (Light green)
Awn Distribution : 0 (None)
Panicle Exsertion : 7 (Moderately well exserted)
Lodging Resistance : 7 (Strong)
Leaf Senescence : 5 (Intermediate)
Panicle Shattering : 5 (Moderate)
Endosperm Type : 1 (Non-glutinous)

BULAW

Albay
Collection No. 15651

BULAW-15651	
% Genetic Similarity	Other Genotypes
97.81	Rc BATO (16185)
97.66	BULAW (15839)
97.42	BULAW (15958)
97.42	BULAW (SUPER 60) (15960)
97.41	BULAW (WHITE) (16034)

Grain Quality Traits

Milling Recovery (%)
- Brown Rice : 76.3 (F)
- Milled Rice : 67.3 (G1)
- Head Rice : 27.3 (aa)

Physical Attributes
- Grain Length (mm) : 6.3 (mm)
- Grain Shape : 2.9 (I)
- Chalky Grains (%) : 4.3 (G1)

Physicochemical Properties
- Amylose Content (%) : 19.4 (I)
- Gelatinization Temperature : 4.2 (I)

Crude Protein Content (%) : 8.5

Agronomic Characteristics

Plant Height (cm) : 125.4
Heading Days After Seeding : 111
Maturity Days After Seeding : 141
Basal Leaf Sheath Color : 1 (Green)
Anthocyanin Color : 0 (Absent)
Leaf Blade Pubescence : 3 (Pubescent)
Auricle Color : 2 (Yellowish green)
Collar Color : 2 (Light green)
Awn Distribution : 0 (None)
Panicle Exsertion : 7 (Moderately well exserted)
Lodging Resistance : 9 (Very strong)
Leaf Senescence : 5 (Intermediate)
Panicle Shattering : 5 (Moderate)
Endosperm Type : 1 (Non-glutinous)

(GUINOBAT) SIROMA

Albay
Collection No.15838

(GUINOBAT) SIROMA-15838	
% Genetic Similarity	Other Genotypes
95.93	SINANDOMENG (15663)
95.93	SINANDOMENG (15848)
95.93	SINANLANG-ANG (15667)
94.64	ROSANA (16089)
93.49	ABANGAY (16336)

Grain Quality Traits

Milling Recovery (%)
- Brown Rice : 78.2 (F)
- Milled Rice : 71.5 (Pr)
- Head Rice : 67.9 (Pr)

Physical Attributes
- Grain Length (mm) : 5.8 (M)
- Grain Shape : 2.1 (I)
- Chalky Grains (%) : 2.0 (G1)

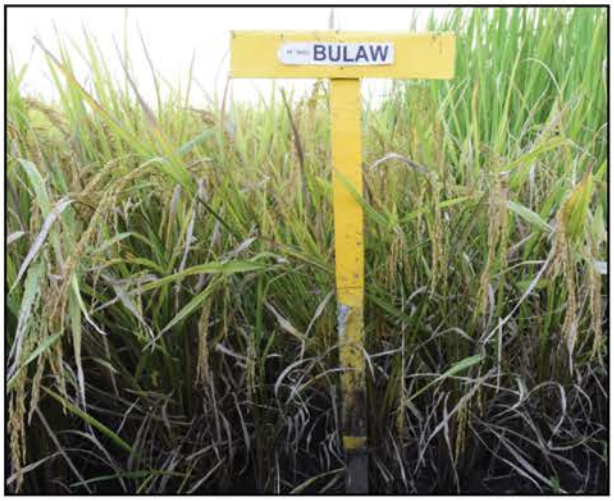
Physicochemical Properties
- Amylose Content : 17.8 (I)
- Gelatinization Temperature : 3.1 (H/HI/I)
- Crude Protein Content (%) : 7.2

Agronomic Characteristics

Plant Height (cm) : 132.3
Heading Days After Seeding : 106
Maturity Days After Seeding : 136
Basal Leaf Sheath Color : 1 (Green)
Anthocyanin Color : 0 (Absent)
Leaf Blade Pubescence : 3 (Pubescent)
Auricle Color : 2 (Yellowish green)
Collar Color : 2 (Light green)
Awn Distribution : 0 (None)
Panicle Exsertion : 7 (Moderately well-exserted)
Lodging Resistance : 5 (Intermediate)
Leaf Senescence : 5 (Intermediate)
Panicle Shattering : 5 (Moderate)
Endosperm Type : 2 (Intermediate)

BULAW

Albay
Collection No. 16033



BULAW-16033	
% Genetic Similarity	Other Genotypes
93.72	PSB Rc 10
92.67	DIAMOND X (16510)
91.46	MORYO-MORYO (16424)
91.45	216 (16399)
91.11	NSIC Rc 222

Grain Quality Traits

Milling Recovery (%)
- Brown Rice : 77.3 (F)
- Milled Rice : 66.7 (G1)
- Head Rice : 49.2 (G1)

Physical Attributes
- Grain Length (mm) : 6.7 (L)
- Grain Shape : 3.0 (I)
- Chalky Grains (%) : 17.1 (aa)

Physicochemical Properties
- Amylose Content (%) : 19.2 (I)
- Gelatinization Temperature : 4.0 (I)

Crude Protein Content (%) : 6.5

Agronomic Characteristics

Plant Height (cm) : 120.2
Heading Days After Seeding : 100
Maturity Days After Seeding : 130
Basal Leaf Sheath Color : 1 (Green)
Anthocyanin Color : 0 (Absent)
Leaf Blade Pubescence : 3 (Pubescent)
Auricle Color : 2 (Yellowish green)
Collar Color : 2 (Light green)
Awn Distribution : 2 (Upper quarter only)
Panicle Exsertion : 7 (Moderately well exserted)
Lodging Resistance : 5 (Intermediate)
Leaf Senescence : 7 (Late)
Panicle Shattering : 5 (Moderate)
Endosperm Type : 3 (Glutinous)

BULAW (WHITE)

Albay
Collection No.16034

BULAW (WHITE)-16034	
% Genetic Similarity	Other Genotypes
99.70	BULAW (15839)
99.33	Rc BATO (16185)
98.60	BLONDE (15654)
97.80	BOLAO (15655)
97.41	BULAW (15651)

Grain Quality Traits

Milling Recovery (%)
- Brown Rice : 77.6 (F)
- Milled Rice : 69.2 (G1)
- Head Rice : 61.3 (Pr)

Physical Attributes
- Grain Length (mm) : 6.2 (M)
- Grain Shape : 2.8 (I)
- Chalky Grains (%) : 1.8 (Pr)

Physicochemical Properties
- Amylose Content (%) : 21.0 (I)
- Gelatinization Temperature : 4.0 (I)
- Crude Protein Content (%) : 8.2

Agronomic Characteristics

Plant Height (cm) : 121.7
Heading Days After Seeding : 90
Maturity Days After Seeding : 120
Basal Leaf Sheath Color : 1 (Green)
Anthocyanin Color : 0 (Absent)
Leaf Blade Pubescence : 3 (Pubescent)
Auricle Color : 2 (Yellowish green)
Collar Color : 2 (Light green)
Awn Distribution : 0 (None)
Panicle Exsertion : 7 (Moderately well exserted)
Lodging Resistance : 1 (Very weak)
Leaf Senescence : 7 (Late)
Panicle Shattering : 5 (Moderate)
Endosperm Type : 1 (Non-glutinous)

BLONDE

Camarines Sur
Collection No.15654

BLONDE-15654	
% Genetic Similarity	Other Genotypes
98.76	BULAW (15839)
98.60	BULAW (WHITE) (16034)
98.50	Rc BATO (16185)
96.98	BLONDE (16037)
96.80	BOLAO (15655)

Grain Quality Traits

Milling Recovery (%)
- Brown Rice : 75.7 (F)
- Milled Rice : 65.7 (G1)
- Head Rice : 55.7 (G1)

Physical Attributes
- Grain Length (mm) : 6.4 (M)
- Grain Shape : 2.9 (I)
- Chalky Grains (%) : 2.7 (G1)

Physicochemical Properties
- Amylose Content (%) : 18.9 (I)
- Gelatinization Temperature : 4.6 (I)
- Crude Protein Content (%) : 7.0

Agronomic Characteristics

- Plant Height (cm) : 128.4
- Heading Days After Seeding : 111
- Maturity Days After Seeding : 141
- Basal Leaf Sheath Color : 1 (Green)
- Anthocyanin Color : 0 (Absent)
- Leaf Blade Pubescence : 3 (Pubescent)
- Auricle Color : 2 (Yellowish green)
- Collar Color : 2 (Light green)
- Awn Distribution : 0 (None)
- Panicle Exsertion : 5 (Just exserted)
- Lodging Resistance : 1 (Very weak)
- Leaf Senescence : 5 (Intermediate)
- Panicle Shattering : 3 (Low)
- Endosperm Type : 1 (Non-glutinous)

BOLAO

Camarines Sur
Collection No.15655

BOLAO-15655	
% Genetic Similarity	Other Genotypes
97.83	Rc BATO (16185)
97.80	BULAW (WHITE) (16034)
97.80	BULAW (15839)
96.80	BLONDE (15654)
96.70	BULAW (15958)
96.70	BULAW (SUPER 60) (15960)

Grain Quality Traits

Milling Recovery (%)
- Brown Rice : 78.5 (F)
- Milled Rice : 70.4 (Pr)
- Head Rice : 57.9 (Pr)

Physical Attributes
- Grain Length (mm) : 6.6 (L)
- Grain Shape : 3.1 (S)
- Chalky Grains (%) : 2.8 (G1)

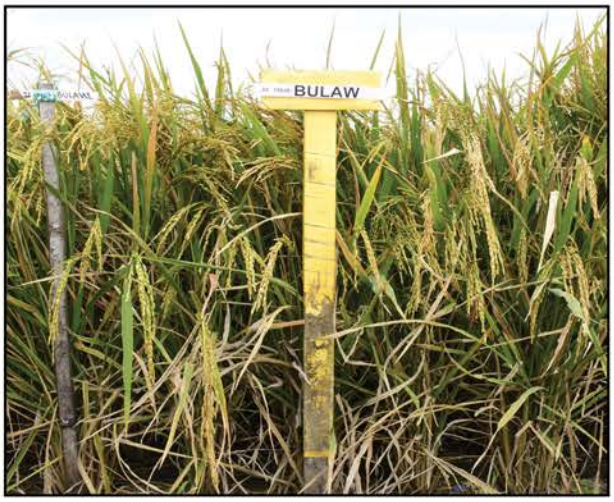
Physicochemical Properties
- Amylose Content (%) : 18.7 (I)
- Gelatinization Temperature : 3.9 (HI/I)
- Crude Protein Content (%) : 8.9

Agronomic Characteristics

Plant Height (cm) : 114.0
Heading Days After Seeding : 91
Maturity Days After Seeding : 121
Basal Leaf Sheath Color : 1 (Green)
Anthocyanin Color : 0 (Absent)
Leaf Blade Pubescence : 3 (Pubescent)
Auricle Color : 2 (Yellowish green)
Collar Color : 2 (Light green)
Awn Distribution : 0 (None)
Panicle Exsertion : 5 (Just exserted)
Lodging Resistance : 9 (Very strong)
Leaf Senescence : 5 (Intermediate)
Panicle Shattering : 5 (Moderate)
Endosperm Type : 1 (Non-glutinous)

BULAW

Camarines Sur
Collection No.15839



BULAW-15839	
% Genetic Similarity	Other Genotypes
99.70	BULAW (WHITE) (16034)
99.59	Rc BATO (16185)
98.76	BLONDE (15654)
97.80	BOLAO (15655)
97.66	BULAW (15651)

Grain Quality Traits

Milling Recovery (%)
- Brown Rice : 77.5 (F)
- Milled Rice : 67.3 (G1)
- Head Rice : 52.3 (G1)

Physical Attributes
- Grain Length (mm) : 6.4 (M)
- Grain Shape : 3.0 (I)
- Chalky Grains (%) : 3.8 (G1)

Physicochemical Properties
- Amylose Content (%) : 19.7 (I)
- Gelatinization Temperature : 4.4 (I)
- Crude Protein Content (%) : 7.6

Agronomic Characteristics

Plant Height (cm) : 118.6
Heading Days After Seeding : 90
Maturity Days After Seeding : 120
Basal Leaf Sheath Color : 1 (Green)
Anthocyanin Color : 0 (Absent)
Leaf Blade Pubescence : 3 (Pubescent)
Auricle Color : 2 (Yellowish green)
Collar Color : 2 (Light green)
Awn Distribution : 0 (None)
Panicle Exsertion : 7 (Moderately well-exserted)
Lodging Resistance : 1 (Very weak)
Leaf Senescence : 7 (Late)
Panicle Shattering : 3 (Low)
Endosperm Type : 1 (Non-glutinous)

SPEED 75

Camarines Sur
Collection No. 15841

SPEED 75-15841	
% Genetic Similarity	Other Genotypes
93.67	VIETNAM (16077)
93.47	URAB (16091)
92.83	PSB Rc 10
92.28	MORYO-MORYO (16424)
91.71	DIAMOND X (16510)

Grain Quality Traits

Milling Recovery (%)
- Brown Rice : 78.0 (F)
- Milled Rice : 69.9 (G1)
- Head Rice : 52.7 (G1)

Physical Attributes
- Grain Length (mm) : 6.7 (L)
- Grain Shape : 3.0 (I)
- Chalky Grains (%) : 8.5 (G2)

Physicochemical Properties
- Amylose Content (%) : 16.4 (L)
- Gelatinization Temperature : 3.7 (HI/I)

Crude Protein Content (%) : 6.0

Agronomic Characteristics

Plant Height (cm) : 108.8
Heading Days After Seeding : 78
Maturity Days After Seeding : 108
Basal Leaf Sheath Color : 1 (Green)
Anthocyanin Color : 0 (Absent)
Leaf Blade Pubescence : 3 (Pubescent)
Auricle Color : 2 (Yellowish green)
Collar Color : 2 (Light green)
Awn Distribution : 0 (None)
Panicle Exsertion : 7 (Moderately well exserted)
Lodging Resistance : 7 (Strong)
Leaf Senescence : 5 (Intermediate)
Panicle Shattering : 5 (Moderate)
Endosperm Type : 2 (Intermediate)

BINOKAYO

Camarines Sur
Collection No.15843

BINOKAYO-15843	
% Genetic Similarity	Other Genotypes
92.56	ABANGAY (16336)
92.46	KAMOROS (16358)
91.73	NTPSA-1 (16376)
91.40	ROSANA (16089)
91.36	216 (16399)

Grain Quality Traits

Milling Recovery (%)
- Brown Rice : 78.1 (F)
- Milled Rice : 68.6 (G1)
- Head Rice : 54.9 (G1)

Physical Attributes
- Grain Length (mm) : 6.1 (M)
- Grain Shape : 2.8 (I)
- Chalky Grains (%) : 2.0 (Pr)

Physicochemical Properties
- Amylose Content (%) : 23.0 (H)
- Gelatinization Temperature : 4.3 (I)
- Crude Protein Content (%) : 7.8

Agronomic Characteristics

Plant Height (cm) : 125.6
Heading Days After Seeding : 90
Maturity Days After Seeding : 120
Basal Leaf Sheath Color : 1 (Green)
Anthocyanin Color : 0 (Absent)
Leaf Blade Pubescence : 3 (Pubescent)
Auricle Color : 2 (Yellowish green)
Collar Color : 2 (Light green)
Awn Distribution : 0 (None)
Panicle Exsertion : 7 (Moderately well exserted)
Lodging Resistance : 1 (Very weak)
Leaf Senescence : 7 (Late)
Panicle Shattering : 5 (Moderate)
Endosperm Type : 1 (Non-glutinous)

75

Camarines Sur
Collection No. 15844

75-15844	
% Genetic Similarity	Other Genotypes
99.88	AS 411 (15573)
99.48	DOUBLE DIAMOND (16498)
99.41	VIETNAM RICE (16497)
99.25	JAPANIRI (16064)
91.59	3-MILLION (15457)
91.59	JASMIN (15661)

Grain Quality Traits

Milling Recovery (%)
- Brown Rice : 78.3 (F)
- Milled Rice : 69.4 (G1)
- Head Rice : 58.8 (Pr)

Physical Attributes
- Grain Length (mm) : 6.9 (L)
- Grain Shape : 3.1 (S)
- Chalky Grains (%) : 1.9 (Pr)

Physicochemical Properties
- Amylose Content (%) : 14.7 (L)
- Gelatinization Temperature : 3.6 (H/HI/I)
- Crude Protein Content (%) : 10.7

Agronomic Characteristics

Plant Height (cm) : 99.3
Heading Days After Seeding : 93
Maturity Days After Seeding : 123
Basal Leaf Sheath Color : 1 (Green)
Anthocyanin Color : 0 (Absent)
Leaf Blade Pubescence : 3 (Pubescent)
Auricle Color : 2 (Yellowish green)
Collar Color : 2 (Light green)
Awn Distribution : 0 (None)
Panicle Exsertion : 5 (Just exserted)
Lodging Resistance : 7 (Strong)
Leaf Senescence : 7 (Late)
Panicle Shattering : 5 (Moderate)
Endosperm Type : 1 (Non-glutinous)

BURDAGOL

Camarines Sur
Collection No. 15845

BURDAGOL-15845	
% Genetic Similarity	Other Genotypes
95.68	BURDAGOL (15892)
95.10	Rc BATO (16185)
94.79	BULAW (15651)
94.79	BULAW (SUPER 60) (15960)
94.79	BULAW (15958)
94.79	BLONDE (15654)

Grain Quality Traits

Milling Recovery (%)
- Brown Rice : 78.7 (F)
- Milled Rice : 70.4 (Pr)
- Head Rice : 59.9 (Pr)

Physical Attributes
- Grain Length (mm) : 6.0 (M)
- Grain Shape : 2.5 (I)
- Chalky Grains (%) : 23.2 (aa)

Physicochemical Properties
- Amylose Content (%) : 17.8 (I)
- Gelatinization Temperature : 4.3 (I)

Crude Protein Content (%) : 10.7

Agronomic Characteristics

Plant Height (cm) : 110.3
Heading Days After Seeding : 90
Maturity Days After Seeding : 120
Basal Leaf Sheath Color : 1 (Green)
Anthocyanin Color : 0 (Absent)
Leaf Blade Pubescence : 3 (Pubescent)
Auricle Color : 2 (Yellowish green)
Collar Color : 2 (Light green)
Awn Distribution : 0 (None)
Panicle Exsertion : 7 (Moderately well exserted)
Lodging Resistance : 1 (Very weak)
Leaf Senescence : 7 (Late)
Panicle Shattering : 5 (Moderate)
Endosperm Type : 1 (Non-glutinous)

BLONDE

Camarines Sur
Collection No. 16037

BLONDE-16037	
% Genetic Similarity	Other Genotypes
97.54	BULAW (15839)
97.49	Rc BATO (16185)
97.22	BULAW (WHITE) (16034)
96.98	BLONDE (15654)
95.94	BULAW (15651)

Grain Quality Traits

Milling Recovery (%)
- Brown Rice : 77.6 (F)
- Milled Rice : 68.2 (G1)
- Head Rice : 61.8 (Pr)

Physical Attributes
- Grain Length (mm) : 6.6 (L)
- Grain Shape : 3.0 (I)
- Chalky Grains (%) : 2.6 (G1)

Physicochemical Properties
- Amylose Content (%) : 19.9 (I)
- Gelatinization Temperature : 4.1 (I)

Crude Protein Content (%) : 11.4

Agronomic Characteristics

Plant Height (cm) : 115.6
Heading Days After Seeding : 90
Maturity Days After Seeding : 120
Basal Leaf Sheath Color : 1 (Green)
Anthocyanin Color : 0 (Absent)
Leaf Blade Pubescence : 3 (Pubescent)
Auricle Color : 2 (Yellowish green)
Collar Color : 2 (Light green)
Awn Distribution : 0 (None)
Panicle Exsertion : 7 (Moderately well-exserted)
Lodging Resistance : 1 (Very weak)
Leaf Senescence : 7 (Late)
Panicle Shattering : 5 (Moderate)
Endosperm Type : 1 (Non-glutinous)

GANAR

Camarines Sur
Collection No.16038

GANAR-16038	
% Genetic Similarity	Other Genotypes
98.72	DESTINY (16042)
98.71	GANAR (15650)
98.61	MESTIZA (15886)
98.61	IL-29 (15513)
98.61	MASIGASIG 88 (16503)

Grain Quality Traits

Milling Recovery (%)
- Brown Rice : 80.2 (G)
- Milled Rice : 71.7 (Pr)
- Head Rice : 48.6 (G1)

Physical Attributes
- Grain Length (mm) : 6.8 (L)
- Grain Shape : 5.2 (G2)
- Chalky Grains (%) : 15.4 (aa)

Physicochemical Properties
- Amylose Content (%) : 22.6 (H)
- Gelatinization Temperature : 4.9 (I/L)
- Crude Protein Content (%) : 9.6

Agronomic Characteristics

- Plant Height (cm) : 112.3
- Heading Days After Seeding : 91
- Maturity Days After Seeding : 121
- Basal Leaf Sheath Color : 1 (Green)
- Anthocyanin Color : 0 (Absent)
- Leaf Blade Pubescence : 3 (Pubescent)
- Auricle Color : 2 (Yellowish green)
- Collar Color : 2 (Light green)
- Awn Distribution : 2 (Upper quarter only)
- Panicle Exsertion : 7 (Moderately well exserted)
- Lodging Resistance : 7 (Strong)
- Leaf Senescence : 5 (Intermediate)
- Panicle Shattering : 5 (Moderate)
- Endosperm Type : 1 (Non-glutinous)

RED RICE

Sorsogon
Collection No.15652

RED RICE-15652	
% Genetic Similarity	Other Genotypes
94.68	M5-BD (16370)
94.54	UP & DOWN (15877)
94.01	NSIC Rc 294
94.00	DIAMOND X (16510)
93.96	NSIC Rc 148

Grain Quality Traits

Milling Recovery (%)
- Brown Rice : 77.0 (F)
- Milled Rice : 68.9 (G1)
- Head Rice : 54.6 (G1)

Physical Attributes
- Grain Length (mm) : 6.2 (M)
- Grain Shape : 2.8 (I)
- Chalky Grains (%) : 4.1 (G1)

Physicochemical Properties
- Amylose Content (%) : 20.6 (I)
- Gelatinization Temperature : 4.0 (I)
- Crude Protein Content (%) : 7.5

Agronomic Characteristics

Plant Height (cm) : 127.9
Heading Days After Seeding : 111
Maturity Days After Seeding : 141
Basal Leaf Sheath Color : 1 (Green)
Anthocyanin Color : 0 (Absent)
Leaf Blade Pubescence : 3 (Pubescent)
Auricle Color : 2 (Yellowish green)
Collar Color : 2 (Light green)
Awn Distribution : 0 (None)
Panicle Exsertion : 5 (Just exserted)
Lodging Resistance : 9 (Very strong)
Leaf Senescence : 5 (Intermediate)
Panicle Shattering : 5 (Moderate)
Endosperm Type : 1 (Non-glutinous)

BLACK RICE

Sorsogon
Collection No. 15653

BLACK RICE-15653	
% Genetic Similarity	Other Genotypes
91.76	ABANGAY (16336)
91.42	216 (16399)
91.01	3-MILLION (15457)
90.71	JASMIN (15661)
90.43	V5 (16517)

Grain Quality Traits

Milling Recovery (%)
- Brown Rice : 73.8 (P)
- Milled Rice : 64.3 (G2)
- Head Rice : 48.7 (G1)

Physical Attributes
- Grain Length (mm) : 6.7 (L)
- Grain Shape : 2.9 (I)
- Chalky Grains (%) : 4.0 (G1)

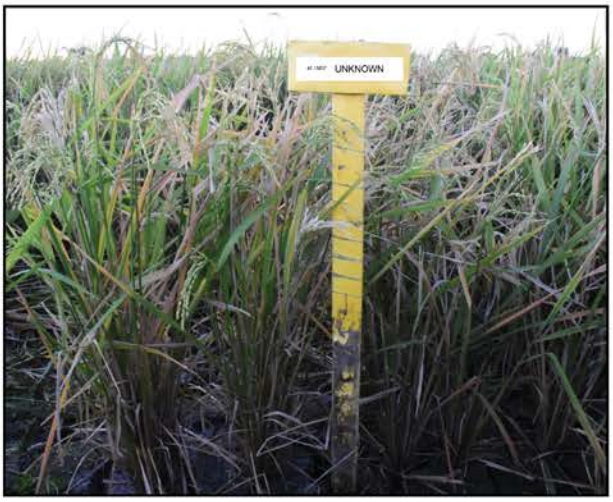
Physicochemical Properties
- Amylose Content (%) : 15.7 (L)
- Gelatinization Temperature : 4.7 (I)
- Crude Protein Content (%) : 9.0

Agronomic Characteristics

Plant Height (cm) : 153.0
Heading Days After Seeding : 117
Maturity Days After Seeding : 147
Basal Leaf Sheath Color : 1 (Green)
Anthocyanin Color : 0 (Absent)
Leaf Blade Pubescence : 3 (Pubescent)
Auricle Color : 2 (Yellowish green)
Collar Color : 2 (Light green)
Awn Distribution : 0 (None)
Panicle Exsertion : 7 (Moderately well exserted)
Lodging Resistance : 3 (Weak)
Leaf Senescence : 5 (Intermediate)
Panicle Shattering : 5 (Moderate)
Endosperm Type : 1 (Non-glutinous)

UNKNOWN

Sorsogon
Collection No.15837



UNKNOWN-15837	
% Genetic Similarity	Other Genotypes
93.95	AZOR 5 (16188)
93.87	KAMANSING (16030)
93.87	TITO-TITO (15507)
93.86	M3(SURALLAH) (16428)
93.84	M3 (15499)

Grain Quality Traits

Milling Recovery (%)
- Brown Rice : 78.0 (F)
- Milled Rice : 70.5 (Pr)
- Head Rice : 67.5 (Pr)

Physical Attributes
- Grain Length (mm) : 5.4 (Sh)
- Grain Shape : 2.2 (I)
- Chalky Grains (%) : 3.6 (G1)

Physicochemical Properties
- Amylose Content (%) : 18.9 (I)
- Gelatinization Temperature : 3.6 (HI/I)
- Crude Protein Content (%) : 9.0

Agronomic Characteristics

Plant Height (cm) : 122.8
Heading Days After Seeding : 90
Maturity Days After Seeding : 120
Basal Leaf Sheath Color : 1 (Green)
Anthocyanin Color : 0 (Absent)
Leaf Blade Pubescence : 3 (Pubescent)
Auricle Color : 2 (Yellowish green)
Collar Color : 2 (Light green)
Awn Distribution : 0 (None)
Panicle Exsertion : 7 (Moderately well exserted)
Lodging Resistance : 3 (Weak)
Leaf Senescence : 5 (Intermediate)
Panicle Shattering : 5 (Moderate)
Endosperm Type : 1 (Non-glutinous)

KINAVITE

Sorsogon
Collection No. 16035

KINAVITE-16035	
% Genetic Similarity	Other Genotypes
99.98	C-4 (16505)
98.18	NSIC Rc 138
97.81	DIAMOND X (16062)
96.65	UNKNOWN VAR 2 (15878)
96.45	DIAMOND X (16510)

Grain Quality Traits

Milling Recovery (%)
- Brown Rice : 75.0 (P)
- Milled Rice : 63.3 (G2)
- Head Rice : 50.0 (G1)

Physical Attributes
- Grain Length (mm) : 6.6 (L)
- Grain Shape : 3.0 (I)
- Chalky Grains (%) : 14.0 (G3)

Physicochemical Properties
- Amylose Content (%) : 23.0 (H)
- Gelatinization Temperature : 6.9 (L)
- Crude Protein Content (%) : 6.2

Agronomic Characteristics

Plant Height (cm) : 124.8
Heading Days After Seeding : 98
Maturity Days After Seeding : 128
Basal Leaf Sheath Color : 1 (Green)
Anthocyanin Color : 0 (Absent)
Leaf Blade Pubescence : 3 (Pubescent)
Auricle Color : 2 (Yellowish green)
Collar Color : 2 (Light green)
Awn Distribution : 1 (Tip only)
Panicle Exsertion : 5 (Just exserted)
Lodging Resistance : 3 (Weak)
Leaf Senescence : 5 (Intermediate)
Panicle Shattering : 5 (Moderate)
Endosperm Type : 2 (Intermediate)

M3

Leyte
Collection No. 15850

M3-15850	
% Genetic Similarity	Other Genotypes
97.59	GANAR (15650)
97.58	DESTINY (16042)
97.48	BELENA 205 (15583)
97.48	TOP RICE (15556)
97.48	SUPER DIAMOND (15558)

Grain Quality Traits

Milling Recovery (%)
- Brown Rice : 77.3 (F)
- Milled Rice : 69.2 (G1)
- Head Rice : 55.8 (G1)

Physical Attributes
- Grain Length (mm) : 6.8 (L)
- Grain Shape : 3.1 (S)
- Chalky Grains (%) : 8.5 (G2)

Physicochemical Properties
- Amylose Content (%) : 21.8 (I)
- Gelatinization Temperature : 5.1 (I/L)
- Crude Protein Content (%) : 6.5

Agronomic Characteristics

Plant Height (cm) : 129.0
Heading Days After Seeding : 98
Maturity Days After Seeding : 128
Basal Leaf Sheath Color : 1 (Green)
Anthocyanin Color : 0 (Absent)
Leaf Blade Pubescence : 3 (Pubescent)
Auricle Color : 2 (Yellowish green)
Collar Color : 2 (Light green)
Awn Distribution : 0 (None)
Panicle Exsertion : 7 (Moderately well exserted)
Lodging Resistance : 7 (Strong)
Leaf Senescence : 5 (Intermediate)
Panicle Shattering : 5 (Moderate)
Endosperm Type : 2 (Intermediate)

MINDANAO

Leyte
Collection No.15851

MINDANAO-15851	
% Genetic Similarity	Other Genotypes
92.68	PSB Rc 10
92.05	DIAMOND X (16510)
91.71	I8 (VN) (15890)
91.38	3-MILLION (15457)
91.33	ROSANA (16089)

Grain Quality Traits

Milling Recovery (%)
- Brown Rice : 78.0 (F)
- Milled Rice : 70.5 (Pr)
- Head Rice : 58.9 (Pr)

Physical Attributes
- Grain Length (mm) : 5.8 (M)
- Grain Shape : 2.5 (I)
- Chalky Grains (%) : 16.2 (aa)

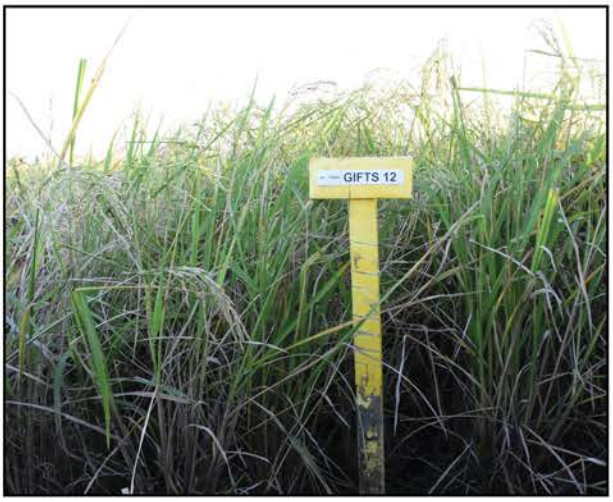
Physicochemical Properties
- Amylose Content : 19.2 (I)
- Gelatinization Temperature : 3.7 (H/HI/I)
- Crude Protein Content (%) : 6.2

Agronomic Characteristics

Plant Height (cm) : —
Heading Days After Seeding : —
Maturity Days After Seeding : —
Basal Leaf Sheath Color : 1 (Green)
Anthocyanin Color : 0 (Absent)
Leaf Blade Pubescence : 3 (Pubescent)
Auricle Color : 2 (Yellowish green)
Collar Color : 2 (Light green)
Awn Distribution : 0 (None)
Panicle Exsertion : 7 (Moderately well exserted)
Lodging Resistance : 7 (Strong)
Leaf Senescence : 5 (Intermediate)
Panicle Shattering : 5 (Moderate)
Endosperm Type : 2 (Intermediate)

GIFTS 12

Samar
Collection No.15846



GIFTS 12-15846	
% Genetic Similarity	Other Genotypes
99.53	RV8 (16320)
91.58	216 (16399)
91.17	JASMIN (15661)
91.14	3-MILLION (15457)
90.60	DALING-DALING (16203)

Grain Quality Traits

Milling Recovery (%)
- Brown Rice : 78.8 (F)
- Milled Rice : 70.4 (Pr)
- Head Rice : 59.1 (Pr)

Physical Attributes
- Grain Length (mm) : 6.0 (M)
- Grain Shape : 2.3 (I)
- Chalky Grains (%) : 11.3 (G3)

Physicochemical Properties
- Amylose Content : 19.4 (I)
- Gelatinization Temperature : 4.1 (I)
- Crude Protein Content (%) : 7.5

Agronomic Characteristics

- Plant Height (cm) : 134.6
- Heading Days After Seeding : 90
- Maturity Days After Seeding : 120
- Basal Leaf Sheath Color : 4 (Purple)
- Anthocyanin Color : 5 (Medium)
- Leaf Blade Pubescence : 3 (Pubescent)
- Auricle Color : 5 (Purple lines)
- Collar Color : 4 (Purple lines)
- Awn Distribution : 0 (None)
- Panicle Exsertion : 9 (Well exserted)
- Lodging Resistance : 3 (Weak)
- Leaf Senescence : 5 (Intermediate)
- Panicle Shattering : 5 (Moderate)
- Endosperm Type : 2 (Intermediate)

KAPULA

Samar
Collection No.15847

KAPULA-15847	
% Genetic Similarity	Other Genotypes
94.26	ROSANA (16089)
94.04	JASMIN (15661)
93.77	KAMOROS (16358)
93.58	SENORITA PILIT (16316)
93.36	ABANGAY (16336)

Grain Quality Traits

Milling Recovery (%)
- Brown Rice : 77.7 (F)
- Milled Rice : 69.8 (G1)
- Head Rice : 61.2 (Pr)

Physical Attributes
- Grain Length (mm) : 6.1 (M)
- Grain Shape : 2.2 (I)
- Chalky Grains (%) : 2.8 (I)

Physicochemical Properties
- Amylose Content (%) : 4.8 (G1)
- Gelatinization Temperature : 3.9 (I/L)
- Crude Protein Content (%) : 7.1

Agronomic Characteristics

Plant Height (cm) : 106.0
Heading Days After Seeding : 90
Maturity Days After Seeding : 120
Basal Leaf Sheath Color : 1 (Green)
Anthocyanin Color : 0 (Absent)
Leaf Blade Pubescence : 3 (Pubescent)
Auricle Color : 2 (Yellowish green)
Collar Color : 2 (Light green)
Awn Distribution : 0 (None)
Panicle Exsertion : 7 (Moderately well exserted)
Lodging Resistance : 7 (Strong)
Leaf Senescence : 7 (Late)
Panicle Shattering : 5 (Moderate)
Endosperm Type : 1 (Non-glutinous)

SINANDOMENG

Samar
Collection No.15848

SINANDOMENG-15848	
% Genetic Similarity	Other Genotypes
100.00	SINANLANG-ANG (15667)
100.00	SINANDOMENG (15663)
95.93	(GUINOBAT) SIROMA (15838)
93.33	ROSANA (16089)
92.85	ABANGAY (16336)

Grain Quality Traits

Milling Recovery (%)
- Brown Rice : 79.0 (F)
- Milled Rice : 69.2 (G1)
- Head Rice : 61.8 (Pr)

Physical Attributes
- Grain Length (mm) : 6.5 (M)
- Grain Shape : 2.7 (I)
- Chalky Grains (%) : 15.2 (aa)

Physicochemical Properties
- Amylose Content (%) : 18.8 (I)
- Gelatinization Temperature : 4.2 (I/L)
- Crude Protein Content (%) : 8.0

Agronomic Characteristics

Plant Height (cm) : 117.4
Heading Days After Seeding : 92
Maturity Days After Seeding : 122
Basal Leaf Sheath Color : 1 (Green)
Anthocyanin Color : 0 (Absent)
Leaf Blade Pubescence : 3 (Pubescent)
Auricle Color : 2 (Yellowish green)
Collar Color : 2 (Light green)
Awn Distribution : 0 (None)
Panicle Exsertion : 7 (Moderately well exserted)
Lodging Resistance : 9 (Very strong)
Leaf Senescence : 5 (Intermediate)
Panicle Shattering : 5 (Moderate)
Endosperm Type : 2 (Intermediate)

SAIGON

Samar
Collection No. 15849

SAIGON-15849	
% Genetic Similarity	Other Genotypes
94.19	PANDAN 1 (16377)
93.88	NSIC Rc 122
93.88	TUDY-TUDY (16514)
93.50	JANJANONG (16515)
93.17	216 (16399)

Grain Quality Traits

Milling Recovery (%)
- Brown Rice : 78.9 (F)
- Milled Rice : 70.3 (Pr)
- Head Rice : 36.4 (G3)

Physical Attributes
- Grain Length (mm) : 6.9 (L)
- Grain Shape : 2.9 (I)
- Chalky Grains (%) : 8.6 (G2)

Physicochemical Properties
- Amylose Content (%) : 18.8 (I)
- Gelatinization Temperature : 3.3 (H/HI/I)
- Crude Protein Content (%) : 6.3

Agronomic Characteristics

Plant Height (cm) : 115.9
Heading Days After Seeding : 91
Maturity Days After Seeding : 121
Basal Leaf Sheath Color : 1 (Green)
Anthocyanin Color : 0 (Absent)
Leaf Blade Pubescence : 3 (Pubescent)
Auricle Color : 2 (Yellowish green)
Collar Color : 2 (Light green)
Awn Distribution : 3 (Upper half only)
Panicle Exsertion : 5 (Just exserted)
Lodging Resistance : 7 (Strong)
Leaf Senescence : 5 (Intermediate)
Panicle Shattering : 5 (Moderate)
Endosperm Type : 2 (Intermediate)

KAMANSING

Samar
Collection No. 16030

KAMANSING-16030	
% Genetic Similarity	Other Genotypes
99.94	M3 (SURALLAH) (16428)
99.92	M3 (15499)
99.91	TITO-TITO (15507)
99.16	M3 (16087)
98.58	M3-BANGA (16315)

Grain Quality Traits

Milling Recovery (%)
- Brown Rice : 77.5 (F)
- Milled Rice : 69.5 (G1)
- Head Rice : 54.7 (G1)

Physical Attributes
- Grain Length (mm) : 5.7 (M)
- Grain Shape : 2.3 (I)
- Chalky Grains (%) : 10.3 (G3)

Physicochemical Properties
- Amylose Content (%) : 20.4 (I)
- Gelatinization Temperature : 2.8 (H/HI/I)
- Crude Protein Content (%) : 6.7

Agronomic Characteristics

Plant Height (cm) : 119.6
Heading Days After Seeding : 90
Maturity Days After Seeding : 120
Basal Leaf Sheath Color : 1 (Green)
Anthocyanin Color : 0 (Absent)
Leaf Blade Pubescence : 3 (Pubescent)
Auricle Color : 2 (Yellowish green)
Collar Color : 2 (Light green)
Awn Distribution : 0 (None)
Panicle Exsertion : 7 (Moderately well exserted)
Lodging Resistance : 1 (Very weak)
Leaf Senescence : 7 (Late)
Panicle Shattering : 5 (Moderate)
Endosperm Type : 1 (Non-glutinous)

CABER

Samar
Collection No. 16032

CABER-16032	
% Genetic Similarity	Other Genotypes
95.77	I8 (VN) (15890)
92.18	ABANGAY (16336)
91.61	JASMIN (15661)
91.50	3-MILLION (15457)
91.44	ROSANA (16089)

Grain Quality Traits

Milling Recovery (%)
- Brown Rice : 78.8 (F)
- Milled Rice : 71.2 (Pr)
- Head Rice : 49.3 (G1)

Physical Attributes
- Grain Length (mm) : 6.6 (L)
- Grain Shape : 3.0 (I)
- Chalky Grains (%) : 8.5 (G2)

Physicochemical Properties
- Amylose Content : 19.0 (I)
- Gelatinization Temperature : 6.3 (I/L)
- Crude Protein Content (%) : 9.1

Agronomic Characteristics

Plant Height (cm) : 137.6
Heading Days After Seeding : 100
Maturity Days After Seeding : 130
Basal Leaf Sheath Color : 1 (Green)
Anthocyanin Color : 0 (Absent)
Leaf Blade Pubescence : 3 (Pubescent)
Auricle Color : 2 (Yellowish green)
Collar Color : 2 (Light green)
Awn Distribution : 1 (Tip only)
Panicle Exsertion : 7 (Moderately well exserted)
Lodging Resistance : 7 (Strong)
Leaf Senescence : 5 (Intermediate)
Panicle Shattering : 5 (Moderate)
Endosperm Type : 1 (Non-glutinous)

FGRG COLLECTIONS FROM REGIONS 6 AND 7

KAYOPO

Bohol
Collection No.16096

KAYOPO-16096	
% Genetic Similarity	Other Genotypes
93.51	RG17-K (16386)
93.41	MINADRE (16193)
93.29	NSIC Rc 420
92.99	ROSANA (16089)
92.94	3-MILLION (15457)
92.94	NTPSA-1 (16376)

Grain Quality Traits

Milling Recovery (%)
- Brown Rice : 75.3 (P)
- Milled Rice : 67.5 (G1)
- Head Rice : 47.7 (G2)

Physical Attributes
- Grain Length (mm) : 5.7 (M)
- Grain Shape : 2.6 (I)
- Chalky Grains (%) : 3.7 (G1)

Physicochemical Properties
- Amylose Content (%) : 20.1 (I)
- Gelatinization Temperature : 4.9 (I)
- Crude Protein Content (%) : 5.8

Agronomic Characteristics

- Plant Height (cm) : 124.1
- Heading Days After Seeding : 98
- Maturity Days After Seeding : 128
- Basal Leaf Sheath Color : 1 (Green)
- Anthocyanin Color : 0 (Absent)
- Leaf Blade Pubescence : 3 (Pubescent)
- Auricle Color : 2 (Yellowish green)
- Collar Color : 2 (Light green)
- Awn Distribution : 0 (None)
- Panicle Exsertion : 7 (Moderately well exserted)
- Lodging Resistance : 3 (Weak)
- Leaf Senescence : 7 (Late)
- Panicle Shattering : 5 (Moderate)
- Endosperm Type : 1 (Non-glutinous)

KADATO

Bohol
Collection No.16097

KADATO-16097	
% Genetic Similarity	Other Genotypes
92.35	PSB Rc 10
92.10	66 PUWA (16098)
91.56	NSIC Rc 420
91.12	DIAMOND X (16510)
91.11	75 DAYS (16509)

Grain Quality Traits

Milling Recovery (%)
- Brown Rice : 77.8 (F)
- Milled Rice : 69.8 (G1)
- Head Rice : 55.4 (G1)

Physical Attributes
- Grain Length (mm) : 6.9 (L)
- Grain Shape : 3.1 (S)
- Chalky Grains (%) : 2.8 (G1)

Physicochemical Properties
- Amylose Content (%) : 26.2 (H)
- Gelatinization Temperature : 4.3 (I)
- Crude Protein Content (%) : 7.6

Agronomic Characteristics

Plant Height (cm) : 123.0
Heading Days After Seeding : 91
Maturity Days After Seeding : 121
Basal Leaf Sheath Color : 1 (Green)
Anthocyanin Color : 0 (Absent)
Leaf Blade Pubescence : 3 (Pubescent)
Auricle Color : 2 (Yellowish green)
Collar Color : 2 (Light green)
Awn Distribution : 0 (None)
Panicle Exsertion : 7 (Moderately well exserted)
Lodging Resistance : 5 (Intermediate)
Leaf Senescence : 5 (Intermediate)
Panicle Shattering : 5 (Moderate)
Endosperm Type : 2 (Intermediate)

66 PUWA

Bohol
Collection No. 16098

66 PUWA-16098	
% Genetic Similarity	Other Genotypes
92.10	KADATO (16097)
91.82	PSB Rc 10
90.97	ROSANA (16089)
90.95	NSIC Rc 420
90.92	DIAMOND X (16510)

Grain Quality Traits

Milling Recovery (%)
- Brown Rice : 78.5 (F)
- Milled Rice : 69.9 (G1)
- Head Rice : 44.8 (G2)

Physical Attributes
- Grain Length (mm) : 6.8 (L)
- Grain Shape : 3.0 (I)
- Chalky Grains (%) : 5.1 (G2)

Physicochemical Properties
- Amylose Content (%) : 24.3 (H)
- Gelatinization Temperature : 4.2 (I)

Crude Protein Content (%) : 7.0

Agronomic Characteristics

Plant Height (cm) : 128.5
Heading Days After Seeding : 90
Maturity Days After Seeding : 120
Basal Leaf Sheath Color : 1 (Green)
Anthocyanin Color : 0 (Absent)
Leaf Blade Pubescence : 3 (Pubescent)
Auricle Color : 2 (Yellowish green)
Collar Color : 2 (Light green)
Awn Distribution : 0 (None)
Panicle Exsertion : 7 (Moderately well exserted)
Lodging Resistance : 3 (Weak)
Leaf Senescence : 5 (Intermediate)
Panicle Shattering : 5 (Moderate)
Endosperm Type : 1 (Non-glutinous)

KATAGO

Bohol
Collection No.16099

KATAGO-16099	
% Genetic Similarity	Other Genotypes
92.95	216 (16399)
91.79	3-MILLION (15457)
91.57	ABANGAY (16336)
91.52	ROSANA (16089)
91.36	I8 (VN) (15890)

Grain Quality Traits

Milling Recovery (%)
- Brown Rice : 79.1 (F)
- Milled Rice : 70.5 (Pr)
- Head Rice : 55.7 (G1)

Physical Attributes
- Grain Length (mm) : 6.3 (M)
- Grain Shape : 2.6 (I)
- Chalky Grains (%) : 12.0 (G3)

Physicochemical Properties
- Amylose Content : 20.5 (I)
- Gelatinization Temperature : 4.0 (I)
- Crude Protein Content (%) : 8.7

Agronomic Characteristics

- Plant Height (cm) : 94.2
- Heading Days After Seeding : 91
- Maturity Days After Seeding : 121
- Basal Leaf Sheath Color : 1 (Green)
- Anthocyanin Color : 0 (Absent)
- Leaf Blade Pubescence : 3 (Pubescent)
- Auricle Color : 2 (Yellowish green)
- Collar Color : 2 (Light green)
- Awn Distribution : 0 (None)
- Panicle Exsertion : 5 (Just exserted)
- Lodging Resistance : 9 (Very strong)
- Leaf Senescence : 5 (Intermediate)
- Panicle Shattering : 5 (Moderate)
- Endosperm Type : 2 (Intermediate)

BASMATI

Cebu
Collection No.15625

BASMATI-15625	
% Genetic Similarity	Other Genotypes
95.58	MASBATE (16294)
91.79	ABANGAY (16336)
90.95	216 (16399)
90.90	JASMIN (15661)
90.69	INBRED-300 (16436)

Grain Quality Traits

Milling Recovery (%)
- Brown Rice : 78.6 (F)
- Milled Rice : 69.6 (G1)
- Head Rice : 60.3 (Pr)

Physical Attributes
- Grain Length (mm) : 7.4 (L)
- Grain Shape : 3.5 (S)
- Chalky Grains (%) : 2.5 (G1)

Physicochemical Properties
- Amylose Content (%) : 18.3 (I)
- Gelatinization Temperature : 6.2 (I/L)
- Crude Protein Content (%) : 8.1

Agronomic Characteristics

Plant Height (cm) : 92.4
Heading Days After Seeding : 90
Maturity Days After Seeding : 120
Basal Leaf Sheath Color : 1 (Green)
Anthocyanin Color : 0 (Absent)
Leaf Blade Pubescence : 3 (Pubescent)
Auricle Color : 2 (Yellowish green)
Collar Color : 2 (Light green)
Awn Distribution : 2 (Upper quarter only)
Panicle Exsertion : 5 (Just exserted)
Lodging Resistance : 9 (Very strong)
Leaf Senescence : 5 (Intermediate)
Panicle Shattering : 5 (Moderate)
Endosperm Type : 1 (Non-glutinous)

VIETNAM

Negros Oriental
Collection No.16077

VIETNAM-16077	
% Genetic Similarity	Other Genotypes
99.64	URAB (16091)
93.67	SPEED 75 (15841)
92.56	VIETNAM (16088)
92.17	PSB Rc 10
91.16	216 (16399)

Grain Quality Traits

Milling Recovery (%)
- Brown Rice : 75.3 (F)
- Milled Rice : 66.0 (G1)
- Head Rice : 41.9 (G2)

Physical Attributes
- Grain Length (mm) : 6.8 (L)
- Grain Shape : 2.9 (I)
- Chalky Grains (%) : 3.5 (G1)

Physicochemical Properties
- Amylose Content (%) : 20.0 (I)
- Gelatinization Temperature : 4.4 (I/L)
- Crude Protein Content (%) : 9.0

Agronomic Characteristics

Plant Height (cm) : 112.6
Heading Days After Seeding : 83
Maturity Days After Seeding : 113
Basal Leaf Sheath Color : 1 (Green)
Anthocyanin Color : 0 (Absent)
Leaf Blade Pubescence : 3 (Pubescent)
Auricle Color : 2 (Yellowish green)
Collar Color : 2 (Light green)
Awn Distribution : 0 (None)
Panicle Exsertion : 7 (Moderately well exserted)
Lodging Resistance : 7 (Strong)
Leaf Senescence : 5 (Intermediate)
Panicle Shattering : 5 (Moderate)
Endosperm Type : 1 (Non-glutinous)

DOUBLE DIAMOND

Negros Oriental
Collection No. 16078

DOUBLE DIAMOND-16078	
% Genetic Similarity	Other Genotypes
100.00	TABUK (16501)
100.00	DOUBLE DIAMOND (16507)
99.98	1561 (15891)
99.98	UNKNOWN VAR 3 (15879)
99.98	SAMPAGUITA (15500)

Grain Quality Traits

Milling Recovery (%)
- Brown Rice : 77.3 (F)
- Milled Rice : 69.7 (G1)
- Head Rice : 45.0 (G2)

Physical Attributes
- Grain Length (mm) : 7.0 (L)
- Grain Shape : 2.9 (I)
- Chalky Grains (%) : 1.2 (Pr)

Physicochemical Properties
- Amylose Content (%) : 15.5 (L)
- Gelatinization Temperature : 6.9 (I/L)
- Crude Protein Content (%) : 8.4

Agronomic Characteristics

Plant Height (cm) : 114.3
Heading Days After Seeding : 104
Maturity Days After Seeding : 134
Basal Leaf Sheath Color : 1 (Green)
Anthocyanin Color : 0 (Absent)
Leaf Blade Pubescence : 3 (Pubescent)
Auricle Color : 2 (Yellowish green)
Collar Color : 2 (Light green)
Awn Distribution : 2 (Upper quarter only)
Panicle Exsertion : 5 (Just exserted)
Lodging Resistance : 7 (Strong)
Leaf Senescence : 5 (Intermediate)
Panicle Shattering : 5 (Moderate)
Endosperm Type : 1 (Non-glutinous)

MILAGROSA

Negros Oriental
Collection No.16079

MILAGROSA-16079	
% Genetic Similarity	Other Genotypes
93.99	PSB Rc 10
92.58	DIAMOND X (16510)
92.29	MORYO-MORYO (16424)
91.91	JUAN RICE (16060)
91.78	NSIC Rc 294

Grain Quality Traits

Milling Recovery (%)
- Brown Rice : 77.8 (F)
- Milled Rice : 69.7 (G1)
- Head Rice : 48.2 (G1)

Physical Attributes
- Grain Length (mm) : 6.6 (L)
- Grain Shape : 3.0 (S)
- Chalky Grains (%) : 10.4 (G3)

Physicochemical Properties
- Amylose Content (%) : 19.2 (I)
- Gelatinization Temperature : 4.1 (I)
- Crude Protein Content (%) : 10.5

Agronomic Characteristics

Plant Height (cm) : 128.1
Heading Days After Seeding : 93
Maturity Days After Seeding : 123
Basal Leaf Sheath Color : 1 (Green)
Anthocyanin Color : 0 (Absent)
Leaf Blade Pubescence : 3 (Pubescent)
Auricle Color : 2 (Yellowish green)
Collar Color : 2 (Light green)
Awn Distribution : 4 (Upper three quarters only)
Panicle Exsertion : 7 (Moderately well exserted)
Lodging Resistance : 5 (Intermediate)
Leaf Senescence : 5 (Intermediate)
Panicle Shattering : 5 (Moderate)
Endosperm Type : 2 (Intermediate)

MESTISA

Negros Oriental
Collection No. 16080

MESTISA-16080	
% Genetic Similarity	Other Genotypes
93.72	3-MILLION (15457)
92.60	ABANGAY (16336)
92.32	JASMIN (15661)
91.68	BURDAGOL (15892)
91.53	KAMOROS (16358)

Grain Quality Traits

Milling Recovery (%)
- Brown Rice : 73.5 (P)
- Milled Rice : 66.9 (G1)
- Head Rice : 62.3 (Pr)

Physical Attributes
- Grain Length (mm) : 6.5 (M)
- Grain Shape : 2.7 (I)
- Chalky Grains (%) : 1.0 (Pr)

Physicochemical Properties
- Amylose Content (%) : 22.5 (H)
- Gelatinization Temperature : 5.0 (I)
- Crude Protein Content (%) : 11.1

Agronomic Characteristics

Plant Height (cm) : 154.0
Heading Days After Seeding : 105
Maturity Days After Seeding : 135
Basal Leaf Sheath Color : 1 (Green)
Anthocyanin Color : 0 (Absent)
Leaf Blade Pubescence : 3 (Pubescent)
Auricle Color : 2 (Yellowish green)
Collar Color : 2 (Light green)
Awn Distribution : 0 (None)
Panicle Exsertion : 7 (Moderately well exserted)
Lodging Resistance : 3 (Weak)
Leaf Senescence : 5 (Intermediate)
Panicle Shattering : 5 (Moderate)
Endosperm Type : 1 (Non-glutinous)

KAIMPAS

Negros Oriental
Collection No. 16081

KAIMPAS-16081	
% Genetic Similarity	Other Genotypes
92.63	BURDAGOL (15892)
92.48	PSB Rc 38
92.24	3-MILLION (15457)
91.47	ABANGAY (16336)
91.41	BURDAGOL (15845)

Grain Quality Traits

Milling Recovery (%)
- Brown Rice : 69.2 (P)
- Milled Rice : 62.6 (G2)
- Head Rice : 55.3 (G1)

Physical Attributes
- Grain Length (mm) : 6.8 (L)
- Grain Shape : 2.7 (I)
- Chalky Grains (%) : 8.4 (G2)

Physicochemical Properties
- Amylose Content (%) : 21.1 (I)
- Gelatinization Temperature : 4.6 (I)
- Crude Protein Content (%) : 7.4

Agronomic Characteristics

Plant Height (cm) : 138.1
Heading Days After Seeding : 100
Maturity Days After Seeding : 130
Basal Leaf Sheath Color : 1 (Green)
Anthocyanin Color : 0 (Absent)
Leaf Blade Pubescence : 3 (Pubescent)
Auricle Color : 2 (Yellowish green)
Collar Color : 2 (Light green)
Awn Distribution : 0 (None)
Panicle Exsertion : 7 (Moderately well exserted)
Lodging Resistance : 1 (Very weak)
Leaf Senescence : 5 (Intermediate)
Panicle Shattering : 5 (Moderate)
Endosperm Type : 2 (Intermediate)

MASHAW

Negros Oriental
Collection No.16082

MASHAW-16082	
% Genetic Similarity	Other Genotypes
96.46	REGOM (16083)
94.72	216 (16399)
94.46	AZOR 5 (16188)
94.29	ROSANA (16089)
94.07	DIAMOND X (16510)

Grain Quality Traits

Milling Recovery (%)
- Brown Rice : 78.4 (F)
- Milled Rice : 70.3 (Pr)
- Head Rice : 57.9 (Pr)

Physical Attributes
- Grain Length (mm) : 6.1 (M)
- Grain Shape : 2.3 (I)
- Chalky Grains (%) : 9.1 (G2)

Physicochemical Properties
- Amylose Content (%) : 19.1 (I)
- Gelatinization Temperature : 4.1 (I)
- Crude Protein Content (%) : 9.6

Agronomic Characteristics

- Plant Height (cm) : 107.4
- Heading Days After Seeding : 91
- Maturity Days After Seeding : 121
- Basal Leaf Sheath Color : 1 (Green)
- Anthocyanin Color : 0 (Absent)
- Leaf Blade Pubescence : 3 (Pubescent)
- Auricle Color : 2 (Yellowish green)
- Collar Color : 2 (Light green)
- Awn Distribution : 2 (Upper quarter only)
- Panicle Exsertion : 5 (Just exserted)
- Lodging Resistance : 5 (Intermediate)
- Leaf Senescence : 5 (Intermediate)
- Panicle Shattering : 5 (Moderate)
- Endosperm Type : 1 (Non-glutinous)

REGOM

Negros Oriental
Collection No. 16083

REGOM-16083	
% Genetic Similarity	Other Genotypes
96.46	MASHAW (16082)
95.35	M3 (16087)
95.11	AZOR 5 (16188)
94.77	TRIPLE 3 (15557)
94.75	M3 (15499)

Grain Quality Traits

Milling Recovery (%)
- Brown Rice : 71.5 (P)
- Milled Rice : 63.2 (G2)
- Head Rice : 52.6 (G1)

Physical Attributes
- Grain Length (mm) : 6.4 (M)
- Grain Shape : 2.7 (I)
- Chalky Grains (%) : 2.7 (G1)

Physicochemical Properties
- Amylose Content (%) : 22.5 (H)
- Gelatinization Temperature : 4.3 (I/L)
- Crude Protein Content (%) : 6.9

Agronomic Characteristics

Plant Height (cm) : 121.3
Heading Days After Seeding : 91
Maturity Days After Seeding : 121
Basal Leaf Sheath Color : 1 (Green)
Anthocyanin Color : 0 (Absent)
Leaf Blade Pubescence : 3 (Pubescent)
Auricle Color : 2 (Yellowish green)
Collar Color : 2 (Light green)
Awn Distribution : 0 (None)
Panicle Exsertion : 5 (Just exserted)
Lodging Resistance : 9 (Very strong)
Leaf Senescence : 5 (Intermediate)
Panicle Shattering : 5 (Moderate)
Endosperm Type : 1 (Non-glutinous)

RED 18

Negros Oriental
Collection No.16086

RED 18-16086	
% Genetic Similarity	Other Genotypes
98.31	3-MILLION (15457)
95.01	JASMIN (15661)
91.38	KAMOROS (16358)
90.77	ABANGAY (16336)
89.85	ROSANA (16089)

Grain Quality Traits

Milling Recovery (%)
- Brown Rice : 74.1 (P)
- Milled Rice : 65.9 (G1)
- Head Rice : 46.3 (G2)

Physical Attributes
- Grain Length (mm) : 6.8 (L)
- Grain Shape : 2.9 (I)
- Chalky Grains (%) : 5.3 (G2)

Physicochemical Properties
- Amylose Content (%) : 21.5 (I)
- Gelatinization Temperature : 4.4 (I/L)
- Crude Protein Content (%) : 9.2

Agronomic Characteristics

Plant Height (cm) : 133.5
Heading Days After Seeding : 91
Maturity Days After Seeding : 121
Basal Leaf Sheath Color : 2 (Green with purple lines)
Anthocyanin Color : 3 (Weak)
Leaf Blade Pubescence : 3 (Pubescent)
Auricle Color : 5 (Purple lines)
Collar Color : 2 (Light green)
Awn Distribution : 0 (None)
Panicle Exsertion : 7 (Moderately well exserted)
Lodging Resistance : 7 (Late)
Leaf Senescence : 5 (Intermediate)
Panicle Shattering : 5 (Moderate)
Endosperm Type : 2 (Intermediate)

M3

Negros Oriental
Collection No.16087

M3-16087	
% Genetic Similarity	Other Genotypes
99.22	M3 (15499)
99.17	M3 (SURALLAH) (16428)
99.16	KAMANSING (16030)
99.14	TITO-TITO (15507)
97.78	M3-BANGA (16315)

Grain Quality Traits

Milling Recovery (%)
- Brown Rice : 78.3 (F)
- Milled Rice : 69.2 (G1)
- Head Rice : 54.5 (G1)

Physical Attributes
- Grain Length (mm) : 7.2 (L)
- Grain Shape : 2.7 (I)
- Chalky Grains (%) : 2.4 (G1)

Physicochemical Properties
- Amylose Content (%) : 20.3 (I)
- Gelatinization Temperature : 5.0 (I)
- Crude Protein Content (%) : 8.5

Agronomic Characteristics

- Plant Height (cm) : 111.9
- Heading Days After Seeding : 91
- Maturity Days After Seeding : 121
- Basal Leaf Sheath Color : 1 (Green)
- Anthocyanin Color : 0 (Absent)
- Leaf Blade Pubescence : 3 (Pubescent)
- Auricle Color : 2 (Yellowish green)
- Collar Color : 2 (Light green)
- Awn Distribution : 0 (None)
- Panicle Exsertion : 7 (Moderately well exserted)
- Lodging Resistance : 3 (Weak)
- Leaf Senescence : 5 (Intermediate)
- Panicle Shattering : 5 (Moderate)
- Endosperm Type : 1 (Non-glutinous)

ROSANA

Negros Oriental
Collection No.16089

ROSANA-16089	
% Genetic Similarity	Other Genotypes
96.06	JASMIN (15661)
95.19	ABANGAY (16336)
95.04	SENORITA PILIT (16316)
94.96	3-MILLION (15457)
94.94	I8 (VN) (15890)

Grain Quality Traits

Milling Recovery (%)
- Brown Rice : 78.7 (F)
- Milled Rice : 69.4 (G1)
- Head Rice : 56.3 (G1)

Physical Attributes
- Grain Length (mm) : 6.8 (L)
- Grain Shape : 2.6 (I)
- Chalky Grains (%) : 16.4 (aa)

Physicochemical Properties
- Amylose Content (%) : 21.8 (I)
- Gelatinization Temperature : 4.1 (I)
- Crude Protein Content (%) : 8.0

Agronomic Characteristics

Plant Height (cm) : 107.0
Heading Days After Seeding : 91
Maturity Days After Seeding : 121
Basal Leaf Sheath Color : 1 (Green)
Anthocyanin Color : 0 (Absent)
Leaf Blade Pubescence : 3 (Pubescent)
Auricle Color : 2 (Yellowish green)
Collar Color : 2 (Light green)
Awn Distribution : 0 (None)
Panicle Exsertion : 7 (Moderately well exserted)
Lodging Resistance : 5 (Intermediate)
Leaf Senescence : 5 (Intermediate)
Panicle Shattering : 5 (Moderate)
Endosperm Type : 2 (Intermediate)

BORIT

Negros Oriental
Collection No. 16090

BORIT-16090	
% Genetic Similarity	Other Genotypes
92.50	IR 64
92.16	PLATOON X (16334)
92.07	NSIC Rc 420
92.06	NSIC Rc 298
91.54	DIAMOND X (16510)

Grain Quality Traits

Milling Recovery (%)
- Brown Rice : 77.1 (F)
- Milled Rice : 65.9 (G1)
- Head Rice : 53.1 (G1)

Physical Attributes
- Grain Length (mm) : 6.5 (M)
- Grain Shape : 2.6 (I)
- Chalky Grains (%) : 4.6 (G1)

Physicochemical Properties
- Amylose Content : 22.7 (H)
- Gelatinization Temperature : 4.8 (I)

Crude Protein Content (%) : 9.4

Agronomic Characteristics

Plant Height (cm) : 123.8
Heading Days After Seeding : 90
Maturity Days After Seeding : 120
Basal Leaf Sheath Color : 2 (Green with purple lines)
Anthocyanin Color : 3 (Weak)
Leaf Blade Pubescence : 3 (Pubescent)
Auricle Color : 2 (Yellowish green)
Collar Color : 2 (Light green)
Awn Distribution : 0 (None)
Panicle Exsertion : 7 (Moderately well exserted)
Lodging Resistance : 1 (Very weak)
Leaf Senescence : 5 (Intermediate)
Panicle Shattering : 5 (Moderate)
Endosperm Type : 1 (Non-glutinous)

URAB

Negros Oriental
Collection No. 16091

URAB-16091	
% Genetic Similarity	Other Genotypes
99.64	VIETNAM (16077)
93.47	SPEED 75 (15841)
92.86	VIETNAM (16088)
92.35	PSB Rc 10
91.19	216 (16399)

Grain Quality Traits

Milling Recovery (%)
- Brown Rice : 77.4 (F)
- Milled Rice : 67.3 (G1)
- Head Rice : 47.8 (G2)

Physical Attributes
- Grain Length (mm) : 6.0 (M)
- Grain Shape : 2.6 (I)
- Chalky Grains (%) : 2.6 (G1)

Physicochemical Properties
- Amylose Content (%) : 20.3 (I)
- Gelatinization Temperature : 4.0 (L)
- Crude Protein Content (%) : 9.3

Agronomic Characteristics

Plant Height (cm) : 107.1
Heading Days After Seeding : 83
Maturity Days After Seeding : 113
Basal Leaf Sheath Color : 1 (Green)
Anthocyanin Color : 0 (Absent)
Leaf Blade Pubescence : 3 (Pubescent)
Auricle Color : 2 (Yellowish green)
Collar Color : 2 (Light green)
Awn Distribution : 0 (None)
Panicle Exsertion : 7 (Moderately well exserted)
Lodging Resistance : 5 (Intermediate)
Leaf Senescence : 5 (Intermediate)
Panicle Shattering : 5 (Moderate)
Endosperm Type : 2 (Intermediate)

DESTINY

Negros Oriental
Collection No.16094

DESTINY-16094	
% Genetic Similarity	Other Genotypes
98.20	DIAMOND X (16510)
95.93	NSIC Rc 218
95.93	DIAMOND V (15576)
95.93	SAMPAGUITA (AGUSAN) (16326)
95.93	SAMPAGUITA (16308)

Grain Quality Traits

Milling Recovery (%)
- Brown Rice : 75.3 (F)
- Milled Rice : 67.9 (G1)
- Head Rice : 25.6 (aa)

Physical Attributes
- Grain Length (mm) : 6.9 (L)
- Grain Shape : 3.0 (I)
- Chalky Grains (%) : 3.7 (G1)

Physicochemical Properties
- Amylose Content (%) : 15.8 (L)
- Gelatinization Temperature : 5.6 (I/L)
- Crude Protein Content (%) : 7.4

Agronomic Characteristics

Plant Height (cm) : 112.9
Heading Days After Seeding : 104
Maturity Days After Seeding : 134
Basal Leaf Sheath Color : 1 (Green)
Anthocyanin Color : 0 (Absent)
Leaf Blade Pubescence : 3 (Pubescent)
Auricle Color : 2 (Yellowish green)
Collar Color : 2 (Light green)
Awn Distribution : 3 (Upper half only)
Panicle Exsertion : 7 (Moderately well exserted)
Lodging Resistance : 9 (Very strong)
Leaf Senescence : 5 (Intermediate)
Panicle Shattering : 5 (Moderate)
Endosperm Type : 1 (Non-glutinous)

LOS BAÑOS

Negros Oriental
Collection No. 16095

LOS BAÑOS-16095	
% Genetic Similarity	Other Genotypes
92.71	216 (16399)
92.08	JASMIN (15661)
92.00	3-MILLION (15457)
91.79	ABANGAY (16336)
91.75	PSB Rc 10

Grain Quality Traits

Milling Recovery (%)
- Brown Rice : 77.8 (F)
- Milled Rice : 69.1 (G1)
- Head Rice : 47.4 (G2)

Physical Attributes
- Grain Length (mm) : 6.6 (L)
- Grain Shape : 3.0 (I)
- Chalky Grains (%) : 3.4 (G1)

Physicochemical Properties
- Amylose Content (%) : 20.5 (I)
- Gelatinization Temperature : 4.9 (I/L)

Crude Protein Content (%) : 9.1

Agronomic Characteristics

Plant Height (cm) : 111.8
Heading Days After Seeding : 105
Maturity Days After Seeding : 135
Basal Leaf Sheath Color : 1 (Green)
Anthocyanin Color : 0 (Absent)
Leaf Blade Pubescence : 3 (Pubescent)
Auricle Color : 2 (Yellowish green)
Collar Color : 2 (Light green)
Awn Distribution : 0 (None)
Panicle Exsertion : 5 (Just exserted)
Lodging Resistance : 9 (Very strong)
Leaf Senescence : 7 (Late)
Panicle Shattering : 5 (Moderate)
Endosperm Type : 1 (Non-glutinous)

MILAGROSA

Negros Oriental
Collection No. 16100

MILAGROSA-16100	
% Genetic Similarity	Other Genotypes
92.54	SINANDOMING (16309)
92.05	DIAMOND X (16510)
91.96	SINANDOMING (15498)
91.66	JASMIN (15661)
91.46	216 (16399)

Grain Quality Traits

Milling Recovery (%)
- Brown Rice : 74.7 (P)
- Milled Rice : 62.2 (G2)
- Head Rice : 32.8 (G3)

Physical Attributes
- Grain Length (mm) : 8.0 (EL)
- Grain Shape : 3.8 (S)
- Chalky Grains (%) : 2.9 (G1)

Physicochemical Properties
- Amylose Content (%) : 16.1 (L)
- Gelatinization Temperature : 6.6 (I/L)
- Crude Protein Content (%) : 9.7

Agronomic Characteristics

Plant Height (cm) : 130.3
Heading Days After Seeding : 92
Maturity Days After Seeding : 122
Basal Leaf Sheath Color : 1 (Green)
Anthocyanin Color : 0 (Absent)
Leaf Blade Pubescence : 3 (Pubescent)
Auricle Color : 2 (Yellowish green)
Collar Color : 2 (Light green)
Awn Distribution : 5 (Whole length)
Panicle Exsertion : 5 (Just exserted)
Lodging Resistance : 9 (Very strong)
Leaf Senescence : 5 (Intermediate)
Panicle Shattering : 5 (Moderate)
Endosperm Type : 1 (Non-glutinous)

MASBATE

Negros Oriental
Collection No. 16294

MASBATE-16294	
% Genetic Similarity	Other Genotypes
95.58	BASMATI (15625)
90.91	ABANGAY (16336)
90.39	216 (16399)
89.58	JASMIN (15661)
89.47	PSB Rc 10

Grain Quality Traits

Milling Recovery (%)
- Brown Rice : 74.0 (P)
- Milled Rice : 63.4 (G2)
- Head Rice : 52.5 (G1)

Physical Attributes
- Grain Length (mm) : 7.7 (EL)
- Grain Shape : 3.6 (S)
- Chalky Grains (%) : 5.7 (G2)

Physicochemical Properties
- Amylose Content (%) : 17.6 (I)
- Gelatinization Temperature : 4.8 (I/L)
- Crude Protein Content (%) : 6.7

Agronomic Characteristics

Plant Height (cm) : 103.2
Heading Days After Seeding : 83
Maturity Days After Seeding : 113
Basal Leaf Sheath Color : 1 (Green)
Anthocyanin Color : 0 (Absent)
Leaf Blade Pubescence : 3 (Pubescent)
Auricle Color : 2 (Yellowish green)
Collar Color : 2 (Light green)
Awn Distribution : 3 (Upper half only)
Panicle Exsertion : 5 (Just exserted)
Lodging Resistance : 7 (Strong)
Leaf Senescence : 5 (Intermediate)
Panicle Shattering : 5 (Moderate)
Endosperm Type : 1 (Non-glutinous)

SUPER NINI

Negros Oriental
Collection No.16295

SUPER NINI-16295	
% Genetic Similarity	Other Genotypes
79.97	KAMOROS (16358)
79.69	I8 (VN) (15890)
79.58	SNC-13 (16388)
79.32	JASMIN (15661)
79.07	ROSANA (16089)

Grain Quality Traits

Milling Recovery (%)
- Brown Rice : 68.1 (P)
- Milled Rice : 59.1 (G3)
- Head Rice : 50.6 (G1)

Physical Attributes
- Grain Length (mm) : 6.8 (L)
- Grain Shape : 2.9 (I)
- Chalky Grains (%) : 16.7 (aa)

Physicochemical Properties
- Amylose Content (%) : 19.6 (I)
- Gelatinization Temperature : 3.1 (H/HI/I)
- Crude Protein Content (%) : 5.7

Agronomic Characteristics

- Plant Height (cm) : 140.8
- Heading Days After Seeding : 83
- Maturity Days After Seeding : 113
- Basal Leaf Sheath Color : 4 (Purple)
- Anthocyanin Color : 7 (Strong)
- Leaf Blade Pubescence : 3 (Pubescent)
- Auricle Color : 3 (Purple)
- Collar Color : 3 (Purple)
- Awn Distribution : 5 (Whole length)
- Panicle Exsertion : 7 (Moderately well exserted)
- Lodging Resistance : 1 (Very weak)
- Leaf Senescence : 5 (Intermediate)
- Panicle Shattering : 3 (Low)
- Endosperm Type : 2 (Intermediate)

SOPER NINI

Negros Oriental
Collection No. 16296

SOPER NINI-16296	
% Genetic Similarity	Other Genotypes
93.70	MAGNOLIA (16512)
92.95	DIAMOND X (16510)
92.65	PSB Rc10
92.13	216 (16399)
91.42	NSIC Rc420

Grain Quality Traits

Milling Recovery (%)
- Brown Rice : 78.5 (F)
- Milled Rice : 70.5 (Pr)
- Head Rice : 60.6 (Pr)

Physical Attributes
- Grain Length (mm) : 6.9 (L)
- Grain Shape : 2.8 (I)
- Chalky Grains (%) : 10.4 (G3)

Physicochemical Properties
- Amylose Content : 19.2 (I)
- Gelatinization Temperature : 2.0 (H)
- Crude Protein Content (%) : 8.0

Agronomic Characteristics

- Plant Height (cm) : 116.2
- Heading Days After Seeding : 83
- Maturity Days After Seeding : 113
- Basal Leaf Sheath Color : 1 (Green)
- Anthocyanin Color : 0 (Absent)
- Leaf Blade Pubescence : 3 (Pubescent)
- Auricle Color : 2 (Yellowish green)
- Collar Color : 2 (Light green)
- Awn Distribution : 0 (None)
- Panicle Exsertion : 7 (Moderately well exserted)
- Lodging Resistance : 3 (Weak)
- Leaf Senescence : 5 (Intermediate)
- Panicle Shattering : 5 (Moderate)
- Endosperm Type : 2 (Intermediate)

MIRACLE

Negros Oriental
Collection No.16297

MIRACLE-16297	
% Genetic Similarity	Other Genotypes
96.78	SENORITA PILIT (16316)
96.76	BARAKO (15400)
93.80	PILIT (15946)
93.02	ABANGAY (16336)
92.89	BUGOS (16302)

Grain Quality Traits

Milling Recovery (%)
- Brown Rice : 77.3 (F)
- Milled Rice : 68.7 (G1)
- Head Rice : 57.5 (Pr)

Physical Attributes
- Grain Length (mm) : 6.3 (M)
- Grain Shape : 2.4 (I)
- Chalky Grains (%) : 5.2 (G2)

Physicochemical Properties
- Amylose Content : 2.1 (VL)
- Gelatinization Temperature : 4.1 (I)
- Crude Protein Content (%) : 7.4

Agronomic Characteristics

- Plant Height (cm) : 117.3
- Heading Days After Seeding : 105
- Maturity Days After Seeding : 135
- Basal Leaf Sheath Color : 1 (Green)
- Anthocyanin Color : 0 (Absent)
- Leaf Blade Pubescence : 3 (Pubescent)
- Auricle Color : 2 (Yellowish green)
- Collar Color : 2 (Light green)
- Awn Distribution : 1 (Tip only)
- Panicle Exsertion : 5 (Just exserted)
- Lodging Resistance : 5 (Intermediate)
- Leaf Senescence : 5 (Intermediate)
- Panicle Shattering : 5 (Moderate)
- Endosperm Type : 3 (Glutinous)

NITOY

Negros Oriental
Collection No. 16537

NITOY-16537	
% Genetic Similarity	Other Genotypes
97.61	7 TONNER (16538)
93.13	DIAMOND X (16510)
93.08	IR 64
92.99	NSIC Rc 294
92.88	PSB Rc 10

Grain Quality Traits

Milling Recovery (%)
- Brown Rice : 80.5 (F)
- Milled Rice : 67.9 (G1)
- Head Rice : 40.5 (G2)

Physical Attributes
- Grain Length (mm) : 6.9 (L)
- Grain Shape : 3.2 (S)
- Chalky Grains (%) : 18.2 (aa)

Physicochemical Properties
- Amylose Content : 17.3 (I)
- Gelatinization Temperature : 4.1 (I)
- Crude Protein Content (%) : 7.7

Agronomic Characteristics

Plant Height (cm) : 106.6
Heading Days After Seeding : 78
Maturity Days After Seeding : 108
Basal Leaf Sheath Color : 2 (Green with purple lines)
Anthocyanin Color : 3 (Weak)
Leaf Blade Pubescence : 3 (Pubescent)
Auricle Color : 4 (Light purple)
Collar Color : 4 (Purple lines)
Awn Distribution : 0 (None)
Panicle Exsertion : 7 (Moderately well exserted)
Lodging Resistance : 5 (Intermediate)
Leaf Senescence : 5 (Intermediate)
Panicle Shattering : 5 (Moderate)
Endosperm Type : 1 (Non-glutinous)

MIRACLE

Negros Occidental
Collection No.16084

MIRACLE-16084	
% Genetic Similarity	Other Genotypes
96.32	ROSANA (16092)
93.06	ROSANA (16089)
91.79	PSB Rc 10
91.64	DIAMOND X (16510)
90.79	NSIC Rc 420

Grain Quality Traits

Milling Recovery (%)
- Brown Rice : 75.6 (F)
- Milled Rice : 68.4 (G1)
- Head Rice : 53.4 (G1)

Physical Attributes
- Grain Length (mm) : 6.0 (M)
- Grain Shape : 2.9 (I)
- Chalky Grains (%) : 14.9 (G3)

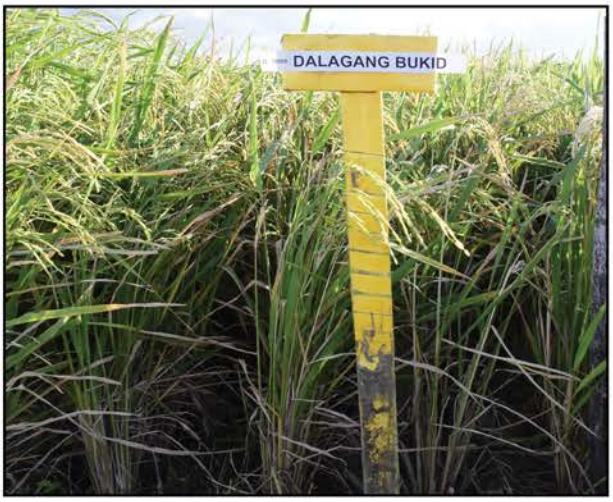
Physicochemical Properties
- Amylose Content : 20.2 (I)
- Gelatinization Temperature : 5.1 (I/L)
- Crude Protein Content (%) : 9.6

Agronomic Characteristics

Plant Height (cm) : 98.7
Heading Days After Seeding : 83
Maturity Days After Seeding : 113
Basal Leaf Sheath Color : 1 (Green)
Anthocyanin Color : 0 (Absent)
Leaf Blade Pubescence : 3 (Pubescent)
Auricle Color : 2 (Yellowish green)
Collar Color : 2 (Light green)
Awn Distribution : 0 (None)
Panicle Exsertion : 5 (Just exserted)
Lodging Resistance : 5 (Intermediate)
Leaf Senescence : 5 (Intermediate)
Panicle Shattering : 5 (Moderate)
Endosperm Type : 2 (Intermediate)

DALAGANG BUKID

Negros Occidental
Collection No.16085



DALAGANG BUKID-16085	
% Genetic Similarity	Other Genotypes
99.82	BARAKO 64 (16437)
96.22	DALING-DALING (16203)
93.18	ABANGAY (16336)
93.08	216 (16399)
93.03	TAP 1 (16394)

Grain Quality Traits

Milling Recovery (%)
- Brown Rice : 77.2 (F)
- Milled Rice : 70.0 (G1)
- Head Rice : 32.8 (G3)

Physical Attributes
- Grain Length (mm) : 6.4 (M)
- Grain Shape : 2.8 (G1)
- Chalky Grains (%) : 3.8 (G1)

Physicochemical Properties
- Amylose Content (%) : 24.3 (H)
- Gelatinization Temperature : 5.8 (I/L)
- Crude Protein Content (%) : 8.7

Agronomic Characteristics

Plant Height (cm) : 137.1
Heading Days After Seeding : 91
Maturity Days After Seeding : 121
Basal Leaf Sheath Color : 2 (Green with purple lines)
Anthocyanin Color : 3 (Weak)
Leaf Blade Pubescence : 3 (Pubescent)
Auricle Color : 5 (Purple lines)
Collar Color : 4 (Purple lines)
Awn Distribution : 0 (None)
Panicle Exsertion : 7 (Moderately well-exserted)
Lodging Resistance : 1 (Very weak)
Leaf Senescence : 5 (Intermediate)
Panicle Shattering : 5 (Moderate)
Endosperm Type : 1 (Non-glutinous)

VIETNAM

Negros Occidental Collection No.16088

VIETNAM-16088	
% Genetic Similarity	Other Genotypes
92.86	URAB (16091)
92.56	VIETNAM (16077)
91.27	PSB Rc 10
91.12	ABANGAY (16336)
91.11	KAMOROS (16358)

Grain Quality Traits

Milling Recovery (%)
- Brown Rice : 73.5 (P)
- Milled Rice : 66.5 (G1)
- Head Rice : 59.6 (Pr)

Physical Attributes
- Grain Length (mm) : 6.7 (L)
- Grain Shape : 2.6 (I)
- Chalky Grains (%) : 14.9 (G3)

Physicochemical Properties
- Amylose Content (%) : 19.8 (L)
- Gelatinization Temperature : 4.7 (I)
- Crude Protein Content (%) : 7.8

Agronomic Characteristics

Plant Height (cm) : 112.7
Heading Days After Seeding : 83
Maturity Days After Seeding : 113
Basal Leaf Sheath Color : 1 (Green)
Anthocyanin Color : 0 (Absent)
Leaf Blade Pubescence : 3 (Pubescent)
Auricle Color : 2 (Yellowish green)
Collar Color : 2 (Light green)
Awn Distribution : 0 (None)
Panicle Exsertion : 7 (Moderately well exserted)
Lodging Resistance : 7 (Strong)
Leaf Senescence : 5 (Intermediate)
Panicle Shattering : 5 (Moderate)
Endosperm Type : 2 (Intermediate)

ROSANA

Negros Occidental
Collection No. 16092

ROSANA-16092	
% Genetic Similarity	Other Genotypes
96.32	MIRACLE (16084)
93.73	ROSANA (16089)
92.11	PSB Rc 10
91.34	DIAMOND X (16510)
91.23	NSIC Rc 420

Grain Quality Traits

Milling Recovery (%)
- Brown Rice : 76.6 (F)
- Milled Rice : 68.9 (G1)
- Head Rice : 55.2 (G1)

Physical Attributes
- Grain Length (mm) : 7.0 (L)
- Grain Shape : 3.2 (S)
- Chalky Grains (%) : 12.7 (G3)

Physicochemical Properties
- Amylose Content (%) : 26.9 (H)
- Gelatinization Temperature : 5.1 (I/L)
- Crude Protein Content (%) : 7.1

Agronomic Characteristics

Plant Height (cm) : 114.5
Heading Days After Seeding : 83
Maturity Days After Seeding : 113
Basal Leaf Sheath Color : 1 (Green)
Anthocyanin Color : 0 (Absent)
Leaf Blade Pubescence : 3 (Pubescent)
Auricle Color : 2 (Yellowish green)
Collar Color : 2 (Light green)
Awn Distribution : 0 (None)
Panicle Exsertion : 7 (Moderately well-exserted)
Lodging Resistance : 7 (Strong)
Leaf Senescence : 5 (Intermediate)
Panicle Shattering : 5 (Moderate)
Endosperm Type : 2 (Intermediate)

DESTINY

Negros Occidental
Collection No. 16093

DESTINY-16093	
% Genetic Similarity	Other Genotypes
100.00	IL-29 (15513)
100.00	SUPER DIAMOND (15558)
100.00	COMBAT (15969)
100.00	MASIGASIG 88 (16503)
100.00	MESTIZA (15886)
100.00	BELENA 205 (15583)
100.00	GSR 12 (15976)
100.00	TOP RICE (15556)
100.00	DREAM RICE (15570)

Grain Quality Traits

Milling Recovery (%)
- Brown Rice : 79.2 (F)
- Milled Rice : 69.7 (G1)
- Head Rice : 54.2 (G1)

Physical Attributes
- Grain Length (mm) : 6.6 (L)
- Grain Shape : 2.8 (I)
- Chalky Grains (%) : 4.4 (G1)

Physicochemical Properties
- Amylose Content (%) : 21.7 (I)
- Gelatinization Temperature : 4.3 (I)
- Crude Protein Content (%) : 8.6

Agronomic Characteristics

Plant Height (cm) : 102.4
Heading Days After Seeding : 104
Maturity Days After Seeding : 134
Basal Leaf Sheath Color : 1 (Green)
Anthocyanin Color : 0 (Absent)
Leaf Blade Pubescence : 3 (Pubescent)
Auricle Color : 2 (Yellowish green)
Collar Color : 2 (Light green)
Awn Distribution : 0 (None)
Panicle Exsertion : 7 (Moderately well-exserted)
Lodging Resistance : 9 (Very strong)
Leaf Senescence : 5 (Intermediate)
Panicle Shattering : 5 (Moderate)
Endosperm Type : 1 (Non-glutinous)

7 TONNER

Negros Occidental
Collection No. 16538

7 TONNER-16538	
% Genetic Similarity	Other Genotypes
97.61	NITOY (16537)
94.04	IR 64
92.66	DIAMOND X (16510)
92.29	PSB Rc 10
92.10	NSIC Rc 298

Grain Quality Traits

Milling Recovery (%)
- Brown Rice : 77.1 (F)
- Milled Rice : 66.6 (G1)
- Head Rice : 50.3 (G1)

Physical Attributes
- Grain Length (mm) : 7.1 (L)
- Grain Shape : 3.2 (S)
- Chalky Grains (%) : 5.2 (G2)

Physicochemical Properties
- Amylose Content (%) : 20.0 (I)
- Gelatinization Temperature : 3.9 (I)
- Crude Protein Content (%) : 7.1

Agronomic Characteristics

Plant Height (cm) : 97.7
Heading Days After Seeding : 82
Maturity Days After Seeding : 112
Basal Leaf Sheath Color : 1 (Green)
Anthocyanin Color : 0 (Absent)
Leaf Blade Pubescence : 3 (Pubescent)
Auricle Color : 2 (Yellowish green)
Collar Color : 2 (Light green)
Awn Distribution : 0 (None)
Panicle Exsertion : 7 (Moderately well exserted)
Lodging Resistance : 7 (Strong)
Leaf Senescence : 5 (Intermediate)
Panicle Shattering : 5 (Moderate)
Endosperm Type : 1 (Non-glutinous)

FGRG COLLECTIONS FROM REGIONS 9 AND 12

3-MILLION

North Cotabato
Collection No. 15457

3-MILLION-15457	
% Genetic Similarity	Other Genotypes
99.05	BODO-BODO (15955)
98.81	BODO-BODO (AGUSAN) (16327)
98.31	RED 18 (16086)
98.27	YANAM (16314)
97.92	JASMIN (15661)

Grain Quality Traits

Milling Recovery (%)
- Brown Rice : 77.9 (F)
- Milled Rice : 72.6 (Pr)
- Head Rice : 66.5 (Pr)

Physical Attributes
- Grain Length (mm) : 6.6 (L)
- Grain Shape : 2.7 (I)
- Chalky Grains (%) : 3.7 (G1)

Physicochemical Properties
- Amylose Content (%) : 22.5 (H)
- Gelatinization Temperature : 4.7 (I)
- Crude Protein Content (%) : 8.6

Agronomic Characteristics

Plant Height (cm) : 115.3
Heading Days After Seeding : 92
Maturity Days After Seeding : 122
Basal Leaf Sheath Color : 1 (Green)
Anthocyanin Color : 0 (Absent)
Leaf Blade Pubescence : 3 (Pubescent)
Auricle Color : 2 (Yellowish green)
Collar Color : 2 (Light green)
Awn Distribution : 0 (None)
Panicle Exsertion : 5 (Just exserted)
Lodging Resistance : 9 (Very strong)
Leaf Senescence : 5 (Intermediate)
Panicle Shattering : 5 (Moderate)
Endosperm Type : 2 (Intermediate)

KULAPO

North Cotabato
Collection No. 15505

KULAPO-15505	
% Genetic Similarity	Other Genotypes
98.91	CARGIL (16070)
98.91	JAPANIRI (15555)
93.53	V5 (16517)
91.96	DIAMOND X (16510)
91.93	ROSANA (16089)

Grain Quality Traits

Milling Recovery (%)
- Brown Rice : 78.4 (F)
- Milled Rice : 70.8 (Pr)
- Head Rice : 57.1 (Pr)

Physical Attributes
- Grain Length (mm) : 6.3 (M)
- Grain Shape : 2.9 (I)
- Chalky Grains (%) : 1.6 (Pr)

Physicochemical Properties
- Amylose Content : 22.5 (H)
- Gelatinization Temperature : 3.6 (H/HI/I)
- Crude Protein Content (%) : 8.9

Agronomic Characteristics

Plant Height (cm) : 112.6
Heading Days After Seeding : 93
Maturity Days After Seeding : 123
Basal Leaf Sheath Color : 1 (Green)
Anthocyanin Color : 0 (Absent)
Leaf Blade Pubescence : 3 (Pubescent)
Auricle Color : 2 (Yellowish green)
Collar Color : 2 (Light green)
Awn Distribution : 0 (None)
Panicle Exsertion : 5 (Just exserted)
Lodging Resistance : 5 (Intermediate)
Leaf Senescence : 5 (Intermediate)
Panicle Shattering : 5 (Moderate)
Endosperm Type : 1 (Non-glutinous)

3 MILLION

North Cotabato
Collection No.16329

3 MILLION-16329	
% Genetic Similarity	Other Genotypes
95.22	DIAMOND X (16510)
95.15	M5-BD (16370)
94.81	NSIC Rc 420
94.80	DIAMOND X (16062)
94.78	UP & DOWN (15877)

Grain Quality Traits

Milling Recovery (%)
- Brown Rice : 77.2 (F)
- Milled Rice : 69.1 (G1)
- Head Rice : 60.0 (Pr)

Physical Attributes
- Grain Length (mm) : 6.3 (M)
- Grain Shape : 2.7 (I)
- Chalky Grains (%) : 5.1 (G2)

Physicochemical Properties
- Amylose Content (%) : 20.3 (I)
- Gelatinization Temperature : 5.2 (I/L)
- Crude Protein Content (%) : 7.6

Agronomic Characteristics

Plant Height (cm) : 110.0
Heading Days After Seeding : 90
Maturity Days After Seeding : 120
Basal Leaf Sheath Color : 1 (Green)
Anthocyanin Color : 0 (Absent)
Leaf Blade Pubescence : 3 (Pubescent)
Auricle Color : 2 (Yellowish green)
Collar Color : 2 (Light green)
Awn Distribution : 0 (None)
Panicle Exsertion : 5 (Just exserted)
Lodging Resistance : 3 (Weak)
Leaf Senescence : 5 (Intermediate)
Panicle Shattering : 5 (Moderate)
Endosperm Type : 1 (Non-glutinous)

INDEX 6

North Cotabato
Collection No.15455

INDEX 6-15455	
% Genetic Similarity	Other Genotypes
99.97	INDEX 6 (16310)
98.96	INDEX 2 (16301)
95.48	INDEX-2 (15939)
95.26	NSIC Rc 420
93.02	DIAMOND X (16062)

Grain Quality Traits

Milling Recovery (%)
- Brown Rice : 78.6 (F)
- Milled Rice : 72.8 (Pr)
- Head Rice : 35.3 (G3)

Physical Attributes
- Grain Length (mm) : 6.7 (L)
- Grain Shape : 3.0 (I)
- Chalky Grains (%) : 14.8 (G3)

Physicochemical Properties
- Amylose Content (%) : 23.5 (H)
- Gelatinization Temperature : 4.1 (I)
- Crude Protein Content (%) : 7.1

Agronomic Characteristics

Plant Height (cm) : 115.0
Heading Days After Seeding : 91
Maturity Days After Seeding : 121
Basal Leaf Sheath Color : 1 (Green)
Anthocyanin Color : 0 (Absent)
Leaf Blade Pubescence : 3 (Pubescent)
Auricle Color : 2 (Yellowish green)
Collar Color : 2 (Light green)
Awn Distribution : 0 (None)
Panicle Exsertion : 5 (Just exserted)
Lodging Resistance : 9 (Very strong)
Leaf Senescence : 5 (Intermediate)
Panicle Shattering : 5 (Moderate)
Endosperm Type : 1 (Non-glutinous)

DASH-12

North Cotabato
Collection No.15456

DASH-12-15456	
% Genetic Similarity	Other Genotypes
97.81	DASH 12 (16335)
97.10	REALINE (15591)
94.00	DIAMOND X (16510)
93.72	M 41 (16317)
93.46	NSIC Rc 120

Grain Quality Traits

Milling Recovery (%)
- Brown Rice : 79.3 (F)
- Milled Rice : 74.1 (Pr)
- Head Rice : 41.0 (G2)

Physical Attributes
- Grain Length (mm) : 6.7 (L)
- Grain Shape : 2.8 (I)
- Chalky Grains (%) : 15.1 (aa)

Physicochemical Properties
- Amylose Content (%) : 21.5 (I)
- Gelatinization Temperature : 4.0 (I)
- Crude Protein Content (%) : 7.3

Agronomic Characteristics

- Plant Height (cm) : 108.5
- Heading Days After Seeding : 104
- Maturity Days After Seeding : 134
- Basal Leaf Sheath Color : 1 (Green)
- Anthocyanin Color : 0 (Absent)
- Leaf Blade Pubescence : 3 (Pubescent)
- Auricle Color : 2 (Yellowish green)
- Collar Color : 2 (Light green)
- Awn Distribution : 4 (Upper three quarters only)
- Panicle Exsertion : 5 (Just exserted)
- Lodging Resistance : 5 (Intermediate)
- Leaf Senescence : 5 (Intermediate)
- Panicle Shattering : 5 (Moderate)
- Endosperm Type : 1 (Non-glutinous)

M-41

North Cotabato
Collection No.15458

M-41-15458	
% Genetic Similarity	Other Genotypes
96.64	PLATOON X (16334)
94.27	M 41 (16317)
94.20	IR 64
93.71	NSIC Rc 298
93.37	DIAMOND X (16510)

Grain Quality Traits

Milling Recovery (%)
- Brown Rice : 78.7 (F)
- Milled Rice : 73.2 (Pr)
- Head Rice : 57.5 (Pr)

Physical Attributes
- Grain Length (mm) : 6.5 (M)
- Grain Shape : 2.9 (I)
- Chalky Grains (%) : 4.4 (G1)

Physicochemical Properties
- Amylose Content (%) : 21.8 (I)
- Gelatinization Temperature : 5.8 (I/L)
- Crude Protein Content (%) : 7.8

Agronomic Characteristics

Plant Height (cm) : 124.8
Heading Days After Seeding : 92
Maturity Days After Seeding : 122
Basal Leaf Sheath Color : 1 (Green)
Anthocyanin Color : 0 (Absent)
Leaf Blade Pubescence : 3 (Pubescent)
Auricle Color : 2 (Yellowish green)
Collar Color : 2 (Light green)
Awn Distribution : 0 (None)
Panicle Exsertion : 5 (Just exserted)
Lodging Resistance : 7 (Strong)
Leaf Senescence : 5 (Intermediate)
Panicle Shattering : 5 (Moderate)
Endosperm Type : 2 (Intermediate)

INDEX 6

North Cotabato
Collection No. 16310

INDEX 6-16310	
% Genetic Similarity	Other Genotypes
99.97	INDEX 6 (16310)
98.94	INDEX 2 (16301)
95.49	INDEX-2 (15939)
95.26	NSIC Rc 420
93.02	DIAMOND X (16062)

Grain Quality Traits

Milling Recovery (%)
- Brown Rice : 77.4 (F)
- Milled Rice : 69.0 (G1)
- Head Rice : 48.4 (G1)

Physical Attributes
- Grain Length (mm) : 7.0 (L)
- Grain Shape : 3.2 (S)
- Chalky Grains (%) : 11.7 (G3)

Physicochemical Properties
- Amylose Content : 21.2 (I)
- Gelatinization Temperature : 3.0 (H/I)
- Crude Protein Content (%) : 7.0

Agronomic Characteristics

Plant Height (cm) : 109.9
Heading Days After Seeding : 91
Maturity Days After Seeding : 121
Basal Leaf Sheath Color : 1 (Green)
Anthocyanin Color : 0 (Absent)
Leaf Blade Pubescence : 3 (Pubescent)
Auricle Color : 2 (Yellowish green)
Collar Color : 2 (Light green)
Awn Distribution : 0 (None)
Panicle Exsertion : 5 (Just exserted)
Lodging Resistance : 9 (Very strong)
Leaf Senescence : 5 (Intermediate)
Panicle Shattering : 5 (Moderate)
Endosperm Type : 2 (Intermediate)

M41

North Cotabato
Collection No.16317

M 41-16317	
% Genetic Similarity	Other Genotypes
95.41	DIAMOND X (16510)
95.22	REALINE (15591)
95.03	DASH 12 (16335)
94.76	216 (16399)
94.51	NSIC Rc 420

Grain Quality Traits

Milling Recovery (%)
- Brown Rice : 76.3 (F)
- Milled Rice : 68.0 (G1)
- Head Rice : 51.8 (G1)

Physical Attributes
- Grain Length (mm) : 6.7 (L)
- Grain Shape : 3.0 (I)
- Chalky Grains (%) : 3.6 (G1)

Physicochemical Properties
- Amylose Content (%) : 19.7 (I)
- Gelatinization Temperature : 5.8 (I/L)
- Crude Protein Content (%) : 8.5

Agronomic Characteristics

- Plant Height (cm) : 112.3
- Heading Days After Seeding : 86
- Maturity Days After Seeding : 116
- Basal Leaf Sheath Color : 1 (Green)
- Anthocyanin Color : 0 (Absent)
- Leaf Blade Pubescence : 3 (Pubescent)
- Auricle Color : 2 (Yellowish green)
- Collar Color : 2 (Light green)
- Awn Distribution : 2 (Upper quarter only)
- Panicle Exsertion : 7 (Moderately well exserted)
- Lodging Resistance : 7 (Strong)
- Leaf Senescence : 5 (Intermediate)
- Panicle Shattering : 5 (Moderate)
- Endosperm Type : 1 (Non-glutinous)

DASH 12

North Cotabato
Collection No. 16335

DASH 12-16335	
% Genetic Similarity	Other Genotypes
98.48	REALINE (15591)
97.81	DASH-12 (15456)
95.21	DIAMOND X (16510)
95.03	M 41 (16317)
94.83	M3 BARAKO (15496)

Grain Quality Traits

Milling Recovery (%)
- Brown Rice : 77.2 (F)
- Milled Rice : 69.2 (G1)
- Head Rice : 60.8 (Pr)

Physical Attributes
- Grain Length (mm) : 6.6 (L)
- Grain Shape : 2.8 (I)
- Chalky Grains (%) : 11.2 (G3)

Physicochemical Properties
- Amylose Content (%) : 20.4 (I)
- Gelatinization Temperature : 4.3 (I/L)
- Crude Protein Content (%) : 7.2

Agronomic Characteristics

Plant Height (cm) : 109.3
Heading Days After Seeding : 104
Maturity Days After Seeding : 134
Basal Leaf Sheath Color : 1 (Green)
Anthocyanin Color : 0 (Absent)
Leaf Blade Pubescence : 3 (Pubescent)
Auricle Color : 2 (Yellowish green)
Collar Color : 2 (Light green)
Awn Distribution : 4 (Upper three quarters only)
Panicle Exsertion : 5 (Just exserted)
Lodging Resistance : 9 (Very strong)
Leaf Senescence : 5 (Intermediate)
Panicle Shattering : 5 (Moderate)
Endosperm Type : 2 (Intermediate)

TITO-TITO

North Cotabato
Collection No.15507

TITO-TITO-15507	
% Genetic Similarity	Other Genotypes
99.96	M3 (SURALLAH) (16428)
99.93	M3 (15499)
99.91	KAMANSING (16030)
99.14	M3 (16087)
98.63	M3-BANGA (16315)

Grain Quality Traits

Milling Recovery (%)
- Brown Rice : 77.5 (F)
- Milled Rice : 68.2 (G1)
- Head Rice : 50.0 (G1)

Physical Attributes
- Grain Length (mm) : 5.9 (M)
- Grain Shape : 2.6 (I)
- Chalky Grains (%) : 1.7 (Pr)

Physicochemical Properties
- Amylose Content (%) : 19.8 (I)
- Gelatinization Temperature : 3.4 (H/I)
- Crude Protein Content (%) : 9.4

Agronomic Characteristics

Plant Height (cm) : 130.4
Heading Days After Seeding : 90
Maturity Days After Seeding : 120
Basal Leaf Sheath Color : 1 (Green)
Anthocyanin Color : 0 (Absent)
Leaf Blade Pubescence : 3 (Pubescent)
Auricle Color : 2 (Yellowish green)
Collar Color : 2 (Light green)
Awn Distribution : 0 (None)
Panicle Exsertion : 7 (Moderately well exserted)
Lodging Resistance : 5 (Intermediate)
Leaf Senescence : 5 (Intermediate)
Panicle Shattering : 5 (Moderate)
Endosperm Type : 1 (Non-glutinous)

MALAYSIAN RICE

North Cotabato
Collection No. 15938

MALAYSIAN RICE-15938	NORTH COTABATO
% Genetic Similarity	Other Genotypes
100.00	INDONESIAN RICE (15940)
99.98	MALAYSIAN RICE (16321)
99.81	DCL-300 (15402)
99.81	DCL-300 (16419)
99.81	JDF 300 PLUS (15553)
99.81	INBRED 300 (15943)

Grain Quality Traits

Milling Recovery (%)
- Brown Rice : 77.9 (F)
- Milled Rice : 69.7 (G1)
- Head Rice : 53.7 (G1)

Physical Attributes
- Grain Length (mm) : 6.9 (L)
- Grain Shape : 2.8 (I)
- Chalky Grains (%) : 12.5 (G3)

Physicochemical Properties
- Amylose Content : 19.3 (I)
- Gelatinization Temperature : 4.1 (I)
- Crude Protein Content (%) : 8.5

Agronomic Characteristics

Plant Height (cm) : 119.5
Heading Days After Seeding : 98
Maturity Days After Seeding : 128
Basal Leaf Sheath Color : 1 (Green)
Anthocyanin Color : 0 (Absent)
Leaf Blade Pubescence : 3 (Pubescent)
Auricle Color : 2 (Yellowish green)
Collar Color : 2 (Light green)
Awn Distribution : 1 (Tip only)
Panicle Exsertion : 7 (Moderately well exserted)
Lodging Resistance : 3 (Weak)
Leaf Senescence : 5 (Intermediate)
Panicle Shattering : 3 (Low)
Endosperm Type : 2 (Intermediate)

DOUBLE DIAMOND

North Cotabato
Collection No.15942

DOUBLE DIAMOND-15942	
% Genetic Similarity	Other Genotypes
100.00	ZAMBOANGA (15945)
100.00	SAMPAGUITA (15948)
100.00	MILAGROSA (15605)
100.00	DIAMOND XX (DOUBLE DIAMOND) (15514)
100.00	UNKNOWN 5 (16189)
100.00	DIAMOND X (15889)
100.00	SUPER KALOY (VIETNAM RICE) (15559)
100.00	ZAMBOANGA (16422)
100.00	DOUBLE DIAMOND (MLANG) (16333)

Grain Quality Traits

Milling Recovery (%)
- Brown Rice : 77.3 (P)
- Milled Rice : 65.4 (G1)
- Head Rice : 20.2 (aa)

Physical Attributes
- Grain Length (mm) : 7.0 (L)
- Grain Shape : 3.1 (S)
- Chalky Grains (%) : 7.8 (G2)

Physicochemical Properties
- Amylose Content (%) : 14.5 (L)
- Gelatinization Temperature : 6.0 (L)
- Crude Protein Content (%) : 7.3

Agronomic Characteristics

- Plant Height (cm) : 113.2
- Heading Days After Seeding : 104
- Maturity Days After Seeding : 134
- Basal Leaf Sheath Color : 1 (Green)
- Anthocyanin Color : 0 (Absent)
- Leaf Blade Pubescence : 3 (Pubescent)
- Auricle Color : 2 (Yellowish green)
- Collar Color : 2 (Light green)
- Awn Distribution : 3 (Upper half only)
- Panicle Exsertion : 5 (Just exserted)
- Lodging Resistance : 9 (Very strong)
- Leaf Senescence : 5 (Intermediate)
- Panicle Shattering : 5 (Moderate)
- Endosperm Type : 1 (Non-glutinous)

BUGOS

North Cotabato
Collection No.16302

BUGOS-16302	
% Genetic Similarity	Other Genotypes
93.76	SUPER DX (16425)
93.74	NSIC Rc 222
93.73	SENORITA PILIT (16316)
93.66	DIAMOND X (15560)
93.64	DIAMOND X (15512)

Grain Quality Traits

Milling Recovery (%)
- Brown Rice : 76.7 (F)
- Milled Rice : 67.3 (G1)
- Head Rice : 48.6 (G1)

Physical Attributes
- Grain Length (mm) : 6.9 (L)
- Grain Shape : 2.8 (I)
- Chalky Grains (%) : 4.5 (G1)

Physicochemical Properties
- Amylose Content (%) : 19.9 (I)
- Gelatinization Temperature : 3.2 (H/HI/I)
- Crude Protein Content (%) : 7.3

Agronomic Characteristics

Plant Height (cm) : 127.1
Heading Days After Seeding : 96
Maturity Days After Seeding : 126
Basal Leaf Sheath Color : 1 (Green)
Anthocyanin Color : 0 (Absent)
Leaf Blade Pubescence : 3 (Pubescent)
Auricle Color : 2 (Yellowish green)
Collar Color : 2 (Light green)
Awn Distribution : 0 (None)
Panicle Exsertion : 5 (Just exserted)
Lodging Resistance : 5 (Intermediate)
Leaf Senescence : 5 (Intermediate)
Panicle Shattering : 5 (Moderate)
Endosperm Type : 2 (Intermediate)

MALAYSIAN RICE

North Cotabato
Collection No.16321

MALAYSIAN RICE-16321	
% Genetic Similarity	Other Genotypes
99.98	DCL-300 (16419)
99.98	INDONESIAN RICE (15940)
99.98	MALAYSIAN RICE (15938)
99.98	DCL-300 (15402)
99.98	JDF 300 PLUS (15553)
99.98	INBRED 300 (15943)

Grain Quality Traits

Milling Recovery (%)
- Brown Rice : 77.5 (F)
- Milled Rice : 69.7 (G1)
- Head Rice : 59.7 (Pr)

Physical Attributes
- Grain Length (mm) : 6.8 (L)
- Grain Shape : 2.9 (I)
- Chalky Grains (%) : 13.1 (G3)

Physicochemical Properties
- Amylose Content (%) : 18.0 (I)
- Gelatinization Temperature : 3.3 (H/I)
- Crude Protein Content (%) : 7.7

Agronomic Characteristics

Plant Height (cm) : 109.0
Heading Days After Seeding : 91
Maturity Days After Seeding : 121
Basal Leaf Sheath Color : 1 (Green)
Anthocyanin Color : 0 (Absent)
Leaf Blade Pubescence : 3 (Pubescent)
Auricle Color : 2 (Yellowish green)
Collar Color : 2 (Light green)
Awn Distribution : 2 (Upper quarter only)
Panicle Exsertion : 5 (Just exserted)
Lodging Resistance : 9 (Very strong)
Leaf Senescence : 5 (Intermediate)
Panicle Shattering : 5 (Moderate)
Endosperm Type : 2 (Intermediate)

DOUBLE DIAMOND (MLANG)

North Cotabato
Collection No. 16333

DOUBLE DIAMOND (MLANG)-16333	
% Genetic Similarity	Other Genotypes
100.00	ZAMBOANGA (15945)
100.00	SAMPAGUITA (15948)
100.00	MILAGROSA (15605)
100.00	DOUBLE DIAMOND (15942)
100.00	DIAMOND XX (DOUBLE DIAMOND) (15514)
100.00	UNKNOWN 5 (16189)
100.00	DIAMOND X (15889)
100.00	SUPER KALOY (VIETNAM RICE) (15559)
100.00	ZAMBOANGA (16422)

Grain Quality Traits

Milling Recovery (%)
- Brown Rice : 75.1 (F)
- Milled Rice : 66.4 (G1)
- Head Rice : 59.5 (Pr)

Physical Attributes
- Grain Length (mm) : 7.2 (L)
- Grain Shape : 3.1 (S)
- Chalky Grains (%) : 1.7 (Pr)

Physicochemical Properties
- Amylose Content (%) : 15.3 (L
- Gelatinization Temperature : 5.6 (I/L)
- Crude Protein Content (%) : 6.2

Agronomic Characteristics

Plant Height (cm) : 110.8
Heading Days After Seeding : 91
Maturity Days After Seeding : 121
Basal Leaf Sheath Color : 1 (Green)
Anthocyanin Color : 0 (Absent)
Leaf Blade Pubescence : 3 (Pubescent)
Auricle Color : 2 (Yellowish green)
Collar Color : 2 (Light green)
Awn Distribution : 2 (Upper quarter only)
Panicle Exsertion : 5 (Just exserted)
Lodging Resistance : 5 (Intermediate)
Leaf Senescence : 5 (Intermediate)
Panicle Shattering : 5 (Moderate)
Endosperm Type : 1 (Non-glutinous)

PLATOON X

North Cotabato
Collection No.16334

PLATOON X-16334	
% Genetic Similarity	Other Genotypes
96.64	M-41 (15458)
94.45	M 41 (16317)
94.35	IR 64
94.00	DIAMOND X (16510)
93.84	NSIC Rc 420

Grain Quality Traits

Milling Recovery (%)
- Brown Rice : 76.4 (F)
- Milled Rice : 67.9 (G1)
- Head Rice : 61.9 (Pr)

Physical Attributes
- Grain Length (mm) : 6.5 (M)
- Grain Shape : 2.9 (I)
- Chalky Grains (%) : 9.6 (G2)

Physicochemical Properties
- Amylose Content (%) : 20.2 (I)
- Gelatinization Temperature : 4.8 (I/L)
- Crude Protein Content (%) : 7.6

Agronomic Characteristics

Plant Height (cm) : 119.0
Heading Days After Seeding : 90
Maturity Days After Seeding : 120
Basal Leaf Sheath Color : 1 (Green)
Anthocyanin Color : 0 (Absent)
Leaf Blade Pubescence : 3 (Pubescent)
Auricle Color : 2 (Yellowish green)
Collar Color : 2 (Light green)
Awn Distribution : 3 (Upper half only)
Panicle Exsertion : 7 (Moderately well exserted)
Lodging Resistance : 7 (Strong)
Leaf Senescence : 5 (Intermediate)
Panicle Shattering : 5 (Moderate)
Endosperm Type : 1 (Non-glutinous)

BODIDOY

North Cotabato
Collection No.15459

BODIDOY-15459	
% Genetic Similarity	Other Genotypes
92.74	ABANGAY (16336)
91.85	3-MILLION (15457)
91.45	JASMIN (15661)
91.38	216 (16399)
91.35	KAMOROS (16358)

Grain Quality Traits

Milling Recovery (%)
- Brown Rice : 77.7 (F)
- Milled Rice : 74.0 (Pr)
- Head Rice : 65.2 (Pr)

Physical Attributes
- Grain Length (mm) : 5.2 (Sh)
- Grain Shape : 1.8 (B)
- Chalky Grains (%) : 11.0 (G3)

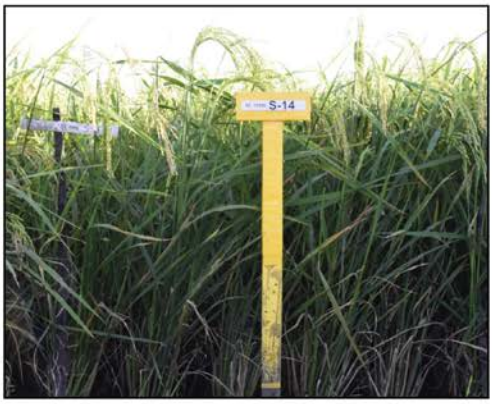
Physicochemical Properties
- Amylose Content (%) : 19.7 (I)
- Gelatinization Temperature : 4.6 (I)
- Crude Protein Content (%) : 7.2

Agronomic Characteristics

Plant Height (cm) : 146.2
Heading Days After Seeding : 104
Maturity Days After Seeding : 134
Basal Leaf Sheath Color : 1 (Green)
Anthocyanin Color : 0 (Absent)
Leaf Blade Pubescence : 3 (Pubescent)
Auricle Color : 2 (Yellowish green)
Collar Color : 2 (Light green)
Awn Distribution : 0 (None)
Panicle Exsertion : 7 (Moderately well exserted)
Lodging Resistance : 3 (Weak)
Leaf Senescence : 5 (Intermediate)
Panicle Shattering : 5 (Moderate)
Endosperm Type : 1 (Non-glutinous)

S-14

South Cotabato
Collection No. 15508



S-14-15508	
% Genetic Similarity	Other Genotypes
98.93	S-14 (16305)
95.53	3-MILLION (15457)
94.31	AZOR 5 (16188)
94.26	KAMANSING (16030)
94.23	M3 (SURALLAH) (16428)

Grain Quality Traits

Milling Recovery (%)
- Brown Rice : 79.8 (F)
- Milled Rice : 73.1 (Pr)
- Head Rice : 60.6 (Pr)

Physical Attributes
- Grain Length (mm) : 5.8 (M)
- Grain Shape : 2.2 (I)
- Chalky Grains (%) : 5.5 (G2)

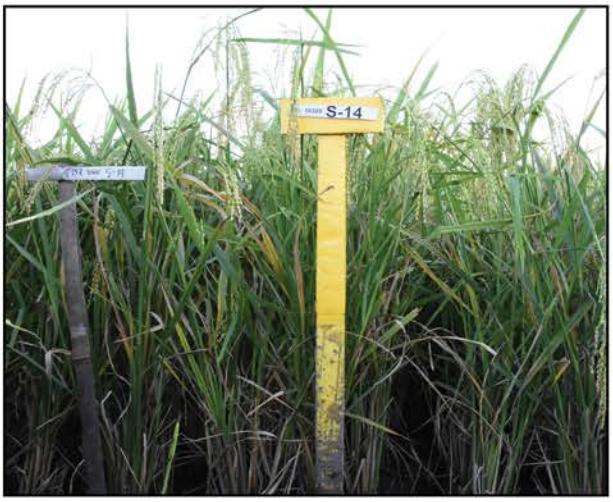
Physicochemical Properties
- Amylose Content (%) : 20.7 (I)
- Gelatinization Temperature : 3.6 (H/HI/I)
- Crude Protein Content (%) : 6.0

Agronomic Characteristics

Plant Height (cm) : 135.5
Heading Days After Seeding : 91
Maturity Days After Seeding : 121
Basal Leaf Sheath Color : 1 (Green)
Anthocyanin Color : 0 (Absent)
Leaf Blade Pubescence : 3 (Pubescent)
Auricle Color : 2 (Yellowish green)
Collar Color : 2 (Light green)
Awn Distribution : 0 (None)
Panicle Exsertion : 5 (Just exserted)
Lodging Resistance : 7 (Strong)
Leaf Senescence : 5 (Intermediate)
Panicle Shattering : 5 (Moderate)
Endosperm Type : 2 (Intermediate)

S-14

North Cotabato
Collection No.16305



S-14-16305	
% Genetic Similarity	Other Genotypes
98.93	S-14 (15508)
94.90	KAMANSING (16030)
94.84	M3 (SURALLAH) (16428)
94.84	TITO-TITO (15507)
94.83	M3 (15499)

Grain Quality Traits

Milling Recovery (%)
- Brown Rice : 78.0 (F)
- Milled Rice : 70.3 (Pr)
- Head Rice : 51.2 (G1)

Physical Attributes
- Grain Length (mm) : 6.0 (M)
- Grain Shape : 2.3 (I)
- Chalky Grains (%) : 5.6 (G2)

Physicochemical Properties
- Amylose Content (%) : 18.6 (I)
- Gelatinization Temperature : 2.0 (H)
- Crude Protein Content (%) : 6.9

Agronomic Characteristics

Plant Height (cm) : 135.4
Heading Days After Seeding : 91
Maturity Days After Seeding : 121
Basal Leaf Sheath Color : 1 (Green)
Anthocyanin Color : 0 (Absent)
Leaf Blade Pubescence : 3 (Pubescent)
Auricle Color : 2 (Yellowish green)
Collar Color : 2 (Light green)
Awn Distribution : 0 (None)
Panicle Exsertion : 5 (Just exserted)
Lodging Resistance : 7 (Strong)
Leaf Senescence : 5 (Intermediate)
Panicle Shattering : 5 (Moderate)
Endosperm Type : 2 (Intermediate)

YANAM

North Cotabato
Collection No.16314

YANAM-16314	
% Genetic Similarity	Other Genotypes
99.14	BODO-BODO (15955)
98.62	BODO-BODO (AGUSAN) (16327)
98.27	3-MILLION (15457)
96.13	SENORITA PILIT (16316)
94.72	JASMIN (15661)

Grain Quality Traits

Milling Recovery (%)
- Brown Rice : 77.8 (F)
- Milled Rice : 69.7 (G1)
- Head Rice : 63.7 (Pr)

Physical Attributes
- Grain Length (mm) : 5.8 (M)
- Grain Shape : 2.4 (I)
- Chalky Grains (%) : 7.0 (G2)

Physicochemical Properties
- Amylose Content (%) : 18.2 (I)
- Gelatinization Temperature : 4.0 (I)
- Crude Protein Content (%) : 7.4

Agronomic Characteristics

- Plant Height (cm) : 124.8
- Heading Days After Seeding : 93
- Maturity Days After Seeding : 123
- Basal Leaf Sheath Color : 1 (Green)
- Anthocyanin Color : 0 (Absent)
- Leaf Blade Pubescence : 3 (Pubescent)
- Auricle Color : 2 (Yellowish green)
- Collar Color : 2 (Light green)
- Awn Distribution : 0 (None)
- Panicle Exsertion : 7 (Moderately well exserted)
- Lodging Resistance : 3 (Weak)
- Leaf Senescence : 5 (Intermediate)
- Panicle Shattering : 5 (Moderate)
- Endosperm Type : 1 (Non-glutinous)

EL GRANDE

North Cotabato
Collection No.15504

EL GRANDE-15504	
% Genetic Similarity	Other Genotypes
98.56	EL GRANDE (16303)
97.22	DIAMOND X (16076)
96.10	MAHARLIKA (16311)
94.33	BWS-6W (16344)
94.33	EXCEL RICE (15571)

Grain Quality Traits

Milling Recovery (%)
- Brown Rice : 77.8 (F)
- Milled Rice : 70.6 (Pr)
- Head Rice : 51.1 (G1)

Physical Attributes
- Grain Length (mm) : 6.7 (L)
- Grain Shape : 3.1 (S)
- Chalky Grains (%) : 1.5 (Pr)

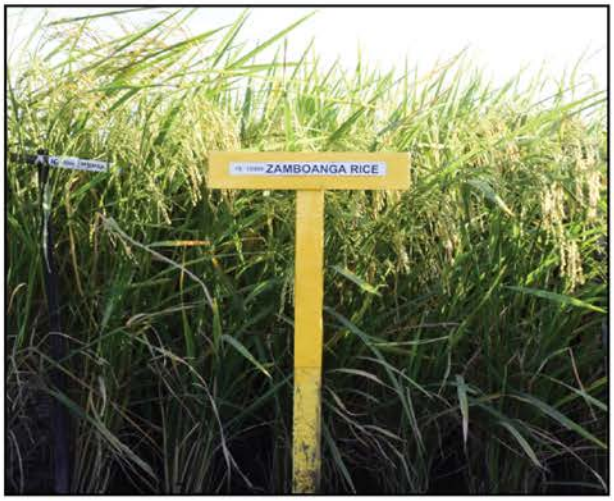
Physicochemical Properties
- Amylose Content (%) : 21.4 (I)
- Gelatinization Temperature : 4.9 (I/L)
- Crude Protein Content (%) : 6.9

Agronomic Characteristics

Plant Height (cm) : 111.5
Heading Days After Seeding : 93
Maturity Days After Seeding : 123
Basal Leaf Sheath Color : 1 (Green)
Anthocyanin Color : 0 (Absent)
Leaf Blade Pubescence : 3 (Pubescent)
Auricle Color : 2 (Yellowish green)
Collar Color : 2 (Light green)
Awn Distribution : 3 (Upper half only)
Panicle Exsertion : 7 (Moderately well exserted)
Lodging Resistance : 7 (Strong)
Leaf Senescence : 5 (Intermediate)
Panicle Shattering : 5 (Moderate)
Endosperm Type : 1 (Non-glutinous)

ZAMBOANGA RICE

North Cotabato
Collection No. 15506



ZAMBOANGA RICE-15506	
% Genetic Similarity	Other Genotypes
99.90	ZAMBOANGA RICE (16300)
95.44	CHICHONG (16323)
92.71	NSIC Rc 420
92.32	ABANGAY (16336)
91.98	I8 (VN) (15890)

Grain Quality Traits

Milling Recovery (%)
- Brown Rice : 78.6 (F)
- Milled Rice : 72.9 (Pr)
- Head Rice : 58.2 (Pr)

Physical Attributes
- Grain Length (mm) : 5.7 (M)
- Grain Shape : 2.4 (I)
- Chalky Grains (%) : 3.0 (G1)

Physicochemical Properties
- Amylose Content (%) : 20.0 (I)
- Gelatinization Temperature : 3.7 (HI/I)
- Crude Protein Content (%) : 7.1

Agronomic Characteristics

Plant Height (cm) : 110.5
Heading Days After Seeding : 91
Maturity Days After Seeding : 121
Basal Leaf Sheath Color : 1 (Green)
Anthocyanin Color : 0 (Absent)
Leaf Blade Pubescence : 3 (Pubescent)
Auricle Color : 2 (Yellowish green)
Collar Color : 2 (Light green)
Awn Distribution : 0 (None)
Panicle Exsertion : 5 (Just exserted)
Lodging Resistance : 7 (Strong)
Leaf Senescence : 5 (Intermediate)
Panicle Shattering : 5 (Moderate)
Endosperm Type : 2 (Intermediate)

ARIGATO

North Cotabato
Collection No.15941

ARIGATO-15941	
% Genetic Similarity	Other Genotypes
98.63	ARIGATO (16318)
96.89	NSIC Rc 128
94.87	DIAMOND X (16510)
94.24	216 (16399)
93.82	UP & DOWN (15877)

Grain Quality Traits

Milling Recovery (%)
- Brown Rice : 77.7 (F)
- Milled Rice : 68.4 (G1)
- Head Rice : 57.2 (Pr)

Physical Attributes
- Grain Length (mm) : 6.7 (L)
- Grain Shape : 3.0 (I)
- Chalky Grains (%) : 3.4 (G1)

Physicochemical Properties
- Amylose Content (%) : 22.1 (H)
- Gelatinization Temperature : 6.8 (I/L)
- Crude Protein Content (%) : 7.2

Agronomic Characteristics

Plant Height (cm) : 128.7
Heading Days After Seeding : 98
Maturity Days After Seeding : 128
Basal Leaf Sheath Color : 1 (Green)
Anthocyanin Color : 0 (Absent)
Leaf Blade Pubescence : 3 (Pubescent)
Auricle Color : 2 (Yellowish green)
Collar Color : 2 (Light green)
Awn Distribution : 0 (None)
Panicle Exsertion : 7 (Moderately well exserted)
Lodging Resistance : 7 (Strong)
Leaf Senescence : 7 (Late)
Panicle Shattering : 5 (Moderate)
Endosperm Type : 1 (Non-glutinous)

ZAMBOANGA RICE

North Cotabato
Collection No.16300

ZAMBOANGA RICE-16300	
% Genetic Similarity	Other Genotypes
99.90	ZAMBOANGA RICE (16300)
95.35	CHICHONG (16323)
92.76	NSIC Rc 420
92.32	ABANGAY (16336)
91.98	I8 (VN) (15890)

Grain Quality Traits

Milling Recovery (%)
- Brown Rice : 78.0 (F)
- Milled Rice : 71.0 (Pr)
- Head Rice : 48.4 (G1)

Physical Attributes
- Grain Length (mm) : 5.7 (M)
- Grain Shape : 2.4 (I)
- Chalky Grains (%) : 6.7 (G2)

Physicochemical Properties
- Amylose Content (%) : 20.8 (I)
- Gelatinization Temperature : 2.6 (H/HI/I)
- Crude Protein Content (%) : 6.7

Agronomic Characteristics

Plant Height (cm) : 105.8
Heading Days After Seeding : 86
Maturity Days After Seeding : 116
Basal Leaf Sheath Color : 1 (Green)
Anthocyanin Color : 0 (Absent)
Leaf Blade Pubescence : 3 (Pubescent)
Auricle Color : 2 (Yellowish green)
Collar Color : 2 (Light green)
Awn Distribution : 0 (None)
Panicle Exsertion : 5 (Just exserted)
Lodging Resistance : 7 (Strong)
Leaf Senescence : 5 (Intermediate)
Panicle Shattering : 5 (Moderate)
Endosperm Type : 2 (Intermediate)

EL GRANDE

North Cotabato
Collection No. 16303

EL GRANDE-16303	
% Genetic Similarity	Other Genotypes
98.56	EL GRANDE (15504)
98.43	DIAMOND X (16076)
97.71	MAHARLIKA (16311)
96.75	EXCEL RICE (15571)
96.73	BWS-6W (16344)

Grain Quality Traits

Milling Recovery (%)
- Brown Rice : 76.6 (F)
- Milled Rice : 68.0 (G1)
- Head Rice : 55.2 (G1)

Physical Attributes
- Grain Length (mm) : 6.8 (L)
- Grain Shape : 3.1 (S)
- Chalky Grains (%) : 2.6 (G1)

Physicochemical Properties
- Amylose Content (%) : 20.8 (I)
- Gelatinization Temperature : 3.1 (H/I)
- Crude Protein Content (%) : 7.6

Agronomic Characteristics

Plant Height (cm) : 108.8
Heading Days After Seeding : 91
Maturity Days After Seeding : 121
Basal Leaf Sheath Color : 1 (Green)
Anthocyanin Color : 0 (Absent)
Leaf Blade Pubescence : 3 (Pubescent)
Auricle Color : 2 (Yellowish green)
Collar Color : 2 (Light green)
Awn Distribution : 0 (None)
Panicle Exsertion : 7 (Moderately well exserted)
Lodging Resistance : 7 (Strong)
Leaf Senescence : 5 (Intermediate)
Panicle Shattering : 5 (Moderate)
Endosperm Type : 1 (Non-glutinous)

ARIGATO

North Cotabato
Collection No. 16318

ARIGATO-16318	
% Genetic Similarity	Other Genotypes
98.63	ARIGATO (15941)
97.22	NSIC Rc 128
95.18	DIAMOND X (16510)
94.62	216 (16399)
93.85	UP & DOWN (15877)

Grain Quality Traits

Milling Recovery (%)
- Brown Rice : 75.6 (F)
- Milled Rice : 67.4 (G1)
- Head Rice : 58.7 (Pr)

Physical Attributes
- Grain Length (mm) : 7.0 (L)
- Grain Shape : 3.2 (S)
- Chalky Grains (%) : 1.8 (Pr)

Physicochemical Properties
- Amylose Content (%) : 21.8 (I)
- Gelatinization Temperature : 5.9 (I/L)
- Crude Protein Content (%) : 7.0

Agronomic Characteristics

Plant Height (cm) : 112.4
Heading Days After Seeding : 97
Maturity Days After Seeding : 127
Basal Leaf Sheath Color : 1 (Green)
Anthocyanin Color : 0 (Absent)
Leaf Blade Pubescence : 3 (Pubescent)
Auricle Color : 2 (Yellowish green)
Collar Color : 2 (Light green)
Awn Distribution : 4 (Upper three quarters only)
Panicle Exsertion : 7 (Moderately well exserted)
Lodging Resistance : 9 (Very strong)
Leaf Senescence : 5 (Intermediate)
Panicle Shattering : 5 (Moderate)
Endosperm Type : 1 (Non-glutinous)

U.S.A.

North Cotabato
Collection No. 16330

USA-16330	
% Genetic Similarity	Other Genotypes
92.71	NSIC Rc 420
92.41	M 41 (16317)
92.36	216 (16399)
92.03	DIAMOND X (16510)
91.85	AZOR 5 (16188)

Grain Quality Traits

Milling Recovery (%)
- Brown Rice : 76.8 (F)
- Milled Rice : 67.3 (G1)
- Head Rice : 58.8 (Pr)

Physical Attributes
- Grain Length (mm) : 7.2 (L)
- Grain Shape : 3.3 (S)
- Chalky Grains (%) : 2.5 (G1)

Physicochemical Properties
- Amylose Content (%) : 16.8 (L)
- Gelatinization Temperature : 5.4 (I/L)
- Crude Protein Content (%) : 7.1

Agronomic Characteristics

Plant Height (cm) : 116.0
Heading Days After Seeding : 92
Maturity Days After Seeding : 122
Basal Leaf Sheath Color : 1 (Green)
Anthocyanin Color : 0 (Absent)
Leaf Blade Pubescence : 3 (Pubescent)
Auricle Color : 2 (Yellowish green)
Collar Color : 2 (Light green)
Awn Distribution : 2 (Upper quarter only)
Panicle Exsertion : 5 (Just exserted)
Lodging Resistance : 9 (Very strong)
Leaf Senescence : 5 (Intermediate)
Panicle Shattering : 5 (Moderate)
Endosperm Type : 1 (Non-glutinous)

INDEX-2

South Cotabato
Collection No.15939

INDEX-2-15939	
% Genetic Similarity	Other Genotypes
96.49	INDEX 2 (16301)
95.49	INDEX 6 (16310)
95.48	INDEX 6 (15455)
94.57	NSIC Rc 420
93.26	DIAMOND X (16510)

Grain Quality Traits

Milling Recovery (%)
- Brown Rice : 78.3 (F)
- Milled Rice : 70.7 (Pr)
- Head Rice : 42.0 (G2)

Physical Attributes
- Grain Length (mm) : 6.4 (M)
- Grain Shape : 2.8 (I)
- Chalky Grains (%) : 6.3 (G2)

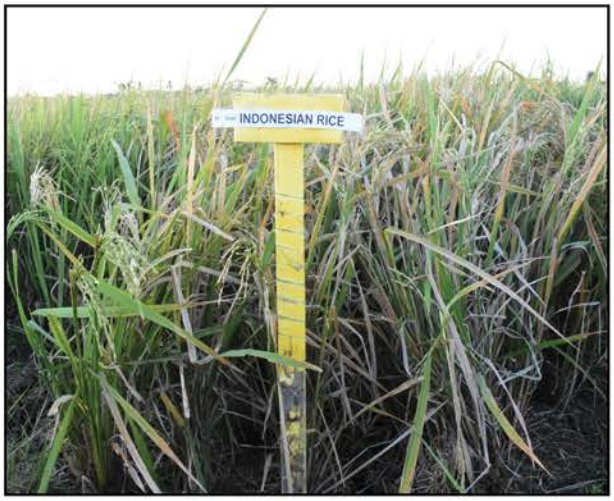
Physicochemical Properties
- Amylose Content (%) : 23.2 (H)
- Gelatinization Temperature : 4.2 (I/L)
- Crude Protein Content (%) : 6.7

Agronomic Characteristics

Plant Height (cm) : 116.5
Heading Days After Seeding : 93
Maturity Days After Seeding : 123
Basal Leaf Sheath Color : 1 (Green)
Anthocyanin Color : 0 (Absent)
Leaf Blade Pubescence : 3 (Pubescent)
Auricle Color : 2 (Yellowish green)
Collar Color : 2 (Light green)
Awn Distribution : 0 (None)
Panicle Exsertion : 5 (Just exserted)
Lodging Resistance : 9 (Very strong)
Leaf Senescence : 5 (Intermediate)
Panicle Shattering : 5 (Moderate)
Endosperm Type : 1 (Non-glutinous)

INDONESIAN RICE

South Cotabato
Collection No. 15940



INDONESIAN RICE-15940	
% Genetic Similarity	Other Genotypes
100.00	MALAYSIAN RICE (15938)
99.98	MALAYSIAN RICE (16321)
99.81	DCL-300 (16419)
99.81	DCL-300 (15402)
99.81	JDF 300 PLUS (15553)

Grain Quality Traits

Milling Recovery (%)
- Brown Rice : 77.6 (F)
- Milled Rice : 70.2 (Pr)
- Head Rice : 57.9 (Pr)

Physical Attributes
- Grain Length (mm) : 7.0 (L)
- Grain Shape : 3.0 (I)
- Chalky Grains (%) : 11.6 (G3)

Physicochemical Properties
- Amylose Content (%) : 20.7 (I)
- Gelatinization Temperature : 4.3 (I/L)
- Crude Protein Content (%) : 7.7

Agronomic Characteristics

Plant Height (cm) : 115.7
Heading Days After Seeding : 91
Maturity Days After Seeding : 121
Basal Leaf Sheath Color : 1 (Green)
Anthocyanin Color : 0 (Absent)
Leaf Blade Pubescence : 3 (Pubescent)
Auricle Color : 2 (Yellowish green)
Collar Color : 2 (Light green)
Awn Distribution : 3 (Upper half only)
Panicle Exsertion : 5 (Just exserted)
Lodging Resistance : 9 (Very strong)
Leaf Senescence : 5 (Intermediate)
Panicle Shattering : 3 (Low)
Endosperm Type : 2 (Intermediate)

INDEX 2

South Cotabato
Collection No. 16301

INDEX 2-16301	
% Genetic Similarity	Other Genotypes
98.96	INDEX 6 (15455)
98.94	INDEX 6 (16310)
96.49	INDEX-2 (15939)
95.53	NSIC Rc 420
93.55	DIAMOND X (16510)

Grain Quality Traits

Milling Recovery (%)
- Brown Rice : 76.5 (P)
- Milled Rice : 68.2 (G1)
- Head Rice : 50.5 (G1)

Physical Attributes
- Grain Length (mm) : 6.8 (L)
- Grain Shape : 3.0 (I)
- Chalky Grains (%) : 3.1 (G1)

Physicochemical Properties
- Amylose Content : 22.5 (H)
- Gelatinization Temperature : 3.7 (H/I)
- Crude Protein Content (%) : 6.7

Agronomic Characteristics

Plant Height (cm) : 117.4
Heading Days After Seeding : 91
Maturity Days After Seeding : 121
Basal Leaf Sheath Color : 1 (Green)
Anthocyanin Color : 0 (Absent)
Leaf Blade Pubescence : 3 (Pubescent)
Auricle Color : 2 (Yellowish green)
Collar Color : 2 (Light green)
Awn Distribution : 0 (None)
Panicle Exsertion : 5 (Just exserted)
Lodging Resistance : 9 (Very strong)
Leaf Senescence : 5 (Intermediate)
Panicle Shattering : 5 (Moderate)
Endosperm Type : 1 (Non-glutinous)

M3-BANGA

South Cotabato
Collection No.16315

M3-BANGA-16315	
% Genetic Similarity	Other Genotypes
98.63	TITO-TITO (15507)
98.59	M3 (SURALLAH) (16428)
98.58	KAMANSING (16030)
98.58	M3 (15499)
97.78	M3 (16087)

Grain Quality Traits

Milling Recovery (%)
- Brown Rice : 77.2 (F)
- Milled Rice : 69.5 (G1)
- Head Rice : 64.2 (Pr)

Physical Attributes
- Grain Length (mm) : 6.1 (M)
- Grain Shape : 2.6 (I)
- Chalky Grains (%) : 2.1 (G1)

Physicochemical Properties
- Amylose Content (%) : 20.3 (I)
- Gelatinization Temperature : 2.0 (H)
- Crude Protein Content (%) : 7.4

Agronomic Characteristics

Plant Height (cm) : 109.7
Heading Days After Seeding : 87
Maturity Days After Seeding : 117
Basal Leaf Sheath Color : 1 (Green)
Anthocyanin Color : 0 (Absent)
Leaf Blade Pubescence : 3 (Pubescent)
Auricle Color : 2 (Yellowish green)
Collar Color : 2 (Light green)
Awn Distribution : 0 (None)
Panicle Exsertion : 5 (Just exserted)
Lodging Resistance : 3 (Weak)
Leaf Senescence : 5 (Intermediate)
Panicle Shattering : 5 (Moderate)
Endosperm Type : 1 (Non-glutinous)

INDONESIAN RICE

South Cotabato
Collection No.16332

INDONESIAN RICE-16332	
% Genetic Similarity	Other Genotypes
95.03	MALAYSIAN RICE (16321)
95.01	DCL-300 (15402)
95.01	DCL-300 (16419)
95.01	INBRED 300 (15943)
95.00	JDF 300 PLUS (15553)

Grain Quality Traits

Milling Recovery (%)
- Brown Rice : 77.1 (F)
- Milled Rice : 69.2 (G1)
- Head Rice : 57.3 (Pr)

Physical Attributes
- Grain Length (mm) : 7.1 (L)
- Grain Shape : 3.1 (S)
- Chalky Grains (%) : 8.4 (G2)

Physicochemical Properties
- Amylose Content (%) : 19.8 (I)
- Gelatinization Temperature : 4.6 (I/L)
- Crude Protein Content (%) : 7.9

Agronomic Characteristics

Plant Height (cm) : 128.9
Heading Days After Seeding : 91
Maturity Days After Seeding : 121
Basal Leaf Sheath Color : 1 (Green)
Anthocyanin Color : 0 (Absent)
Leaf Blade Pubescence : 3 (Pubescent)
Auricle Color : 2 (Yellowish green)
Collar Color : 2 (Light green)
Awn Distribution : 3 (Upper half only)
Panicle Exsertion : 5 (Just exserted)
Lodging Resistance : 9 (Very strong)
Leaf Senescence : 5 (Intermediate)
Panicle Shattering : 3 (Low)
Endosperm Type : 2 (Intermediate)

HR400

South Cotabato
Collection No. 15495

HR400-15495	
% Genetic Similarity	Other Genotypes
98.81	HR-400 (16322)
95.72	DIAMOND X (16510)
93.90	PSB Rc 10
92.60	OFFSPRING (16307)
92.50	NSIC Rc 294

Grain Quality Traits

Milling Recovery (%)
- Brown Rice : 80.4 (G)
- Milled Rice : 73.5 (Pr)
- Head Rice : 53.7 (G1)

Physical Attributes
- Grain Length (mm) : 7.2 (L)
- Grain Shape : 3.2 (S)
- Chalky Grains (%) : 15.4 (aa)

Physicochemical Properties
- Amylose Content (%) : 21.8 (I)
- Gelatinization Temperature : 4.0 (I)
- Crude Protein Content (%) : 6.4

Agronomic Characteristics

Plant Height (cm) : 113.3
Heading Days After Seeding : 83
Maturity Days After Seeding : 113
Basal Leaf Sheath Color : 1 (Green)
Anthocyanin Color : 0 (Absent)
Leaf Blade Pubescence : 3 (Pubescent)
Auricle Color : 2 (Yellowish green)
Collar Color : 2 (Light green)
Awn Distribution : 2 (Upper quarter only)
Panicle Exsertion : 5 (Just exserted)
Lodging Resistance : 5 (Intermediate)
Leaf Senescence : 5 (Intermediate)
Panicle Shattering : 5 (Moderate)
Endosperm Type : 2 (Intermediate)

M3 BARAKO

South Cotabato
Collection No. 15496

M3 BARAKO-15496	
% Genetic Similarity	Other Genotypes
100.00	M3-BARAKO (16313)
99.93	RJ 40 (16496)
94.83	DASH 12 (16335)
94.60	DIAMOND X (16510)
94.26	SUPER DX (16425)

Grain Quality Traits

Milling Recovery (%)
- Brown Rice : 79.2 (F)
- Milled Rice : 71.7 (Pr)
- Head Rice : 54.1 (G1)

Physical Attributes
- Grain Length (mm) : 6.8 (L)
- Grain Shape : 2.6 (I)
- Chalky Grains (%) : 3.2 (G1)

Physicochemical Properties
- Amylose Content : 21.7 (I)
- Gelatinization Temperature : 4.4 (I)
- Crude Protein Content (%) : 7.2

Agronomic Characteristics

Plant Height (cm) : 115.2
Heading Days After Seeding : 95
Maturity Days After Seeding : 122
Basal Leaf Sheath Color : 1 (Green)
Anthocyanin Color : 0 (Absent)
Leaf Blade Pubescence : 3 (Pubescent)
Auricle Color : 2 (Yellowish green)
Collar Color : 2 (Light green)
Awn Distribution : 0 (None)
Panicle Exsertion : 5 (Just exserted)
Lodging Resistance : 3 (Weak)
Leaf Senescence : 5 (Intermediate)
Panicle Shattering : 5 (Moderate)
Endosperm Type : 2 (Intermediate)

M3-BARAKO

South Cotabato
Collection No. 16313

M3-BARAKO-16313	
% Genetic Similarity	Other Genotypes
100.00	M3 BARAKO (15496)
99.93	RJ 40 (16496)
94.82	DASH 12 (16335)
94.60	DIAMOND X (16510)
94.27	SUPER DX (16425)

Grain Quality Traits

Milling Recovery (%)
- Brown Rice : 77.2 (F)
- Milled Rice : 69.0 (G1)
- Head Rice : 52.4 (G1)

Physical Attributes
- Grain Length (mm) : 7.0 (L)
- Grain Shape : 2.7 (I)
- Chalky Grains (%) : 6.1 (G2)

Physicochemical Properties
- Amylose Content (%) : 21.2 (I)
- Gelatinization Temperature : 3.2 (H/I)
- Crude Protein Content (%) : 7.4

Agronomic Characteristics

Plant Height (cm) : 113.8
Heading Days After Seeding : 91
Maturity Days After Seeding : 121
Basal Leaf Sheath Color : 1 (Green)
Anthocyanin Color : 0 (Absent)
Leaf Blade Pubescence : 3 (Pubescent)
Auricle Color : 2 (Yellowish green)
Collar Color : 2 (Light green)
Awn Distribution : 1 (Tip only)
Panicle Exsertion : 5 (Just exserted)
Lodging Resistance : 3 (Weak)
Leaf Senescence : 5 (Intermediate)
Panicle Shattering : 5 (Moderate)
Endosperm Type : 2 (Intermediate)

HR-400

South Cotabato
Collection No.16322

HR-400-16322	
% Genetic Similarity	Other Genotypes
98.81	HR400 (15495)
95.81	DIAMOND X (16510)
94.01	PSB Rc 10
92.89	OFFSPRING (16307)
92.89	NSIC Rc 294

Grain Quality Traits

Milling Recovery (%)
- Brown Rice : 77.4 (F)
- Milled Rice : 69.0 (G1)
- Head Rice : 49.7 (G1)

Physical Attributes
- Grain Length (mm) : 7.5 (EL)
- Grain Shape : 3.5 (S)
- Chalky Grains (%) : 3.0 (G1)

Physicochemical Properties
- Amylose Content (%) : 19.1 (I)
- Gelatinization Temperature : 4.0 (I)
- Crude Protein Content (%) : 7.7

Agronomic Characteristics

Plant Height (cm) : 98.2
Heading Days After Seeding : 83
Maturity Days After Seeding : 113
Basal Leaf Sheath Color : 1 (Green)
Anthocyanin Color : 0 (Absent)
Leaf Blade Pubescence : 3 (Pubescent)
Auricle Color : 2 (Yellowish green)
Collar Color : 2 (Light green)
Awn Distribution : 0 (None)
Panicle Exsertion : 5 (Just exserted)
Lodging Resistance : 7 (Strong)
Leaf Senescence : 5 (Intermediate)
Panicle Shattering : 5 (Moderate)
Endosperm Type : 2 (Intermediate)

SAMPAGUITA

South Cotabato
Collection No. 15500

SAMPAGUITA-15500	
% Genetic Similarity	Other Genotypes
100.00	DESTINY (15502)
100.00	DIAMOND V (15576)
100.00	UNKNOWN VAR 3 (15879)
100.00	NSIC Rc 218
100.00	1561 (15891)
100.00	SAMPAGUITA (16308)
100.00	SAMPAGUITA (AGUSAN) (16326)
100.00	TABUK (16501)
100.00	DOUBLE DIAMOND (16507)

Grain Quality Traits

Milling Recovery (%)
- Brown Rice : 74.7 (P)
- Milled Rice : 65.7 (G1)
- Head Rice : 51.1 (G1)

Physical Attributes
- Grain Length (mm) : 6.9 (L)
- Grain Shape : 3.0 (I)
- Chalky Grains (%) : 2.4 (G1)

Physicochemical Properties
- Amylose Content (%) : 15.7 (L)
- Gelatinization Temperature : 5.4 (I/L)
- Crude Protein Content (%) : 7.3

Agronomic Characteristics

Plant Height (cm) : 116.1
Heading Days After Seeding : 91
Maturity Days After Seeding : 121
Basal Leaf Sheath Color : 1 (Green)
Anthocyanin Color : 0 (Absent)
Leaf Blade Pubescence : 3 (Pubescent)
Auricle Color : 2 (Yellowish green)
Collar Color : 2 (Light green)
Awn Distribution : 3 (Upper half only)
Panicle Exsertion : 5 (Just exserted)
Lodging Resistance : 5 (Intermediate)
Leaf Senescence : 5 (Intermediate)
Panicle Shattering : 5 (Moderate)
Endosperm Type : 1 (Non-glutinous)

DESTINY

South Cotabato
Collection No. 15502

DESTINY-15502	
% Genetic Similarity	Other Genotypes
100.00	DIAMOND V (15576)
100.00	SAMPAGUITA (AGUSAN) (16326)
100.00	SAMPAGUITA (15500)
100.00	1561 (15891)
100.00	UNKNOWN VAR 3 (15879)
100.00	NSIC Rc 218
100.00	SAMPAGUITA (16308)
100.00	TABUK (16501)
100.00	DOUBLE DIAMOND (16507)

Grain Quality Traits

Milling Recovery (%)
- Brown Rice : 77.3 (F)
- Milled Rice : 69.8 (G1)
- Head Rice : 39.4 (G2)

Physical Attributes
- Grain Length (mm) : 6.9 (L)
- Grain Shape : 2.9 (I)
- Chalky Grains (%) : 1.5 (Pr)

Physicochemical Properties
- Amylose Content (%) : 15.7 (L)
- Gelatinization Temperature : 5.1 (I/L)
- Crude Protein Content (%) : 8.5

Agronomic Characteristics

Plant Height (cm) : 129.2
Heading Days After Seeding : 95
Maturity Days After Seeding : 125
Basal Leaf Sheath Color : 1 (Green)
Anthocyanin Color : 0 (Absent)
Leaf Blade Pubescence : 3 (Pubescent)
Auricle Color : 2 (Yellowish green)
Collar Color : 2 (Light green)
Awn Distribution : 4 (Upper three quarters only)
Panicle Exsertion : 5 (Just exserted)
Lodging Resistance : 5 (Intermediate)
Leaf Senescence : 5 (Intermediate)
Panicle Shattering : 5 (Moderate)
Endosperm Type : 1 (Non-glutinous)

SAMPAGUITA

South Cotabato
Collection No.16308

SAMPAGUITA-16308	
% Genetic Similarity	Other Genotypes
100.00	1561 (15891)
100.00	UNKNOWN VAR 3 (15879)
100.00	NSIC Rc 218
100.00	SAMPAGUITA (15500)
100.00	DIAMOND V (15576)
100.00	SAMPAGUITA (AGUSAN) (16326)
100.00	DESTINY (15502)
100.00	TABUK (16501)
100.00	DOUBLE DIAMOND (16507)

Grain Quality Traits

Milling Recovery (%)
- Brown Rice : 75.6 (F)
- Milled Rice : 67.7 (G1)
- Head Rice : 57.0 (Pr)

Physical Attributes
- Grain Length (mm) : 7.3 (L)
- Grain Shape : 3.2 (S)
- Chalky Grains (%) : 2.4 (G1)

Physicochemical Properties
- Amylose Content (%) : 14.8 (L)
- Gelatinization Temperature : 3.9 (HI/I)
- Crude Protein Content (%) : 6.2

Agronomic Characteristics

Plant Height (cm) : 121.4
Heading Days After Seeding : 91
Maturity Days After Seeding : 121
Basal Leaf Sheath Color : 1 (Green)
Anthocyanin Color : 0 (Absent)
Leaf Blade Pubescence : 3 (Pubescent)
Auricle Color : 2 (Yellowish green)
Collar Color : 2 (Light green)
Awn Distribution : 2 (Upper quarter only)
Panicle Exsertion : 5 (Just exserted)
Lodging Resistance : 9 (Very strong)
Leaf Senescence : 5 (Intermediate)
Panicle Shattering : 5 (Moderate)
Endosperm Type : 1 (Non-glutinous)

ML

South Cotabato
Collection No. 16325

ML-16325	
% Genetic Similarity	Other Genotypes
100.00	PEDRO (15497)
99.99	PEDRO (16298)
92.23	PSB Rc 10
92.02	JASMIN (15661)
91.89	NSIC Rc 420

Grain Quality Traits

Milling Recovery (%)
- Brown Rice : 77.3 (F)
- Milled Rice : 68.4 (G1)
- Head Rice : 60.6 (Pr)

Physical Attributes
- Grain Length (mm) : 6.1 (M)
- Grain Shape : 2.5 (I)
- Chalky Grains (%) : 9.1 (G2)

Physicochemical Properties
- Amylose Content (%) : 16.9 (L)
- Gelatinization Temperature : 4.2 (I)
- Crude Protein Content (%) : 8.0

Agronomic Characteristics

Plant Height (cm) : 100.6
Heading Days After Seeding : 78
Maturity Days After Seeding : 108
Basal Leaf Sheath Color : 1 (Green)
Anthocyanin Color : 0 (Absent)
Leaf Blade Pubescence : 3 (Pubescent)
Auricle Color : 2 (Yellowish green)
Collar Color : 2 (Light green)
Awn Distribution : 2 (Upper quarter only)
Panicle Exsertion : 5 (Just exserted)
Lodging Resistance : 7 (Strong)
Leaf Senescence : 5 (Intermediate)
Panicle Shattering : 5 (Moderate)
Endosperm Type : 1 (Non-glutinous)

INDIAN RICE

South Cotabato
Collection No. 15503

INDIAN RICE-15503	
% Genetic Similarity	Other Genotypes
98.10	INDIAN RICE (16324)
94.81	IR 64
92.86	DIAMOND X (16510)
92.57	NSIC Rc 298
92.45	PSB Rc 10

Grain Quality Traits

Milling Recovery (%)
- Brown Rice : 78.1 (F)
- Milled Rice : 71.5 (Pr)
- Head Rice : 51.8 (G1)

Physical Attributes
- Grain Length (mm) : 6.6 (L)
- Grain Shape : 2.8 (I)
- Chalky Grains (%) : 3.2 (G1)

Physicochemical Properties
- Amylose Content (%) : 20.0 (I)
- Gelatinization Temperature : 3.9 (HI/I)
- Crude Protein Content (%) : 7.5

Agronomic Characteristics

Plant Height (cm) : 107.0
Heading Days After Seeding : 91
Maturity Days After Seeding : 121
Basal Leaf Sheath Color : 1 (Green)
Anthocyanin Color : 0 (Absent)
Leaf Blade Pubescence : 3 (Pubescent)
Auricle Color : 2 (Yellowish green)
Collar Color : 2 (Light green)
Awn Distribution : 0 (None)
Panicle Exsertion : 5 (Just exserted)
Lodging Resistance : 9 (Very strong)
Leaf Senescence : 5 (Intermediate)
Panicle Shattering : 5 (Moderate)
Endosperm Type : 1 (Non-glutinous)

INDIAN RICE

South Cotabato
Collection No.16324

INDIAN RICE-16324	
% Genetic Similarity	Other Genotypes
98.10	INDIAN RICE (15503)
94.16	IR 64
93.80	PSB Rc 10
93.62	DIAMOND X (16510)
92.97	216 (16399)

Grain Quality Traits

Milling Recovery (%)
- Brown Rice : 77.1 (F)
- Milled Rice : 68.6 (G1)
- Head Rice : 60.9 (Pr)

Physical Attributes
- Grain Length (mm) : 6.7 (L)
- Grain Shape : 2.9 (I)
- Chalky Grains (%) : 10.9 (G3)

Physicochemical Properties
- Amylose Content (%) : 18.7 (I)
- Gelatinization Temperature : 2.3 (H/I)
- Crude Protein Content (%) : 7.5

Agronomic Characteristics

Plant Height (cm) : 114.9
Heading Days After Seeding : 83
Maturity Days After Seeding : 113
Basal Leaf Sheath Color : 1 (Green)
Anthocyanin Color : 0 (Absent)
Leaf Blade Pubescence : 3 (Pubescent)
Auricle Color : 2 (Yellowish green)
Collar Color : 2 (Light green)
Awn Distribution : 3 (Upper half only)
Panicle Exsertion : 5 (Just exserted)
Lodging Resistance : 9 (Very strong)
Leaf Senescence : 5 (Intermediate)
Panicle Shattering : 5 (Moderate)
Endosperm Type : 1 (Non-glutinous)

PEDRO

South Cotabato
Collection No.15497

PEDRO-15497	
% Genetic Similarity	Other Genotypes
100.00	ML (16325)
99.96	PEDRO (16298)
92.22	PSB Rc 10
92.01	JASMIN (15661)
91.84	NSIC Rc 420

Grain Quality Traits

Milling Recovery (%)
- Brown Rice : 78.5 (F)
- Milled Rice : 71.7 (Pr)
- Head Rice : 35.2 (G3)

Physical Attributes
- Grain Length (mm) : 6.4 (M)
- Grain Shape : 2.5 (I)
- Chalky Grains (%) : 5.1 (G2)

Physicochemical Properties
- Amylose Content (%) : 18.4 (I)
- Gelatinization Temperature : 4.3 (I)
- Crude Protein Content (%) : 8.1

Agronomic Characteristics

Plant Height (cm) : 114.4
Heading Days After Seeding : 78
Maturity Days After Seeding : 108
Basal Leaf Sheath Color : 1 (Green)
Anthocyanin Color : 0 (Absent)
Leaf Blade Pubescence : 3 (Pubescent)
Auricle Color : 2 (Yellowish green)
Collar Color : 2 (Light green)
Awn Distribution : 0 (None)
Panicle Exsertion : 9 (Well exserted)
Lodging Resistance : 7 (Strong)
Leaf Senescence : 5 (Intermediate)
Panicle Shattering : 5 (Moderate)
Endosperm Type : 2 (Intermediate)

SINANDOMING

South Cotabato
Collection No.15498

SINANDOMING-15498	
% Genetic Similarity	Other Genotypes
93.55	SINANDOMING (16309)
92.93	PSB Rc 10
92.68	216 (16399)
92.49	DIAMOND X (16510)
91.96	MILAGROSA (16100)

Grain Quality Traits

Milling Recovery (%)
- Brown Rice : 77.6 (F)
- Milled Rice : 70.5 (Pr)
- Head Rice : 36.5 (G3)

Physical Attributes
- Grain Length (mm) : 7.2 (L)
- Grain Shape : 3.4 (S)
- Chalky Grains (%) : 2.6 (G1)

Physicochemical Properties
- Amylose Content (%) : 15.7 (L)
- Gelatinization Temperature : 4.6 (I)
- Crude Protein Content (%) : 7.3

Agronomic Characteristics

Plant Height (cm) : 116.6
Heading Days After Seeding : 90
Maturity Days After Seeding : 120
Basal Leaf Sheath Color : 1 (Green)
Anthocyanin Color : 0 (Absent)
Leaf Blade Pubescence : 3 (Pubescent)
Auricle Color : 2 (Yellowish green)
Collar Color : 2 (Light green)
Awn Distribution : 0 (None)
Panicle Exsertion : 7 (Moderately well exserted)
Lodging Resistance : 5 (Intermediate)
Leaf Senescence : 7 (Strong)
Panicle Shattering : 5 (Moderate)
Endosperm Type : 1 (Non-glutinous)

M3

South Cotabato
Collection No. 15499

M3-15499	
% Genetic Similarity	Other Genotypes
99.96	M3 (SURALLAH) (16428)
99.93	TITO-TITO (15507)
99.92	KAMANSING (16030)
99.22	M3 (16087)
98.58	M3-BANGA (16315)

Grain Quality Traits

Milling Recovery (%)
- Brown Rice : 78.7 (F)
- Milled Rice : 72.0 (Pr)
- Head Rice : 51.0 (Pr)

Physical Attributes
- Grain Length (mm) : 5.8 (M)
- Grain Shape : 2.5 (I)
- Chalky Grains (%) : 3.1 (G1)

Physicochemical Properties
- Amylose Content (%) : 19.3 (I)
- Gelatinization Temperature : 2.5 (HI/I)
- Crude Protein Content (%) : 7.7

Agronomic Characteristics

Plant Height (cm) : 111.8
Heading Days After Seeding : 86
Maturity Days After Seeding : 116
Basal Leaf Sheath Color : 1 (Green)
Anthocyanin Color : 0 (Absent)
Leaf Blade Pubescence : 3 (Pubescent)
Auricle Color : 2 (Yellowish green)
Collar Color : 2 (Light green)
Awn Distribution : 0 (None)
Panicle Exsertion : 5 (Just exserted)
Lodging Resistance : 3 (Weak)
Leaf Senescence : 5 (Intermediate)
Panicle Shattering : 5 (Moderate)
Endosperm Type : 1 (Non-glutinous)

OFFSPRING

South Cotabato
Collection No.15501

OFFSPRING-15501	
% Genetic Similarity	Other Genotypes
95.95	DIAMOND X (16062)
95.73	DIAMOND X (16510)
94.81	216 (16399)
94.70	NSIC Rc 138
94.54	NSIC Rc 216

Grain Quality Traits

Milling Recovery (%)
- Brown Rice : 79.1 (F)
- Milled Rice : 72.0 (Pr)
- Head Rice : 29.3 (aa)

Physical Attributes
- Grain Length (mm) : 7.1 (L)
- Grain Shape : 3.1 (S)
- Chalky Grains (%) : 2.3 (G1)

Physicochemical Properties
- Amylose Content (%) : 21.5 (I)
- Gelatinization Temperature : 4.1 (I)
- Crude Protein Content (%) : 7.7

Agronomic Characteristics

Plant Height (cm) : 102.7
Heading Days After Seeding : 91
Maturity Days After Seeding : 121
Basal Leaf Sheath Color : 1 (Green)
Anthocyanin Color : 0 (Absent)
Leaf Blade Pubescence : 3 (Pubescent)
Auricle Color : 2 (Yellowish green)
Collar Color : 2 (Light green)
Awn Distribution : 3 (Upper half only)
Panicle Exsertion : 5 (Just exserted)
Lodging Resistance : 9 (Very strong)
Leaf Senescence : 5 (Intermediate)
Panicle Shattering : 5 (Moderate)
Endosperm Type : 1 (Non-glutinous)

PEDRO

South Cotabato
Collection No. 16298

PEDRO-16298	
% Genetic Similarity	Other Genotypes
99.99	ML (16325)
99.96	PEDRO (15497)
92.19	PSB Rc 10
92.00	JASMIN (15661)
91.82	DIAMOND X (16510)

Grain Quality Traits

Milling Recovery (%)
- Brown Rice : 76.7 (F)
- Milled Rice : 67.8 (G1)
- Head Rice : 42.6 (G2)

Physical Attributes
- Grain Length (mm) : 6.3 (M)
- Grain Shape : 2.6 (I)
- Chalky Grains (%) : 4.7 (G1)

Physicochemical Properties
- Amylose Content (%) : 17.8 (H)
- Gelatinization Temperature : 4.0 (I)
- Crude Protein Content (%) : 7.4

Agronomic Characteristics

Plant Height (cm) : 113.9
Heading Days After Seeding : 78
Maturity Days After Seeding : 108
Basal Leaf Sheath Color : 1 (Green)
Anthocyanin Color : 0 (Absent)
Leaf Blade Pubescence : 3 (Pubescent)
Auricle Color : 2 (Yellowish green)
Collar Color : 2 (Light green)
Awn Distribution : 0 (None)
Panicle Exsertion : 7 (Moderately well exserted)
Lodging Resistance : 7 (Strong)
Leaf Senescence : 5 (Intermediate)
Panicle Shattering : 5 (Moderate)
Endosperm Type : 1 (Non-glutinous)

OFFSPRING

South Cotabato
Collection No. 16307

OFFSPRING-16307	
% Genetic Similarity	Other Genotypes
98.52	DIAMOND X (16510)
96.00	DIAMOND X (16062)
95.70	NSIC Rc 216
95.51	NSIC Rc 222
95.15	DIAMOND X (15606)

Grain Quality Traits

Milling Recovery (%)
- Brown Rice : 76.3 (F)
- Milled Rice : 71.5 (Pr)
- Head Rice : 51.0 (G1)

Physical Attributes
- Grain Length (mm) : 7.4 (L)
- Grain Shape : 3.3 (S)
- Chalky Grains (%) : 2.5 (G1)

Physicochemical Properties
- Amylose Content (%) : 19.8 (I)
- Gelatinization Temperature : 4.1 (HI/I)
- Crude Protein Content (%) : 7.0

Agronomic Characteristics

Plant Height (cm) : 103.1
Heading Days After Seeding : 91
Maturity Days After Seeding : 121
Basal Leaf Sheath Color : 1 (Green)
Anthocyanin Color : 0 (Absent)
Leaf Blade Pubescence : 3 (Pubescent)
Auricle Color : 2 (Yellowish green)
Collar Color : 2 (Light green)
Awn Distribution : 3 (Upper half only)
Panicle Exsertion : 5 (Just exserted)
Lodging Resistance : 7 (Strong)
Leaf Senescence : 5 (Intermediate)
Panicle Shattering : 5 (Moderate)
Endosperm Type : 1 (Non-glutinous)

SEÑORITA PILIT

South Cotabato
Collection No. 16316

SEÑORITA PILIT-16316	
% Genetic Similarity	Other Genotypes
97.86	3-MILLION (15457)
97.00	JASMIN (15661)
96.87	BODO-BODO (15955)
96.83	BODO-BODO (AGUSAN) (16327)
96.78	MIRACLE (16297)

Grain Quality Traits

Milling Recovery (%)
- Brown Rice : 68.2 (P)
- Milled Rice : 59.8 (G3)
- Head Rice : 51.9 (G1)

Physical Attributes
- Grain Length (mm) : 6.6 (L)
- Grain Shape : 2.6 (I)
- Chalky Grains (%) : 42.9 (aa)

Physicochemical Properties
- Amylose Content (%) : 10.0 (VL)
- Gelatinization Temperature : 4.7 (H)
- Crude Protein Content (%) : 8.1

Agronomic Characteristics

Plant Height (cm) : 152.4
Heading Days After Seeding : 106
Maturity Days After Seeding : 136
Basal Leaf Sheath Color : 1 (Green)
Anthocyanin Color : 0 (Absent)
Leaf Blade Pubescence : 3 (Pubescent)
Auricle Color : 2 (Yellowish green)
Collar Color : 2 (Light green)
Awn Distribution : 0 (None)
Panicle Exsertion : 5 (Just exserted)
Lodging Resistance : 7 (Strong)
Leaf Senescence : 5 (Intermediate)
Panicle Shattering : 5 (Moderate)
Endosperm Type : 3 (Glutinous)

ELON-ELON

South Cotabato
Collection No.16319

ELON-ELON-16319	
% Genetic Similarity	Other Genotypes
98.26	M90 SG (16361)
94.49	EC3 (16353)
94.37	KAOLOB (16357)
93.91	EC2 (16354)
93.88	MINONING (16373)

Grain Quality Traits

Milling Recovery (%)
- Brown Rice : 74.0 (P)
- Milled Rice : 64.4 (G2)
- Head Rice : 55.5 (G1)

Physical Attributes
- Grain Length (mm) : 6.5 (M)
- Grain Shape : 2.3 (I)
- Chalky Grains (%) : 2.4 (G1)

Physicochemical Properties
- Amylose Content (%) : 14.3 (L)
- Gelatinization Temperature : 4.9 (I/L)
- Crude Protein Content (%) : 6.6

Agronomic Characteristics

- Plant Height (cm) : 134.8
- Heading Days After Seeding : 104
- Maturity Days After Seeding : 134
- Basal Leaf Sheath Color : 1 (Green)
- Anthocyanin Color : 0 (Absent)
- Leaf Blade Pubescence : 3 (Pubescent)
- Auricle Color : 2 (Yellowish green)
- Collar Color : 2 (Light green)
- Awn Distribution : 3 (Upper half only)
- Panicle Exsertion : 7 (Moderately well exserted)
- Lodging Resistance : 3 (Weak)
- Leaf Senescence : 5 (Intermediate)
- Panicle Shattering : 5 (Moderate)
- Endosperm Type : 1 (Non-glutinous)

BOTOY-BOTOY

South Cotabato
Collection No. 16331

BOTOY-BOTOY-16331	
% Genetic Similarity	Other Genotypes
99.43	BOTOY (16312)
95.40	M3 (15499)
95.37	KAMANSING (16030)
95.37	M3 (SURALLAH) (16428)
95.33	TITO-TITO (15507)

Grain Quality Traits

Milling Recovery (%)
- Brown Rice : 77.1 (F)
- Milled Rice : 69.7 (G1)
- Head Rice : 63.5 (Pr)

Physical Attributes
- Grain Length (mm) : 5.9 (M)
- Grain Shape : 2.6 (I)
- Chalky Grains (%) : 2.4 (G1)

Physicochemical Properties
- Amylose Content (%) : 19.4 (I)
- Gelatinization Temperature : 3.3 (H/I)
- Crude Protein Content (%) : 7.9

Agronomic Characteristics

Plant Height (cm) : 104.8
Heading Days After Seeding : 82
Maturity Days After Seeding : 112
Basal Leaf Sheath Color : 1 (Green)
Anthocyanin Color : 0 (Absent)
Leaf Blade Pubescence : 3 (Pubescent)
Auricle Color : 2 (Yellowish green)
Collar Color : 2 (Light green)
Awn Distribution : 0 (None)
Panicle Exsertion : 5 (Just exserted)
Lodging Resistance : 7 (Strong)
Leaf Senescence : 7 (Strong)
Panicle Shattering : 5 (Moderate)
Endosperm Type : 1 (Non-glutinous)

M3 (SURALLAH)

South Cotabato
Collection No.16428

M3 (SURALLAH)-16428	
% Genetic Similarity	Other Genotypes
99.96	TITO-TITO (15507)
99.96	M3 (15499)
99.94	KAMANSING (16030)
99.17	M3 (16087)
98.59	M3-BANGA (16315)

Grain Quality Traits

Milling Recovery (%)
- Brown Rice : 76.9 (F)
- Milled Rice : 69.5 (G1)
- Head Rice : 64.4 (Pr)

Physical Attributes
- Grain Length (mm) : 5.9 (M)
- Grain Shape : 2.5 (I)
- Chalky Grains (%) : 1.4 (Pr)

Physicochemical Properties
- Amylose Content (%) : 19.3 (I)
- Gelatinization Temperature : 2.0 (H)
- Crude Protein Content (%) : 7.6

Agronomic Characteristics

Plant Height (cm) : 109.7
Heading Days After Seeding : 91
Maturity Days After Seeding : 121
Basal Leaf Sheath Color : 1 (Green)
Anthocyanin Color : 0 (Absent)
Leaf Blade Pubescence : 3 (Pubescent)
Auricle Color : 2 (Yellowish green)
Collar Color : 2 (Light green)
Awn Distribution : 0 (None)
Panicle Exsertion : 5 (Just exserted)
Lodging Resistance : 3 (Weak)
Leaf Senescence : 5 (Intermediate)
Panicle Shattering : 5 (Moderate)
Endosperm Type : 2 (Intermediate)

PALAY CHU

Zamboanga del Sur
Collection No.16304

PALAY CHU-16304	
% Genetic Similarity	Other Genotypes
96.24	Rc BATO (16185)
96.22	DIAMOND X (16510)
95.94	BULAW (15839)
95.88	BULAW (WHITE) (16034)
95.36	M5-BD (16370)

Grain Quality Traits

Milling Recovery (%)
- Brown Rice : 77.0 (F)
- Milled Rice : 69.1 (G1)
- Head Rice : 58.2 (Pr)

Physical Attributes
- Grain Length (mm) : 7.0 (L)
- Grain Shape : 3.0 (S)
- Chalky Grains (%) : 5.5 (G2)

Physicochemical Properties
- Amylose Content (%) : 19.2 (I)
- Gelatinization Temperature : 2.0 (H)
- Crude Protein Content (%) : 8.2

Agronomic Characteristics

Plant Height (cm) : 112.9
Heading Days After Seeding : 91
Maturity Days After Seeding : 121
Basal Leaf Sheath Color : 1 (Green)
Anthocyanin Color : 0 (Absent)
Leaf Blade Pubescence : 3 (Pubescent)
Auricle Color : 2 (Yellowish green)
Collar Color : 2 (Light green)
Awn Distribution : 0 (None)
Panicle Exsertion : 7 (Moderately well exserted)
Lodging Resistance : 7 (Strong)
Leaf Senescence : 7 (Late)
Panicle Shattering : 5 (Moderate)
Endosperm Type : 1 (Non-glutinous)

CHICHONG

Zamboanga del Sur
Collection No. 16323

CHICHONG-16323	
% Genetic Similarity	Other Genotypes
95.44	ZAMBOANGA RICE (15506)
95.35	ZAMBOANGA RICE (16300)
92.10	NSIC Rc 420
91.74	216 (16399)
91.65	3-MILLION (15457)

Grain Quality Traits

Milling Recovery (%)
- Brown Rice : 78.0 (F)
- Milled Rice : 71.3 (Pr)
- Head Rice : 61.7 (Pr)

Physical Attributes
- Grain Length (mm) : 6.2 (M)
- Grain Shape : 2.5 (I)
- Chalky Grains (%) : 7.0 (G2)

Physicochemical Properties
- Amylose Content (%) : 19.6 (I)
- Gelatinization Temperature : 4.1 (I)
- Crude Protein Content (%) : 7.6

Agronomic Characteristics

Plant Height (cm) : 108.5
Heading Days After Seeding : 104
Maturity Days After Seeding : 134
Basal Leaf Sheath Color : 1 (Green)
Anthocyanin Color : 0 (Absent)
Leaf Blade Pubescence : 3 (Pubescent)
Auricle Color : 2 (Yellowish green)
Collar Color : 2 (Light green)
Awn Distribution : 0 (None)
Panicle Exsertion : 5 (Just exserted)
Lodging Resistance : 3 (Weak)
Leaf Senescence : 5 (Intermediate)
Panicle Shattering : 5 (Moderate)
Endosperm Type : 1 (Non-glutinous)

R.I. 300

Zamboanga del Sur
Collection No. 16418

R.I.300-16418	
% Genetic Similarity	Other Genotypes
95.26	TOTONG (16435)
94.76	TARA RICE (16431)
93.72	216 (16399)
93.39	NSIC Rc 420
92.58	NSIC Rc 308

Grain Quality Traits

Milling Recovery (%)
- Brown Rice : 77.2 (F)
- Milled Rice : 69.3 (G1)
- Head Rice : 60.4 (Pr)

Physical Attributes
- Grain Length (mm) : 6.7 (L)
- Grain Shape : 2.8 (I)
- Chalky Grains (%) : 2.8 (G1)

Physicochemical Properties
- Amylose Content (%) : 20.0 (I)
- Gelatinization Temperature : 3.9 (HI/I/L)
- Crude Protein Content (%) : 7.6

Agronomic Characteristics

Plant Height (cm) : 120.0
Heading Days After Seeding : 91
Maturity Days After Seeding : 121
Basal Leaf Sheath Color : 1 (Green)
Anthocyanin Color : 0 (Absent)
Leaf Blade Pubescence : 3 (Pubescent)
Auricle Color : 2 (Yellowish green)
Collar Color : 2 (Light green)
Awn Distribution : 2 (Upper quarter only)
Panicle Exsertion : 7 (Moderately well exserted)
Lodging Resistance : 7 (Strong)
Leaf Senescence : 5 (Intermediate)
Panicle Shattering : 5 (Moderate)
Endosperm Type : 1 (Non-glutinous)

FGRG COLLECTIONS FROM REGIONS 10, 11, AND 13

MORYO-MORYO

Agusan del Norte
Collection No.15954

MORYO-MORYO-15954	
% Genetic Similarity	Other Genotypes
100.00	NSIC Rc 400
96.69	MORYO-MORYO (16424)
94.54	PSB Rc 10
93.09	JUAN RICE (16060)
92.74	NSIC Rc 294

Grain Quality Traits

Milling Recovery (%)
- Brown Rice : 78.3 (F)
- Milled Rice : 69.7 (G1)
- Head Rice : 57.7 (Pr)

Physical Attributes
- Grain Length (mm) : 6.6 (L)
- Grain Shape : 2.9 (I)
- Chalky Grains (%) : 5.2 (G2)

Physicochemical Properties
- Amylose Content (%) : 19.9 (I)
- Gelatinization Temperature : 4.3 (I)
- Crude Protein Content (%) : 7.2

Agronomic Characteristics

Plant Height (cm) : 120.9
Heading Days After Seeding : 100
Maturity Days After Seeding : 130
Basal Leaf Sheath Color : 1 (Green)
Anthocyanin Color : 0 (Absent)
Leaf Blade Pubescence : 3 (Pubescent)
Auricle Color : 2 (Yellowish green)
Collar Color : 2 (Light green)
Awn Distribution : 0 (None)
Panicle Exsertion : 7 (Moderately well-exserted)
Lodging Resistance : 7 (Strong)
Leaf Senescence : 7 (Late)
Panicle Shattering : 5 (Moderate)
Endosperm Type : 1 (Non-glutinous)

MORYO-MORYO

Agusan del Norte
Collection No. 16424

MORYO-MORYO-16424	
% Genetic Similarity	Other Genotypes
96.69	MORYO-MORYO (15954)
96.67	NSIC Rc 400
95.49	PSB Rc 10
94.76	DIAMOND X (16510)
94.73	NSIC Rc 294

Grain Quality Traits

Milling Recovery (%)
- Brown Rice : 73.0 (P)
- Milled Rice : 63.7 (G2)
- Head Rice : 54.2 (G1)

Physical Attributes
- Grain Length (mm) : 6.7 (L)
- Grain Shape : 3.1 (S)
- Chalky Grains (%) : 6.2 (G2)

Physicochemical Properties
- Amylose Content (%) : 20.1 (I)
- Gelatinization Temperature : 3.8 (HI/I)
- Crude Protein Content (%) : 7.1

Agronomic Characteristics

Plant Height (cm) : 106.7
Heading Days After Seeding : 105
Maturity Days After Seeding : 135
Basal Leaf Sheath Color : 1 (Green)
Anthocyanin Color : 0 (Absent)
Leaf Blade Pubescence : 3 (Pubescent)
Auricle Color : 2 (Yellowish green)
Collar Color : 2 (Light green)
Awn Distribution : 0 (None)
Panicle Exsertion : 7 (Moderately well exserted)
Lodging Resistance : 7 (Strong)
Leaf Senescence : 5 (Intermediate)
Panicle Shattering : 5 (Moderate)
Endosperm Type : 1 (Non-glutinous)

TARA RICE

Agusan del Sur
Collection No.16431

TARA RICE-16431	
% Genetic Similarity	Other Genotypes
95.87	TOTONG (16435)
95.05	GSR 2 (15515)
94.76	R.I.300 (16418)
94.76	216 (16399)
93.68	NSIC Rc 420

Grain Quality Traits

Milling Recovery (%)
- Brown Rice : 74.0 (P)
- Milled Rice : 64.3 (G2)
- Head Rice : 58.6 (Pr)

Physical Attributes
- Grain Length (mm) : 6.8 (L)
- Grain Shape : 3.1 (S)
- Chalky Grains (%) : 2.5 (G1)

Physicochemical Properties
- Amylose Content (%) : 18.5 (I)
- Gelatinization Temperature : 4.3 (H/I/L)
- Crude Protein Content (%) : 7.8

Agronomic Characteristics

Plant Height (cm) : 122.4
Heading Days After Seeding : 93
Maturity Days After Seeding : 123
Basal Leaf Sheath Color : 1 (Green)
Anthocyanin Color : 0 (Absent)
Leaf Blade Pubescence : 3 (Pubescent)
Auricle Color : 2 (Yellowish green)
Collar Color : 2 (Light green)
Awn Distribution : 0 (None)
Panicle Exsertion : 7 (Moderately well exserted)
Lodging Resistance : 7 (Strong)
Leaf Senescence : 5 (Intermediate)
Panicle Shattering : 5 (Moderate)
Endosperm Type : 1 (Non-glutinous)

TOTONG

Agusan del Sur
Collection No. 16435

TOTONG-16435	
% Genetic Similarity	Other Genotypes
95.87	TARA RICE (16431)
95.26	R.I.300 (16418)
93.47	216 (16399)
92.74	ABANGAY (16336)
92.02	NSIC Rc 420

Grain Quality Traits

Milling Recovery (%)
- Brown Rice : 73.4 (P)
- Milled Rice : 65.1 (G1)
- Head Rice : 58.2 (Pr)

Physical Attributes
- Grain Length (mm) : 6.7 (L)
- Grain Shape : 2.8 (I)
- Chalky Grains (%) : 3.3 (G1)

Physicochemical Properties
- Amylose Content (%) : 18.9 (I)
- Gelatinization Temperature : 4.0 (I)
- Crude Protein Content (%) : 8.0

Agronomic Characteristics

Plant Height (cm) : 120.6
Heading Days After Seeding : 93
Maturity Days After Seeding : 123
Basal Leaf Sheath Color : 1 (Green)
Anthocyanin Color : 0 (Absent)
Leaf Blade Pubescence : 3 (Pubescent)
Auricle Color : 2 (Yellowish green)
Collar Color : 2 (Light green)
Awn Distribution : 3 (Upper half only)
Panicle Exsertion : 5 (Just exserted)
Lodging Resistance : 9 (Very strong)
Leaf Senescence : 5 (Intermediate)
Panicle Shattering : 5 (Moderate)
Endosperm Type : 1 (Non-glutinous)

RED RICE

Agusan del Sur
Collection No. 15944

RED RICE-15944	
% Genetic Similarity	Other Genotypes
92.20	216 (16399)
92.10	WHITE TONNER (16306)
90.86	JANJANONG (16515)
90.85	DIAMOND X (16510)
90.67	PSB Rc 10

Grain Quality Traits

Milling Recovery (%)
- Brown Rice : 78.0 (F)
- Milled Rice : 68.6 (G1)
- Head Rice : 33.7 (G3)

Physical Attributes
- Grain Length (mm) : 7.0 (L)
- Grain Shape : 3.1 (S)
- Chalky Grains (%) : 13.8 (G3)

Physicochemical Properties
- Amylose Content (%) : 19.3 (I)
- Gelatinization Temperature : 6.1 (I/L)
- Crude Protein Content (%) : 7.5

Agronomic Characteristics

Plant Height (cm) : 111.8
Heading Days After Seeding : 90
Maturity Days After Seeding : 120
Basal Leaf Sheath Color : 3 (Light purple)
Anthocyanin Color : 5 (Medium)
Leaf Blade Pubescence : 3 (Pubescent)
Auricle Color : 2 (Yellowish green)
Collar Color : 2 (Light green)
Awn Distribution : 1 (Tip only)
Panicle Exsertion : 7 (Moderately well exserted)
Lodging Resistance : 3 (Weak)
Leaf Senescence : 5 (Intermediate)
Panicle Shattering : 5 (Moderate)
Endosperm Type : 2 (Intermediate)

BODO-BODO

Agusan del Sur
Collection No. 15955

BODO-BODO-15955	
% Genetic Similarity	Other Genotypes
99.47	BODO-BODO (AGUSAN) (16327)
99.14	YANAM (16314)
99.05	3-MILLION (15457)
96.87	SENORITA PILIT (16316)
95.34	JASMIN (15661)

Grain Quality Traits

Milling Recovery (%)
- Brown Rice : 79.2 (F)
- Milled Rice : 73.3 (Pr)
- Head Rice : 68.6 (Pr)

Physical Attributes
- Grain Length (mm) : 5.7 (M)
- Grain Shape : 2.3 (I)
- Chalky Grains (%) : 6.7 (G2)

Physicochemical Properties
- Amylose Content (%) : 19.1 (I)
- Gelatinization Temperature : 4.3 (I)
- Crude Protein Content (%) : 7.4

Agronomic Characteristics

Plant Height (cm) : 90.2
Heading Days After Seeding : 67
Maturity Days After Seeding : 97
Basal Leaf Sheath Color : 1 (Green)
Anthocyanin Color : 0 (Absent)
Leaf Blade Pubescence : 3 (Pubescent)
Auricle Color : 2 (Yellowish green)
Collar Color : 2 (Light green)
Awn Distribution : 0 (None)
Panicle Exsertion : 5 (Just exserted)
Lodging Resistance : 7 (Strong)
Leaf Senescence : 7 (Late)
Panicle Shattering : 5 (Moderate)
Endosperm Type : 2 (Intermediate)

BARAKO 64

Agusan del Sur
Collection No. 16437

BARAKO 64-16437	
% Genetic Similarity	Other Genotypes
99.82	DALAGANG BUKID (16085)
96.14	DALING-DALING (16203)
93.31	TAP 1 (16394)
93.21	ABANGAY (16336)
93.16	216 (16399)

Grain Quality Traits

Milling Recovery (%)
- Brown Rice : 76.9 (F)
- Milled Rice : 68.9 (G1)
- Head Rice : 49.0 (G1)

Physical Attributes
- Grain Length (mm) : 6.7 (L)
- Grain Shape : 2.7 (I)
- Chalky Grains (%) : 35.0 (aa)

Physicochemical Properties
- Amylose Content (%) : 18.9 (HI/I)
- Gelatinization Temperature : 3.5 (HI/I)
- Crude Protein Content (%) : 7.0

Agronomic Characteristics

Plant Height (cm) : 137.5
Heading Days After Seeding : 90
Maturity Days After Seeding : 120
Basal Leaf Sheath Color : 3 (Light purple)
Anthocyanin Color : 3 (Weak)
Leaf Blade Pubescence : 3 (Pubescent)
Auricle Color : 2 (Yellowish green)
Collar Color : 4 (Purple lines)
Awn Distribution : 2 (Upper quarter only)
Panicle Exsertion : 7 (Moderately well exserted)
Lodging Resistance : 7 (Strong)
Leaf Senescence : 5 (Intermediate)
Panicle Shattering : 5 (Moderate)
Endosperm Type : 2 (Intermediate)

ABANGAY

Agusan del Sur
Collection No. 16336

ABANGAY-16336	
% Genetic Similarity	Other Genotypes
96.13	216 (16399)
95.88	3-MILLION (15457)
95.60	KAMOROS (16358)
95.39	M126-1 (16372)
95.35	JASMIN (15661)

Grain Quality Traits

Milling Recovery (%)
- Brown Rice : 75.6 (F)
- Milled Rice : 68.1 (G1)
- Head Rice : 59.2 (Pr)

Physical Attributes
- Grain Length (mm) : 5.6 (M)
- Grain Shape : 2.3 (I)
- Chalky Grains (%) : 8.2 (G2)

Physicochemical Properties
- Amylose Content (%) : 19.1 (I)
- Gelatinization Temperature : 4.1 (I)
- Crude Protein Content (%) : 7.7

Agronomic Characteristics

Plant Height (cm) : 128.3
Heading Days After Seeding : 97
Maturity Days After Seeding : 127
Basal Leaf Sheath Color : 1 (Green)
Anthocyanin Color : 0 (Absent)
Leaf Blade Pubescence : 3 (Pubescent)
Auricle Color : 2 (Yellowish green)
Collar Color : 2 (Light green)
Awn Distribution : 0 (None)
Panicle Exsertion : 5 (Just exserted)
Lodging Resistance : 5 (Intermediate)
Leaf Senescence : 5 (Intermediate)
Panicle Shattering : 5 (Moderate)
Endosperm Type : 2 (Intermediate)

ANGELICA

Agusan del Sur
Collection No.16337

ANGELICA-16337	
% Genetic Similarity	Other Genotypes
94.51	TUDY-TUDY (16514)
94.50	NSIC Rc 122
94.11	216 (16399)
93.87	JANJANONG (16515)
93.37	DALING-DALING (16203)

Grain Quality Traits

Milling Recovery (%)
- Brown Rice : 77.4 (F)
- Milled Rice : 68.5 (G1)
- Head Rice : 59.2 (Pr)

Physical Attributes
- Grain Length (mm) : 7.0 (L)
- Grain Shape : 3.1 (S)
- Chalky Grains (%) : 14.4 (G3)

Physicochemical Properties
- Amylose Content (%) : 19.9 (I)
- Gelatinization Temperature : 4.2 (I)
- Crude Protein Content (%) : 8.4

Agronomic Characteristics

Plant Height (cm) : 143.3
Heading Days After Seeding : 97
Maturity Days After Seeding : 127
Basal Leaf Sheath Color : 3 (Light purple)
Anthocyanin Color : 3 (Weak)
Leaf Blade Pubescence : 2 (Intermediate)
Auricle Color : 5 (Purple lines)
Collar Color : 4 (Purple lines)
Awn Distribution : 1 (Tip only)
Panicle Exsertion : 9 (Well exserted)
Lodging Resistance : 7 (Strong)
Leaf Senescence : 5 (Intermediate)
Panicle Shattering : 5 (Moderate)
Endosperm Type : 2 (Intermediate)

ANGELO I

Agusan del Sur
Collection No. 16338

ANGELO I-16338	
% Genetic Similarity	Other Genotypes
94.61	NTPSA-1 (16376)
94.03	EC2 (16354)
93.73	216 (16399)
93.67	KAMOROS (16358)
93.60	PKPDWARF (16384)

Grain Quality Traits

Milling Recovery (%)
- Brown Rice : 77.3 (F)
- Milled Rice : 69.2 (G1)
- Head Rice : 50.7 (G1)

Physical Attributes
- Grain Length (mm) : 6.9 (L)
- Grain Shape : 3.0 (I)
- Chalky Grains (%) : 34.99 (aa)

Physicochemical Properties
- Amylose Content (%) : 22.3 (H)
- Gelatinization Temperature : 4.4 (I/L)
- Crude Protein Content (%) : 7.3

Agronomic Characteristics

Plant Height (cm) : 143.5
Heading Days After Seeding : 112
Maturity Days After Seeding : 142
Basal Leaf Sheath Color : 1 (Green)
Anthocyanin Color : 0 (Absent)
Leaf Blade Pubescence : 3 (Pubescent)
Auricle Color : 2 (Yellowish green)
Collar Color : 2 (Light green)
Awn Distribution : 0 (None)
Panicle Exsertion : 9 (Well exserted)
Lodging Resistance : 9 (Very strong)
Leaf Senescence : 5 (Intermediate)
Panicle Shattering : 5 (Moderate)
Endosperm Type : 1 (Non-glutinous)

BISADA

Agusan del Sur
Collection No. 16339

BISADA-16339	
% Genetic Similarity	Other Genotypes
99.66	BISADA (16347)
99.11	BES I (16340)
97.69	SAN CARLOS (16387)
95.64	PK P2-6 (16382)
94.63	KAMOROS (16358)

Grain Quality Traits

Milling Recovery (%)
- Brown Rice : 77.5 (F)
- Milled Rice : 68.2 (G1)
- Head Rice : 61.2 (Pr)

Physical Attributes
- Grain Length (mm) : 7.0 (L)
- Grain Shape : 3.5 (S)
- Chalky Grains (%) : 2.7 (G1)

Physicochemical Properties
- Amylose Content (%) : 21.2 (I)
- Gelatinization Temperature : 3.4 (H/I)
- Crude Protein Content (%) : 7.9

Agronomic Characteristics

Plant Height (cm) : 155.2
Heading Days After Seeding : 104
Maturity Days After Seeding : 134
Basal Leaf Sheath Color : 1 (Green)
Anthocyanin Color : 0 (Absent)
Leaf Blade Pubescence : 3 (Pubescent)
Auricle Color : 2 (Yellowish green)
Collar Color : 2 (Light green)
Awn Distribution : 0 (None)
Panicle Exsertion : 9 (Well exserted)
Lodging Resistance : 1 (Very weak)
Leaf Senescence : 5 (Intermediate)
Panicle Shattering : 5 (Moderate)
Endosperm Type : 1 (Non-glutinous)

BES I

Agusan del Sur
Collection No.16340

BES I-16340	
% Genetic Similarity	Other Genotypes
99.11	BISADA (16339)
98.95	BISADA (16347)
97.60	SAN CARLOS (16387)
95.15	PK P2-6 (16382)
94.35	KAMOROS (16358)

Grain Quality Traits

Milling Recovery (%)
- Brown Rice : 77.4 (F)
- Milled Rice : 67.2 (G1)
- Head Rice : 59.2 (Pr)

Physical Attributes
- Grain Length (mm) : 6.9 (L)
- Grain Shape : 3.5 (S)
- Chalky Grains (%) : 2.6 (G1)

Physicochemical Properties
- Amylose Content (%) : 19.3 (I)
- Gelatinization Temperature : 4.3 (I/L)
- Crude Protein Content (%) : 8.8

Agronomic Characteristics

Plant Height (cm) : 162.3
Heading Days After Seeding : 96
Maturity Days After Seeding : 126
Basal Leaf Sheath Color : 1 (Green)
Anthocyanin Color : 0 (Absent)
Leaf Blade Pubescence : 3 (Pubescent)
Auricle Color : 2 (Yellowish green)
Collar Color : 2 (Light green)
Awn Distribution : 0 (None)
Panicle Exsertion : 9 (Well exserted)
Lodging Resistance : 1 (Very weak)
Leaf Senescence : 5 (Intermediate)
Panicle Shattering : 5 (Moderate)
Endosperm Type : 1 (Non-glutinous)

BWSI-3B

Agusan del Sur
Collection No.16341

BWSI-3B-16341	
% Genetic Similarity	Other Genotypes
92.22	BWSI-4R (16343)
92.17	ABANGAY (16336)
90.96	BWS3-3B (16345)
90.57	3-MILLION (15457)
90.51	147-2 (16396)

Grain Quality Traits

Milling Recovery (%)
- Brown Rice : 74.8 (P)
- Milled Rice : 65.2 (G1)
- Head Rice : 54.4 (G1)

Physical Attributes
- Grain Length (mm) : 6.8 (L)
- Grain Shape : 3.1 (S)
- Chalky Grains (%) : 1.5 (Pr)

Physicochemical Properties
- Amylose Content (%) : 18.3 (I)
- Gelatinization Temperature : 4.1 (I)
- Crude Protein Content (%) : 7.8

Agronomic Characteristics

Plant Height (cm) : 157.1
Heading Days After Seeding : 104
Maturity Days After Seeding : 134
Basal Leaf Sheath Color : 1 (Green)
Anthocyanin Color : 0 (Absent)
Leaf Blade Pubescence : 3 (Pubescent)
Auricle Color : 2 (Yellowish green)
Collar Color : 2 (Light green)
Awn Distribution : 0 (None)
Panicle Exsertion : 9 (Well exserted)
Lodging Resistance : 3 (Weak)
Leaf Senescence : 5 (Intermediate)
Panicle Shattering : 5 (Moderate)
Endosperm Type : 1 (Non-glutinous)

BWS-WY

Agusan del Sur
Collection No. 16342

BWS-WY-16342	
% Genetic Similarity	Other Genotypes
93.03	3-MILLION (15457)
92.98	216 (16399)
92.27	PSB Rc 38
92.18	PSB Rc 40
92.15	BURDAGOL (15892)

Grain Quality Traits

Milling Recovery (%)
- Brown Rice : 75.6 (F)
- Milled Rice : 67.6 (G1)
- Head Rice : 58.3 (Pr)

Physical Attributes
- Grain Length (mm) : 6.5 (M)
- Grain Shape : 2.8 (I)
- Chalky Grains (%) : 7.5 (G2)

Physicochemical Properties
- Amylose Content (%) : 22.6 (H)
- Gelatinization Temperature : 5.0 (I)
- Crude Protein Content (%) : 8.0

Agronomic Characteristics

Plant Height (cm) : 140.5
Heading Days After Seeding : 102
Maturity Days After Seeding : 132
Basal Leaf Sheath Color : 1 (Green)
Anthocyanin Color : 0 (Absent)
Leaf Blade Pubescence : 3 (Pubescent)
Auricle Color : 2 (Yellowish green)
Collar Color : 2 (Light green)
Awn Distribution : 0 (None)
Panicle Exsertion : 9 (Well exserted)
Lodging Resistance : 7 (Strong)
Leaf Senescence : 5 (Intermediate)
Panicle Shattering : 5 (Moderate)
Endosperm Type : 2 (Intermediate)

BWSI-4R

Agusan del Sur
Collection No.16343

BWSI-4R-16343	
% Genetic Similarity	Other Genotypes
96.39	PANDAN 1 (16377)
95.50	JASMIN (15661)
95.23	216 (16399)
94.81	DIAMOND X (16510)
94.80	ABANGAY (16336)

Grain Quality Traits

Milling Recovery (%)
- Brown Rice : 75.8 (F)
- Milled Rice : 67.9 (G1)
- Head Rice : 60.3 (Pr)

Physical Attributes
- Grain Length (mm) : 5.9 (M)
- Grain Shape : 2.7 (I)
- Chalky Grains (%) : 0.4 (Pr)

Physicochemical Properties
- Amylose Content (%) : 17.9 (I)
- Gelatinization Temperature : 4.1 (I)
- Crude Protein Content (%) : 9.3

Agronomic Characteristics

Plant Height (cm) : 93.2
Heading Days After Seeding : 91
Maturity Days After Seeding : 121
Basal Leaf Sheath Color : 1 (Green)
Anthocyanin Color : 0 (Absent)
Leaf Blade Pubescence : 3 (Pubescent)
Auricle Color : 2 (Yellowish green)
Collar Color : 2 (Light green)
Awn Distribution : 0 (None)
Panicle Exsertion : 5 (Just exserted)
Lodging Resistance : 9 (Very strong)
Leaf Senescence : 5 (Intermediate)
Panicle Shattering : 5 (Moderate)
Endosperm Type : 1 (Non-glutinous)

BWS-6W

Agusan del Sur
Collection No. 16344

BWS-6W-16344	
% Genetic Similarity	Other Genotypes
99.99	EXCEL RICE (15571)
97.63	UP & DOWN (15877)
97.17	MAHARLIK (16311)
97.15	NSIC Rc 148
96.73	EL GRANDE (16303)

Grain Quality Traits

Milling Recovery (%)
- Brown Rice : 77.6 (F)
- Milled Rice : 67.3 (G1)
- Head Rice : 62.6 (Pr)

Physical Attributes
- Grain Length (mm) : 6.8 (L)
- Grain Shape : 3.3 (S)
- Chalky Grains (%) : 7.9 (G2)

Physicochemical Properties
- Amylose Content (%) : 20.2 (I)
- Gelatinization Temperature : 4.3 (I)
- Crude Protein Content (%) : 8.1

Agronomic Characteristics

Plant Height (cm) : 152.0
Heading Days After Seeding : 104
Maturity Days After Seeding : 134
Basal Leaf Sheath Color : 1 (Green)
Anthocyanin Color : 0 (Absent)
Leaf Blade Pubescence : 3 (Pubescent)
Auricle Color : 2 (Yellowish green)
Collar Color : 2 (Light green)
Awn Distribution : 0 (None)
Panicle Exsertion : 9 (Well exserted)
Lodging Resistance : 1 (Very weak)
Leaf Senescence : 5 (Intermediate)
Panicle Shattering : 5 (Moderate)
Endosperm Type : 1 (Non-glutinous)

BWS3-3B

Agusan del Sur
Collection No.16345

BWS3-3B-16345	
% Genetic Similarity	Other Genotypes
97.05	BWSI-4B (16346)
94.21	ABANGAY (16336)
94.00	BWSI-4R (16343)
93.92	JASMIN (15661)
93.91	216 (16399)

Grain Quality Traits

Milling Recovery (%)
- Brown Rice : 75.5 (F)
- Milled Rice : 68.1 (G1)
- Head Rice : 55.9 (G1)

Physical Attributes
- Grain Length (mm) : 6.1 (M)
- Grain Shape : 2.5 (I)
- Chalky Grains (%) : 1.7 (Pr)

Physicochemical Properties
- Amylose Content (%) : 13.8 (L)
- Gelatinization Temperature : 6.0 (L)
- Crude Protein Content (%) : 8.2

Agronomic Characteristics

Plant Height (cm) : 130.2
Heading Days After Seeding : 104
Maturity Days After Seeding : 134
Basal Leaf Sheath Color : 1 (Green)
Anthocyanin Color : 0 (Absent)
Leaf Blade Pubescence : 3 (Pubescent)
Auricle Color : 2 (Yellowish green)
Collar Color : 2 (Light green)
Awn Distribution : 0 (None)
Panicle Exsertion : 9 (Well exserted)
Lodging Resistance : 3 (Weak)
Leaf Senescence : 5 (Intermediate)
Panicle Shattering : 5 (Moderate)
Endosperm Type : 1 (Non-glutinous)

BWSI-4B

Agusan del Sur
Collection No. 16346

BWSI-4B-16346	
% Genetic Similarity	Other Genotypes
97.05	BWS3-3B (16345)
92.14	ABANGAY (16336)
91.96	BWSI-4R (16343)
91.85	3-MILLION (15457)
91.65	PANDAN 2 (16378)

Grain Quality Traits

Milling Recovery (%)
- Brown Rice : 74.8 (P)
- Milled Rice : 68.1 (G1)
- Head Rice : 60.4 (Pr)

Physical Attributes
- Grain Length (mm) : 6.0 (M)
- Grain Shape : 2.4 (I)
- Chalky Grains (%) : 1.1 (Pr)

Physicochemical Properties
- Amylose Content (%) : 13.2 (L)
- Gelatinization Temperature : 5.5 (I/L)
- Crude Protein Content (%) : 7.3

Agronomic Characteristics

Plant Height (cm) : 139.9
Heading Days After Seeding : 104
Maturity Days After Seeding : 134
Basal Leaf Sheath Color : 1 (Green)
Anthocyanin Color : 0 (Absent)
Leaf Blade Pubescence : 3 (Pubescent)
Auricle Color : 2 (Yellowish green)
Collar Color : 2 (Light green)
Awn Distribution : 0 (None)
Panicle Exsertion : 9 (Well exserted)
Lodging Resistance : 7 (Strong)
Leaf Senescence : 5 (Intermediate)
Panicle Shattering : 5 (Moderate)
Endosperm Type : 1 (Non-glutinous)

BISADA

Agusan del Sur
Collection No.16347

BISADA-16347	
% Genetic Similarity	Other Genotypes
99.66	BISADA (16339)
98.95	BES I (16340)
97.11	SAN CARLOS (16387)
95.07	PK P2-6 (16382)
93.76	NTPSA-1 (16376)

Grain Quality Traits

Milling Recovery (%)
- Brown Rice : 77.3 (F)
- Milled Rice : 67.4 (G1)
- Head Rice : 59.5 (Pr)

Physical Attributes
- Grain Length (mm) : 7.1 (L)
- Grain Shape : 3.6 (S)
- Chalky Grains (%) : 10.4 (G3)

Physicochemical Properties
- Amylose Content (%) : 19.3 (I)
- Gelatinization Temperature : 4.2 (I/L)
- Crude Protein Content (%) : 8.1

Agronomic Characteristics

Plant Height (cm) : 168.4
Heading Days After Seeding : 114
Maturity Days After Seeding : 144
Basal Leaf Sheath Color : 1 (Green)
Anthocyanin Color : 0 (Absent)
Leaf Blade Pubescence : 3 (Pubescent)
Auricle Color : 2 (Yellowish green)
Collar Color : 2 (Light green)
Awn Distribution : 0 (None)
Panicle Exsertion : 9 (Well exserted)
Lodging Resistance : 1 (Very weak)
Leaf Senescence : 5 (Intermediate)
Panicle Shattering : 5 (Moderate)
Endosperm Type : 1 (Non-glutinous)

C4-TYSAN

Agusan del Sur
Collection No.16348

C4 TYSAN-16348	
% Genetic Similarity	Other Genotypes
96.50	TANURA (16393)
91.31	PSB Rc 10
91.07	216 (16399)
90.74	DIAMOND X (16510)
90.43	NSIC Rc 420

Grain Quality Traits

Milling Recovery (%)
- Brown Rice : 76.1 (F)
- Milled Rice : 69.8 (G1)
- Head Rice : 59.3 (Pr)

Physical Attributes
- Grain Length (mm) : 5.7 (M)
- Grain Shape : 2.4 (I)
- Chalky Grains (%) : 1.1 (Pr)

Physicochemical Properties
- Amylose Content (%) : 23.6 (H)
- Gelatinization Temperature : 7.0 (L)
- Crude Protein Content (%) : 8.5

Agronomic Characteristics

Plant Height (cm) : 119.2
Heading Days After Seeding : 104
Maturity Days After Seeding : 134
Basal Leaf Sheath Color : 1 (Green)
Anthocyanin Color : 0 (Absent)
Leaf Blade Pubescence : 3 (Pubescent)
Auricle Color : 2 (Yellowish green)
Collar Color : 2 (Light green)
Awn Distribution : 0 (None)
Panicle Exsertion : 5 (Just exserted)
Lodging Resistance : 9 (Very strong)
Leaf Senescence : 5 (Intermediate)
Panicle Shattering : 5 (Moderate)
Endosperm Type : 1 (Non-glutinous)

CAROVAN

Agusan del Sur
Collection No. 16349

CAROVAN-16349	
% Genetic Similarity	Other Genotypes
95.42	216 (16399)
94.60	3-MILLION (15457)
94.35	ABANGAY (16336)
93.97	DAHILI (16352)
93.86	DIAMOND X (16510)

Grain Quality Traits

Milling Recovery (%)
- Brown Rice : 77.1 (F)
- Milled Rice : 69.1 (G1)
- Head Rice : 59.7 (Pr)

Physical Attributes
- Grain Length (mm) : 6.9 (L)
- Grain Shape : 3.3 (S)
- Chalky Grains (%) : 1.3 (Pr)

Physicochemical Properties
- Amylose Content (%) : 18.4 (I)
- Gelatinization Temperature : 4.0 (I)
- Crude Protein Content (%) : 8.9

Agronomic Characteristics

Plant Height (cm) : 157.3
Heading Days After Seeding : 91
Maturity Days After Seeding : 121
Basal Leaf Sheath Color : 1 (Green)
Anthocyanin Color : 0 (Absent)
Leaf Blade Pubescence : 3 (Pubescent)
Auricle Color : 2 (Yellowish green)
Collar Color : 2 (Light green)
Awn Distribution : 2 (Upper quarter only)
Panicle Exsertion : 9 (Well exserted)
Lodging Resistance : 1 (Very weak)
Leaf Senescence : 5 (Intermediate)
Panicle Shattering : 5 (Moderate)
Endosperm Type : 1 (Non-glutinous)

DIWATA

Agusan del Sur
Collection No. 16351

DIWATA-16351	
% Genetic Similarity	Other Genotypes
95.24	HI-NOON (16506)
95.05	BURDAGOL (15660)
94.29	XOR (16395)
94.06	PUKPUKLO (16067)
94.05	SNC-13 (16388)

Grain Quality Traits

Milling Recovery (%)
- Brown Rice : 77.5 (F)
- Milled Rice : 70.0 (G1)
- Head Rice : 59.1 (Pr)

Physical Attributes
- Grain Length (mm) : 5.6 (M)
- Grain Shape : 2.3 (I)
- Chalky Grains (%) : 7.2 (G2)

Physicochemical Properties
- Amylose Content (%) : 22.9 (H)
- Gelatinization Temperature : 4.4 (I)
- Crude Protein Content (%) : 8.5

Agronomic Characteristics

Plant Height (cm) : 138.8
Heading Days After Seeding : 104
Maturity Days After Seeding : 134
Basal Leaf Sheath Color : 1 (Green)
Anthocyanin Color : 0 (Absent)
Leaf Blade Pubescence : 3 (Pubescent)
Auricle Color : 2 (Yellowish green)
Collar Color : 2 (Light green)
Awn Distribution : 0 (None)
Panicle Exsertion : 9 (Well exserted)
Lodging Resistance : 1 (Very weak)
Leaf Senescence : 5 (Intermediate)
Panicle Shattering : 5 (Moderate)
Endosperm Type : 1 (Non-glutinous)

DAHILI

Agusan del Sur
Collection No.16352

DAHILI-16352	
% Genetic Similarity	Other Genotypes
95.57	216 (16399)
95.14	DIAMOND X (16510)
95.07	SAN CARLOS (16387)
94.92	ABANGAY (16336)
94.66	NSIC Rc 222

Grain Quality Traits

Milling Recovery (%)
- Brown Rice : 76.7 (F)
- Milled Rice : 67.8 (G1)
- Head Rice : 58.9 (Pr)

Physical Attributes
- Grain Length (mm) : 7.0 (L)
- Grain Shape : 3.2 (S)
- Chalky Grains (%) : 1.2 (Pr)

Physicochemical Properties
- Amylose Content : 18.5 (I)
- Gelatinization Temperature : 6.9 (L)
- Crude Protein Content (%) : 8.7

Agronomic Characteristics

Plant Height (cm) : 131.5
Heading Days After Seeding : 104
Maturity Days After Seeding : 134
Basal Leaf Sheath Color : 1 (Green)
Anthocyanin Color : 0 (Absent)
Leaf Blade Pubescence : 3 (Pubescent)
Auricle Color : 2 (Yellowish green)
Collar Color : 2 (Light green)
Awn Distribution : 5 (Whole length)
Panicle Exsertion : 7 (Moderately well exserted)
Lodging Resistance : 1 (Very weak)
Leaf Senescence : 5 (Intermediate)
Panicle Shattering : 5 (Moderate)
Endosperm Type : 1 (Non-glutinous)

EC3

Agusan del Sur
Collection No. 16353

EC3-16353	
% Genetic Similarity	Other Genotypes
95.45	M90 SG (16361)
95.40	216 (16399)
95.26	NTPSA-1 (16376)
94.99	EC2 (16354)
94.85	M108-1 (16364)

Grain Quality Traits

Milling Recovery (%)
- Brown Rice : 75.9 (F)
- Milled Rice : 67.9 (G1)
- Head Rice : 58.4 (Pr)

Physical Attributes
- Grain Length (mm) : 5.8 (M)
- Grain Shape : 2.8 (I)
- Chalky Grains (%) : 1.1 (Pr)

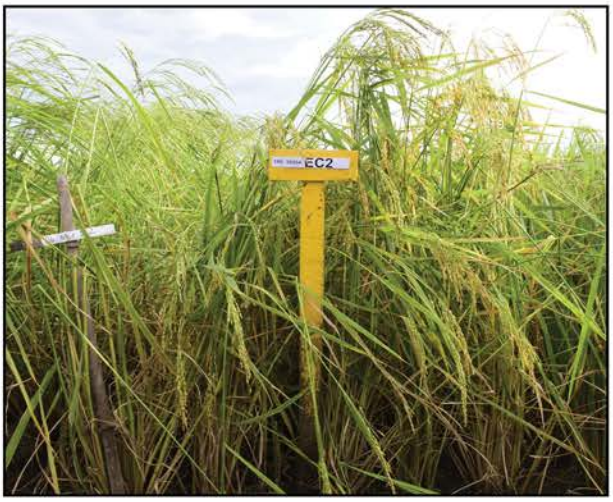
Physicochemical Properties
- Amylose Content (%) : 19.9 (I)
- Gelatinization Temperature : 5.8 (I/L)
- Crude Protein Content (%) : 8.1

Agronomic Characteristics

Plant Height (cm) : 156.6
Heading Days After Seeding : 112
Maturity Days After Seeding : 142
Basal Leaf Sheath Color : 1 (Green)
Anthocyanin Color : 0 (Absent)
Leaf Blade Pubescence : 3 (Pubescent)
Auricle Color : 2 (Yellowish green)
Collar Color : 2 (Light green)
Awn Distribution : 0 (None)
Panicle Exsertion : 7 (Moderately well exserted)
Lodging Resistance : 1 (Very weak)
Leaf Senescence : 5 (Intermediate)
Panicle Shattering : 5 (Moderate)
Endosperm Type : 1 (Non-glutinous)

EC2

Agusan del Sur
Collection No.16354



EC2-16354	
% Genetic Similarity	Other Genotypes
97.32	M108-1 (16364)
96.56	NTPSA-1 (16376)
96.31	MINDORO (16375)
94.99	EC3 (16353)
94.90	M90 SG (16361)

Grain Quality Traits

Milling Recovery (%)
- Brown Rice : 76.2 (F)
- Milled Rice : 68.4 (G1)
- Head Rice : 58.6 (Pr)

Physical Attributes
- Grain Length (mm) : 6.3 (M)
- Grain Shape : 2.8 (I)
- Chalky Grains (%) : 1.3 (Pr)

Physicochemical Properties
- Amylose Content (%) : 13.4 (L)
- Gelatinization Temperature : 5.7 (I/L)
- Crude Protein Content (%) : 8.0

Agronomic Characteristics

Plant Height (cm) : 153.6
Heading Days After Seeding : 92
Maturity Days After Seeding : 122
Basal Leaf Sheath Color : 1 (Green)
Anthocyanin Color : 0 (Absent)
Leaf Blade Pubescence : 3 (Pubescent)
Auricle Color : 2 (Yellowish green)
Collar Color : 2 (Light green)
Awn Distribution : 0 (None)
Panicle Exsertion : 7 (Moderately well exserted)
Lodging Resistance : 1 (Very weak)
Leaf Senescence : 5 (Intermediate)
Panicle Shattering : 5 (Moderate)
Endosperm Type : 1 (Non-glutinous)

JASMINE R

Agusan del Sur
Collection No.16356

JASMINE R-16356	
% Genetic Similarity	Other Genotypes
94.39	216 (16399)
93.91	JANJANONG (16515)
93.75	DIAMOND X (16510)
93.68	JASMIN (15661)
93.55	TANURA (16393)

Grain Quality Traits

Milling Recovery (%)
- Brown Rice : 76.8 (F)
- Milled Rice : 66.1 (G1)
- Head Rice : 60.7 (Pr)

Physical Attributes
- Grain Length (mm) : 7.1 (L)
- Grain Shape : 3.4 (S)
- Chalky Grains (%) : 9.0 (G2)

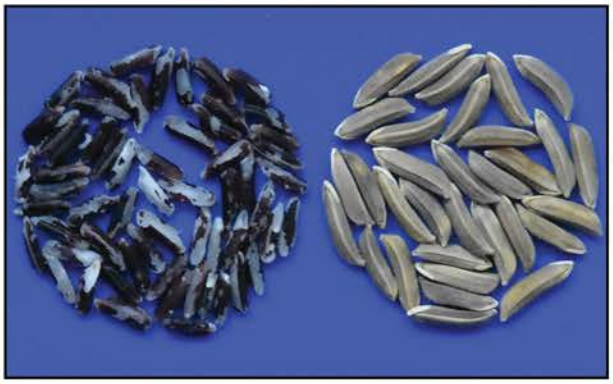
Physicochemical Properties
- Amylose Content (%) : 22.6 (H)
- Gelatinization Temperature : 7.0 (L)
- Crude Protein Content (%) : 7.1

Agronomic Characteristics

Plant Height (cm) : 156.1
Heading Days After Seeding : 96
Maturity Days After Seeding : 126
Basal Leaf Sheath Color : 1 (Green)
Anthocyanin Color : 0 (Absent)
Leaf Blade Pubescence : 3 (Pubescent)
Auricle Color : 2 (Yellowish green)
Collar Color : 2 (Light green)
Awn Distribution : 0 (None)
Panicle Exsertion : 7 (Moderately well exserted)
Lodging Resistance : 1 (Very weak)
Leaf Senescence : 5 (Intermediate)
Panicle Shattering : 5 (Moderate)
Endosperm Type : 1 (Non-glutinous)

KAOLOB

Agusan del Sur
Collection No.16357



KAOLOB-16357	
% Genetic Similarity	Other Genotypes
95.65	M90 SG (16361)
94.42	EC2 (16354)
94.37	ELON-ELON (16319)
94.36	KAMOROS (16358)
94.33	EC3 (16353)

Grain Quality Traits

Milling Recovery (%)
- Brown Rice : 74.8 (F)
- Milled Rice : 64.2 (G2)
- Head Rice : 54.9 (G1)

Physical Attributes
- Grain Length (mm) : 6.6 (L)
- Grain Shape : 3.3 (S)
- Chalky Grains (%) : 5.8 (G2)

Physicochemical Properties
- Amylose Content (%) : 17.8 (I)
- Gelatinization Temperature : 4.5 (I/L)
- Crude Protein Content (%) : 8.5

Agronomic Characteristics

Plant Height (cm) : 138.6
Heading Days After Seeding : 91
Maturity Days After Seeding : 121
Basal Leaf Sheath Color : 1 (Green)
Anthocyanin Color : 0 (Absent)
Leaf Blade Pubescence : 3 (Pubescent)
Auricle Color : 2 (Yellowish green)
Collar Color : 2 (Light green)
Awn Distribution : 2 (Upper quarters only)
Panicle Exsertion : 1 (Enclosed)
Lodging Resistance : 7 (Strong)
Leaf Senescence : 5 (Intermediate)
Panicle Shattering : 5 (Moderate)
Endosperm Type : 1 (Non-glutinous)

KAMOROS

Agusan del Sur
Collection No. 16358

KAMOROS-16358	
% Genetic Similarity	Other Genotypes
97.25	NTPSA-1 (16376)
95.60	ABANGAY (16336)
95.34	SAN CARLOS (16387)
95.33	3-MILLION (15457)
95.21	MINONING (16373)

Grain Quality Traits

Milling Recovery (%)
- Brown Rice : 77.2 (F)
- Milled Rice : 70.2 (Pr)
- Head Rice : 59.2 (Pr)

Physical Attributes
- Grain Length (mm) : 5.9 (M)
- Grain Shape : 2.3 (I)
- Chalky Grains (%) : 3.9 (G1)

Physicochemical Properties
- Amylose Content (%) : 15.3 (L)
- Gelatinization Temperature : 4.3 (I/L)
- Crude Protein Content (%) : 8.7

Agronomic Characteristics

Plant Height (cm) : —
Heading Days After Seeding : 100
Maturity Days After Seeding : 130
Basal Leaf Sheath Color : 1 (Green)
Anthocyanin Color : 0 (Absent)
Leaf Blade Pubescence : 3 (Pubescent)
Auricle Color : 2 (Yellowish green)
Collar Color : 2 (Light green)
Awn Distribution : 0 (None)
Panicle Exsertion : 7 (Moderately well exserted)
Lodging Resistance : 1 (Very weak)
Leaf Senescence : 5 (Intermediate)
Panicle Shattering : 5 (Moderate)
Endosperm Type : 1 (Non-glutinous)

L2B2 VI

Agusan del Sur
Collection No. 16360

L2B2 VI-16360	
% Genetic Similarity	Other Genotypes
91.28	216 (16399)
91.27	NSIC Rc 420
91.06	DIAMOND X (16510)
91.03	3-MILLION (15457)
90.66	JASMIN (15661)

Grain Quality Traits

Milling Recovery (%)
- Brown Rice : 76.5 (F)
- Milled Rice : 66.4 (G1)
- Head Rice : 57.6 (Pr)

Physical Attributes
- Grain Length (mm) : 7.0 (L)
- Grain Shape : 2.9 (I)
- Chalky Grains (%) : 9.0 (G2)

Physicochemical Properties
- Amylose Content (%) : 19.0 (I)
- Gelatinization Temperature : 4.3 (I)
- Crude Protein Content (%) : 8.3

Agronomic Characteristics

Plant Height (cm) : 125.7
Heading Days After Seeding : 91
Maturity Days After Seeding : 121
Basal Leaf Sheath Color : 1 (Green)
Anthocyanin Color : 0 (Absent)
Leaf Blade Pubescence : 3 (Pubescent)
Auricle Color : 2 (Yellowish green)
Collar Color : 2 (Light green)
Awn Distribution : 0 (None)
Panicle Exsertion : 7 (Moderately well exserted)
Lodging Resistance : 5 (Intermediate)
Leaf Senescence : 5 (Intermediate)
Panicle Shattering : 5 (Moderate)
Endosperm Type : 1 (Non-glutinous)

M90 SG

Agusan del Sur
Collection No.16361

M90 SG-16361	
% Genetic Similarity	Other Genotypes
98.26	ELON-ELON (16319)
95.65	KAOLOB (16357)
95.45	EC3 (16353)
94.94	MINONING (16373)
94.90	EC2 (16354)

Grain Quality Traits

Milling Recovery (%)
- Brown Rice : 75.8 (F)
- Milled Rice : 67.5 (G1)
- Head Rice : 60.9 (Pr)

Physical Attributes
- Grain Length (mm) : 6.1 (M)
- Grain Shape : 3.2 (S)
- Chalky Grains (%) : 5.6 (G2)

Physicochemical Properties
- Amylose Content (%) : 13.8 (L)
- Gelatinization Temperature : 6.0 (L)
- Crude Protein Content (%) : 7.7

Agronomic Characteristics

- Plant Height (cm) : 149.9
- Heading Days After Seeding : 93
- Maturity Days After Seeding : 123
- Basal Leaf Sheath Color : 1 (Green)
- Anthocyanin Color : 0 (Absent)
- Leaf Blade Pubescence : 3 (Pubescent)
- Auricle Color : 2 (Yellowish green)
- Collar Color : 2 (Light green)
- Awn Distribution : 2 (Upper quarter only)
- Panicle Exsertion : 5 (Intermediate)
- Lodging Resistance : 5 (Intermediate)
- Leaf Senescence : 5 (Intermediate)
- Panicle Shattering : 5 (Moderate)
- Endosperm Type : 1 (Non-glutinous)

MANISI

Agusan del Sur
Collection No.16362

MANISI-16362	
% Genetic Similarity	Other Genotypes
95.51	MINONING (16373)
94.99	KAMOROS (16358)
94.90	PKPDWARF (16384)
94.65	NTPSA-1 (16376)
94.25	ABANGAY (16336)

Grain Quality Traits

Milling Recovery (%)
- Brown Rice : 79.3 (F)
- Milled Rice : 70.5 (Pr)
- Head Rice : 63.7 (Pr)

Physical Attributes
- Grain Length (mm) : 5.3 (Sh)
- Grain Shape : 2.3 (I)
- Chalky Grains (%) : 7.5 (G2)

Physicochemical Properties
- Amylose Content (%) : 12.8 (L)
- Gelatinization Temperature : 4.1 (I)
- Crude Protein Content (%) : 8.0

Agronomic Characteristics

Plant Height (cm) : 137.1
Heading Days After Seeding : 91
Maturity Days After Seeding : 121
Basal Leaf Sheath Color : 2 (Green with purple lines)
Anthocyanin Color : 3 (Weak)
Leaf Blade Pubescence : 3 (Pubescent)
Auricle Color : 5 (Purple lines)
Collar Color : 4 (Purple lines)
Awn Distribution : 0 (None)
Panicle Exsertion : 7 (Moderately well exserted)
Lodging Resistance : 3 (Weak)
Leaf Senescence : 5 (Intermediate)
Panicle Shattering : 5 (Moderate)
Endosperm Type : 1 (Non-glutinous)

M108-1

Agusan del Sur
Collection No. 16364

M108-1-16364	
% Genetic Similarity	Other Genotypes
97.32	EC2 (16354)
96.56	NTPSA-1 (16376)
95.64	MINDORO (16375)
94.85	EC3 (16353)
93.67	ABANGAY (16336)

Grain Quality Traits

Milling Recovery (%)
- Brown Rice : 76.2 (F)
- Milled Rice : 69.9 (G1)
- Head Rice : 60.0 (Pr)

Physical Attributes
- Grain Length (mm) : 5.8 (M)
- Grain Shape : 2.5 (I)
- Chalky Grains (%) : 0.7 (Pr)

Physicochemical Properties
- Amylose Content (%) : 14.2 (L)
- Gelatinization Temperature : 5.3 (I/L)
- Crude Protein Content (%) : 8.3

Agronomic Characteristics

Plant Height (cm) : 133.6
Heading Days After Seeding : 112
Maturity Days After Seeding : 142
Basal Leaf Sheath Color : 3 (Light purple)
Anthocyanin Color : 5 (Medium)
Leaf Blade Pubescence : 3 (Pubescent)
Auricle Color : 2 (Yellowish green)
Collar Color : 2 (Light green)
Awn Distribution : 0 (None)
Panicle Exsertion : 9 (Well exserted)
Lodging Resistance : 7 (Strong)
Leaf Senescence : 5 (Intermediate)
Panicle Shattering : 5 (Moderate)
Endosperm Type : 1 (Non-glutinous)

M31-VF

Agusan del Sur
Collection No. 16365

M31-VF-16365	
% Genetic Similarity	Other Genotypes
93.99	RG17-K (16386)
92.62	216 (16399)
92.39	MASHAW (16082)
92.30	3-MILLION (15457)
92.18	NSIC Rc 420

Grain Quality Traits

Milling Recovery (%)
- Brown Rice : 75.5 (F)
- Milled Rice : 67.6 (G1)
- Head Rice : 61.1 (Pr)

Physical Attributes
- Grain Length (mm) : 6.2 (M)
- Grain Shape : 2.9 (I)
- Chalky Grains (%) : 2.7 (G1)

Physicochemical Properties
- Amylose Content (%) : 23.3 (H)
- Gelatinization Temperature : 6.9 (I/L)
- Crude Protein Content (%) : 8.4

Agronomic Characteristics

Plant Height (cm) : 167.1
Heading Days After Seeding : 92
Maturity Days After Seeding : 122
Basal Leaf Sheath Color : 1 (Green)
Anthocyanin Color : 0 (Absent)
Leaf Blade Pubescence : 3 (Pubescent)
Auricle Color : 2 (Yellowish green)
Collar Color : 2 (Light green)
Awn Distribution : 0 (None)
Panicle Exsertion : 9 (Well exserted)
Lodging Resistance : 3 (Weak)
Leaf Senescence : 5 (Intermediate)
Panicle Shattering : 5 (Moderate)
Endosperm Type : 1 (Non-glutinous)

MANGO SINGKET

Agusan del Sur
Collection No. 16366

MANGO SINGKET-16366	
% Genetic Similarity	Other Genotypes
92.27	ABANGAY (16336)
91.96	3-MILLION (15457)
91.90	216 (16399)
91.88	JASMIN (15661)
91.78	KAMOROS (16358)

Grain Quality Traits

Milling Recovery (%)
- Brown Rice : 75.5 (F)
- Milled Rice : 68.8 (G1)
- Head Rice : 56.7 (G1)

Physical Attributes
- Grain Length (mm) : 5.6 (M)
- Grain Shape : 2.2 (I)
- Chalky Grains (%) : 19.0 (aa)

Physicochemical Properties
- Amylose Content (%) : 22.2 (H)
- Gelatinization Temperature : 5.1 (I/L)
- Crude Protein Content (%) : 7.9

Agronomic Characteristics

Plant Height (cm) : 146.0
Heading Days After Seeding : 91
Maturity Days After Seeding : 121
Basal Leaf Sheath Color : 1 (Green)
Anthocyanin Color : 0 (Absent)
Leaf Blade Pubescence : 3 (Pubescent)
Auricle Color : 2 (Yellowish green)
Collar Color : 2 (Light green)
Awn Distribution : 0 (None)
Panicle Exsertion : 7 (Moderately well exserted)
Lodging Resistance : 3 (Weak)
Leaf Senescence : 5 (Intermediate)
Panicle Shattering : 5 (Moderate)
Endosperm Type : 2 (Intermediate)

M420-1

Agusan del Sur
Collection No.16367

M420-1-16367	
% Genetic Similarity	Other Genotypes
93.36	ABANGAY (16336)
92.70	3-MILLION (15457)
92.40	JASMIN (15661)
91.93	KAMOROS (16358)
91.78	147-2 (16396)

Grain Quality Traits

Milling Recovery (%)
- Brown Rice : 75.1 (P)
- Milled Rice : 66.2 (G1)
- Head Rice : 46.9 (G2)

Physical Attributes
- Grain Length (mm) : 6.4 (M)
- Grain Shape : 2.6 (I)
- Chalky Grains (%) : 7.4 (G2)

Physicochemical Properties
- Amylose Content (%) : 15.7 (L)
- Gelatinization Temperature : 4.4 (I/L)
- Crude Protein Content (%) : 9.5

Agronomic Characteristics

Plant Height (cm) : 150.6
Heading Days After Seeding : 91
Maturity Days After Seeding : 121
Basal Leaf Sheath Color : 1 (Green)
Anthocyanin Color : 0 (Absent)
Leaf Blade Pubescence : 3 (Pubescent)
Auricle Color : 2 (Yellowish green)
Collar Color : 2 (Light green)
Awn Distribution : 0 (None)
Panicle Exsertion : 7 (Moderately well exserted)
Lodging Resistance : 3 (Weak)
Leaf Senescence : 5 (Intermediate)
Panicle Shattering : 5 (Moderate)
Endosperm Type : 1 (Non-glutinous)

M5-BD

Agusan del Sur
Collection No. 16370

M5-BD-16370	
% Genetic Similarity	Other Genotypes
97.64	UP & DOWN (15877)
97.62	NSIC Rc 148
96.50	DIAMOND X (16510)
96.33	NSIC Rc 294
95.88	EXCEL RICE (15571)

Grain Quality Traits

Milling Recovery (%)
- Brown Rice : 78.2 (F)
- Milled Rice : 69.3 (G1)
- Head Rice : 62.7 (Pr)

Physical Attributes
- Grain Length (mm) : 6.8 (L)
- Grain Shape : 3.3 (S)
- Chalky Grains (%) : 1.3 (Pr)

Physicochemical Properties
- Amylose Content : 19.3 (I)
- Gelatinization Temperature : 4.7 (I/L)
- Crude Protein Content (%) : 8.8

Agronomic Characteristics

Plant Height (cm) : 115.0
Heading Days After Seeding : 91
Maturity Days After Seeding : 121
Basal Leaf Sheath Color : 1 (Green)
Anthocyanin Color : 0 (Absent)
Leaf Blade Pubescence : 3 (Pubescent)
Auricle Color : 2 (Yellowish green)
Collar Color : 2 (Light green)
Awn Distribution : 2 (Upper quarter only)
Panicle Exsertion : 5 (Intermediate)
Lodging Resistance : 5 (Intermediate)
Leaf Senescence : 5 (Intermediate)
Panicle Shattering : 5 (Moderate)
Endosperm Type : 1 (Non-glutinous)

M105-R

Agusan del Sur
Collection No.16371

M105-R-16371	
% Genetic Similarity	Other Genotypes
92.48	ABANGAY (16336)
91.61	216 (16399)
91.30	KAMOROS (16358)
91.30	3-MILLION (15457)
91.13	DIAMOND X (16510)

Grain Quality Traits

Milling Recovery (%)
- Brown Rice : 78.7 (F)
- Milled Rice : 70.1 (Pr)
- Head Rice : 57.4 (Pr)

Physical Attributes
- Grain Length (mm) : 6.2 (M)
- Grain Shape : 2.5 (I)
- Chalky Grains (%) : 8.7 (G2)

Physicochemical Properties
- Amylose Content (%) : 23.2 (H)
- Gelatinization Temperature : 7.0 (L)
- Crude Protein Content (%) : 7.9

Agronomic Characteristics

- Plant Height (cm) : 119.2
- Heading Days After Seeding : 112
- Maturity Days After Seeding : 142
- Basal Leaf Sheath Color : 1 (Green)
- Anthocyanin Color : 0 (Absent)
- Leaf Blade Pubescence : 3 (Pubescent)
- Auricle Color : 2 (Yellowish green)
- Collar Color : 2 (Light green)
- Awn Distribution : 0 (None)
- Panicle Exsertion : 5 (Just exserted)
- Lodging Resistance : 9 (Very strong)
- Leaf Senescence : 5 (Intermediate)
- Panicle Shattering : 5 (Moderate)
- Endosperm Type : 2 (Intermediate)

M126-1

Agusan del Sur
Collection No.16372

M126-1-16372	
% Genetic Similarity	Other Genotypes
95.39	ABANGAY (16336)
94.22	SNC-13 (16388)
94.00	KAMOROS (16358)
93.82	ROSANA (16089)
93.48	216 (16399)

Grain Quality Traits

Milling Recovery (%)
- Brown Rice : 77.8 (F)
- Milled Rice : 70.2 (Pr)
- Head Rice : 62.7 (Pr)

Physical Attributes
- Grain Length (mm) : 5.6 (M)
- Grain Shape : 2.1 (I)
- Chalky Grains (%) : 4.8 (G1)

Physicochemical Properties
- Amylose Content (%) : 21.2 (I)
- Gelatinization Temperature : 4.6 (I/L)
- Crude Protein Content (%) : 9.0

Agronomic Characteristics

Plant Height (cm) : 149.4
Heading Days After Seeding : 100
Maturity Days After Seeding : 130
Basal Leaf Sheath Color : 1 (Green)
Anthocyanin Color : 0 (Absent)
Leaf Blade Pubescence : 3 (Pubescent)
Auricle Color : 2 (Yellowish green)
Collar Color : 2 (Light green)
Awn Distribution : 0 (None)
Panicle Exsertion : 7 (Moderately well exserted)
Lodging Resistance : 5 (Intermediate)
Leaf Senescence : 5 (Intermediate)
Panicle Shattering : 5 (Moderate)
Endosperm Type : 1 (Non-glutinous)

MINONING

Agusan del Sur
Collection No. 16373

MINONING-16373	
% Genetic Similarity	Other Genotypes
95.70	PKPDWARF (16384)
95.51	MANISI (16362)
95.21	KAMOROS (16358)
94.94	M90 SG (16361)
94.67	NTPSA-1 (16376)

Grain Quality Traits

Milling Recovery (%)
- Brown Rice : 76.4 (F)
- Milled Rice : 68.6 (G1)
- Head Rice : 56.8 (G1)

Physical Attributes
- Grain Length (mm) : 6.2 (M)
- Grain Shape : 2.7 (I)
- Chalky Grains (%) : 5.5 (G2)

Physicochemical Properties
- Amylose Content : 16.2 (L)
- Gelatinization Temperature : 6.2 (L)
- Crude Protein Content (%) : 7.6

Agronomic Characteristics

Plant Height (cm) : 139.1
Heading Days After Seeding : 91
Maturity Days After Seeding : 121
Basal Leaf Sheath Color : 1 (Green)
Anthocyanin Color : 0 (Absent)
Leaf Blade Pubescence : 3 (Pubescent)
Auricle Color : 2 (Yellowish green)
Collar Color : 2 (Light green)
Awn Distribution : 0 (None)
Panicle Exsertion : 9 (Well exserted)
Lodging Resistance : 7 (Strong)
Leaf Senescence : 5 (Intermediate)
Panicle Shattering : 5 (Moderate)
Endosperm Type : 1 (Non-glutinous)

MINDORO-5R

Agusan del Sur
Collection No.16374

MINDORO-5R-16374	
% Genetic Similarity	Other Genotypes
92.67	KAMOROS (16358)
92.58	PANAKA (16385)
91.59	3-MILLION (15457)
91.03	NTPSA-1 (16376)
90.84	ABANGAY (16336)

Grain Quality Traits

Milling Recovery (%)
- Brown Rice : 77.9 (F)
- Milled Rice : 70.3 (Pr)
- Head Rice : 59.6 (Pr)

Physical Attributes
- Grain Length (mm) : 5.6 (M)
- Grain Shape : 2.2 (I)
- Chalky Grains (%) : 6.0 (G2)

Physicochemical Properties
- Amylose Content (%) : 17.8 (I)
- Gelatinization Temperature : 4.1 (I)
- Crude Protein Content (%) : 8.1

Agronomic Characteristics

Plant Height (cm) : 138.8
Heading Days After Seeding : 91
Maturity Days After Seeding : 121
Basal Leaf Sheath Color : 1 (Green)
Anthocyanin Color : 0 (Absent)
Leaf Blade Pubescence : 3 (Pubescent)
Auricle Color : 2 (Yellowish green)
Collar Color : 2 (Light green)
Awn Distribution : 0 (None)
Panicle Exsertion : 5 (Just exserted)
Lodging Resistance : 1 (Very weak)
Leaf Senescence : 5 (Intermediate)
Panicle Shattering : 5 (Moderate)
Endosperm Type : 2 (Intermediate)

MINDORO

Agusan del Sur
Collection No. 16375

MINDORO-16375	
% Genetic Similarity	Other Genotypes
96.31	EC2 (16354)
95.72	NTPSA-1 (16376)
95.64	M108-1 (16364)
93.83	KAMOROS (16358)
93.66	WAG-WAG (16073)

Grain Quality Traits

Milling Recovery (%)
- Brown Rice : 75.9 (F)
- Milled Rice : 67.6 (G1)
- Head Rice : 55.9 (G1)

Physical Attributes
- Grain Length (mm) : 5.8 (M)
- Grain Shape : 2.7 (I)
- Chalky Grains (%) : 1.7 (Pr)

Physicochemical Properties
- Amylose Content (%) : 12.3 (L)
- Gelatinization Temperature : 4.5 (I/L)
- Crude Protein Content (%) : 8.0

Agronomic Characteristics

Plant Height (cm) : 153.2
Heading Days After Seeding : 91
Maturity Days After Seeding : 121
Basal Leaf Sheath Color : 1 (Green)
Anthocyanin Color : 0 (Absent)
Leaf Blade Pubescence : 3 (Pubescent)
Auricle Color : 2 (Yellowish green)
Collar Color : 2 (Light green)
Awn Distribution : 0 (None)
Panicle Exsertion : 7 (Moderately well exserted)
Lodging Resistance : 1 (Very weak)
Leaf Senescence : 5 (Intermediate)
Panicle Shattering : 5 (Moderate)
Endosperm Type : 1 (Non-glutinous)

NTPSA-1

Agusan del Sur
Collection No.16376

NTPSA-1-16376	
% Genetic Similarity	Other Genotypes
97.25	KAMOROS (16358)
96.56	EC2 (16354)
96.56	M108-1 (16364)
95.72	MINDORO (16375)
95.52	SAN CARLOS (16387)

Grain Quality Traits

Milling Recovery (%)
- Brown Rice : 77.3 (F)
- Milled Rice : 70.2 (Pr)
- Head Rice : 59.0 (Pr)

Physical Attributes
- Grain Length (mm) : 5.4 (Sh)
- Grain Shape : 2.3 (I)
- Chalky Grains (%) : 0.7 (Pr)

Physicochemical Properties
- Amylose Content : 14.2 (L)
- Gelatinization Temperature : 5.3 (I/L)
- Crude Protein Content (%) : 8.3

Agronomic Characteristics

- Plant Height (cm) : 128.4
- Heading Days After Seeding : 91
- Maturity Days After Seeding : 121
- Basal Leaf Sheath Color : 1 (Green)
- Anthocyanin Color : 0 (Absent)
- Leaf Blade Pubescence : 3 (Pubescent)
- Auricle Color : 2 (Yellowish green)
- Collar Color : 2 (Light green)
- Awn Distribution : 0 (None)
- Panicle Exsertion : 7 (Moderately well exserted)
- Lodging Resistance : 7 (Strong)
- Leaf Senescence : 5 (Intermediate)
- Panicle Shattering : 5 (Moderate)
- Endosperm Type : 1 (Non-glutinous)

PANDAN 1

Agusan del Sur
Collection No.16377

PANDAN 1-16377	
% Genetic Similarity	Other Genotypes
96.39	BWSI-4R (16343)
94.52	NSIC Rc 31
94.19	SAIGON (15849)
93.92	DIAMOND X (16510)
93.66	MAGNOLIA (16512)

Grain Quality Traits

Milling Recovery (%)
- Brown Rice : 78.3 (F)
- Milled Rice : 69.6 (G1)
- Head Rice : 60.6 (Pr)

Physical Attributes
- Grain Length (mm) : 6.8 (L)
- Grain Shape : 2.6 (I)
- Chalky Grains (%) : 4.6 (G1)

Physicochemical Properties
- Amylose Content (%) : 15.2 (L)
- Gelatinization Temperature : 6.0 (L)
- Crude Protein Content (%) : 7.8

Agronomic Characteristics

Plant Height (cm) : 114.8
Heading Days After Seeding : 91
Maturity Days After Seeding : 121
Basal Leaf Sheath Color : 1 (Green)
Anthocyanin Color : 0 (Absent)
Leaf Blade Pubescence : 3 (Pubescent)
Auricle Color : 2 (Yellowish green)
Collar Color : 2 (Light green)
Awn Distribution : 0 (None)
Panicle Exsertion : 5 (Just exserted)
Lodging Resistance : 7 (Strong)
Leaf Senescence : 5 (Intermediate)
Panicle Shattering : 5 (Moderate)
Endosperm Type : 1 (Non-glutinous)

PANDAN 2

Agusan del Sur
Collection No. 16378

PANDAN 2-16378	
% Genetic Similarity	Other Genotypes
92.32	ABANGAY (16336)
92.11	BWS3-3B (16345)
92.07	147-2 (16396)
92.01	JASMIN (15661)
91.95	MINONING (16373)

Grain Quality Traits

Milling Recovery (%)
- Brown Rice : 76.8 (F)
- Milled Rice : 69.7 (G1)
- Head Rice : 56.3 (G1)

Physical Attributes
- Grain Length (mm) : 5.9 (M)
- Grain Shape : 2.2 (I)
- Chalky Grains (%) : 0.2 (Pr)

Physicochemical Properties
- Amylose Content (%) : 14.2 (L)
- Gelatinization Temperature : 6.0 (L)
- Crude Protein Content (%) : 8.5

Agronomic Characteristics

Plant Height (cm) : 118.4
Heading Days After Seeding : 91
Maturity Days After Seeding : 121
Basal Leaf Sheath Color : 1 (Green)
Anthocyanin Color : 0 (Absent)
Leaf Blade Pubescence : 3 (Pubescent)
Auricle Color : 2 (Yellowish green)
Collar Color : 2 (Light green)
Awn Distribution : 0 (None)
Panicle Exsertion : 7 (Moderately well exserted)
Lodging Resistance : 3 (Weak)
Leaf Senescence : 5 (Intermediate)
Panicle Shattering : 5 (Moderate)
Endosperm Type : 1 (Non-glutinous)

PANGASINAN

Agusan del Sur
Collection No.16379

PANGASINAN-16379	
% Genetic Similarity	Other Genotypes
93.82	CAROVAN (16349)
93.80	DIAMOND X (16510)
93.69	3 MILLION (16329)
93.60	216 (16399)
93.59	NSIC Rc 420

Grain Quality Traits

Milling Recovery (%)
- Brown Rice : 78.0 (F)
- Milled Rice : 69.4 (G1)
- Head Rice : 64.5 (Pr)

Physical Attributes
- Grain Length (mm) : 6.7 (L)
- Grain Shape : 3.2 (S)
- Chalky Grains (%) : 1.3 (Pr)

Physicochemical Properties
- Amylose Content (%) : 18.6 (I)
- Gelatinization Temperature : 4.5 (I/L)
- Crude Protein Content (%) : 9.0

Agronomic Characteristics

Plant Height (cm) : 114.7
Heading Days After Seeding : 91
Maturity Days After Seeding : 121
Basal Leaf Sheath Color : 1 (Green)
Anthocyanin Color : 0 (Absent)
Leaf Blade Pubescence : 3 (Pubescent)
Auricle Color : 2 (Yellowish green)
Collar Color : 2 (Light green)
Awn Distribution : 0 (None)
Panicle Exsertion : 5 (Just exserted)
Lodging Resistance : 5 (Intermediate)
Leaf Senescence : 5 (Intermediate)
Panicle Shattering : 5 (Moderate)
Endosperm Type : 2 (Intermediate)

PILIT CARABAO

Agusan del Sur
Collection No.16380

PILIT CARABAO-16380	
% Genetic Similarity	Other Genotypes
91.80	TRES MARIAS (16392)
85.87	PILI-RG (16383)
84.45	KAMOROS (16358)
84.39	NTPSA-1 (16376)
84.25	KAOLOB (16357)

Grain Quality Traits

Milling Recovery (%)
- Brown Rice : 77.0 (F)
- Milled Rice : 68.4 (G1)
- Head Rice : 56.0 (G1)

Physical Attributes
- Grain Length (mm) : 6.7 (L)
- Grain Shape : 2.7 (I)
- Chalky Grains (%) : 40.9 (aa)

Physicochemical Properties
- Amylose Content (%) : 14.8 (L)
- Gelatinization Temperature : 5.8 (I/L)
- Crude Protein Content (%) : 8.3

Agronomic Characteristics

Plant Height (cm) : 163.1
Heading Days After Seeding : 104
Maturity Days After Seeding : 134
Basal Leaf Sheath Color : 1 (Green)
Anthocyanin Color : 0 (Absent)
Leaf Blade Pubescence : 3 (Pubescent)
Auricle Color : 2 (Yellowish green)
Collar Color : 2 (Light green)
Awn Distribution : 0 (None)
Panicle Exsertion : 9 (Well exserted)
Lodging Resistance : 3 (Weak)
Leaf Senescence : 5 (Intermediate)
Panicle Shattering : 5 (Moderate)
Endosperm Type : 2 (Intermediate)

PKP2-6

Agusan del Sur
Collection No. 16382

PK P2-6-16382	
% Genetic Similarity	Other Genotypes
95.64	BISADA (16339)
95.15	BES I (16340)
95.07	BISADA (16347)
94.85	SAN CARLOS (16387)
93.24	KAMOROS (16358)

Grain Quality Traits

Milling Recovery (%)
- Brown Rice : 77.1 (F)
- Milled Rice : 66.8 (G1)
- Head Rice : 58.4 (Pr)

Physical Attributes
- Grain Length (mm) : 6.9 (L)
- Grain Shape : 3.3 (S)
- Chalky Grains (%) : 2.3 (G1)

Physicochemical Properties
- Amylose Content (%) : 20.8 (I)
- Gelatinization Temperature : 4.0 (I)
- Crude Protein Content (%) : 7.5

Agronomic Characteristics

Plant Height (cm) : 170.0
Heading Days After Seeding : 91
Maturity Days After Seeding : 121
Basal Leaf Sheath Color : 1 (Green)
Anthocyanin Color : 0 (Absent)
Leaf Blade Pubescence : 3 (Pubescent)
Auricle Color : 2 (Yellowish green)
Collar Color : 2 (Light green)
Awn Distribution : 0 (None)
Panicle Exsertion : 9 (Well exserted)
Lodging Resistance : 1 (Very weak)
Leaf Senescence : 5 (Intermediate)
Panicle Shattering : 5 (Moderate)
Endosperm Type : 1 (Non-glutinous)

PILI-RG

Agusan del Sur
Collection No. 16383

PILI-RG-16383	
% Genetic Similarity	Other Genotypes
92.21	216 (16399)
92.07	ROSANA (16089)
92.07	DAHILI (16352)
91.96	KAMOROS (16358)
91.66	NTPSA-1 (16376)

Grain Quality Traits

Milling Recovery (%)
- Brown Rice : 77.2 (F)
- Milled Rice : 69.7 (G1)
- Head Rice : 59.5 (Pr)

Physical Attributes
- Grain Length (mm) : 6.9 (L)
- Grain Shape : 3.1 (S)
- Chalky Grains (%) : 1.7 (Pr)

Physicochemical Properties
- Amylose Content (%) : 21.8 (I)
- Gelatinization Temperature : 5.7 (I/L)
- Crude Protein Content (%) : 8.1

Agronomic Characteristics

Plant Height (cm) : 169.7
Heading Days After Seeding : 91
Maturity Days After Seeding : 121
Basal Leaf Sheath Color : 1 (Green)
Anthocyanin Color : 0 (Absent)
Leaf Blade Pubescence : 3 (Pubescent)
Auricle Color : 2 (Yellowish green)
Collar Color : 2 (Light green)
Awn Distribution : 0 (None)
Panicle Exsertion : 9 (Well exserted)
Lodging Resistance : 3 (Weak)
Leaf Senescence : 5 (Intermediate)
Panicle Shattering : 5 (Moderate)
Endosperm Type : 1 (Non-glutinous)

PKPDWARF

Agusan del Sur
Collection No.16384

PKPDWARF-16384	
% Genetic Similarity	Other Genotypes
95.70	MINONING (16373)
94.90	MANISI (16362)
94.77	KAMOROS (16358)
94.36	NTPSA-1 (16376)
94.29	EC3 (16353)

Grain Quality Traits

Milling Recovery (%)
- Brown Rice : 76.3 (F)
- Milled Rice : 67.8 (G1)
- Head Rice : 57.1 (Pr)

Physical Attributes
- Grain Length (mm) : 5.6 (M)
- Grain Shape : 2.3 (I)
- Chalky Grains (%) : 4.0 (G1)

Physicochemical Properties
- Amylose Content (%) : 12.6 (L)
- Gelatinization Temperature : 4.3 (I/L)
- Crude Protein Content (%) : 8.0

Agronomic Characteristics

Plant Height (cm) : 110.2
Heading Days After Seeding : 91
Maturity Days After Seeding : 121
Basal Leaf Sheath Color : 1 (Green)
Anthocyanin Color : 0 (Absent)
Leaf Blade Pubescence : 3 (Pubescent)
Auricle Color : 2 (Yellowish green)
Collar Color : 2 (Light green)
Awn Distribution : 0 (None)
Panicle Exsertion : 5 (Just exserted)
Lodging Resistance : 7 (Strong)
Leaf Senescence : 5 (Intermediate)
Panicle Shattering : 5 (Moderate)
Endosperm Type : 1 (Non-glutinous)

PANAKA

Agusan del Sur
Collection No. 16385

PANAKA-16385	
% Genetic Similarity	Other Genotypes
92.58	KAMOROS (16358)
92.58	MINDORO-5R (16374)
90.21	3-MILLION (15457)
89.55	NTPSA-1 (16376)
89.45	JASMIN (15661)

Grain Quality Traits

Milling Recovery (%)
- Brown Rice : 79.0 (F)
- Milled Rice : 71.7 (Pr)
- Head Rice : 63.5 (Pr)

Physical Attributes
- Grain Length (mm) : 5.5 (M)
- Grain Shape : 2.0 (B)
- Chalky Grains (%) : 6.9 (G2)

Physicochemical Properties
- Amylose Content (%) : 23.9 (H)
- Gelatinization Temperature : 5.0 (I)
- Crude Protein Content (%) : 8.2

Agronomic Characteristics

Plant Height (cm) : 166.8
Heading Days After Seeding : 91
Maturity Days After Seeding : 121
Basal Leaf Sheath Color : 2 (Green with purple lines)
Anthocyanin Color : 3 (Weak)
Leaf Blade Pubescence : 3 (Pubescent)
Auricle Color : 3 (Purple)
Collar Color : 3 (Purple)
Awn Distribution : 0 (None)
Panicle Exsertion : 7 (Moderately well exserted)
Lodging Resistance : 3 (Weak)
Leaf Senescence : 5 (Intermediate)
Panicle Shattering : 5 (Moderate)
Endosperm Type : 2 (Intermediate)

RG17-K

Agusan del Sur
Collection No.16386

RG17-K-16386	
% Genetic Similarity	Other Genotypes
93.99	M31-VF (16365)
93.92	KAMOROS (16358)
93.51	KAYOPO (16096)
93.36	NTPSA-1 (16376)
93.26	3-MILLION (15457)

Grain Quality Traits

Milling Recovery (%)
- Brown Rice : 77.2 (F)
- Milled Rice : 70.0 (G1)
- Head Rice : 61.2 (Pr)

Physical Attributes
- Grain Length (mm) : 5.8 (M)
- Grain Shape : 2.7 (I)
- Chalky Grains (%) : 0.8 (Pr)

Physicochemical Properties
- Amylose Content (%) : 22.2 (H)
- Gelatinization Temperature : 5.0 (I)
- Crude Protein Content (%) : 8.6

Agronomic Characteristics

- Plant Height (cm) : 153.1
- Heading Days After Seeding : 91
- Maturity Days After Seeding : 121
- Basal Leaf Sheath Color : 1 (Green)
- Anthocyanin Color : 0 (Absent)
- Leaf Blade Pubescence : 3 (Pubescent)
- Auricle Color : 2 (Yellowish green)
- Collar Color : 2 (Light green)
- Awn Distribution : 0 (None)
- Panicle Exsertion : 9 (Well exserted)
- Lodging Resistance : 3 (Weak)
- Leaf Senescence : 5 (Intermediate)
- Panicle Shattering : 5 (Moderate)
- Endosperm Type : 1 (Non-glutinous)

SAN CARLOS

Agusan del Sur
Collection No.16387

SAN CARLOS-16387	
% Genetic Similarity	Other Genotypes
97.69	BISADA (16339)
97.60	BES I (16340)
97.11	BISADA (16347)
95.67	216 (16399)
95.52	NTPSA-1 (16376)

Grain Quality Traits

Milling Recovery (%)
- Brown Rice : 77.9 (F)
- Milled Rice : 68.4 (G1)
- Head Rice : 62.3 (Pr)

Physical Attributes
- Grain Length (mm) : 6.9 (L)
- Grain Shape : 3.7 (S)
- Chalky Grains (%) : 1.0 (Pr)

Physicochemical Properties
- Amylose Content (%) : 20.3 (I)
- Gelatinization Temperature : 4.0 (I)
- Crude Protein Content (%) : 7.1

Agronomic Characteristics

Plant Height (cm) : 157.7
Heading Days After Seeding : 92
Maturity Days After Seeding : 122
Basal Leaf Sheath Color : 1 (Green)
Anthocyanin Color : 0 (Absent)
Leaf Blade Pubescence : 3 (Pubescent)
Auricle Color : 2 (Yellowish green)
Collar Color : 2 (Light green)
Awn Distribution : 0 (None)
Panicle Exsertion : 7 (Moderately well exserted)
Lodging Resistance : 1 (Very weak)
Leaf Senescence : 5 (Intermediate)
Panicle Shattering : 5 (Moderate)
Endosperm Type : 1 (Non-glutinous)

SNC-13

Agusan del Sur
Collection No.16388

SNC-13-16388	
% Genetic Similarity	Other Genotypes
94.90	XOR (16395)
94.85	HI-NOON (16506)
94.84	KAMOROS (16358)
94.75	ROSANA (16089)
94.55	ABANGAY (16336)

Grain Quality Traits

Milling Recovery (%)
- Brown Rice : 75.7 (F)
- Milled Rice : 66.9 (G1)
- Head Rice : 57.5 (Pr)

Physical Attributes
- Grain Length (mm) : 5.5 (M)
- Grain Shape : 2.2 (I)
- Chalky Grains (%) : 12.4 (G3)

Physicochemical Properties
- Amylose Content (%) : 22.8 (H)
- Gelatinization Temperature : 4.5 (I/L)
- Crude Protein Content (%) : 9.2

Agronomic Characteristics

Plant Height (cm) : 153.1
Heading Days After Seeding : 106
Maturity Days After Seeding : 136
Basal Leaf Sheath Color : 1 (Green)
Anthocyanin Color : 0 (Absent)
Leaf Blade Pubescence : 3 (Pubescent)
Auricle Color : 2 (Yellowish green)
Collar Color : 2 (Light green)
Awn Distribution : 0 (None)
Panicle Exsertion : 7 (Moderately well exserted)
Lodging Resistance : 5 (Intermediate)
Leaf Senescence : 5 (Intermediate)
Panicle Shattering : 5 (Moderate)
Endosperm Type : 1 (Non-glutinous)

SANIP-R

Agusan del Sur
Collection No. 16389

SANIP-R-16389	
% Genetic Similarity	Other Genotypes
94.27	ABANGAY (16336)
93.83	KAMOROS (16358)
93.49	3-MILLION (15457)
93.39	JASMIN (15661)
93.33	MANISI (16362)

Grain Quality Traits

Milling Recovery (%)
- Brown Rice : 77.7 (F)
- Milled Rice : 69.4 (G1)
- Head Rice : 58.4 (Pr)

Physical Attributes
- Grain Length (mm) : 6.2 (M)
- Grain Shape : 2.6 (I)
- Chalky Grains (%) : 8.5 (G2)

Physicochemical Properties
- Amylose Content (%) : 23.2 (H)
- Gelatinization Temperature : 5.3 (I/L)
- Crude Protein Content (%) : 7.6

Agronomic Characteristics

Plant Height (cm) : 148.7
Heading Days After Seeding : 92
Maturity Days After Seeding : 122
Basal Leaf Sheath Color : 1 (Green)
Anthocyanin Color : 0 (Absent)
Leaf Blade Pubescence : 3 (Pubescent)
Auricle Color : 2 (Yellowish green)
Collar Color : 2 (Light green)
Awn Distribution : 2 (Upper quarter only)
Panicle Exsertion : 5 (Just exserted)
Lodging Resistance : 5 (Intermediate)
Leaf Senescence : 5 (Intermediate)
Panicle Shattering : 5 (Moderate)
Endosperm Type : 2 (Intermediate)

SALKET

Agusan del Sur
Collection No. 16390

SALKET-16390	
% Genetic Similarity	Other Genotypes
94.80	169-2 (16397)
93.39	216 (16399)
92.64	NTPSA-1 (16376)
92.13	KAMOROS (16358)
92.07	NSIC Rc 420

Grain Quality Traits

Milling Recovery (%)
- Brown Rice : 76.7 (F)
- Milled Rice : 67.2 (G1)
- Head Rice : 59.6 (Pr)

Physical Attributes
- Grain Length (mm) : 6.7 (L)
- Grain Shape : 3.1 (S)
- Chalky Grains (%) : 17.7 (aa)

Physicochemical Properties
- Amylose Content (%) : 18.6 (I)
- Gelatinization Temperature : 4.6 (I/L)
- Crude Protein Content (%) : 8.8

Agronomic Characteristics

Plant Height (cm) : 159.9
Heading Days After Seeding : 91
Maturity Days After Seeding : 121
Basal Leaf Sheath Color : 1 (Green)
Anthocyanin Color : 0 (Absent)
Leaf Blade Pubescence : 3 (Pubescent)
Auricle Color : 2 (Yellowish green)
Collar Color : 2 (Light green)
Awn Distribution : 0 (None)
Panicle Exsertion : 9 (Well exserted)
Lodging Resistance : 1 (Very weak)
Leaf Senescence : 7 (Strong)
Panicle Shattering : 5 (Moderate)
Endosperm Type : 1 (Non-glutinous)

SNR-2

Agusan del Sur
Collection No. 16391

SNR-2-16391	
% Genetic Similarity	Other Genotypes
94.39	KAMOROS (16358)
94.33	SNC-13 (16388)
94.13	3-MILLION (15457)
93.86	ABANGAY (16336)
93.63	NTPSA-1 (16376)

Grain Quality Traits

Milling Recovery (%)
- Brown Rice : 76.9 (F)
- Milled Rice : 67.7 (G1)
- Head Rice : 56.9 (G1)

Physical Attributes
- Grain Length (mm) : 6.7 (L)
- Grain Shape : 3.0 (I)
- Chalky Grains (%) : 3.7 (G1)

Physicochemical Properties
- Amylose Content (%) : 16.3 (L)
- Gelatinization Temperature : 5.5 (I/L)
- Crude Protein Content (%) : 9.2

Agronomic Characteristics

Plant Height (cm) : 139.4
Heading Days After Seeding : 86
Maturity Days After Seeding : 116
Basal Leaf Sheath Color : 2 (Green with purple lines)
Anthocyanin Color : 3 (Weak)
Leaf Blade Pubescence : 3 (Pubescent)
Auricle Color : 3 (Purple)
Collar Color : 4 (Purple lines)
Awn Distribution : 0 (Absent)
Panicle Exsertion : 9 (Well exserted)
Lodging Resistance : 1 (Very weak)
Leaf Senescence : 7 (Late)
Panicle Shattering : 5 (Moderate)
Endosperm Type : 1 (Non-glutinous)

TRES MARIAS

Agusan del Sur
Collection No.16392

TRES MARIAS-16392	
% Genetic Similarity	Other Genotypes
91.80	PILIT CARABAO (16380)
88.35	PILI-RG (16383)
87.60	KAMOROS (16358)
87.20	NTPSA-1 (16376)
86.41	ROSANA (16089)

Grain Quality Traits

Milling Recovery (%)
- Brown Rice : 77.8 (F)
- Milled Rice : 69.5 (G1)
- Head Rice : 54.5 (G1)

Physical Attributes
- Grain Length (mm) : 6.5 (M)
- Grain Shape : 2.7 (I)
- Chalky Grains (%) : 14.7 (G3)

Physicochemical Properties
- Amylose Content (%) : 16.2 (L)
- Gelatinization Temperature : 4.9 (I/L)
- Crude Protein Content (%) : 9.7

Agronomic Characteristics

Plant Height (cm) : 153.4
Heading Days After Seeding : 93
Maturity Days After Seeding : 123
Basal Leaf Sheath Color : 1 (Green)
Anthocyanin Color : 0 (Absent)
Leaf Blade Pubescence : 3 (Pubescent)
Auricle Color : 2 (Yellowish green)
Collar Color : 2 (Light green)
Awn Distribution : 0 (None)
Panicle Exsertion : 7 (Moderately well exserted)
Lodging Resistance : 5 (Intermediate)
Leaf Senescence : 5 (Intermediate)
Panicle Shattering : 5 (Moderate)
Endosperm Type : 1 (Non-glutinous)

TANURA

Agusan del Sur
Collection No.16393

TANURA-16393	
% Genetic Similarity	Other Genotypes
96.50	C4 TYSAN (16348)
94.26	JASMIN (15661)
93.80	INBRED-300 (16436)
93.67	DIAMOND X (16510)
93.55	JASMINE R (16356)

Grain Quality Traits

Milling Recovery (%)
- Brown Rice : 76.7 (F)
- Milled Rice : 68.5 (G1)
- Head Rice : 57.1 (Pr)

Physical Attributes
- Grain Length (mm) : 7.1 (L)
- Grain Shape : 3.2 (S)
- Chalky Grains (%) : 17.2 (aa)

Physicochemical Properties
- Amylose Content : 20.9 (I)
- Gelatinization Temperature : 6.9 (L)
- Crude Protein Content (%) : 8.4

Agronomic Characteristics

Plant Height (cm) : —
Heading Days After Seeding : 92
Maturity Days After Seeding : 122
Basal Leaf Sheath Color : 1 (Green)
Anthocyanin Color : 0 (Absent)
Leaf Blade Pubescence : 3 (Pubescent)
Auricle Color : 2 (Yellowish green)
Collar Color : 2 (Light green)
Awn Distribution : 0 (None)
Panicle Exsertion : 7 (Moderately well exserted)
Lodging Resistance : 7 (Strong)
Leaf Senescence : 5 (Intermediate)
Panicle Shattering : 5 (Moderate)
Endosperm Type : 1 (Non-glutinous)

TAP 1

Agusan del Sur
Collection No. 16394

TAP 1-16394	
% Genetic Similarity	Other Genotypes
95.20	216 (16399)
94.73	3-MILLION (15457)
94.48	ABANGAY (16336)
94.32	JASMIN (15661)
94.24	NTPSA-1 (16376)

Grain Quality Traits

Milling Recovery (%)
- Brown Rice : 76.9 (F)
- Milled Rice : 69.1 (G1)
- Head Rice : 62.0 (Pr)

Physical Attributes
- Grain Length (mm) : 6.4 (M)
- Grain Shape : 2.9 (I)
- Chalky Grains (%) : 4.5 (G1)

Physicochemical Properties
- Amylose Content (%) : 20.7 (I)
- Gelatinization Temperature : 4.6 (I)
- Crude Protein Content (%) : 7.7

Agronomic Characteristics

Plant Height (cm) : 162.0
Heading Days After Seeding : 92
Maturity Days After Seeding : 122
Basal Leaf Sheath Color : 1 (Green)
Anthocyanin Color : 0 (Absent)
Leaf Blade Pubescence : 3 (Pubescent)
Auricle Color : 2 (Yellowish green)
Collar Color : 2 (Light green)
Awn Distribution : 2 (Upper quarter only)
Panicle Exsertion : 9 (Well exserted)
Lodging Resistance : 1 (Very weak)
Leaf Senescence : 5 (Intermediate)
Panicle Shattering : 5 (Moderate)
Endosperm Type : 1 (Non-glutinous)

XOR

Agusan del Sur
Collection No. 16395

XOR-16395	
% Genetic Similarity	Other Genotypes
96.52	BURDAGOL (15660)
95.87	HI-NOON (16506)
94.90	SNC-13 (16388)
94.29	DIWATA (16351)
93.94	POKPOKLO (15666)

Grain Quality Traits

Milling Recovery (%)
- Brown Rice : 77.5 (F)
- Milled Rice : 69.5 (G1)
- Head Rice : 64.6 (Pr)

Physical Attributes
- Grain Length (mm) : 5.3 (Sh)
- Grain Shape : 2.1 (I)
- Chalky Grains (%) : 2.5 (G1)

Physicochemical Properties
- Amylose Content (%) : 22.1 (H)
- Gelatinization Temperature : 4.9 (I/L)
- Crude Protein Content (%) : 8.0

Agronomic Characteristics

Plant Height (cm) : 159.5
Heading Days After Seeding : 125
Maturity Days After Seeding : 155
Basal Leaf Sheath Color : 1 (Green)
Anthocyanin Color : 0 (Absent)
Leaf Blade Pubescence : 3 (Pubescent)
Auricle Color : 2 (Yellowish green)
Collar Color : 2 (Light green)
Awn Distribution : 0 (None)
Panicle Exsertion : 9 (Well exserted)
Lodging Resistance : 3 (Weak)
Leaf Senescence : 5 (Intermediate)
Panicle Shattering : 5 (Moderate)
Endosperm Type : 1 (Non-glutinous)

147-2

Agusan del Sur
Collection No.16396

147-2-16396	
% Genetic Similarity	Other Genotypes
94.44	ABANGAY (16336)
92.49	BWS3-3B (16345)
92.29	ROSANA (16089)
92.14	JASMIN (15661)
92.07	PANDAN 2 (16378)

Grain Quality Traits

Milling Recovery (%)
- Brown Rice : 76.2 (F)
- Milled Rice : 68.3 (G1)
- Head Rice : 59.0 (Pr)

Physical Attributes
- Grain Length (mm) : 6.5 (M)
- Grain Shape : 2.6 (I)
- Chalky Grains (%) : 44.3 (aa)

Physicochemical Properties
- Amylose Content (%) : 13.1 (L)
- Gelatinization Temperature : 4.3 (HI/I/L)
- Crude Protein Content (%) : 8.2

Agronomic Characteristics

Plant Height (cm) : 152.9
Heading Days After Seeding : 92
Maturity Days After Seeding : 122
Basal Leaf Sheath Color : 1 (Green)
Anthocyanin Color : 0 (Absent)
Leaf Blade Pubescence : 3 (Pubescent)
Auricle Color : 2 (Yellowish green)
Collar Color : 2 (Light green)
Awn Distribution : 0 (None)
Panicle Exsertion : 7 (Moderately well exserted)
Lodging Resistance : 1 (Very weak)
Leaf Senescence : 5 (Intermediate)
Panicle Shattering : 5 (Moderate)
Endosperm Type : 1 (Non-glutinous)

169-2

Agusan del Sur
Collection No. 16397

169-2-16397	
% Genetic Similarity	Other Genotypes
94.80	SALKET (16390)
94.28	216 (16399)
93.18	NTPSA-1 (16376)
93.01	MINONING (16373)
92.89	ADANGAY (16336)

Grain Quality Traits

Milling Recovery (%)
- Brown Rice : 75.8 (F)
- Milled Rice : 68.3 (G1)
- Head Rice : 57.1 (Pr)

Physical Attributes
- Grain Length (mm) : 6.5 (M)
- Grain Shape : 3.1 (S)
- Chalky Grains (%) : 29.3 (aa)

Physicochemical Properties
- Amylose Content (%) : 21.6 (I)
- Gelatinization Temperature : 6.8 (L)
- Crude Protein Content (%) : 7.8

Agronomic Characteristics

Plant Height (cm) : 157.6
Heading Days After Seeding : 100
Maturity Days After Seeding : 130
Basal Leaf Sheath Color : 1 (Green)
Anthocyanin Color : 0 (Absent)
Leaf Blade Pubescence : 3 (Pubescent)
Auricle Color : 2 (Yellowish green)
Collar Color : 2 (Light green)
Awn Distribution : 0 (None)
Panicle Exsertion : 9 (Well exserted)
Lodging Resistance : 1 (Very weak)
Leaf Senescence : 5 (Intermediate)
Panicle Shattering : 5 (Moderate)
Endosperm Type : 1 (Non-glutinous)

216

Agusan del Sur
Collection No.16399

216-16399	
% Genetic Similarity	Other Genotypes
96.61	JANJANONG (16515)
96.55	DIAMOND X (16510)
96.14	NSIC Rc 420
96.13	ABANGAY (16336)
95.89	DALING-DALING (16203)

Grain Quality Traits

Milling Recovery (%)
- Brown Rice : 75.9 (F)
- Milled Rice : 68.2 (G1)
- Head Rice : 58.8 (Pr)

Physical Attributes
- Grain Length (mm) : 6.2 (M)
- Grain Shape : 2.7 (I)
- Chalky Grains (%) : 8.4 (G2)

Physicochemical Properties
- Amylose Content (%) : 19.5 (I)
- Gelatinization Temperature : 3.6 (HI/I)
- Crude Protein Content (%) : 8.5

Agronomic Characteristics

Plant Height (cm) : 145.5
Heading Days After Seeding : 92
Maturity Days After Seeding : 122
Basal Leaf Sheath Color : 1 (Green)
Anthocyanin Color : 0 (Absent)
Leaf Blade Pubescence : 3 (Pubescent)
Auricle Color : 2 (Yellowish green)
Collar Color : 2 (Light green)
Awn Distribution : 0 (None)
Panicle Exsertion : 7 (Moderately well exserted)
Lodging Resistance : 1 (Very weak)
Leaf Senescence : 5 (Intermediate)
Panicle Shattering : 5 (Moderate)
Endosperm Type : 1 (Non-glutinous)

112-4

Agusan del Sur
Collection No. 16400

112-4-16400	
% Genetic Similarity	Other Genotypes
93.05	KAMOROS (16358)
92.80	ABANGAY (16336)
92.49	RG17-K (16386)
91.68	3-MILLION (15457)
91.29	JASMIN (15661)

Grain Quality Traits

Milling Recovery (%)
- Brown Rice : 77.5 (F)
- Milled Rice : 70.2 (Pr)
- Head Rice : 61.0 (Pr)

Physical Attributes
- Grain Length (mm) : 5.6 (M)
- Grain Shape : 2.3 (I)
- Chalky Grains (%) : 9.1 (G2)

Physicochemical Properties
- Amylose Content (%) : 18.4 (I)
- Gelatinization Temperature : 4.0 (I)
- Crude Protein Content (%) : 8.1

Agronomic Characteristics

Plant Height (cm) : 153.4
Heading Days After Seeding : 91
Maturity Days After Seeding : 121
Basal Leaf Sheath Color : 2 (Green with purple lines)
Anthocyanin Color : 3 (Weak)
Leaf Blade Pubescence : 3 (Pubescent)
Auricle Color : 3 (Purple)
Collar Color : 4 (Purple lines)
Awn Distribution : 5 (Whole length)
Panicle Exsertion : 7 (Moderately well exserted)
Lodging Resistance : 1 (Very weak)
Leaf Senescence : 7 (Late)
Panicle Shattering : 5 (Moderate)
Endosperm Type : 2 (Intermediate)

BARAKO

Surigao del Sur
Collection No.15400

BARAKO-15400	
% Genetic Similarity	Other Genotypes
96.76	MIRACLE (16297)
95.03	SENORITA PILIT (16316)
92.32	3-MILLION (15457)
92.27	ABANGAY (16336)
92.25	PILIT (15946)

Grain Quality Traits

Milling Recovery (%)
- Brown Rice : 80.6 (G)
- Milled Rice : 73.1 (Pr)
- Head Rice : 61.4 (Pr)

Physical Attributes
- Grain Length (mm) : 6.9 (L)
- Grain Shape : 2.9 (I)
- Chalky Grains (%) : 15.4 (aa)

Physicochemical Properties
- Amylose Content (%) : 20.7 (H)
- Gelatinization Temperature : 6.0 (L)
- Crude Protein Content (%) : 6.2

Agronomic Characteristics

Plant Height (cm) : 148.4
Heading Days After Seeding : 110
Maturity Days After Seeding : 140
Basal Leaf Sheath Color : 1 (Green)
Anthocyanin Color : 0 (Absent)
Leaf Blade Pubescence : 3 (Pubescent)
Auricle Color : 2 (Yellowish green)
Collar Color : 2 (Light green)
Awn Distribution : 2 (Upper quarter only)
Panicle Exsertion : 5 (Just exserted)
Lodging Resistance : 3 (Weak)
Leaf Senescence : 7 (Late)
Panicle Shattering : 5 (Moderate)
Endosperm Type : 2 (Intermediate)

SUPER DX

Surigao del Sur
Collection No.15401

SUPER DX-15401	
% Genetic Similarity	Other Genotypes
96.75	NSIC Rc 222
96.04	GANADOR (16063)
95.77	LAWIN (15977)
95.69	BEST RICE (15885)
95.66	DIAMOND X (15512)
95.66	TRIPLE 1 (15592)

Grain Quality Traits

Milling Recovery (%)
- Brown Rice : 79.5 (F)
- Milled Rice : 72.8 (Pr)
- Head Rice : 59.4 (Pr)

Physical Attributes
- Grain Length (mm) : 7.1 (L)
- Grain Shape : 3.2 (S)
- Chalky Grains (%) : 14.4 (G3)

Physicochemical Properties
- Amylose Content (%) : 24.6 (H)
- Gelatinization Temperature : 4.5 (I/L)
- Crude Protein Content (%) : 5.6

Agronomic Characteristics

Plant Height (cm) : 131.1
Heading Days After Seeding : 92
Maturity Days After Seeding : 122
Basal Leaf Sheath Color : 1 (Green)
Anthocyanin Color : 0 (Absent)
Leaf Blade Pubescence : 3 (Pubescent)
Auricle Color : 2 (Yellowish green)
Collar Color : 2 (Light green)
Awn Distribution : 3 (Upper half only)
Panicle Exsertion : 7 (Moderately well exserted)
Lodging Resistance : 9 (Very strong)
Leaf Senescence : 5 (Intermediate)
Panicle Shattering : 5 (Moderate)
Endosperm Type : 2 (Intermediate)

DCL-300

Surigao del Sur
Collection No. 15402

DCL-300-15402	
% Genetic Similarity	Other Genotypes
100.00	JDF 300 PLUS (15553)
100.00	INBRED 300 (15943)
100.00	DCL-300 (16419)
99.98	MALAYSIAN RICE (16321)
99.81	MALAYSIAN RICE (15938)
99.81	INDONESIAN RICE (15940)

Grain Quality Traits

Milling Recovery (%)
- Brown Rice : 77.3 (P)
- Milled Rice : 68.0 (G1)
- Head Rice : 49.9 (G1)

Physical Attributes
- Grain Length (mm) : 6.7 (L)
- Grain Shape : 2.8 (I)
- Chalky Grains (%) : 8.7 (G2)

Physicochemical Properties
- Amylose Content (%) : 19.6 (I)
- Gelatinization Temperature : 4.0 (I)
- Crude Protein Content (%) : 7.8

Agronomic Characteristics

Plant Height (cm) : 108.8
Heading Days After Seeding : 91
Maturity Days After Seeding : 121
Basal Leaf Sheath Color : 1 (Green)
Anthocyanin Color : 0 (Absent)
Leaf Blade Pubescence : 3 (Pubescent)
Auricle Color : 2 (Yellowish green)
Collar Color : 2 (Light green)
Awn Distribution : 3 (Upper half only)
Panicle Exsertion : 5 (Just exserted)
Lodging Resistance : 9 (Very strong)
Leaf Senescence : 5 (Intermediate)
Panicle Shattering : 5 (Moderate)
Endosperm Type : 2 (Intermediate)

IRIG

Surigao del Sur
Collection No.15403

IRIG-15403	
% Genetic Similarity	Other Genotypes
99.86	IRIG (16420)
91.95	3-MILLION (15457)
91.77	JASMIN (15661)
91.64	216 (16399)
91.61	NSIC Rc 420

Grain Quality Traits

Milling Recovery (%)
- Brown Rice : 77.2 (F)
- Milled Rice : 69.2 (G1)
- Head Rice : 51.1 (G1)

Physical Attributes
- Grain Length (mm) : 7.2 (L)
- Grain Shape : 3.1 (S)
- Chalky Grains (%) : 6.0 (G2)

Physicochemical Properties
- Amylose Content (%) : 18.7 (I)
- Gelatinization Temperature : 4.1 (I)
- Crude Protein Content (%) : 7.7

Agronomic Characteristics

- Plant Height (cm) : 117.2
- Heading Days After Seeding : 75
- Maturity Days After Seeding : 105
- Basal Leaf Sheath Color : 1 (Green)
- Anthocyanin Color : 0 (Absent)
- Leaf Blade Pubescence : 3 (Pubescent)
- Auricle Color : 2 (Yellowish green)
- Collar Color : 2 (Light green)
- Awn Distribution : 0 (None)
- Panicle Exsertion : 7 (Moderately well-exserted)
- Lodging Resistance : 3 (Weak)
- Leaf Senescence : 5 (Intermediate)
- Panicle Shattering : 5 (Moderate)
- Endosperm Type : 1 (Non-glutinous)

DCL-300

Surigao del Sur
Collection No.16419

DCL-300-16419	
% Genetic Similarity	Other Genotypes
100.00	JDF 300 PLUS (15553)
100.00	INBRED 300 (15943)
100.00	DCL-300 (15402)
99.98	MALAYSIAN RICE (16321)
99.81	MALAYSIAN RICE (15938)

Grain Quality Traits

Milling Recovery (%)
- Brown Rice : 77.6 (F)
- Milled Rice : 69.4 (G1)
- Head Rice : 59.6 (Pr)

Physical Attributes
- Grain Length (mm) : 7.0 (L)
- Grain Shape : 2.9 (I)
- Chalky Grains (%) : 12.0 (G3)

Physicochemical Properties
- Amylose Content (%) : 18.7 (I)
- Gelatinization Temperature : 3.3 (HI/I)
- Crude Protein Content (%) : 8.0

Agronomic Characteristics

Plant Height (cm) : 106.0
Heading Days After Seeding : 91
Maturity Days After Seeding : 121
Basal Leaf Sheath Color : 1 (Green)
Anthocyanin Color : 0 (Absent)
Leaf Blade Pubescence : 3 (Pubescent)
Auricle Color : 2 (Yellowish green)
Collar Color : 2 (Light green)
Awn Distribution : 4 (Upper three-quarters only)
Panicle Exsertion : 5 (Just exserted)
Lodging Resistance : 9 (Very strong)
Leaf Senescence : 5 (Intermediate)
Panicle Shattering : 5 (Moderate)
Endosperm Type : 2 (Intermediate)

IRIG

Surigao del Sur
Collection No. 16420

IRIG-16420	
% Genetic Similarity	Other Genotypes
99.86	IRIG (15403)
92.07	SUPER DX (16425)
92.07	3-MILLION (15457)
91.82	JASMIN (15661)
91.73	NSIC Rc 420

Grain Quality Traits

Milling Recovery (%)
- Brown Rice : 74.4 (P)
- Milled Rice : 66.0 (G1)
- Head Rice : 59.9 (Pr)

Physical Attributes
- Grain Length (mm) : 7.0 (L)
- Grain Shape : 2.9 (I)
- Chalky Grains (%) : 6.8 (G2)

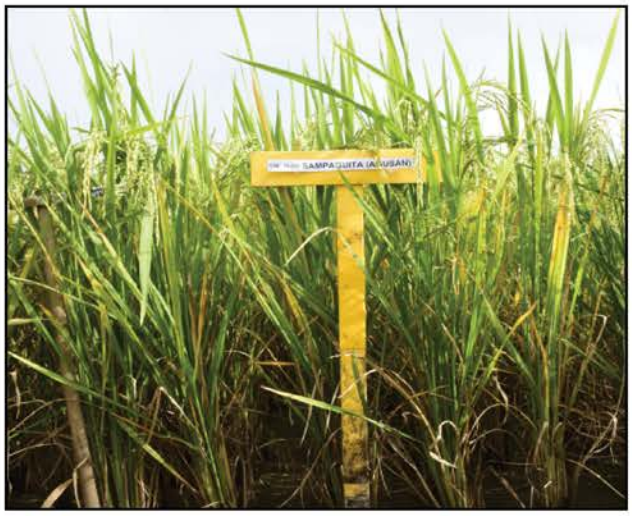
Physicochemical Properties
- Amylose Content (%) : 17.8 (I)
- Gelatinization Temperature : 3.6 (HI/I)
- Crude Protein Content (%) : 7.8

Agronomic Characteristics

Plant Height (cm) : 125.3
Heading Days After Seeding : 75
Maturity Days After Seeding : 105
Basal Leaf Sheath Color : 1 (Green)
Anthocyanin Color : 0 (Absent)
Leaf Blade Pubescence : 3 (Pubescent)
Auricle Color : 2 (Yellowish green)
Collar Color : 2 (Light green)
Awn Distribution : 0 (None)
Panicle Exsertion : 7 (Moderately well exserted)
Lodging Resistance : 3 (Weak)
Leaf Senescence : 5 (Intermediate)
Panicle Shattering : 5 (Moderate)
Endosperm Type : 1 (Non-glutinous)

SAMPAGUITA (AGUSAN)

Davao De Oro
Collection No.16326



SAMPAGUITA (AGUSAN)-16326	
% Genetic Similarity	Other Genotypes
100.00	DESTINY (15502)
100.00	DIAMOND V (15576)
100.00	UNKNOWN VAR 3 (15879)
100.00	SAMPAGUITA (15500)
100.00	NSIC Rc 218
100.00	1561 (15891)
100.00	SAMPAGUITA (16308)
100.00	TABUK (16501)
100.00	DOUBLE DIAMOND (16507)

Grain Quality Traits

Milling Recovery (%)
- Brown Rice : 76.4 (F)
- Milled Rice : 68.4 (G1)
- Head Rice : 60.6 (Pr)

Physical Attributes
- Grain Length (mm) : 7.2 (L)
- Grain Shape : 3.0 (I)
- Chalky Grains (%) : 2.5 (G1)

Physicochemical Properties
- Amylose Content (%) : 14.3 (L)
- Gelatinization Temperature : 5.0 (I)
- Crude Protein Content (%) : 6.4

Agronomic Characteristics

- Plant Height (cm) : 116.2
- Heading Days After Seeding : 91
- Maturity Days After Seeding : 121
- Basal Leaf Sheath Color : 1 (Green)
- Anthocyanin Color : 0 (Absent)
- Leaf Blade Pubescence : 3 (Pubescent)
- Auricle Color : 2 (Yellowish green)
- Collar Color : 2 (Light green)
- Awn Distribution : 3 (Upper half only)
- Panicle Exsertion : 5 (Just exserted)
- Lodging Resistance : 7 (Strong)
- Leaf Senescence : 5 (Intermediate)
- Panicle Shattering : 5 (Moderate)
- Endosperm Type : 2 (Intermediate)

BODO-BODO (AGUSAN)

Davao De Oro
Collection No.16327

BODO-BODO (AGUSAN)-16327	
% Genetic Similarity	Other Genotypes
99.47	BODO-BODO (15955)
98.81	3-MILLION (15457)
98.62	YANAM (16314)
96.83	SENORITA PILIT (16316)
95.66	JASMIN (15661)

Grain Quality Traits

Milling Recovery (%)
- Brown Rice : 78.2 (F)
- Milled Rice : 70.1 (Pr)
- Head Rice : 61.0 (Pr)

Physical Attributes
- Grain Length (mm) : 5.6 (M)
- Grain Shape : 2.2 (I)
- Chalky Grains (%) : 9.9 (G2)

Physicochemical Properties
- Amylose Content (%) : 18.8 (I)
- Gelatinization Temperature : 3.7 (H/I)
- Crude Protein Content (%) : 7.7

Agronomic Characteristics

- Plant Height (cm) : 113.1
- Heading Days After Seeding : 91
- Maturity Days After Seeding : 121
- Basal Leaf Sheath Color : 1 (Green)
- Anthocyanin Color : 0 (Absent)
- Leaf Blade Pubescence : 3 (Pubescent)
- Auricle Color : 2 (Yellowish green)
- Collar Color : 2 (Light green)
- Awn Distribution : 0 (None)
- Panicle Exsertion : 7 (Moderately well exserted)
- Lodging Resistance : 5 (Intermediate)
- Leaf Senescence : 5 (Intermediate)
- Panicle Shattering : 5 (Moderate)
- Endosperm Type : 1 (Non-glutinous)

WHITE TONNER

Davao De Oro
Collection No.16306

WHITE TONNER-16306	
% Genetic Similarity	Other Genotypes
93.28	DIAMOND X (16510)
92.31	PSB Rc 10
92.10	RED RICE (15944)
92.04	216 (16399)
91.80	NSIC Rc 420

Grain Quality Traits

Milling Recovery (%)
- Brown Rice : 77.3 (F)
- Milled Rice : 68.0 (G1)
- Head Rice : 49.5 (G1)

Physical Attributes
- Grain Length (mm) : 6.9 (L)
- Grain Shape : 3.3 (S)
- Chalky Grains (%) : 5.7 (G2)

Physicochemical Properties
- Amylose Content (%) : 18.1 (I)
- Gelatinization Temperature : 5.3 (I/L)
- Crude Protein Content (%) : 7.9

Agronomic Characteristics

Plant Height (cm) : 124.6
Heading Days After Seeding : 83
Maturity Days After Seeding : 113
Basal Leaf Sheath Color : 3 (Light purple)
Anthocyanin Color : 0 (Absent)
Leaf Blade Pubescence : 3 (Pubescent)
Auricle Color : 4 (Light purple)
Collar Color : 4 (Purple lines)
Awn Distribution : 0 (None)
Panicle Exsertion : 7 (Moderately well exserted)
Lodging Resistance : 7 (Strong)
Leaf Senescence : 5 (Intermediate)
Panicle Shattering : 5 (Moderate)
Endosperm Type : 1 (Non-glutinous)

SAMPAGUITA

Davao del Norte
Collection No. 15948

SAMPAGUITA-15948	
% Genetic Similarity	Other Genotypes
100.00	DIAMOND XX (DOUBLE DIAMOND) (15514)
100.00	DOUBLE DIAMOND (15942)
100.00	SUPER KALOY (VIETNAM RICE) (15559)
100.00	ZAMBOANGA (15945)
100.00	UNKNOWN 5 (16189)
100.00	DIAMOND X (15889)
100.00	DOUBLE DIAMOND (MLANG) (16333)
100.00	MILAGROSA (15605)
100.00	ZAMBOANGA (16422)

Grain Quality Traits

Milling Recovery (%)
- Brown Rice : 77.6 (F)
- Milled Rice : 70.0 (G1)
- Head Rice : 54.0 (G1)

Physical Attributes
- Grain Length (mm) : 7.1 (L)
- Grain Shape : 3.1 (S)
- Chalky Grains (%) : 2.1 (G1)

Physicochemical Properties
- Amylose Content (%) : 16.1 (L)
- Gelatinization Temperature : 5.2 (I/L)
- Crude Protein Content (%) : 6.7

Agronomic Characteristics

Plant Height (cm) : 114.0
Heading Days After Seeding : 91
Maturity Days After Seeding : 121
Basal Leaf Sheath Color : 1 (Green)
Anthocyanin Color : 0 (Absent)
Leaf Blade Pubescence : 3 (Pubescent)
Auricle Color : 2 (Yellowish green)
Collar Color : 2 (Light green)
Awn Distribution : 2 (Upper quarter only)
Panicle Exsertion : 5 (Just exserted)
Lodging Resistance : 9 (Very strong)
Leaf Senescence : 5 (Intermediate)
Panicle Shattering : 5 (Moderate)
Endosperm Type : 2 (Intermediate)

RV8

Davao del Sur
Collection No. 16320

RV8-16320	
% Genetic Similarity	Other Genotypes
99.53	GIFTS 12 (15846)
91.33	216 (16399)
90.86	JASMIN (15661)
90.71	3-MILLION (15457)
90.32	DALING-DALING (16203)

Grain Quality Traits

Milling Recovery (%)
- Brown Rice : 76.5 (F)
- Milled Rice : 68.7 (G1)
- Head Rice : 59.6 (Pr)

Physical Attributes
- Grain Length (mm) : 6.4 (M)
- Grain Shape : 2.4 (I)
- Chalky Grains (%) : 20.2 (aa)

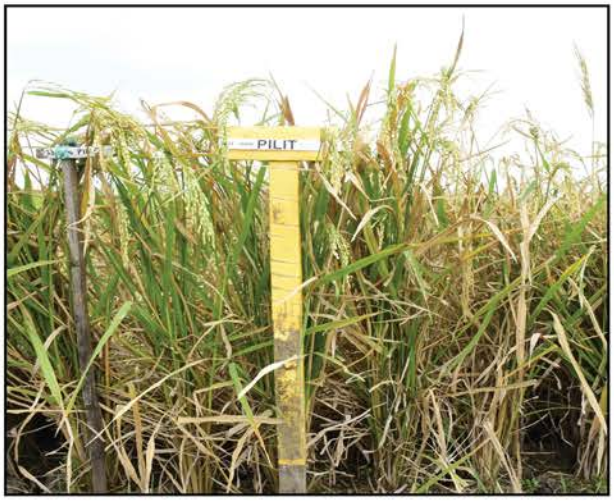
Physicochemical Properties
- Amylose Content (%) : 19.0 (I)
- Gelatinization Temperature : 4.0 (I)
- Crude Protein Content (%) : 7.6

Agronomic Characteristics

Plant Height (cm) : 142.5
Heading Days After Seeding : 91
Maturity Days After Seeding : 121
Basal Leaf Sheath Color : 4 (Purple)
Anthocyanin Color : 7 (Strong)
Leaf Blade Pubescence : 3 (Pubescent)
Auricle Color : 4 (Light purple)
Collar Color : 4 (Purple lines)
Awn Distribution : 0 (None)
Panicle Exsertion : 7 (Moderately well exserted)
Lodging Resistance : 3 (Weak)
Leaf Senescence : 5 (Intermediate)
Panicle Shattering : 5 (Moderate)
Endosperm Type : 2 (Intermediate)

PILIT

Bukidnon
Collection No. 15946



PILIT-15946	
% Genetic Similarity	Other Genotypes
94.62	RTS 11-B (16433)
94.37	SENORITA PILIT (16316)
93.90	JASMIN (15661)
93.80	MIRACLE (16297)
93.53	3-MILLION (15457)

Grain Quality Traits

Milling Recovery (%)
- Brown Rice : 75.8 (F)
- Milled Rice : 68.4 (G1)
- Head Rice : 35.6 (G3)

Physical Attributes
- Grain Length (mm) : 6.8 (L)
- Grain Shape : 3.0 (I)
- Chalky Grains (%) : 23.6 (aa)

Physicochemical Properties
- Amylose Content (%) : 6.2 (VL)
- Gelatinization Temperature : 5.0 (I/L)
- Crude Protein Content (%) : 9.6

Agronomic Characteristics

Plant Height (cm) : 149.5
Heading Days After Seeding : —
Maturity Days After Seeding : —
Basal Leaf Sheath Color : 1 (Green)
Anthocyanin Color : 0 (Absent)
Leaf Blade Pubescence : 3 (Pubescent)
Auricle Color : 2 (Yellowish green)
Collar Color : 2 (Light green)
Awn Distribution : 1 (Tip only)
Panicle Exsertion : 7 (Moderately well exserted)
Lodging Resistance : 5 (Intermediate)
Leaf Senescence : 5 (Intermediate)
Panicle Shattering : 5 (Moderate)
Endosperm Type : 3 (Glutinous)

THAILAND RICE

Bukidnon
Collection No.16429

THAILAND RICE-16429	
% Genetic Similarity	Other Genotypes
91.30	PSB Rc 10
90.79	216 (16399)
90.68	JASMIN (15661)
90.32	NSIC Rc 222
90.30	I8 (VN) (15890)

Grain Quality Traits

Milling Recovery (%)
- Brown Rice : 75.1 (F)
- Milled Rice : 65.3 (G1)
- Head Rice : 58.4 (Pr)

Physical Attributes
- Grain Length (mm) : 8.2 (EL)
- Grain Shape : 4.0 (S)
- Chalky Grains (%) : 3.4 (G1)

Physicochemical Properties
- Amylose Content (%) : 18.0 (I)
- Gelatinization Temperature : 4.8 (I/L)
- Crude Protein Content (%) : 7.7

Agronomic Characteristics

Plant Height (cm) : —
Heading Days After Seeding : 83
Maturity Days After Seeding : 113
Basal Leaf Sheath Color : 1 (Green)
Anthocyanin Color : 0 (Absent)
Leaf Blade Pubescence : 3 (Pubescent)
Auricle Color : 2 (Yellowish green)
Collar Color : 2 (Light green)
Awn Distribution : 4 (Upper three quarters only)
Panicle Exsertion : 5 (Just exserted)
Lodging Resistance : 7 (Strong)
Leaf Senescence : 5 (Intermediate)
Panicle Shattering : 5 (Moderate)
Endosperm Type : 1 (Non-glutinous)

RTS 11-B

Bukidnon
Collection No.16433

RTS 11-B-16433	
% Genetic Similarity	Other Genotypes
95.06	RTS-12-B (16421)
94.62	PILIT (15946)
94.36	RTS 11-A (15950)
94.08	RTS 13 (16434)
93.80	216 (16399)

Grain Quality Traits

Milling Recovery (%)
- Brown Rice : 77.1 (F)
- Milled Rice : 68.5 (G1)
- Head Rice : 61.1 (Pr)

Physical Attributes
- Grain Length (mm) : 6.9 (L)
- Grain Shape : 2.8 (I)
- Chalky Grains (%) : 0.6 (Pr)

Physicochemical Properties
- Amylose Content (%) : 2.2 (VL)
- Gelatinization Temperature : 4.1 (I)
- Crude Protein Content (%) : 6.4

Agronomic Characteristics

Plant Height (cm) : —
Heading Days After Seeding : 91
Maturity Days After Seeding : 121
Basal Leaf Sheath Color : 2 (Green with purple lines)
Anthocyanin Color : 3 (Weak)
Leaf Blade Pubescence : 3 (Pubescent)
Auricle Color : 5 (Purple lines)
Collar Color : 4 (Purple lines)
Awn Distribution : 2 (Upper quarter only)
Panicle Exsertion : 9 (Well exserted)
Lodging Resistance : 3 (Weak)
Leaf Senescence : 5 (Intermediate)
Panicle Shattering : 5 (Moderate)
Endosperm Type : 3 (Glutinous)

RTS 13

Bukidnon
Collection No.16434

RTS 13-16434	
% Genetic Similarity	Other Genotypes
94.48	RTS 11-A (15950)
94.08	RTS 11-B (16433)
93.68	RTS-12-B (16421)
93.03	216 (16399)
92.43	3-MILLION (15457)

Grain Quality Traits

Milling Recovery (%)
- Brown Rice : 76.7 (F)
- Milled Rice : 67.5 (G1)
- Head Rice : 55.2 (G1)

Physical Attributes
- Grain Length (mm) : 6.6 (L)
- Grain Shape : 3.0 (I)
- Chalky Grains (%) : 7.2 (G2)

Physicochemical Properties
- Amylose Content (%) : 3.8 (VL)
- Gelatinization Temperature : 4.0 (I)
- Crude Protein Content (%) : 7.0

Agronomic Characteristics

- Plant Height (cm) : 139.3
- Heading Days After Seeding : 83
- Maturity Days After Seeding : 113
- Basal Leaf Sheath Color : 1 (Green)
- Anthocyanin Color : 0 (Absent)
- Leaf Blade Pubescence : 3 (Pubescent)
- Auricle Color : 2 (Yellowish green)
- Collar Color : 2 (Light green)
- Awn Distribution : 0 (None)
- Panicle Exsertion : 9 (Well exserted)
- Lodging Resistance : 7 (Strong)
- Leaf Senescence : 5 (Intermediate)
- Panicle Shattering : 5 (Moderate)
- Endosperm Type : 3 (Glutinous)

INBRED-300

Bukidnon
Collection No.16436

INBRED-300-16436	
% Genetic Similarity	Other Genotypes
96.53	JDF 300 PLUS (15553)
96.53	DCL-300 (15402)
96.53	INBRED 300 (15943)
96.52	DCL-300 (16419)
96.50	MALAYSIAN RICE (16321)

Grain Quality Traits

Milling Recovery (%)
- Brown Rice : 77.4 (F)
- Milled Rice : 69.2 (G1)
- Head Rice : 48.4 (G1)

Physical Attributes
- Grain Length (mm) : 7.0 (L)
- Grain Shape : 2.8 (I)
- Chalky Grains (%) : 14.7 (G3)

Physicochemical Properties
- Amylose Content (%) : 19.0 (I)
- Gelatinization Temperature : 4.2 (HI/I/L)
- Crude Protein Content (%) : 7.6

Agronomic Characteristics

Plant Height (cm) : 114.1
Heading Days After Seeding : 83
Maturity Days After Seeding : 113
Basal Leaf Sheath Color : 1 (Green)
Anthocyanin Color : 0 (Absent)
Leaf Blade Pubescence : 3 (Pubescent)
Auricle Color : 2 (Yellowish green)
Collar Color : 2 (Light green)
Awn Distribution : 4 (Upper three quarters only)
Panicle Exsertion : 5 (Just exserted)
Lodging Resistance : 7 (Strong)
Leaf Senescence : 5 (Intermediate)
Panicle Shattering : 5 (Moderate)
Endosperm Type : 2 (Intermediate)

INBRED 300

Bukidnon
Collection No. 15943

INBRED 300-15943	
% Genetic Similarity	Other Genotypes
100.00	JDF 300 PLUS (15553)
100.00	DCL-300 (15402)
100.00	DCL-300 (16419)
99.98	MALAYSIAN RICE (16321)
99.81	MALAYSIAN RICE (15938)

Grain Quality Traits

Milling Recovery (%)
- Brown Rice : 78.5 (F)
- Milled Rice : 69.4 (G1)
- Head Rice : 44.8 (G2)

Physical Attributes
- Grain Length (mm) : 6.9 (L)
- Grain Shape : 2.8 (I)
- Chalky Grains (%) : 13.3 (G3)

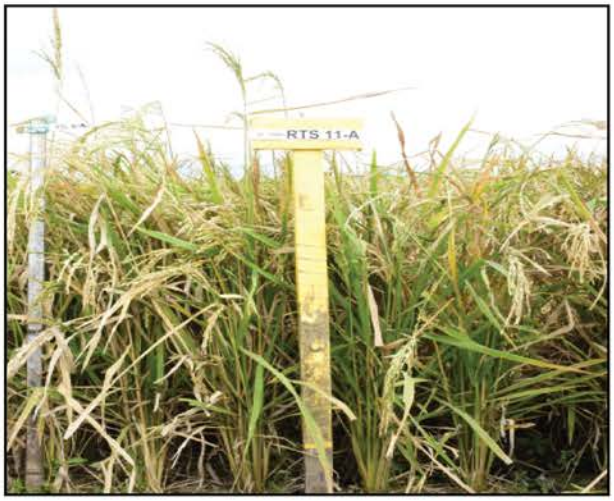
Physicochemical Properties
- Amylose Content (%) : 20.2 (I)
- Gelatinization Temperature : 4.1 (I)
- Crude Protein Content (%) : 7.5

Agronomic Characteristics

Plant Height (cm) : 111.1
Heading Days After Seeding : 98
Maturity Days After Seeding : 128
Basal Leaf Sheath Color : 1 (Green)
Anthocyanin Color : 0 (Absent)
Leaf Blade Pubescence : 3 (Pubescent)
Auricle Color : 2 (Yellowish green)
Collar Color : 2 (Light green)
Awn Distribution : 2 (Upper quarter only)
Panicle Exsertion : 5 (Just exserted)
Lodging Resistance : 7 (Strong)
Leaf Senescence : 5 (Intermediate)
Panicle Shattering : 3 (Low)
Endosperm Type : 2 (Intermediate)

RTS-11A

Bukidnon
Collection No. 15950



RTS-11A-15950	
% Genetic Similarity	Other Genotypes
94.48	RTS 13 (16434)
94.36	RTS 11-B (16433)
94.14	RTS-12-B (16421)
94.08	216 (16399)
93.85	DIAMOND X (16510)

Grain Quality Traits

Milling Recovery (%)
- Brown Rice : 77.6 (F)
- Milled Rice : 69.0 (G1)
- Head Rice : 52.1 (G1)

Physical Attributes
- Grain Length (mm) : 6.8 (L)
- Grain Shape : 2.7 (I)
- Chalky Grains (%) : 14.3 (G3)

Physicochemical Properties
- Amylose Content (%) : 18.5 (I)
- Gelatinization Temperature : 4.3 (I)
- Crude Protein Content (%) : 7.5

Agronomic Characteristics

Plant Height (cm) : 122.0
Heading Days After Seeding : 92
Maturity Days After Seeding : 122
Basal Leaf Sheath Color : 1 (Green)
Anthocyanin Color : 0 (Absent)
Leaf Blade Pubescence : 3 (Pubescent)
Auricle Color : 2 (Yellowish green)
Collar Color : 2 (Light green)
Awn Distribution : 0 (None)
Panicle Exsertion : 5 (Just exserted)
Lodging Resistance : 5 (Intermediate)
Leaf Senescence : 5 (Intermediate)
Panicle Shattering : 3 (Low)
Endosperm Type : 2 (Intermediate)

RTS-12-B

Bukidnon
Collection No. 16421

RTS-12-B-16421	
% Genetic Similarity	Other Genotypes
95.06	RTS 11-B (16433)
94.14	RTS 11-A (15950)
93.68	RTS 13 (16434)
93.21	216 (16399)
92.94	PILIT (15946)

Grain Quality Traits

Milling Recovery (%)
- Brown Rice : 71.2 (P)
- Milled Rice : 60.8 (G2)
- Head Rice : 53.8 (G1)

Physical Attributes
- Grain Length (mm) : 6.9 (L)
- Grain Shape : 3.2 (S)
- Chalky Grains (%) : 6.8 (G2)

Physicochemical Properties
- Amylose Content : 3.3 (VL)

Gelatinization Temperature : 3.7 (HI/I)

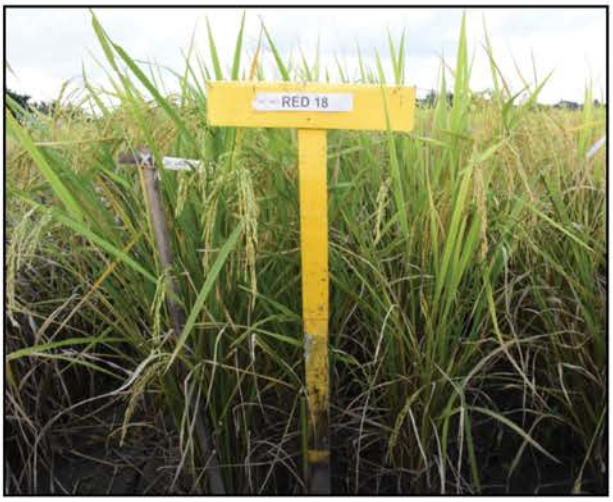
Crude Protein Content (%) : 7.0

Agronomic Characteristics

Plant Height (cm) : 166.6
Heading Days After Seeding : 91
Maturity Days After Seeding : 121
Basal Leaf Sheath Color : 3 (Light purple)
Anthocyanin Color : 5 (Medium)
Leaf Blade Pubescence : 3 (Pubescent)
Auricle Color : 3 (Purple)
Collar Color : 3 (Purple)
Awn Distribution : 0 (None)
Panicle Exsertion : 9 (Well exserted)
Lodging Resistance : 5 (Intermediate)
Leaf Senescence : 5 (Intermediate)
Panicle Shattering : 5 (Moderate)
Endosperm Type : 3 (Glutinous)

RED 18

Misamis Oriental
Collection No.16427



RED 18-16427	
% Genetic Similarity	Other Genotypes
99.71	RED RICE (15953)
92.42	PSB Rc 10
92.08	DIAMOND X (16510)
91.87	216 (16399)
91.61	NSIC Rc 420

Grain Quality Traits

Milling Recovery (%)
- Brown Rice : 64.5 (P)
- Milled Rice : 56.9 (G3)
- Head Rice : 51.2 (G1)

Physical Attributes
- Grain Length (mm) : 6.7 (L)
- Grain Shape : 3.1 (S)
- Chalky Grains (%) : 3.7 (G1)

Physicochemical Properties
- Amylose Content (%) : 17.8 (I)
- Gelatinization Temperature : 4.1 (I)
- Crude Protein Content (%) : 8.6

Agronomic Characteristics

Plant Height (cm) : 126.1
Heading Days After Seeding : 106
Maturity Days After Seeding : 136
Basal Leaf Sheath Color : 1 (Green)
Anthocyanin Color : 0 (Absent)
Leaf Blade Pubescence : 3 (Pubescent)
Auricle Color : 2 (Yellowish green)
Collar Color : 2 (Light green)
Awn Distribution :
Panicle Exsertion :
Lodging Resistance :
Leaf Senescence :
Panicle Shattering :
Endosperm Type : 1 (Non-glutinous)

ZAMBOANGA

Misamis Oriental
Collection No. 16422

ZAMBOANGA-16422	
% Genetic Similarity	Other Genotypes
100.00	DOUBLE DIAMOND (MLANG) (16333)
100.00	SAMPAGUITA (15948)
100.00	DIAMOND XX (DOUBLE DIAMOND) (15514)
100.00	DOUBLE DIAMOND (15942)
100.00	UNKNOWN 5 (16189)
100.00	MILAGROSA (15605)
100.00	DIAMOND X (15889)
100.00	SUPER KALOY (VIETNAM RICE) (15559)
100.00	ZAMBOANGA (15945)

Grain Quality Traits

Milling Recovery (%)
- Brown Rice : 75.6 (F)
- Milled Rice : 67.4 (G1)
- Head Rice : 60.4 (Pr)

Physical Attributes
- Grain Length (mm) : 7.2 (L)
- Grain Shape : 3.1 (S)
- Chalky Grains (%) : 2.6 (G1)

Physicochemical Properties
- Amylose Content : 14.3 (L)
- Gelatinization Temperature : 5.6 (I/L)
- Crude Protein Content (%) : 6.3

Agronomic Characteristics

Plant Height (cm) : 115.2
Heading Days After Seeding : 93
Maturity Days After Seeding : 123
Basal Leaf Sheath Color : 1 (Green)
Anthocyanin Color : 0 (Absent)
Leaf Blade Pubescence : 3 (Pubescent)
Auricle Color : 2 (Yellowish green)
Collar Color : 2 (Light green)
Awn Distribution : 2 (Upper quarter only)
Panicle Exsertion : 5 (Just exserted)
Lodging Resistance : 7 (Strong)
Leaf Senescence : 5 (Intermediate)
Panicle Shattering : 5 (Moderate)
Endosperm Type : 1 (Non-glutinous)

CHAPTER 3

Agro-Morphological Characters of Farmer-Grown Rice Genotypes

Marilyn C. Ferrer, Xavier Greg I. Caguiat, Jose Mari Z. Nombrere, Jeric R. Castro, Mary Ann Rańeses, Malvin D. Duldulao, Danny O. Alfonso, Sailila E. Abdula

Many rice varieties have been developed and officially released in the Philippines from the mid-1950s to 2020 and were recommended for various ecosystems (Laborte et al., 2015; NSIC 2020; Palanog et al., 2021). During the early 1990s until the late 2000s, the Philippines had the largest number of varieties released per unit rice area and the fastest varietal replacement when compared with other countries such as Indonesia or Bangladesh (Raitzer et al., 2015). Modern rice varieties (MVs) were adopted more rapidly in the Philippines than in any other country (Herdt and Capule, 1983). Farmers have adopted these varieties in varying degrees. They considered the suitability of rice varieties based on several characteristics (Joshi and Pandey, 2005). Generally, farmers preferred high-yielding rice varieties, with good grain quality, and tolerance of biotic stresses (Maligalig et al., 2018). The development and spread of MVs have contributed substantially to increased rice farmers' productivity and profitability (Herdt and Capule, 1983; Mariano et al., 2012).

Only a few varieties have been widely adopted by farmers (Laborte et al., 2015) even with the development and release of MVs. Some patronized farmer-grown rice genotypes (FGRGs) due to their desirable agronomic characters and claims of higher yield. FGRGs refer to rice varieties that have been selected and commonly used by farmers and evolved in farmers' fields without following a formal seed system. These are usually named by a group of farmers and are unidentified, neither registered nor approved by the National Seed Industry Council (NSIC).

These FGRGs may have a vast wealth of important genes, which make them desirable raw materials for future needs of rice improvement efforts. Exploration of these FGRGs is thus needed to help plant breeders develop a set of selection criteria in different environments and determine the identity and authenticity of proliferated seeds that could be used for national cooperative testing. This paper provides information on the phenotypic characters of FGRGs based on the standard descriptors for rice; identifies varieties with desirable traits; and compares FGRGs with some NSIC-registered rice varieties.

Agro-morphological characterization

Characterization of different morphological traits is an important step in assessing genetic potential. Detailed information about each genotype enhances its value (Rao et al., 2002) and can help breeders utilize appropriate characters in rice yield improvement programs (Rabara et al., 2014). One way to ensure food security for future generations is to exploit the present-day genetic diversity of rice and to identify promising ones for use in future breeding programs (Sajid et al., 2015). Agro-morphological characterization of rice genotypes leads to the discovery of traits that can determine if an individual variety is duplicate or unique.

Some 335 FGRGs collected from different provinces in the Philippines were characterized in this study. A field experiment was conducted at PhilRice CES, Maligaya, Science City of Munoz, Nueva Ecija during the wet seasons of 2017 to 2019.

Seed lots amounting to 20 grams per sample were used. Seeds were sown in a raised seedbed covered with carbonized rice hull. Transplanted were 21-day-old seedlings at a planting distance of 25 cm × 25 cm. A total of 100 plants per plot were planted in the field for characterization. Standard recommended practices for land preparation and crop establishment for rice were followed.

Observed variables included both qualitative and quantitative agro-morphological characters. FGRGs were characterized based on descriptors established by Bioversity International, IRRI, and WARDA in 2007. Data on agro-morphological characters were gathered from the vegetative to the maturity stages and given scores based on the general appearance of the population in the plot. Five to ten rice plants were randomly chosen in the field for the measurement of quantitative data of each genotype. A total of 40 qualitative (Table 1) and 19 quantitative (Table 2) morpho-agronomic traits were selected from the descriptor list and used to characterize the genotypes.

Table 1. Qualitative descriptors used to characterize 335 FGRGs.

Descriptor	Descriptor States	Stage of Recording
Basal leaf sheath color	**1**=green, **2**=green purple lines, **3**=light purple, **4**=purple	Vegetative
Leaf sheath (anthocyanin coloration)	**0**=absent ,**3**=weak, **5**=medium, **7**=strong	Late vegetative
Leaf blade (anthocyanin coloration)	**0**=absent, **1**=present	Late vegetative
Leaf blade (distribution of anthocyanin coloration)	**1**=tips only, **2**=margins only, **3**=blotches only, **4**=even (uniform purple)	Late vegetative
Leaf blade (green intensity)	**0**=no green due to anthocyanin, **3**=light, **5**=medium, **7**=dark	Late vegetative
Leaf blade attitude	**1**=erect, **5**=horizontal, **7**=drooping	Late vegetative
Leaf blade pubescence	**1**=glabrous, **2**=intermediate, **3**=pubescent	Late vegetative
Auricle color	**0**=absent (no auricles), **1**=whitish, **2**=yellowish green, **3**=purple, **4**=light purple	Late vegetative
Collar color	**0**=absent (no collar), **1**=green, **2**=light green, **3**=purple, **4**=purple lines	Late vegetative
Ligule shape	**0**=absent (no ligule), **1**=truncate, **2**=acute to acuminate, **3**=two-cleft	Late vegetative
Ligule color	**0**=absent (no ligule),**1**=whitish, **2**=yellowish green, **3**=purple, **4**=light purple, **5**=purple lines	Late vegetative
Flag leaf attitude (early)	**1**=erect, **3**=semi-erect (intermediate), **5**= horizontal, **7** = descending	Anthesis
Culm habit	**1**=erect (<15°), **3**=semi-erect, **5**=open, **7**=spreading, **9**=procumbent	After flowering
Culm kneeing ability	**0**=absent, **1**=present	After flowering
Culm nodes anthocyanin coloration	**0**=absent, **1**=purple, **2**=light purple, **3**=purple lines	After flowering-near maturity
Culm underlying node color	**0**=no color due to anthocyanin, **1**=light gold, **2**=green	Near maturity
Culm internode anthocyanin	**0**=absent, **1**=purple, **2**=purple lines	Near maturity
Culm underlying internode coloration	**1**=light gold, **2**=green	Near maturity
Flag leaf attitude (late)	**1**=erect, **3**=semi-erect, **5**=horizontal, **7**=descending	Near maturity
Stigma color	**1**=white, **2**=light green, **3**=yellow, **4**=light purple, **5**=purple	Anthesis

Table 1. (Continuation)

Descriptor	Descriptor States	Stage of Recording
Lemma and palea color (early)	**1** =white, **2**= g-swht, **3**=gold & gold furrows, **4**= brown, **5**= brown spot on g, **6**= brown furrows on g, **7**= blackish brown, **8**= green, **9**= yellowish green, 1**0**= purple, 1**1**= reddish to lp, **12**= p shade, **13**= p spots on g, **14**= p furrows on g, **15**= black	After anthesis to hard dough
Apiculus color (early)	**1**=white, **2**=straw, **3**=brown (tawny), **4**=green, **5**=red, **6**=red apex, **7**=purple, **8**=purple apex, **9**=black	After anthesis to hard dough
Awns distribution	**0**=absent, **1**=tip only, **2**=upper quarter only, **3**=upper half only, **4**=upper three-quarters only, **5**=whole length	Flowering to maturity
Awns color (early)	**0**=absent, **1**=whitish, **2**=straw, **3**=gold, **4**=brown (tawny), **5**=light green, **6**=red, **7**=purple, **8**=black	After anthesis
Panicle main axis attitude	**1**=upright (erect), **2**=semi-upright, **3**=slightly drooping, **4**=strongly drooping	Near maturity
Panicle attitude of branches	**1**=compact, **3**=semi-compact, **5**=open, **7**=horizontal, **9**=drooping	Near maturity
Panicle secondary branching	**0**=absent, **1**=sparse (light), **2**=dense (heavy), **3**=clustering	Near maturity
Panicle exsertion	**1**=enclosed, **3**=partly exserted, **5**=just exserted, **7**=moderately well exserted, **9**=well exserted	Near maturity
Culm lodging resistance	**1**=Very weak, **3**=Weak, **5**=Intermediate, **7**=Strong, **9**=Very strong	Maturity
Leaf senescence	**1**=Very early, **3**=Early, **5**=Intermediate**, 7**= Late, **9**=Very late	At harvest
Panicle shattering	**1**=Very low (<1%), **3**=Low (~3%), **5**=Moderate (~15%), **7**=High (~35%), 9=Very high (>50%)	At harvest
Panicle threshability	**1**=difficult, **2**=intermediate, **3**=easy	Postharvest
Awn color (late)	**0**=absent (awnless), **1**=straw, **2**=gold**, 3**=brown (tawny), **4**=red, **5**=purple, **6**=black	Postharvest
Lemma and palea pubescence	**1**=glabrous, **2**=hairs on lemma keel, **3**=hairs on upper portion, **4**=short hair, **5**=long hair	Postharvest
Lemma and palea color (late)	**1**=white, **2**=straw, **3**=gold and gold furrows, **4**=brown (tawny), **5**=brown spots, **6**=brown furrows, **7**=purple, **8**=reddish to light purple, **9**=purple spots, **10**=purple furrows, **11**=black	Postharvest
Apiculus color (late)	**1**=white, **2**=straw, **3**=brown (tawny), **4**=green, **5**=red, **6**=red apex, **7**=purple, **8**=purple apex, **9**=black	Postharvest
Sterile lemma color	**1**=straw, **2**=gold, **3**=red, **4**=purple	Postharvest
Caryopsis pericarp color	**1**=white, **2**=light brown, **3**=speckled brown, **4**=brown, **5**=red, **6**=variable purple, **7**=purple	Postharvest
Endosperm type	**1**=non-glutinous (non-waxy), **2**=intermediate, **3**=glutinous (waxy)	Postharvest

Table 2. Quantitative descriptors used to characterize 335 FGRGs.

Descriptor	Observed Phenotypic Classes	Stage of Measurement
Ligule Length (mm)	5 random samples	After anthesis
Leaf blade length (cm)	5 random samples	Early reproductive stage
Leaf blade width (cm)	5 random samples	Early reproductive stage
Flag leaf length (cm)	5 random samples	7 days after anthesis
Flag leaf width (cm)	5 random samples	7 days after anthesis
Culm length (cm)	5 random samples	After flowering to maturity
Culm number per plant	5 random samples	After anthesis to near maturity
Culm diameter at basal internode (mm)	5 random samples	Flowering
Panicle number per plant	5 random samples	Early ripening
Panicle length of the main axis (cm)	5 random samples	7 days after anthesis/upon full panicle exsertion
Awn length (mm)	10 random samples	After anthesis
Spikelet fertility		After harvest
Sterile lemma length (mm)	5 random samples	After harvest
Grain length (mm)	10 random samples	After harvest
Grain width (mm)	10 random samples	After harvest
Grain weight of 100 fully developed grains (g)		After harvest
Caryopsis: length (mm)	10 random samples	After harvest
Caryopsis width (mm)	10 random samples	After harvest
Caryopsis shape (length/width)	10 random samples	After harvest

DATA ANALYSIS

Descriptive statistics such as mean, range, and sample variance were computed for analysis of the quantitative traits. Descriptive analysis was used to determine the average level and standard deviation of each trait (Riadi et al., 2019). Phenotypic proportions based on the percentage of entries for the different accessions were computed for the qualitative traits. The same formula as that used by Siopongco et al. (1999) was applied to the quantitative characters following the construction of frequency classes, with the class boundaries being equal to some function of mean and standard deviation. For each quantitative character, the overall genotype means (x) and standard deviation (σ) were used to subdivide the population values (xi) into 10 frequency classes, ranging from class 1 (if $xi \leq -2\sigma$} to class 10 (if $xi \leq X+2\sigma$), the class interval being 0.5σ. The lowest and the highest values were considered to determine the number of classes constructed.

Qualitative and quantitative data were analyzed using the Numerical Taxonomy and Multivariate Analysis System (NTSYS, version 2; Rolf, 1990). Multivariate cluster analyses were performed separately for qualitative and quantitative data sets. Clustering using the sequential, agglomerative, hierarchical, and non-overlapping type (SAHN) was done based on the unweighted pair group method, arithmetic average (UPGMA). A simple matching similarity coefficient was used for qualitative analysis.

The standardized Shannon-Weaver Diversity Index was computed following the formula (Shannon and Weaver, 1949):

$$H' = \frac{-\sum p_i (log_2\, p_i)}{log_2\, n}$$

Where: H'= Shannon-Weaver index

n = number of phenotype descriptors for character

Pi = proportion of the total number of entries belonging to the i^{th} class.

Where: H' was classified as the following arbitrary rating scale:

High diversity :(H'=0.67-1.00)
Moderate diversity :(H'=0.34-0.66)
Low diversity :(H'=0-0.33)

Quantitative traits of FGRGs

Variations in characters were observed in different FGRGs. Table 3 shows the mean performance of the genotypes. Maturity days ranged from 97 to 177 days after sowing (DAS); Early David and Bodo-bodo were found to be early-maturing. Moreover, plant height averaged 124.5 cm. The 100-seed weight ranged from 1.7g to 4.2g; Elon-elon was observed to have the heaviest grain weight. Spikelet fertility ranged from 13 % to 98%.

Qualitative traits of FGRGs

In general, agro-morphological characterization showed that FGRGs mostly have semi-erect culm, erect flag leaf, and leaf blades, intermediate leaf senescence, and semi-compact panicles (Figure 1). FGRGs have medium to dark green leaf blades, slightly to strongly drooping panicle main axis, and intermediate to easy panicle threshability.

Table 3. Mean, standard error, standard deviation, minimum value and maximum value of the 335 FGRGs.

Traits	Mean	SE	Sd	Min	Max
Heading days	94.00	0.50	8.80	67.00	147.00
Maturity	123.00	0.70	12.40	97.00	177.00
Awn length (mm)	0.50	0.10	2.20	0.00	30.76
Caryopsis length (mm)	6.50	0.00	0.60	4.50	8.10
Caryopsis width (mm)	2.10	0.00	0.20	1.45	2.62
Culm diameter at basal internode (mm)	6.90	0.00	0.90	4.40	9.60
Culm length (cm)	97.70	0.90	16.50	64.80	151.40
Culm number per plant	16.30	0.20	4.30	8.80	29.00
Spikelet Fertility (%)	83.00	0.60	10.00	13.30	98.00
Flag leaf length (cm)	35.70	0.30	6.00	21.00	53.00
Flag leaf width (cm)	1.70	0.00	0.20	1.12	2.38
Number of filled grains	141.00	2.20	39.80	16.00	283.00
Number of unfilled grains	29.00	1.10	20.20	2.20	145.80
Grain length (mm)	11.20	0.50	9.20	6.04	84.80
Grain width (mm)	2.50	0.00	0.20	1.80	3.20
Grain weight of 100 fully developed grains (g)	2.50	0.00	0.40	1.65	4.20
Leaf blade length (cm)	48.90	0.40	8.10	30.40	76.40
Leaf blade width (cm)	1.40	0.00	0.30	0.76	2.66
Ligule length (mm)	20.30	0.20	3.90	11.40	33.40
Panicle number per plant	16.30	0.20	4.30	8.80	46.00
Sterile lemma length (mm)	2.30	0.00	0.30	1.66	3.52
Plant height (cm)	124.50	0.90	16.70	90.20	173.30

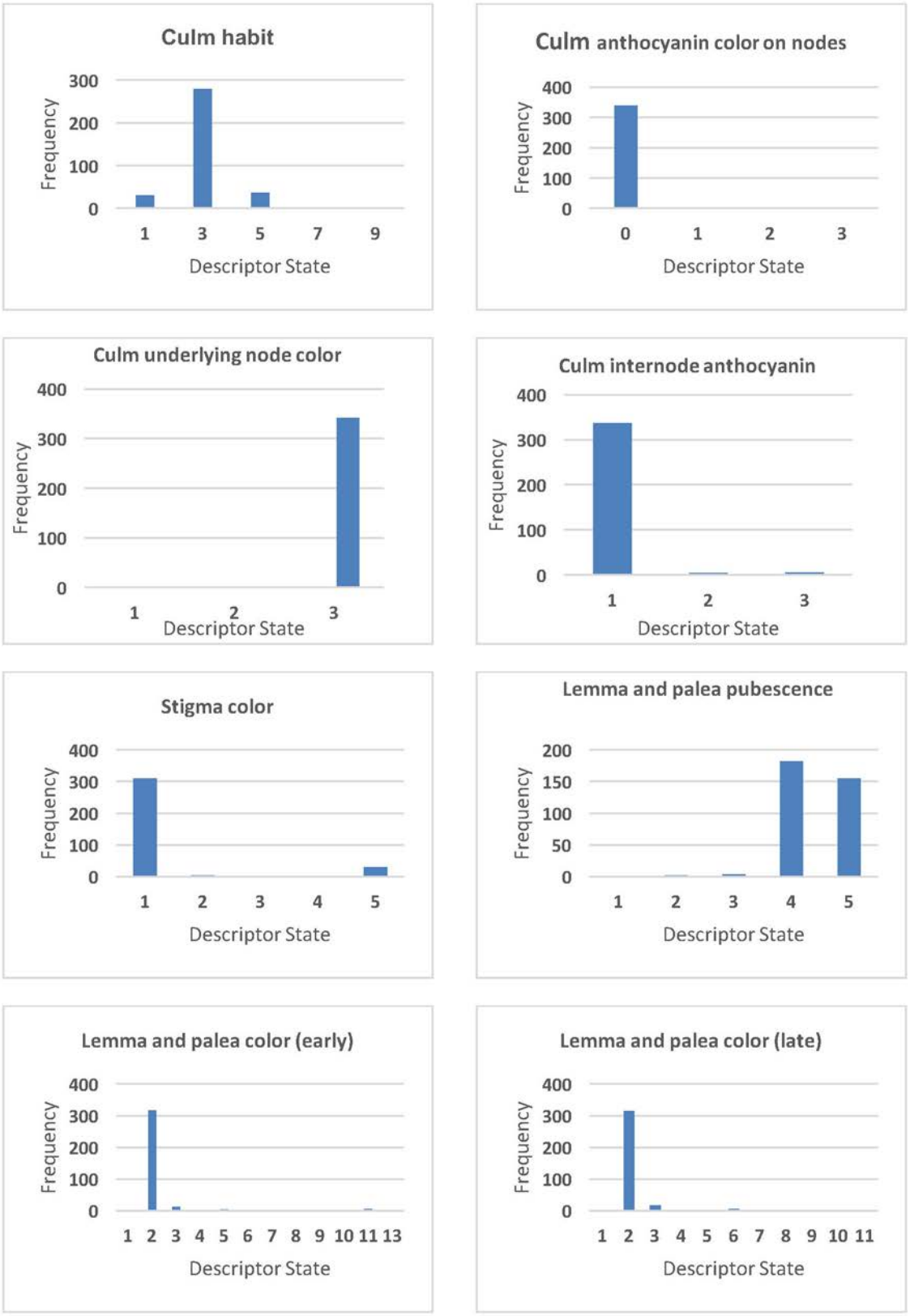


Figure 1. Frequency distribution of qualitative traits among the FGRGs.

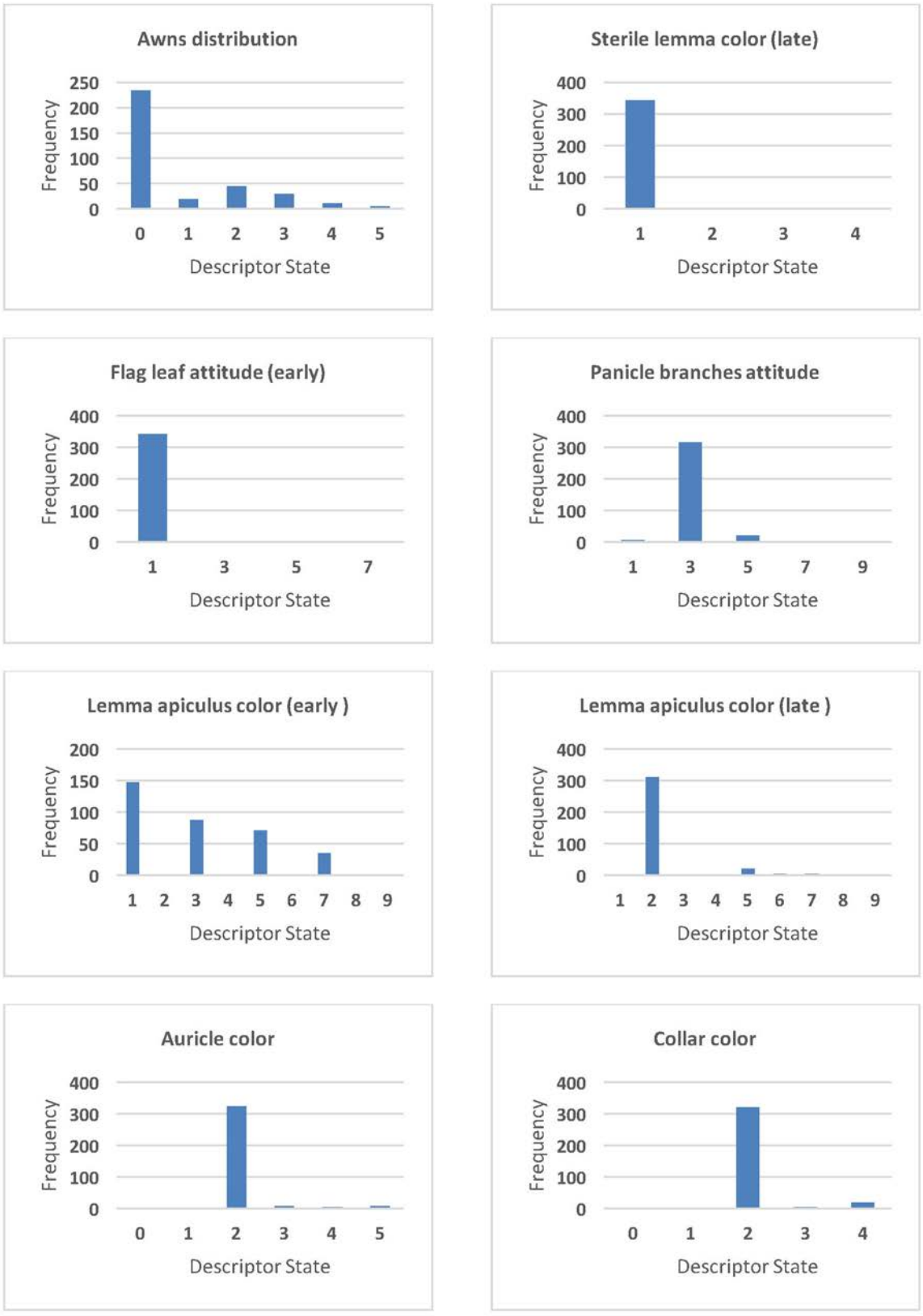


Figure 1. (continuation)

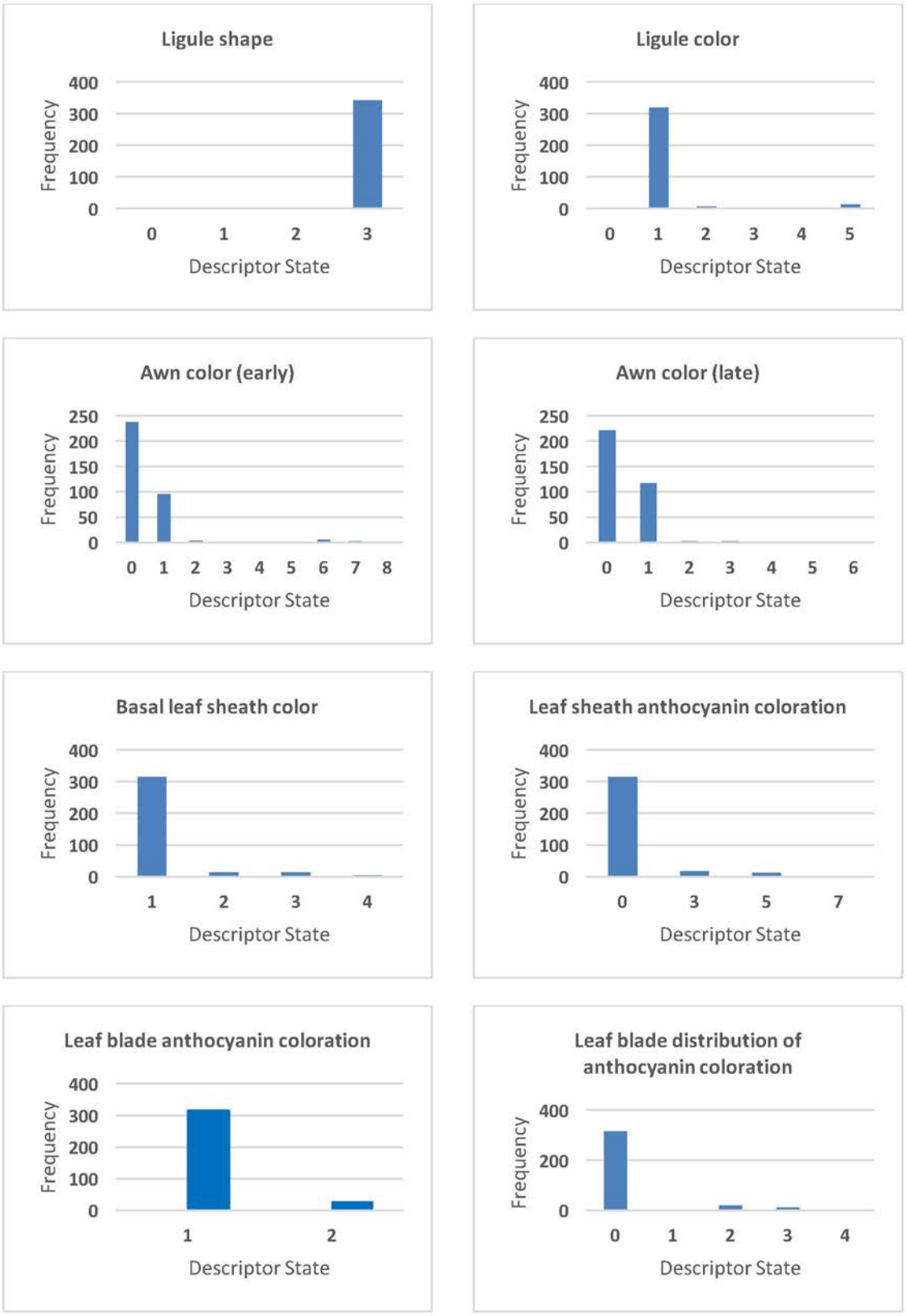


Figure 1. (continuation)

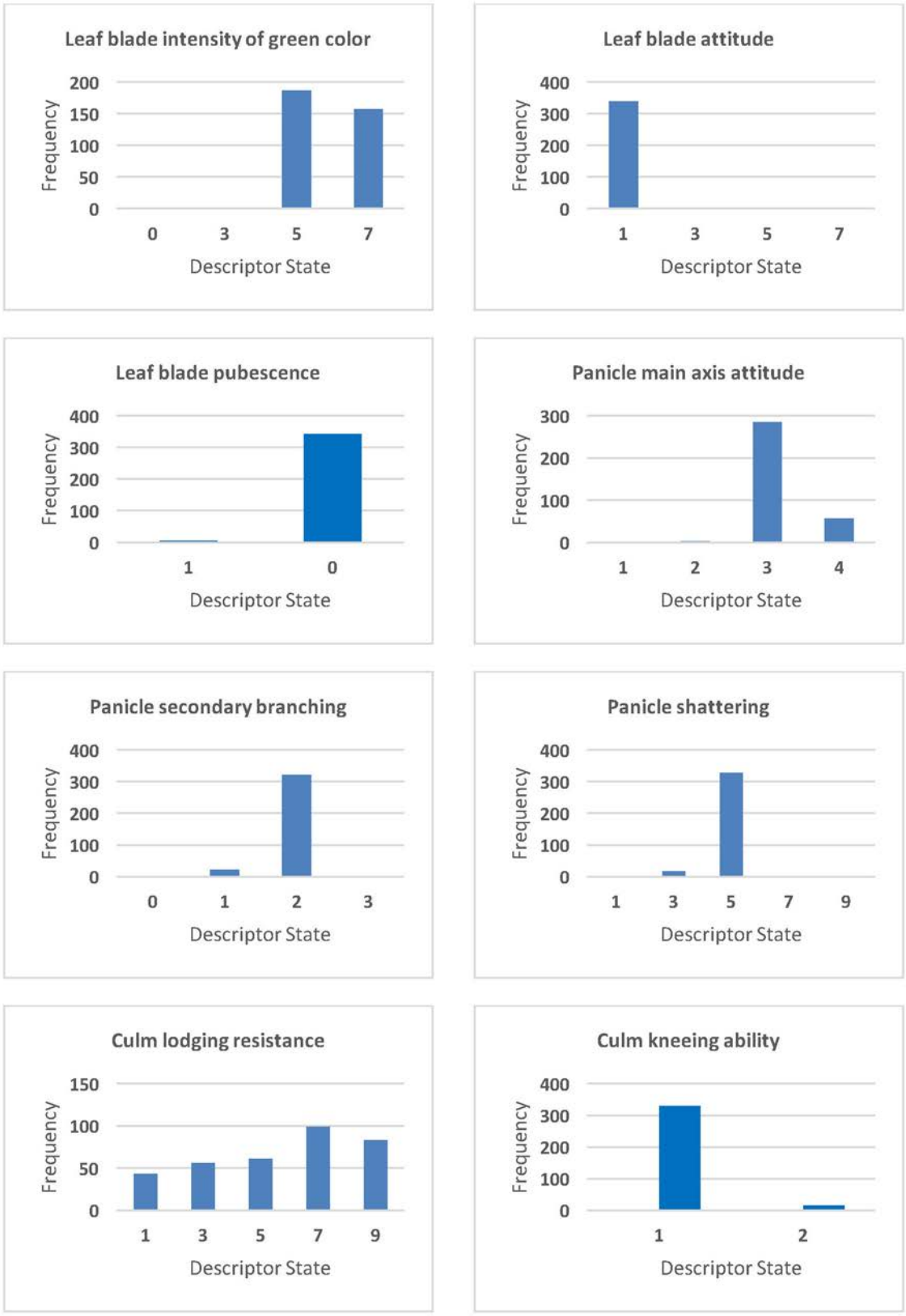


Figure 1. (continuation)

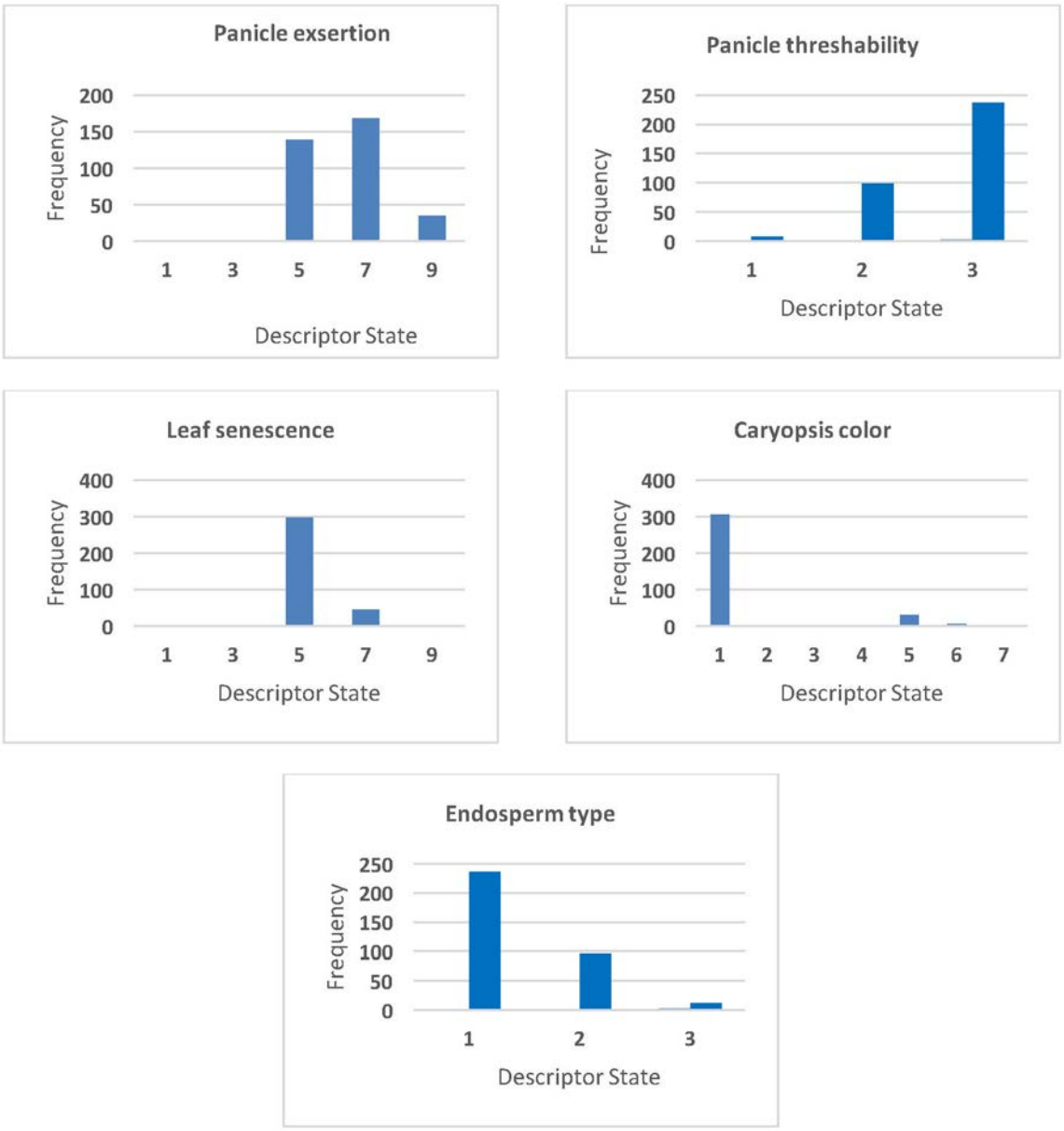


Figure 1. (continuation)

Variation of FGRGs using the Shannon-Weaver Diversity Index

The computed diversity indices for qualitative traits ranged from 0.01 to 0.97 (Table 4). The mean diversity index of 0.24 indicated the low variation within the FGRGs in terms of qualitative traits. On the other hand, a high degree of variation was exhibited within the FGRGs for the quantitative characters (Table 5).

The pooling of diversity values for the qualitative and quantitative traits gave an overall diversity index of 0.44, indicative of moderate variability existing within the FGRGs.

Table 4. Computed diversity indices (H') for qualitative characters of FGRGs.

Descriptor	H'	Classification
Culm lodging resistance	0.97	High
Panicle threshability	0.64	Moderate
Panicle exsertion	0.60	Moderate
Lemma apiculus color (early observation)	0.58	Moderate
Awns distribution	0.56	Moderate
Lemma and palea pubescence	0.49	Moderate
Leaf blade anthocyanin coloration	0.41	Moderate
Awn color (late observation)	0.38	Moderate
Endosperm type	0.36	Moderate
Awn color (early observation)	0.35	Moderate
Culm habit	0.29	Low
Leaf sheath anthocyanin coloration	0.26	Low
Culm kneeing ability	0.26	Low
Leaf senescence	0.24	Low
Leaf blade intensity of green color	0.24	Low
Stigma color	0.23	Low
Caryopsis color	0.22	Low
Panicle branches attitude	0.21	Low
Basal leaf sheath color	0.19	Low
Ligule color	0.18	Low
Collar color	0.17	Low
Panicle secondary branching	0.17	Low
Lemma and palea color (late observation)	0.17	Low
Lemma and palea color (early observation)	0.16	Low
Panicle shattering	0.12	Low
Lemma apiculus color (late observation)	0.12	Low
Panicle main axis attitude	0.11	Low
Culm internode anthocyanin	0.10	Low
Leaf blade distribution of anthocyanin coloration	0.10	Low
Culm anthocyanin color on nodes	0.08	Low
Culm underlying internode coloration	0.07	Low
Leaf blade attitude	0.06	Low
Auricle color	0.04	Low
Culm underlying node color	0.03	Low
Flag leaf attitude (early observation)	0.03	Low
Ligule shape	0.03	Low
Leaf blade pubescence	0.02	Low
Sterile lemma color (late observation)	0.01	Low
Average	**0.24**	**Low**

Table 5. Computed diversity indices (H') for quantitative characters of FGRGs.

Descriptor	H'	Classification
Flag leaf width (cm)	0.92	High
Flag leaf length (cm)	0.92	High
Culm length (cm)	0.87	High
Leaf-blade width (cm)	0.87	High
Plant height (cm)	0.86	High
Ligule length (mm)	0.85	High
Panicle length of the main axis (cm)	0.85	High
Leaf-blade length (cm)	0.84	High
Grain width (mm)	0.83	High
Grain weight of 100 fully developed grains (g)	0.82	High
Sterile lemma length (mm)	0.82	High
Caryopsis width (mm)	0.82	High
Culm diameter at basal internode (mm)	0.81	High
Number of filled grains	0.80	High
Culm number per plant	0.80	High
Caryopsis length (mm)	0.79	High
Panicle number per plant	0.78	High
Caryopsis shape	0.78	High
Spikelet fertility (%)	0.74	High
Number of unfilled grains	0.72	High
Heading days	0.63	Moderate
Maturity	0.56	Moderate
Awn length (mm)	0.32	Low
Grain Length (mm)	0.16	Low
Average	**0.76**	**High**

Phenotypic similarities of FGRGs to some NSIC-approved varieties

The similarities of FGRGs to some NSIC-approved varieties were analyzed based on 59 morpho-agronomic traits. Results showed possible duplications and revealed morphological relatedness of some FGRGs to some NSIC-registered varieties based on the similarity coefficients (Annex 1). NSIC Rc 218 is comparable with variety 1561 (79%) and 70% similar with 16 FGRGs as well. NSIC Rc 274 has a feature similar to those of Tudy tudy (79%) and other 31 FGRGs (70%), too. Moreover, Maharlika and Index look like NSIC Rc 300 (77%). Likewise, Mindanao and Masigasig are 76% similar to NSIC Rc 128. Furthermore, Janjanong resembles NSIC Rc 160 (76%).

Selection of farmer-grown rice genotypes

The FGRGs enumerated in the study exhibit many interesting characters that can be useful for farmers, breeders, and other stakeholders. Plant height is one of the most important selection criteria for modern rice varietal development (Sarif et al., 2020). In the current study GSR_2, Basmati, 75 days (Pasuquin), Miracle, BWSI 4R, Bodo bodo, HR 400, 7 Tonner have the shortest stature (Table 6). Moreover, grain size is a stable varietal property that can be used to identify a variety and is among the first criteria of rice quality that breeders consider in developing new varieties (Traore et al., 2011). Long grains (>11 mm length) were observed on Milagrosa, Masbate, and RTS_12. FGRGs that had the longest panicles (>32cm) are Destiny, 711, Milagrosa, Jasmine R, DCL 300. The panicle length and number of grains per plant directly control the yield of a particular variety (Ashfaq et al., 2012).

Table 6. FGRGs with desirable attributes.

Trait	Value	Varieties
Early maturity	97 DAS	Early David, Bodo Bodo, GSR_2, Basmati, 75 days (Pasuquin), Miracle,
Short culm	<100cm	BWSI 4R, Bodo Bodo, HR 400, 7 Tonner
Dense panicle	>300	Optimus, S14, Tap1
Heavy grains (1000 g wt.)	4.2	Arigato
Long grain	>11 mm	Milagrosa, Masbate, RTS_12
Long panicle	>32cm	Destiny, 711, Milagrosa, Jasmine R, DCL 300

CONCLUSION

Phenotypic characterization of these FGRGs provides a complete morphological profile that could be used as a basis for identification and authentication. Establishing the genetic identity of rice varieties using the morphological method is a significant step to show the origin and proprietary ownership. This will serve as a reference for identity verification, validation, as well as duplicate identification and elimination.

Several FGRGs possess desirable traits that may be used for direct utilization or as parentals in rice improvement programs. However, some FGRGs are closely clustered with NSIC-released rice varieties. Further analysis using molecular techniques is needed to confirm the identity of these FGRGs. More stringent policies on varietal release and branding and seed regulation are recommended to lessen the proliferation of FGRGs in the market.

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Annex 1. Phenotypic similarity coefficients of FGRGs compared with some NSIC-approved varieties.

Farmer-grown Rice Genotype	NSIC Rc 128	NSIC Rc 160	NSIC Rc 190	NSIC Rc 204H	NSIC Rc 218	NSIC Rc 274	NSIC Rc 300	NSIC Rc 308
BARAKO	0.6	0.53	0.53	0.64	0.53	0.67	0.5	0.5
SUPER DX	0.58	0.6	0.6	0.55	0.63	0.64	0.58	0.47
DCL_300	0.52	0.58	0.52	0.57	0.58	0.67	0.61	0.53
IRIG	0.6	0.56	0.61	0.57	0.56	0.57	0.6	0.5
INDEX 6	0.62	0.66	0.65	0.67	0.6	0.69	0.68	0.6
DASH 12	0.52	0.65	0.55	0.64	0.63	0.6	0.76	0.48
3 MILLION	0.6	0.6	0.6	0.74	0.6	0.71	0.66	0.55
M 41	0.62	0.58	0.58	0.62	0.61	0.67	0.6	0.52
BODIDOY	0.63	0.53	0.56	0.6	0.5	0.57	0.53	0.56
HR400	0.52	0.61	0.56	0.55	0.6	0.57	0.58	0.44
M3 BARAKO	0.6	0.71	0.63	0.62	0.61	0.64	0.63	0.53
PEDRO	0.62	0.65	0.6	0.62	0.56	0.6	0.6	0.55
SINANDOMING	0.6	0.66	0.66	0.67	0.66	0.69	0.61	0.69
M3	0.67	0.65	0.58	0.62	0.65	0.6	0.66	0.5
SAMPAGUITA	0.57	0.71	0.55	0.6	0.74	0.57	0.68	0.52
OFFSPRING	0.6	0.63	0.58	0.57	0.63	0.67	0.66	0.45
DESTINY	0.57	0.61	0.56	0.55	0.65	0.67	0.56	0.56
INDIAN RICE	0.67	0.65	0.61	0.64	0.56	0.74	0.65	0.56
EL GRANDE	0.6	0.65	0.6	0.57	0.65	0.6	0.73	0.56
KULAPO	0.63	0.58	0.6	0.64	0.56	0.64	0.58	0.48
ZAMBOANGA RICE	0.65	0.65	0.61	0.67	0.6	0.64	0.56	0.63
TITO TITO	0.62	0.65	0.65	0.62	0.58	0.62	0.55	0.58
S 14	0.58	0.61	0.58	0.64	0.58	0.67	0.6	0.53
DIAMOND X	0.67	0.68	0.63	0.67	0.6	0.62	0.69	0.52
IL_29	0.6	0.61	0.61	0.57	0.63	0.67	0.63	0.53
DIAMOND XX (DOUBLE DIAMOND)	0.58	0.71	0.56	0.57	0.71	0.62	0.65	0.53
GSR 2	0.72	0.61	0.6	0.64	0.55	0.62	0.63	0.48
TRIPLE R	0.65	0.55	0.65	0.67	0.56	0.62	0.55	0.6
UNIVERSAL RICE	0.62	0.63	0.63	0.62	0.61	0.62	0.6	0.58
JDF 300 PLUS	0.53	0.6	0.55	0.55	0.63	0.6	0.6	0.48
711	0.55	0.58	0.55	0.67	0.6	0.55	0.65	0.52
JAPANIRI	0.65	0.6	0.58	0.67	0.58	0.69	0.56	0.6
TOP RICE	0.65	0.58	0.61	0.62	0.55	0.67	0.6	0.65
TRIPLE 3	0.62	0.73	0.61	0.6	0.61	0.69	0.69	0.56
SUPER DIAMOND	0.58	0.63	0.61	0.55	0.61	0.69	0.56	0.6
SUPER KALOY (VIETNAM RICE)	0.5	0.68	0.6	0.57	0.74	0.6	0.66	0.53
DIAMOND X	0.65	0.66	0.63	0.6	0.61	0.6	0.68	0.48
DIAMOND X	0.57	0.65	0.61	0.57	0.63	0.6	0.61	0.48
HIGH RICE	0.62	0.6	0.58	0.52	0.61	0.6	0.58	0.42
DIAMOND X	0.68	0.68	0.66	0.64	0.58	0.67	0.69	0.52
SUPPER DIAMOND X	0.65	0.66	0.66	0.62	0.63	0.67	0.65	0.66
1L29	0.63	0.65	0.63	0.64	0.56	0.67	0.6	0.55
46	0.53	0.58	0.56	0.57	0.66	0.5	0.58	0.48
401	0.58	0.55	0.61	0.62	0.53	0.6	0.58	0.47
DREAM RICE	0.67	0.6	0.71	0.62	0.56	0.67	0.55	0.53
EXCEL RICE	0.62	0.61	0.58	0.62	0.55	0.71	0.56	0.74
GENETICS	0.68	0.56	0.65	0.64	0.5	0.64	0.56	0.61
AS 411	0.6	0.61	0.55	0.67	0.56	0.64	0.63	0.63
BELENA 215	0.65	0.61	0.6	0.67	0.58	0.62	0.63	0.61
DREAM RICE	0.65	0.6	0.69	0.67	0.58	0.64	0.66	0.5
DIAMOND V	0.57	0.61	0.56	0.67	0.68	0.57	0.68	0.47
JFD 300 PLUS	0.53	0.6	0.53	0.55	0.6	0.55	0.6	0.4
R_DANNY	0.63	0.65	0.61	0.55	0.69	0.62	0.6	0.56
GREEN SUPER RICE	0.55	0.52	0.53	0.52	0.58	0.69	0.55	0.6
JAPANIRI	0.57	0.52	0.56	0.6	0.48	0.71	0.5	0.47
DIAMOND X	0.62	0.68	0.63	0.62	0.65	0.62	0.68	0.47

Annex 1. (continuation)

Farmer-grown Rice Genotype	NSIC Rc 128	NSIC Rc 160	NSIC Rc 190	NSIC Rc 204H	NSIC Rc 218	NSIC Rc 274	NSIC Rc 300	NSIC Rc 308
MAHARLIKA	0.6	0.71	0.61	0.67	0.65	0.69	0.77	0.55
BELENA 205	0.61	0.59	0.62	0.57	0.57	0.69	0.57	0.57
GSR 8	0.63	0.56	0.52	0.6	0.56	0.55	0.65	0.56
REALINE	0.55	0.6	0.66	0.62	0.61	0.71	0.68	0.52
TRIPLE 1	0.52	0.63	0.61	0.64	0.68	0.69	0.6	0.55
R5	0.47	0.47	0.53	0.48	0.42	0.43	0.44	0.44
DIAMOND X	0.53	0.69	0.58	0.62	0.69	0.62	0.68	0.55
BASMATI	0.57	0.63	0.61	0.62	0.65	0.67	0.66	0.5
AEROBIC (San Jose)	0.57	0.5	0.53	0.45	0.44	0.48	0.44	0.48
DIAMOND X	0.4	0.44	0.44	0.5	0.44	0.4	0.4	0.34
JASMIN	0.62	0.61	0.61	0.6	0.63	0.57	0.61	0.56
JASMIN	0.58	0.61	0.53	0.55	0.68	0.62	0.63	0.47
SINANDOMENG	0.6	0.65	0.71	0.57	0.61	0.64	0.6	0.58
90 DAYS	0.67	0.58	0.58	0.57	0.52	0.69	0.6	0.56
CHINESE RICE	0.52	0.53	0.5	0.52	0.45	0.5	0.52	0.44
UNKNOWN	0.65	0.55	0.61	0.69	0.58	0.6	0.55	0.53
(GUINOBAT) SIROMA	0.6	0.63	0.58	0.64	0.55	0.6	0.56	0.58
SPEED 75	0.65	0.6	0.6	0.62	0.58	0.6	0.68	0.56
BINOKAYO	0.72	0.55	0.66	0.64	0.52	0.67	0.52	0.56
75	0.6	0.63	0.6	0.64	0.58	0.71	0.61	0.58
BURDAGOL	0.58	0.56	0.6	0.67	0.53	0.69	0.55	0.58
GIFTS 12	0.47	0.44	0.42	0.5	0.4	0.43	0.4	0.44
KAPULA	0.65	0.61	0.61	0.67	0.52	0.69	0.56	0.53
SINANDOMENG	0.58	0.61	0.63	0.6	0.55	0.64	0.6	0.61
SAIGON	0.55	0.61	0.55	0.55	0.68	0.6	0.6	0.45
M3	0.59	0.64	0.64	0.63	0.56	0.63	0.62	0.56
UNKNOWN	0.58	0.63	0.58	0.55	0.55	0.67	0.6	0.5
UP & DOWN	0.72	0.63	0.56	0.64	0.53	0.62	0.58	0.52
UNKNOWN VAR 2	0.6	0.68	0.63	0.62	0.6	0.74	0.65	0.52
UNKNOWN VAR 3	0.53	0.61	0.53	0.57	0.68	0.57	0.63	0.52
RC 85	0.55	0.73	0.61	0.55	0.56	0.64	0.61	0.6
MALAGKIT (EXOTIC)	0.59	0.49	0.59	0.68	0.46	0.55	0.47	0.47
EARLY DAVID	0.43	0.4	0.39	0.4	0.42	0.43	0.44	0.44
BEST RICE	0.65	0.55	0.63	0.62	0.52	0.64	0.6	0.56
MESTIZA	0.65	0.71	0.61	0.62	0.61	0.57	0.69	0.58
TANAKA	0.62	0.69	0.68	0.69	0.61	0.62	0.65	0.56
DIAMOND X	0.62	0.61	0.65	0.64	0.6	0.64	0.58	0.53
I8 (VN)	0.65	0.58	0.56	0.62	0.6	0.64	0.56	0.61
1561	0.53	0.65	0.58	0.64	0.79	0.64	0.65	0.53
KINADOY (PUTI)	0.62	0.53	0.6	0.62	0.53	0.64	0.55	0.52
DASH 9	0.58	0.52	0.52	0.49	0.46	0.51	0.49	0.44
129	0.65	0.63	0.66	0.62	0.6	0.69	0.58	0.58
TRIPLE 8	0.62	0.63	0.66	0.67	0.58	0.76	0.63	0.56
KINADOY (BULIK)	0.6	0.58	0.58	0.6	0.53	0.67	0.5	0.56
MALAYSIAN RICE	0.48	0.5	0.48	0.55	0.56	0.55	0.52	0.56
INDEX 2	0.63	0.69	0.69	0.69	0.63	0.74	0.68	0.55
INDONESIAN RICE	0.52	0.65	0.53	0.6	0.65	0.62	0.61	0.47
ARIGATO	0.67	0.58	0.61	0.64	0.55	0.67	0.56	0.63
DOUBLE DIAMOND	0.58	0.69	0.55	0.67	0.71	0.62	0.66	0.52
INBRED 300	0.52	0.52	0.48	0.57	0.56	0.55	0.56	0.44
ZAMBOANGA	0.55	0.66	0.58	0.67	0.73	0.62	0.65	0.56
SAMPAGUITA	0.52	0.63	0.6	0.6	0.66	0.62	0.65	0.52
ANGELICA (Claveria)	0.65	0.58	0.55	0.57	0.53	0.67	0.58	0.55
RED RICE	0.62	0.61	0.66	0.57	0.56	0.64	0.58	0.56
MORYO MORYO	0.62	0.52	0.56	0.6	0.56	0.62	0.56	0.61
RED RICE	0.45	0.4	0.5	0.43	0.5	0.5	0.42	0.4

Annex 1. (continuation)

Farmer-grown Rice Genotype	NSIC Rc 128	NSIC Rc 160	NSIC Rc 190	NSIC Rc 204H	NSIC Rc 218	NSIC Rc 274	NSIC Rc 300	NSIC Rc 308
BULAW (SUPER_60)	0.6	0.53	0.56	0.57	0.52	0.6	0.58	0.58
OPTIMUS	0.6	0.55	0.65	0.64	0.65	0.6	0.56	0.53
COMBAT	0.62	0.69	0.6	0.62	0.58	0.57	0.76	0.53
GLOBAL SUPER RICE	0.62	0.61	0.66	0.62	0.53	0.71	0.58	0.58
GSR 12	0.63	0.68	0.63	0.69	0.63	0.6	0.68	0.52
LAWIN	0.57	0.63	0.66	0.62	0.63	0.76	0.65	0.56
BLONDE	0.68	0.53	0.6	0.62	0.48	0.67	0.5	0.66
GANAR	0.57	0.69	0.63	0.52	0.69	0.6	0.63	0.58
AEROBIC (Porac)	0.67	0.6	0.6	0.6	0.52	0.69	0.61	0.53
MILAGROSA SELECT	0.52	0.47	0.45	0.55	0.42	0.52	0.44	0.44
DESTINY	0.63	0.68	0.65	0.67	0.6	0.64	0.71	0.55
LAKATAN	0.41	0.46	0.49	0.45	0.43	0.45	0.44	0.44
JUAN RICE	0.57	0.61	0.61	0.67	0.65	0.62	0.61	0.56
WINNER RICE	0.6	0.61	0.69	0.57	0.65	0.6	0.6	0.55
DIAMOND X	0.62	0.63	0.65	0.6	0.66	0.69	0.65	0.58
GANADOR	0.6	0.66	0.65	0.6	0.69	0.62	0.65	0.5
JAPANIRI	0.65	0.56	0.56	0.62	0.52	0.55	0.6	0.6
GSR	0.67	0.61	0.66	0.67	0.6	0.71	0.61	0.53
PUKPUKLO	0.63	0.58	0.6	0.55	0.48	0.64	0.55	0.5
IMELDA RICE	0.58	0.6	0.5	0.69	0.68	0.55	0.58	0.45
BONGKITAN	0.5	0.39	0.42	0.5	0.39	0.43	0.4	0.4
CARGIL	0.68	0.58	0.61	0.64	0.52	0.64	0.56	0.56
WAG WAG PINO	0.71	0.6	0.61	0.64	0.58	0.64	0.6	0.53
RAMINAD	0.57	0.53	0.53	0.55	0.53	0.5	0.52	0.53
WAG WAG	0.57	0.63	0.61	0.6	0.5	0.62	0.6	0.47
R5	0.55	0.58	0.53	0.6	0.56	0.48	0.58	0.4
IMPROVED 222	0.62	0.61	0.65	0.62	0.55	0.67	0.6	0.61
DIAMOND X	0.6	0.71	0.66	0.52	0.68	0.6	0.65	0.53
VIETNAM	0.67	0.65	0.68	0.62	0.63	0.57	0.63	0.55
DOUBLE DIAMOND	0.6	0.73	0.55	0.62	0.74	0.55	0.68	0.48
MILAGROSA	0.55	0.58	0.61	0.5	0.66	0.55	0.65	0.56
MESTISA	0.59	0.62	0.61	0.64	0.57	0.55	0.7	0.52
KAIMPAS	0.67	0.58	0.6	0.64	0.56	0.57	0.63	0.48
MASHAW	0.63	0.66	0.6	0.57	0.66	0.6	0.63	0.53
REGOM	0.6	0.68	0.63	0.67	0.63	0.71	0.6	0.65
MIRACLE	0.67	0.6	0.58	0.64	0.56	0.6	0.58	0.58
DALAGANG BUKID	0.47	0.52	0.49	0.41	0.44	0.49	0.44	0.49
RED 18	0.47	0.42	0.48	0.45	0.45	0.4	0.37	0.47
M3	0.7	0.69	0.65	0.62	0.61	0.69	0.69	0.56
VIETNAM	0.65	0.68	0.61	0.57	0.58	0.57	0.6	0.55
ROSANA	0.67	0.58	0.61	0.67	0.56	0.71	0.55	0.58
BORIT	0.6	0.53	0.58	0.5	0.5	0.62	0.47	0.58
URAB	0.67	0.61	0.65	0.62	0.58	0.67	0.55	0.52
ROSANA	0.63	0.65	0.6	0.67	0.58	0.62	0.58	0.5
DESTINY	0.73	0.68	0.65	0.71	0.53	0.62	0.69	0.53
DESTINY	0.58	0.73	0.6	0.6	0.68	0.55	0.68	0.52
LOS BAÑOS	0.62	0.68	0.65	0.69	0.55	0.69	0.63	0.55
KAYOPO	0.67	0.55	0.63	0.64	0.53	0.69	0.55	0.6
KADATO	0.62	0.6	0.65	0.62	0.61	0.64	0.6	0.56
66 PUWA	0.64	0.61	0.64	0.56	0.54	0.71	0.57	0.62
KATAGO	0.6	0.61	0.68	0.64	0.56	0.71	0.63	0.55
MILAGROSA	0.5	0.56	0.58	0.55	0.58	0.67	0.6	0.47
ABANGAY	0.57	0.56	0.6	0.57	0.52	0.64	0.55	0.45
ANGELO I	0.58	0.56	0.56	0.62	0.52	0.64	0.63	0.5
BES I	0.63	0.65	0.65	0.6	0.6	0.6	0.61	0.5
BWSI 3B	0.62	0.6	0.61	0.62	0.52	0.55	0.65	0.52

Annex 1. (continuation)

Farmer-grown Rice Genotype	NSIC Rc 128	NSIC Rc 160	NSIC Rc 190	NSIC Rc 204H	NSIC Rc 218	NSIC Rc 274	NSIC Rc 300	NSIC Rc 308
BWS WY	0.6	0.63	0.6	0.6	0.56	0.62	0.63	0.56
BWSI 4R	0.62	0.58	0.6	0.64	0.56	0.71	0.58	0.6
BWS 6W	0.63	0.61	0.61	0.64	0.56	0.57	0.58	0.47
BWS3 3B	0.6	0.61	0.66	0.62	0.53	0.55	0.63	0.45
BWSI 4B	0.57	0.61	0.55	0.62	0.52	0.57	0.6	0.47
C4 TYSAN	0.62	0.63	0.6	0.69	0.53	0.74	0.63	0.58
CAROVAN	0.55	0.55	0.5	0.57	0.58	0.57	0.55	0.55
DIWATA	0.59	0.67	0.59	0.63	0.52	0.59	0.66	0.52
DAHILI	0.53	0.61	0.58	0.55	0.53	0.57	0.6	0.5
EC3	0.6	0.56	0.63	0.67	0.55	0.6	0.56	0.45
EC2	0.57	0.6	0.65	0.57	0.58	0.64	0.55	0.53
JASMINE R	0.62	0.56	0.63	0.62	0.5	0.57	0.6	0.53
KAOLOB	0.54	0.54	0.62	0.5	0.61	0.55	0.61	0.49
KAMOROS	0.69	0.65	0.68	0.6	0.6	0.57	0.63	0.56
L2B2 VI	0.67	0.61	0.69	0.6	0.61	0.62	0.68	0.61
MANISI	0.48	0.44	0.5	0.4	0.45	0.48	0.4	0.39
M108 1	0.52	0.5	0.48	0.45	0.45	0.52	0.5	0.45
M31 VF	0.6	0.55	0.58	0.57	0.55	0.6	0.56	0.5
MANGO SINGKET	0.6	0.65	0.61	0.52	0.55	0.55	0.53	0.53
M420 1	0.57	0.58	0.6	0.57	0.55	0.57	0.52	0.5
M5 BD	0.57	0.6	0.55	0.52	0.65	0.64	0.63	0.47
M105 R	0.57	0.65	0.65	0.69	0.55	0.74	0.65	0.45
M126 1	0.68	0.53	0.56	0.62	0.55	0.57	0.5	0.55
MINONING	0.63	0.61	0.6	0.6	0.61	0.64	0.63	0.58
MINDORO 5R	0.56	0.48	0.54	0.61	0.52	0.63	0.49	0.39
MINDORO	0.62	0.63	0.6	0.57	0.6	0.64	0.58	0.55
NTPSA 1	0.67	0.61	0.68	0.57	0.56	0.6	0.61	0.56
PANDAN 1	0.58	0.65	0.65	0.64	0.63	0.64	0.63	0.53
PANDAN 2	0.68	0.61	0.61	0.57	0.66	0.6	0.6	0.58
PANGASINAN	0.63	0.55	0.55	0.64	0.55	0.64	0.56	0.58
PILIT CARABAO	0.5	0.55	0.52	0.62	0.47	0.6	0.6	0.39
PK P2 6	0.62	0.6	0.63	0.57	0.61	0.64	0.61	0.53
PILI RG	0.63	0.65	0.63	0.6	0.61	0.62	0.6	0.6
PKPDWARF	0.65	0.66	0.63	0.64	0.6	0.74	0.65	0.53
SAN CARLOS	0.6	0.66	0.66	0.64	0.6	0.67	0.61	0.58
SNC 13	0.57	0.61	0.61	0.67	0.53	0.6	0.61	0.48
SANIP R	0.57	0.61	0.53	0.57	0.69	0.6	0.58	0.55
SALKET	0.53	0.56	0.6	0.55	0.55	0.67	0.53	0.63
SNR 2	0.43	0.44	0.45	0.48	0.39	0.45	0.44	0.37
TRES MARIAS	0.57	0.52	0.6	0.6	0.56	0.62	0.53	0.56
TANURA	0.65	0.68	0.7	0.62	0.65	0.67	0.7	0.58
TAP 1	0.52	0.5	0.53	0.52	0.63	0.57	0.53	0.47
XOR	0.58	0.58	0.55	0.64	0.61	0.55	0.56	0.48
147 2	0.58	0.61	0.6	0.67	0.63	0.67	0.6	0.6
169 2	0.58	0.55	0.55	0.55	0.53	0.55	0.55	0.44
216	0.67	0.61	0.63	0.64	0.63	0.62	0.56	0.55
112 4	0.43	0.4	0.4	0.36	0.39	0.45	0.31	0.42
AEROBIC (San Gabriel)	0.67	0.55	0.53	0.6	0.53	0.6	0.53	0.56
GOLIATH	0.65	0.65	0.66	0.57	0.61	0.57	0.56	0.56
MINDANAO	0.76	0.64	0.67	0.6	0.6	0.63	0.6	0.55
BURDAGOL	0.58	0.56	0.65	0.67	0.55	0.6	0.52	0.52
RTS 11 A	0.62	0.56	0.58	0.57	0.56	0.62	0.53	0.6
BODO BODO	0.67	0.53	0.58	0.62	0.5	0.67	0.52	0.55
Rc BATO	0.67	0.63	0.6	0.52	0.56	0.52	0.66	0.55
ATONG	0.67	0.63	0.63	0.6	0.65	0.69	0.6	0.52
AZOR 5	0.67	0.63	0.67	0.64	0.68	0.69	0.68	0.6

Annex 1. (continuation)

Farmer-grown Rice Genotype	NSIC Rc 128	NSIC Rc 160	NSIC Rc 190	NSIC Rc 204H	NSIC Rc 218	NSIC Rc 274	NSIC Rc 300	NSIC Rc 308
UNKNOWN 5	0.61	0.61	0.59	0.57	0.72	0.6	0.59	0.49
MALAYA	0.62	0.56	0.61	0.6	0.58	0.64	0.61	0.48
PINO 45	0.6	0.63	0.68	0.6	0.65	0.69	0.65	0.65
MINADRE	0.71	0.68	0.67	0.6	0.67	0.64	0.67	0.54
PINOLO	0.67	0.65	0.71	0.67	0.66	0.69	0.6	0.53
INTAN/MIRACLE	0.38	0.42	0.5	0.4	0.45	0.38	0.47	0.32
UP & DOWN	0.53	0.66	0.56	0.6	0.65	0.69	0.66	0.53
UNKNOWN 1 (80 DAì	0.6	0.61	0.6	0.6	0.56	0.6	0.63	0.52
DALING DALING	0.52	0.53	0.56	0.52	0.63	0.57	0.53	0.55
MASBATE	0.57	0.56	0.53	0.52	0.56	0.52	0.55	0.44
SUPER NINI	0.25	0.16	0.18	0.15	0.13	0.17	0.15	0.21
SOPER NINI	0.68	0.56	0.65	0.64	0.61	0.67	0.56	0.53
MIRACLE	0.55	0.65	0.52	0.62	0.61	0.52	0.65	0.58
PEDRO	0.65	0.61	0.58	0.69	0.6	0.6	0.61	0.58
ZAMBOANGA RICE	0.65	0.65	0.6	0.62	0.58	0.62	0.6	0.55
INDEX 2	0.58	0.71	0.68	0.64	0.66	0.71	0.66	0.63
BUGOS	0.6	0.52	0.55	0.62	0.56	0.64	0.55	0.56
EL GRANDE	0.65	0.65	0.68	0.62	0.61	0.74	0.65	0.55
PALAY CHU	0.58	0.66	0.63	0.67	0.66	0.64	0.63	0.61
S 14	0.6	0.58	0.58	0.64	0.55	0.76	0.53	0.58
WHITE TONNER	0.53	0.53	0.47	0.48	0.44	0.48	0.56	0.42
OFFSPRING	0.6	0.6	0.6	0.57	0.63	0.62	0.63	0.48
SAMPAGUITA	0.53	0.61	0.61	0.6	0.71	0.62	0.61	0.48
INDEX 6	0.62	0.68	0.61	0.74	0.63	0.71	0.77	0.58
M3 BARAKO	0.52	0.6	0.56	0.57	0.63	0.64	0.58	0.5
YANAM	0.65	0.63	0.63	0.67	0.61	0.64	0.61	0.63
M3 BANGA	0.65	0.71	0.61	0.6	0.58	0.6	0.69	0.48
SENORITA PILIT	0.6	0.65	0.65	0.64	0.6	0.6	0.63	0.5
M 41	0.63	0.55	0.55	0.55	0.56	0.55	0.61	0.53
ARIGATO	0.6	0.66	0.66	0.6	0.61	0.67	0.65	0.52
ELON ELON	0.52	0.58	0.52	0.6	0.53	0.62	0.65	0.44
RV8	0.48	0.35	0.4	0.4	0.34	0.43	0.37	0.4
MALAYSIAN RICE	0.53	0.63	0.58	0.55	0.69	0.6	0.63	0.47
HR 400	0.68	0.55	0.55	0.69	0.56	0.6	0.58	0.48
CHICHONG	0.63	0.65	0.55	0.64	0.6	0.6	0.65	0.48
INDIAN RICE	0.6	0.6	0.63	0.6	0.61	0.62	0.61	0.48
ML	0.65	0.65	0.5	0.57	0.58	0.52	0.6	0.55
SAMPAGUITA AGUSAN	0.55	0.61	0.56	0.55	0.71	0.6	0.58	0.52
BODO BODO AGUSAN	0.63	0.57	0.62	0.54	0.59	0.63	0.62	0.57
3 MILLION	0.62	0.61	0.65	0.6	0.63	0.64	0.63	0.48
U.S.A.	0.53	0.66	0.58	0.57	0.69	0.62	0.66	0.52
BOTOY BOTOY	0.73	0.53	0.65	0.64	0.5	0.74	0.58	0.53
INDONESIAN RICE	0.52	0.61	0.6	0.6	0.71	0.64	0.63	0.5
DOUBLE DIAMOND	0.57	0.68	0.65	0.52	0.68	0.6	0.58	0.53
PLATOON X	0.58	0.66	0.61	0.5	0.63	0.64	0.58	0.58
DASH 12	0.5	0.66	0.52	0.67	0.58	0.6	0.76	0.45
ANGELICA	0.42	0.42	0.4	0.33	0.44	0.38	0.44	0.37
BISADA	0.62	0.63	0.63	0.62	0.55	0.55	0.6	0.47
BISADA	0.6	0.56	0.6	0.6	0.52	0.6	0.6	0.56
M90 SG	0.53	0.56	0.61	0.62	0.61	0.64	0.55	0.47
PANAKA	0.42	0.44	0.42	0.38	0.42	0.43	0.45	0.35
RG17 K	0.6	0.58	0.65	0.69	0.58	0.62	0.56	0.48
R.I.300	0.58	0.56	0.55	0.64	0.69	0.57	0.6	0.6
DCL 300	0.55	0.56	0.56	0.57	0.6	0.64	0.58	0.5
IRIG	0.62	0.6	0.68	0.57	0.58	0.55	0.61	0.5
RTS 12 B	0.38	0.39	0.39	0.36	0.35	0.4	0.39	0.37

Annex 1. (continuation)

Farmer-grown Rice Genotype	NSIC Rc 128	NSIC Rc 160	NSIC Rc 190	NSIC Rc 204H	NSIC Rc 218	NSIC Rc 274	NSIC Rc 300	NSIC Rc 308
ZAMBOANGA	0.57	0.73	0.6	0.64	0.74	0.6	0.65	0.53
MORYO MORYO	0.72	0.74	0.63	0.64	0.55	0.64	0.68	0.65
RED 18	0.48	0.48	0.5	0.65	0.5	0.59	0.5	0.52
M3 (SURALLAH)	0.7	0.66	0.65	0.69	0.68	0.67	0.65	0.52
THAILAND RICE	0.69	0.58	0.53	0.57	0.6	0.62	0.58	0.56
TARA RICE	0.68	0.59	0.66	0.61	0.62	0.66	0.57	0.59
RTS 11 B	0.35	0.35	0.37	0.24	0.35	0.31	0.35	0.32
RTS 13	0.57	0.5	0.52	0.57	0.48	0.62	0.5	0.48
TOTONG	0.53	0.66	0.58	0.6	0.66	0.67	0.66	0.61
INBRED 300	0.56	0.54	0.49	0.6	0.57	0.57	0.56	0.43
BARAKO 64	0.43	0.37	0.52	0.43	0.42	0.43	0.39	0.39
INAMID	0.55	0.68	0.61	0.69	0.76	0.55	0.65	0.5
RJ 40	0.63	0.6	0.71	0.64	0.66	0.67	0.58	0.55
VIETNAM RICE	0.63	0.61	0.6	0.62	0.63	0.62	0.66	0.53
DOUBLE DIAMOND	0.63	0.61	0.6	0.6	0.6	0.6	0.61	0.6
75 DAYS (Burgos)	0.71	0.63	0.7	0.64	0.6	0.67	0.61	0.58
TABUK	0.6	0.69	0.65	0.6	0.71	0.67	0.66	0.6
BELINA 219	0.62	0.61	0.65	0.67	0.61	0.67	0.61	0.6
MASIGASIG 88	0.76	0.64	0.59	0.67	0.56	0.62	0.7	0.52
TRIPLE 2	0.65	0.68	0.6	0.71	0.66	0.62	0.63	0.6
C 4	0.62	0.63	0.53	0.55	0.58	0.6	0.56	0.52
HI NOON	0.58	0.63	0.61	0.67	0.55	0.62	0.68	0.53
DOUBLE DIAMOND	0.55	0.71	0.53	0.57	0.68	0.57	0.63	0.53
SAN JOSE	0.65	0.6	0.56	0.6	0.68	0.62	0.6	0.55
75 DAYS (Pasuquin)	0.67	0.61	0.55	0.6	0.53	0.55	0.56	0.53
DIAMOND X	0.63	0.63	0.69	0.67	0.71	0.67	0.6	0.55
RYAN RICE	0.55	0.7	0.6	0.57	0.72	0.62	0.65	0.51
MAGNOLIA	0.55	0.65	0.56	0.55	0.66	0.62	0.6	0.48
B5	0.73	0.74	0.74	0.6	0.67	0.69	0.61	0.6
TUDY TUDY	0.63	0.71	0.65	0.62	0.66	0.79	0.71	0.58
JANJANONG	0.63	0.76	0.71	0.6	0.66	0.71	0.68	0.52
V5	0.58	0.61	0.56	0.55	0.6	0.6	0.68	0.58
NITOY	0.5	0.5	0.48	0.43	0.4	0.38	0.5	0.39
7 TONNER	0.72	0.6	0.63	0.64	0.6	0.62	0.58	0.56
MILAGROSA	0.52	0.6	0.61	0.64	0.61	0.64	0.6	0.56
GANAR	0.66	0.59	0.62	0.57	0.52	0.69	0.59	0.52
BULAW	0.54	0.52	0.52	0.55	0.43	0.69	0.49	0.59
RED RICE	0.58	0.53	0.53	0.57	0.47	0.69	0.55	0.53
BLACK RICE	0.63	0.56	0.56	0.71	0.54	0.6	0.54	0.52
BLONDE	0.49	0.48	0.46	0.55	0.46	0.67	0.48	0.51
BOLAO	0.54	0.57	0.56	0.57	0.52	0.74	0.57	0.52
BALAKI	0.5	0.44	0.44	0.48	0.4	0.6	0.44	0.52
BURDAGOL	0.42	0.44	0.42	0.52	0.35	0.62	0.44	0.47
SENORITA	0.54	0.54	0.62	0.6	0.59	0.71	0.52	0.61
POKPOKLO	0.5	0.53	0.53	0.57	0.45	0.6	0.55	0.47
SINANLANGANG	0.54	0.57	0.62	0.52	0.56	0.71	0.54	0.64
BULAW	0.58	0.55	0.6	0.62	0.52	0.67	0.56	0.63
RED RICE	0.48	0.4	0.44	0.5	0.52	0.52	0.47	0.5
PILIT	0.58	0.56	0.54	0.58	0.61	0.5	0.51	0.42
BULAW	0.53	0.55	0.6	0.57	0.5	0.76	0.5	0.6
KAMANSING	0.67	0.53	0.61	0.64	0.55	0.67	0.5	0.61
CABER	0.59	0.56	0.56	0.62	0.62	0.55	0.54	0.46
BULAW	0.5	0.48	0.5	0.52	0.53	0.55	0.48	0.5
BULAW (WHITE)	0.57	0.53	0.58	0.67	0.58	0.64	0.55	0.58
KINAVITE	0.54	0.62	0.57	0.62	0.61	0.64	0.62	0.48

CHAPTER

4

Grain Quality Traits of Farmer-Grown Rice Genotypes

Marissa V. Romero, Gerome A. Corpuz, Rochelle C. Huliganga, and Henry F. Mamucod

Rice is an extremely important crop because it forms the foundation of the diet for more than half of the world's population. It provides more than 20% of the daily calories for over 3.5 billion people (Khush, 2013). Rice accounts for about 40% of calorie intake in tropical Asia (Peng and Khush, 2003). Aside from being an excellent source of energy from carbohydrates, rice also has a good amount of protein. In addition, unpolished rice offers additional vitamins, minerals, dietary fiber, antioxidants, and other phytonutrients. In pigmented rice such as black and red rice, there are other compounds with additional health-promoting properties. These unique rices contain anthocyanins and other phenolic compounds with antioxidant activities. They act as free radical scavengers that cause the common non-communicable diseases such as diabetes, cardiovascular disease, and cancer. Incidentally, anthocyanins are also the major pigments responsible for the color in rice. The darker the rice, the more anthocyanins it contains.

The total global rice consumption increased from 437.18 million metric tons (M mt) for the 2008-2009 crop year to 504.31 M mt for 2020-2021 (Shahbandeh, 2021a). Majority of rice consumption is in Asia since it is the staple food in most of the countries here. It is also not surprising that China, with the highest population in the world, tops the list in 2020-2021 with 149.00 M mt, followed by India (106.50), Bangladesh (35.90), Indonesia (35.80), Vietnam (21.25), Philippines (14.40), Thailand (12.50), Myanmar (10.40), and Japan (8.25 M mt) (Shahbandeh, 2021b).

Majority of our population eat rice as staple food at least twice a day, explaining our high consumption. According to the dietary survey of the Department of Science and Technology - Food and Nutrition Research Institute (DOST-FNRI), rice and rice products account for 37.2% of the Filipino mean one-day household food intake (DOST-FNRI, 2016). Filipinos eat rice mainly as table rice in boiled form. They prefer well-milled or polished white rice but are now recognizing the nutritional and health benefits of unpolished or brown rice as well as pigmented rice. It is also used in other dishes such as fried rice, *paella*, *arroz valenciana*, and others. Rice in its many forms - rough, brown, and milled rices; brokens; rice flour and starch - is also processed into various products that enhance its profitability. Glutinous rice is usually used as a main ingredient in rice-based food products, locally known as *kakanin*. Only a small portion goes to seeds, feeds, and waste.

Rice is grown in more than a hundred countries in Asia, the Americas, Africa, Europe, and Oceania. In 2019, the total harvested area was about 162 million ha, with a total production of 755 M mt (FAOSTAT, 2020). Asia accounts for about 90% of total global rice production. In terms of milled rice, China was the top producer with 146.73 M mt in 2019/2020, followed

by India (118.87), Bangladesh (35.85), Indonesia (34.70), Vietnam (27.10), Thailand (17.66), Myanmar (12.70), Philippines (11.93), and Japan (7.61 M mt) (Shahbandeh, 2021c).

As the most important crop in the Philippines, rice is grown nationwide. Central Luzon (18.7%), Western Visayas (11.3%), Cagayan Valley (11%), Ilocos region (9.8%), SOCCSKSARGEN (7.5%), and Bicol region (6.8%) are the top rice-producing areas (GRISP, 2013). In 2018, total rice production was 19.07 M mt from 4.8 million ha, at an average yield of 3.97 t/ha (PSA, 2019).

The high demand for rice consumption steered rice breeding efforts toward high-yielding varieties. The first high-yielding modern rice variety (IR8) was released in 1966 by the International Rice Research Institute (IRRI), which jumpstarted the "Green Revolution" in Asia. Since then, numerous rice varieties with good yield potentials have been developed. Peng et al. (2000) have studied the trends in grain yield of IRRI cultivars and lines since 1966. They indicated that the increase in yield of cultivars released before 1980 was attributed to the improvement in harvest index, while the increase in total biomass was associated with yield trends for those developed after 1980. Although yield was the most significant trait, IRRI also recognized the importance of grain quality, which led to the development of the very popular IR64 in 1980-1989 (Peng and Khush, 2003). This rice variety became the standard for eating quality.

In the Philippines, the National Cooperative Test (NCT) program is responsible for the evaluation and recommendation of rice lines for registration by the National Seed Industry Council (NSIC) (NCT, 1997). NCT was started in 1954 by the DA- Bureau of Plant Industry (DA-BPI), University of the Philippines College of Agriculture (UPCA), and the DA - Bureau of Agricultural Extension (DA-BAEX). It is presently implemented by the Rice Technical Working Group (RTWG) of the NSIC, known up to 2000 as the Philippine Seed Board (PSB). The RTWG conducts field testing and performance evaluation of promising lines; nominates to the NSIC new and improved varieties for cultivation; and formulates procedures for varietal assessment and identification. Rice varieties are developed for the upland, irrigated lowland, hybrid, cold-tolerant, saline-tolerant, special purpose, submergence-tolerant, and heat-tolerant ecosystems. Rice test entries from breeding institutions such as DA-PhilRice, IRRI, UP Los Baños (UPLB), and private companies are evaluated through NCT for yield performance, resistance to pests and diseases, and grain quality.

Throughout the years, the NCT program has evaluated numerous rice entries and has facilitated the registration of hundreds of modern rice varieties under various ecosystems for commercial release. Table 1 lists the registered modern or improved PSB and NSIC rice varieties approved from 1990 to 2020.

Aside from being high-yielding, most of these rice varieties also have resistance to certain pests and diseases as well as good grain quality. DA continuously implements various programs that aim to promote, access, and utilize these varieties so that the farmers and other rice industry stakeholders can help increase rice productivity in the country.

Interestingly, the availability and accessibility of released modern rice varieties did not prevent farmers from continuing to select, maintain, and cultivate their own rice genotypes. Since these materials do not go through the formal seed system of development and evaluation, they are considered "unclassified" and are referred hereto as farmer-grown rice genotypes (FGRG). They have unique names, usually given by the farmers themselves. Farmers' preference for these FGRG is influenced by various factors: culture/tradition, availability in the area, crop management practices, and important traits for yield, resistance to pests and diseases, and grain quality.

To help understand the continuing proliferation of FGRG and why they are still popular among farmers, a total of 335 FGRGs were collected all over the Philippines and were comprehensively and meticulously characterized in the field and laboratory for their phenotypic and genotypic traits. This chapter is focused on grain quality, which is important to all rice stakeholders, including farmers, traders, millers, retailers, food processors, and consumers.

SCREENING FOR GRAIN QUALITY

Rice quality assessment determines a wide array of parameters under the categories of milling potentials, physical attributes, physicochemical properties, cooking parameters, and sensory characteristics. Screening for grain quality generally follows the standard protocols described in the NCT Manual (NCT, 1997). Table 2 summarizes the selected grain quality parameters evaluated here, their classification, and recommended or preferred values.

Table 1. Registered PSB and NSIC rice varieties in the Philippines.

Ecosystem	Variety Name	Year Approved	Variety Name	Year Approved
Upland	PSB Rc 1	1990	NSIC Rc 11	2001
	PSB Rc 3	1997	NSIC 2011 Rc 23	2011
	PSB Rc 5	1997	NSIC 2014 Rc 25	2014
	PSB Rc 7	2001	NSIC 2014 Rc 27	2014
	NSIC Rc 9	2001	NSIC 2014 Rc 29	2014
Irrigated lowland	PSB Rc 2	1991	NSIC Rc 154	2007
	PSB Rc 4	1991	NSIC Rc 156	2007
	PSB Rc 6	1992	NSIC Rc 158	2007
	PSB Rc 8	1992	NSIC Rc 160	2007
	PSB Rc 10	1992	NSIC Rc 212	2009
	PSB Rc 12	1992	NSIC Rc 214	2009
	PSB Rc 18	1994	NSIC Rc 216	2009
	PSB Rc 20	1994	NSIC Rc 222	2009
	PSB Rc 22	1994	NSIC Rc 224	2010
	PSB Rc 28	1994	NSIC Rc 226	2010
	PSB Rc 30	1995	NSIC 2011 Rc 238	2011
	PSB Rc 32	1995	NSIC 2011 Rc 240	2011
	PSB Rc 34	1995	NSIC 2012 Rc 298	2012
	PSB Rc 52	1997	NSIC 2012 Rc 300	2012
	PSB Rc 54	1997	NSIC 2012 Rc 302	2012
	PSB Rc 56	1997	NSIC 2012 Rc 308	2012
	PSB Rc 58	1997	NSIC 2014 Rc 352	2014
	PSB Rc 64	1997	NSIC 2014 Rc 354	2014
	PSB Rc 66	1997	NSIC 2014 Rc 356	2014
	PSB Rc 74	1998	NSIC 2014 Rc 358	2014
	PSB Rc 78	2000	NSIC 2014 Rc 360	2014
	PSB Rc 80	2000	NSIC 2015 Rc 394	2015
	PSB Rc 82	2000	NSIC 2015 Rc 396	2015
	NSIC Rc 110	2002	NSIC 2015 Rc 398	2015
	NSIC Rc 112	2002	NSIC 2015 Rc 400	2015
	NSIC Rc 118	2003	NSIC 2015 Rc 402	2015
	NSIC Rc 120	2003	NSIC 2016 Rc 436	2016
	NSIC Rc 122	2003	NSIC 2016 Rc 438	2016
	NSIC Rc 130	2004	NSIC 2016 Rc 440	2016
	NSIC Rc 134	2005	NSIC 2016 Rc 442	2016
	NSIC Rc 138	2006	NSIC 2018 Rc 506	2018
	NSIC Rc 140	2006	NSIC 2018 Rc 508	2018
	NSIC Rc 142	2006	NSIC 2018 Rc 510	2018
	NSIC Rc 144	2006	NSIC 2018 Rc 512	2018
	NSIC Rc 146	2006	NSIC 2018 Rc 514	2018
	NSIC Rc 150	2007	NSIC 2019 Rc 580	2019
	NSIC Rc 152	2007	NSIC 2019 Rc 582	2019
Rainfed lowland	PSB Rc 14	1992	NSIC 2013 Rc 348	2013
	PSB Rc 16	1993	NSIC 2015 Rc 416	2015
	PSB Rc 24	1994	NSIC 2015 Rc 418	2015
	PSB Rc 36	1995	NSIC 2015 Rc 420	2015
	PSB Rc 38	1995	NSIC 2015 Rc 422	2015
	PSB Rc 40	1995	NSIC 2015 Rc 424	2015
	PSB Rc 42	1995	NSIC 2015 Rc 426	2015
	PSB Rc 60	1997	NSIC 2015 Rc 428	2015
	PSB Rc 62	1997	NSIC 2015 Rc 430	2015
	PSB Rc 68	1997	NSIC 2016 Rc 434	2016
	PSB Rc 70	1997	NSIC 2016 Rc 472	2016
	PSB Rc 98	2001	NSIC 2016 Rc 474	2016
	PSB Rc 100	2001	NSIC 2016 Rc 476	2016

Table 1. (continuation)

Ecosystem	Variety Name	Year Approved	Variety Name	Year Approved
	PSB Rc 102	2001	NSIC 2016 Rc 478	2016
	NSIC Rc 192	2009	NSIC 2016 Rc 480	2016
	NSIC 2011 Rc 272	2011	NSIC 2019 Rc 568	2019
	NSIC 2011 Rc 274	2011	NSIC 2019 Rc 570	2019
	NSIC 2011 Rc 276	2011	NSIC 2019 Rc 572	2019
	NSIC 2011 Rc 278	2011	NSIC 2019 Rc 574	2019
	NSIC 2011 Rc 280	2011	NSIC 2019 Rc 576	2019
	NSIC 2011 Rc 282	2011	NSIC 2019 Rc 578	2019
	NSIC 2011 Rc 284	2011	NSIC 2020 Rc 592	2020
	NSIC 2011 Rc 286	2011	NSIC 2020 Rc 594	2020
	NSIC 2011 Rc 288	2011	NSIC 2020 Rc 596	2020
	NSIC 2013 Rc 346	2013	NSIC 2020 Rc 598	2020
Hybrid	PSB Rc 26H	1994	NSIC 2014 Rc 366H	2014
	PSB Rc 72H	1997	NSIC 2014 Rc 368H	2014
	PSB Rc 76H	1998	NSIC 2014 Rc 370H	2014
	NSIC Rc 114H	2002	NSIC 2014 Rc 372H	2014
	NSIC Rc 116H	2002	NSIC 2014 Rc 374H	2014
	NSIC Rc 124H	2004	NSIC 2014 Rc 376H	2014
	NSIC Rc 126H	2004	NSIC 2014 Rc 378H	2014
	NSIC Rc 132H	2004	NSIC 2014 Rc 380H	2014
	NSIC Rc 136H	2006	NSIC 2014 Rc 382H	2014
	NSIC Rc 162H	2007	NSIC 2014 Rc 384H	2014
	NSIC Rc 164H	2007	NSIC 2014 Rc 386H	2014
	NSIC Rc 166H	2007	NSIC 2014 Rc 388H	2014
	NSIC Rc 168H	2007	NSIC 2015 Rc 404H	2015
	NSIC Rc 174H	2008	NSIC 2015 Rc 406H	2015
	NSIC Rc 176H	2008	NSIC 2015 Rc 408H	2015
	NSIC Rc 178H	2008	NSIC 2015 Rc 410H	2015
	NSIC Rc 180H	2008	NSIC 2015 Rc 412H	2015
	NSIC Rc 196H	2009	NSIC 2016 Rc 432H	2016
	NSIC Rc 198H	2009	NSIC 2016 Rc 444H	2016
	NSIC Rc 200H	2009	NSIC 2016 Rc 446H	2016
	NSIC Rc 202H	2009	NSIC 2016 Rc 448H	2016
	NSIC Rc 204H	2009	NSIC 2016 Rc 450H	2016
	NSIC Rc 206H	2009	NSIC 2016 Rc 452H	2016
	NSIC Rc 208H	2009	NSIC 2016 Rc 454H	2016
	NSIC Rc 210H	2009	NSIC 2016 Rc 456H	2016
	NSIC Rc 228H	2010	NSIC 2016 Rc 458H	2016
	NSIC Rc 230H	2010	NSIC 2017 Rc 486H	2017
	NSIC Rc 232H	2010	NSIC 2017 Rc 488H	2017
	NSIC Rc 234H	2010	NSIC 2017 Rc 490H	2017
	NSIC Rc 236H	2010	NSIC 2017 Rc 492H	2017
	NSIC 2011 Rc 244H	2011	NSIC 2017 Rc 494H	2017
	NSIC 2011 Rc 246H	2011	NSIC 2017 Rc 496H	2017
	NSIC 2011 Rc 248H	2011	NSIC 2017 Rc 498H	2017
	NSIC 2011 Rc 250H	2011	NSIC 2017 Rc 500H	2017
	NSIC 2011 Rc 252H	2011	NSIC 2017 Rc 502H	2017
	NSIC 2011 Rc 254H	2011	NSIC 2017 Rc 504H	2017
	NSIC 2011 Rc 256H	2011	NSIC 2018 Rc 516H	2018
	NSIC 2011 Rc 258H	2011	NSIC 2018 Rc 518H	2018
	NSIC 2011 Rc 260H	2011	NSIC 2018 Rc 520H	2018
	NSIC 2011 Rc 262H	2011	NSIC 2018 Rc 522H	2018
	NSIC 2011 Rc 264H	2011	NSIC 2018 Rc 524H	2018
	NSIC 2011 Rc 266H	2011	NSIC 2018 Rc 526H	2018
	NSIC 2011 Rc 268H	2011	NSIC 2018 Rc 538H	2018

Table 1. (continuation)

Ecosystem	Variety Name	Year Approved	Variety Name	Year Approved
	NSIC 2011 Rc 270H	2011	NSIC 2018 Rc 540H	2018
	NSIC 2012 Rc 306H	2012	NSIC 2018 Rc 542H	2018
	NSIC 2012 Rc 310H	2012	NSIC 2018 Rc 544H	2018
	NSIC 2012 Rc 312H	2012	NSIC 2018 Rc 546H	2018
	NSIC 2012 Rc 314H	2012	NSIC 2018 Rc 548H	2018
	NSIC 2012 Rc 316H	2012	NSIC 2018 Rc 550H	2018
	NSIC 2012 Rc 318H	2012	NSIC 2018 Rc 552H	2018
	NSIC 2012 Rc 320H	2012	NSIC 2019 Rc 586H	2019
	NSIC 2012 Rc 322H	2012	NSIC 2019 Rc 588H	2019
	NSIC 2013 Rc 350H	2013	NSIC 2020 Rc 614H	2020
	NSIC 2014 Rc 362H	2014	NSIC 2020 Rc 616H	2020
	NSIC 2014 Rc 364H	2014	NSIC 2020 Rc 618H	2020
Cold-tolerant	PSB Rc 44	1995	NSIC Rc 104	2001
	PSB Rc 46	1995	NSIC 2019 Rc 560	2019
	PSB Rc 92	2001	NSIC 2019 Rc 562	2019
	PSB Rc 94	2001	NSIC 2019 Rc 564	2019
	PSB Rc 96	2001	NSIC 2019 Rc 566	2019
Saline-tolerant	PSB Rc 48	1995	NSIC 2013 Rc 336	2013
	PSB Rc 50	1995	NSIC 2013 Rc 338	2013
	PSB Rc 84	2000	NSIC 2013 Rc 340	2013
	PSB Rc 86	2000	NSIC 2014 Rc 390	2014
	PSB Rc 88	2000	NSIC 2014 Rc 392	2014
	PSB Rc 90	2001	NSIC 2016 Rc 462	2016
	NSIC Rc 106	2001	NSIC 2016 Rc 464	2016
	NSIC Rc 108	2001	NSIC 2016 Rc 466	2016
	NSIC Rc 182	2009	NSIC 2016 Rc 468	2016
	NSIC Rc 184	2009	NSIC 2016 Rc 470	2016
	NSIC Rc 186	2009	NSIC 2018 Rc 528	2018
	NSIC Rc 188	2009	NSIC 2018 Rc 530	2018
	NSIC Rc 190	2009	NSIC 2018 Rc 532	2018
	NSIC 2011 Rc 290	2011	NSIC 2018 Rc 534	2018
	NSIC 2011 Rc 292	2011	NSIC 2018 Rc 536	2018
	NSIC 2011 Rc 294	2011	NSIC 2019 Rc 554	2019
	NSIC 2011 Rc 296	2011	NSIC 2019 Rc 556	2019
	NSIC 2013 Rc 324	2013	NSIC 2019 Rc 558	2019
	NSIC 2013 Rc 326	2013	NSIC 2020 Rc 604	2020
	NSIC 2013 Rc 328	2013	NSIC 2020 Rc 606	2020
	NSIC 2013 Rc 330	2013	NSIC 2020 Rc 608	2020
	NSIC 2013 Rc 332	2013	NSIC 2020 Rc 610	2020
	NSIC 2013 Rc 334	2013	NSIC 2020 Rc 612	2020
Special Purpose	NSIC Rc 13	2004	NSIC 2011 Rc 242SR	2011
	NSIC Rc 15	2004	NSIC 2012 Rc 304SR	2012
	NSIC Rc 17	2004	NSIC 2013 Rc 342SR	2013
	NSIC Rc 128	2004	NSIC 2013 Rc 344SR	2013
	NSIC Rc 19	2005	NSIC 2015 Rc 414 SR	2015
	NSIC Rc 148	2007	NSIC 2016 Rc 460	2016
	NSIC Rc 170	2008	NSIC 2017 Rc 31SR	2017
	NSIC Rc 172	2008	NSIC 2017 Rc 482SR	2017
	NSIC Rc 218SR	2009	NSIC 2017 Rc 484SR	2017
	NSIC Rc 220SR	2009	NSIC 2019 Rc 584SR	2019
	NSIC 2011 Rc 21SR	2011		
Submergence-tolerant	NSIC Rc 194	2009	NSIC 2020 Rc 590	2020
Heat-tolerant	NSIC 2020 Rc 600	2020	NSIC 2020 Rc 602	2020

**source: NCT data*

Table 2. Classification and recommended values for grain quality parameters.

Parameter	Classification		Recommended Value
Milling potentials			
Brown rice	Good (G)	80.0% and above	75.0% and above
	Fair (F)	75.0 – 79.9%	(Fair to good)
	Poor (P)	below 75.0%	
Total milled rice	Premium (Pr)	70.1% and above	65.1% and above
	Grade 1 (G1)	65.1% – 70.0%	(Grade 1 to premium)
	Grade 2 (G2)	60.1% – 65.0%	
	Grade 3 (G3)	55.1% – 60.0%	
Head rice	Premium (Pr)	57.0% and above	48.0% and above
	Grade 1 (G1)	48.0% – 56.9%	(Grade 1 to premium)
	Grade 2 (G2)	39.0% – 47.9%	
	Grade 3 (G3)	30.0% – 38.9%	
Physical attributes			
Grain length	Extra long (EL)	7.5 mm and above	6.6 – 7.4 mm
	Long (L)	6.6 – 7.4 mm	Long
	Medium (M)	5.5 – 6.5 mm	
	Short (Sh)	5.4 mm and below	
Grain shape	Slender (S)	More than 3.0	More than 3.0
	Intermediate (I)	2.0 – 3.0	Slender
	Bold (B)	less than 2.0	
Chalky grains	Premium (Pr)	Less than 2.0%	Less than 5.0%
	Grade 1 (G1)	2.0% – 5.0%	(Grade 1 to premium)
	Grade 2 (G2)	5.1% – 10.0%	
	Grade 3 (G3)	10.1% – 15.0%	
Physicochemical properties			
Amylose content	Waxy/Glutinous (W)	0.0% – 2.0%	17.1 – 22.0%
	Very low (VL)	2.1% –10.0%	Intermediate
	Low (L)	10.1% – 17.0%	
	Intermediate (I)	17.1% – 22.0%	
	High (H)	22.1% and above	
Gelatinization temperature	High (H)	1 – 2	4 – 5
	High-Intermediate (HI)	3	Intermediate
	Intermediate (I)	4 – 5	
	Low (L)	6 – 7	
Crude protein		6 – 9%	

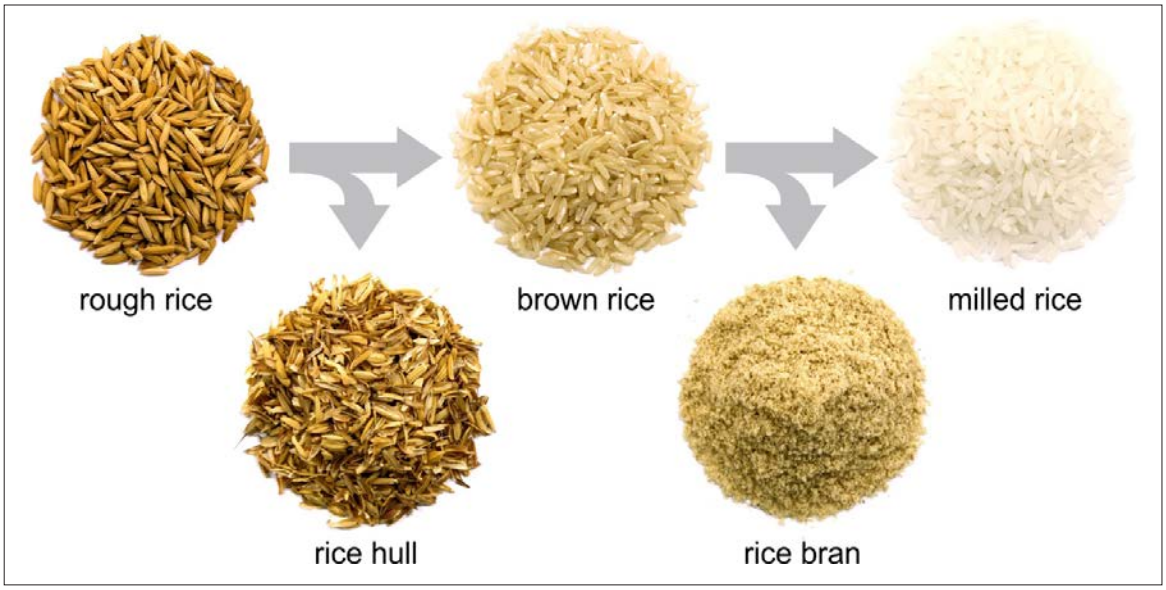

Figure 1. Processing of rice samples.

Figure 2. Determination of milling potentials: (a) brown rice recovery, (b) total milled rice recovery, and (c) head rice recovery.

Milling potentials

Farmers, traders, and millers consider percentage milling recovery as a very vital grain quality parameter because it greatly influences the pricing and marketability of rice. It indicates the amounts of brown, total milled, and head rices from a given quantity of rough rice or paddy. Figures 1 and 2 illustrate the process of determining the milling potentials from rough to brown, milled, and head rice. About 125 grams (g) of rough rice were passed through a dehuller to remove the outermost covering, known as hull. The resulting brown rice (BR) was then weighed and polished for bran and embryo removal. The total milled rice (TMR) was also weighed. The whole grains were separated from the brokens to get the head rice (HR). The Rice Varietal Improvement Group (RVIG) of the NCT recommends the following values for percent BR, TMR, and HR: at least 75% (fair), 65.1% (Grade 1), and 48% (Grade 1), respectively.

Physical attributes

An important contributing factor to the acceptability of any commodity is physical appearance. In rice, the parameters considered are grain length and shape as well as the amount of chalky grains. Length and width were measured by a calibrated caliper in millimeters (Figure 3). Shape was calculated as the ratio of grain length to width. The uniformity in these parameters enhances the consumers' acceptability of raw rice. Preference for grain length and shape varies in different parts of the world. For instance, rice consumers from most of the Southeast Asian countries, including the Philippines, Thailand, and Vietnam, prefer long and slender grains; those from India and Pakistan like extra long and slender grains; whereas those from Japan and Korea favor short and bold grains.

Figure 3. Determination of physical attributes:
(a) grain length and shape, and (b) chalky grains.

Figure 4. Determination of physicochemical properties: (a) moisture content, (b) amylose content, (c) gelatinization temperature (alkali-spreading value), and (d) crude protein content.

A chalky grain is either whole or broken, 50% or more of which appears white like chalk. Chalky grains were carefully selected manually. Since chalkiness is considered as an inferior characteristic, the amount of chalky grains in one lot of sample should preferably not exceed 5%.

Physicochemical properties

Among the grain quality parameters in rice, the physicochemical properties (Figure 4) are considered as the most important. They are the key determinants of cooking and eating qualities, which means that these properties can be predicted somehow even without evaluating the actual cooking parameters and sensory attributes. Physicochemical parameters include amylose content, gelatinization temperature, and crude protein.

Starch is composed of linear (amylose) and branched (amylopectin) fractions, linked by glucose units. Based on amylose, rice is classified as waxy or glutinous, very low, low, intermediate, and high-amylose type according to its amount (Table 2). In general, the higher the amylose content (AC), the harder the cooked rice texture is. Rice with high AC is likely to cook hard and dry, while low-AC rice tends to have softer and stickier cooked grains. Meanwhile, waxy or glutinous rice has very soft and very cohesive cooked rice. This is usually used as an ingredient for rice-based food products. Majority of Filipinos prefer intermediate-amylose rice with acceptable soft texture. They are not very fond of rice that is either too soft or too hard. AC was determined following the iodine colorimetric method of Juliano et al. (2010). Rice flour was weighed and soaked overnight with reagents and percent amylose was calculated.

Gelatinization temperature (GT) is the temperature at which the starch granules begin to swell irreversibly in hot water. This is accompanied by loss of birefringence (the ability to refract light in two directions) and crystallinity. GT affects the behavior of rice upon cooking, thus it is used as indicator to predict how long the cooking time is. The extent of alkali-spreading of raw milled rice soaked in potassium hydroxide solution is used to estimate GT. The ratings for alkali-spreading values (ASV) and their corresponding GT are specified in Table 2. Lower GT indicates a shorter cooking time while high-GT rice elongates less and requires more water and time for cooking. GT was evaluated based on the ASV following a numerical scale described by Little et al. (1958) and Bhattacharya (1979). Six whole grains were spaced evenly in a small Petri dish added with sodium hydroxide (enough to submerge the grains in solution). The dish was covered and left undisturbed for 23 hours at room temperature and visually evaluated using a seven-point numerical scale.

Most people think that rice contains carbohydrates only since it is a major source of energy. However, rice has 6–10% protein also. This provides additional nutrients for rice consumers. Crude protein content was determined by Kjeldahl method as described in AOAC (2000).

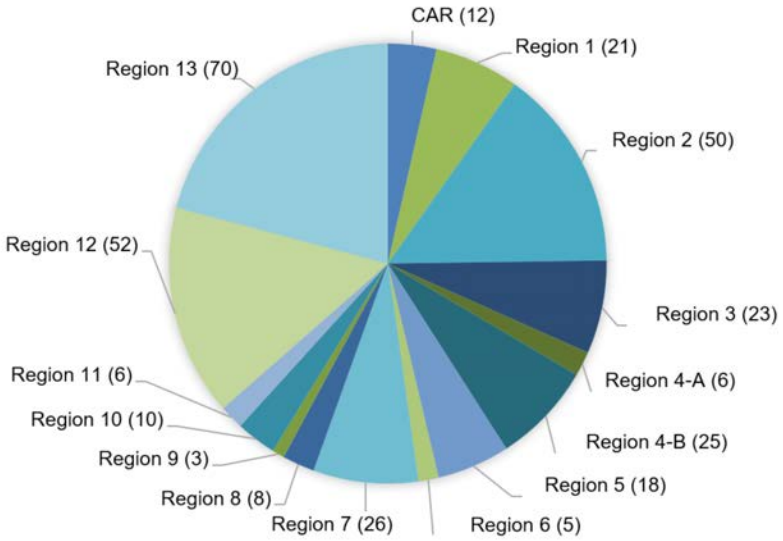

Figure 5. Sources of FGRGs sample.

SAMPLE SOURCES OF FGRGs

A total of 335 FGRG were collected from 15 regions in Luzon (CAR, Regions 1-5), Visayas (Regions 6-8), and Mindanao (Regions 9-13), as sketched in Figure 5. They consisted of mostly white rice, but there were also some red, black, and mixtures of white and red/black rices. The most number of rice samples was obtained from Regions 13 (70), 12 (52), and 2 (50); the least came from Regions 9 (3), 6 (5), 4-A (6), and 11 (6). The details of the source and manner of collection for each sample is indicated in Chapter 2 (Farmer-grown rice genotypes collected in different regions in the Philippines).

GRAIN QUALITY CHARACTERISTICS OF FGRGs

To fully characterize the 335 FGRGs in terms of grain quality, they were subjected to rigorous screening for the various parameters under milling potentials, physical attributes, and physicochemical properties. Prior to analyses, the samples were cleaned and processed in the Rice Chemistry and Food Science Division (RCFSD) laboratory of PhilRice and stored properly.

Milling potentials

Table 3 shows the milling potentials of the FGRGs. Most of the samples (298) passed the recommended value for % BR (fair to good), and nine were classified as "good". In terms of TMR, almost all samples (312)

Table 3. Milling potentials of FGRGs.

Parameter	Values (%)	Classification	Number of Samples
Brown rice (%)	80.0 and above	Good*	9
	75.0 – 79.9	Fair*	289
	Below 75.0	Poor	37
Total milled rice (%)	70.1 and above	Premium*	106
	65.1 – 70.0	Grade 1*	206
	60.1 – 65.0	Grade 2	18
	55.1 – 60.0	Grade 3	5
Head rice (%)	57.0 and above	Premium*	151
	48.0 – 56.9	Grade 1*	118
	39.0 – 47.9	Grade 2	40
	30.0 – 38.9	Grade 3	17
	Below 30.0	aa	9

*recommended classification

also passed the recommended value of ≥65.1 (Grade 1 to premium). They are similar to many of the more recent registered rice varieties with good TMR (Table 4). Remarkably, 106 of the FGRG obtained premium classification. The percentage distribution of the samples falling under the different classifications for TMR is presented in Figure 6. This clearly shows that about 93% were classified to have either Grade 1 to premium TMR. The top 10 FGRG with the highest % TMR (73.0–75.7%) are shown in Figure 7. The first three include Malagkit Exotic, Dash-12, and Bodidoy. The other seven varieties had comparable TMR. For % HR, majority of the rice samples (269) also passed the recommended classification of Grade 1 to premium, except for 66 with Grade 2 to aa only. The data show that most of the FGRGs evaluated had good to excellent milling potentials, which is important particularly to farmers, traders, and millers. They parallel the good to excellent milling potentials of most of the registered NSIC modern rice varieties.

Table 4. Total milled rice of registered rice varieties.

TMR Classification	Rice Varieties
Premium	NSIC Rc 154, NSIC Rc 160, NSIC Rc 188, NSIC Rc 192, NSIC 2011 Rc 238, NSIC 2011 Rc 240, NSIC 2011 Rc 286, NSIC 2011 Rc 296, NSIC 2012 Rc 300, NSIC 2013 Rc 308, NSIC 2013 Rc 310H, NSIC 2013 Rc 318H, NSIC 2014 Rc 358, NSIC 2014 Rc 364H, NSIC 2014 Rc 366H, NSIC 2014 Rc 368H, NSIC 2014 Rc 372H, NSIC 2014 Rc 374H, NSIC 2014 Rc 376H, NSIC 2014 Rc 378H, NSIC 2014 Rc 380H, NSIC 2014 Rc 382H, NSIC 2014 Rc 384H, NSIC 2014 Rc 386H, NSIC 2014 Rc 388H, NSIC 2014 Rc 390, NSIC 2014 Rc 392, NSIC 2015 Rc 394, NSIC 2015 Rc 398, NSIC 2015 Rc 402, NSIC 2015 Rc 404H, NSIC 2015 Rc 406H, NSIC 2015 Rc 408H, NSIC 2015 Rc 410H, NSIC 2015 Rc 412H, NSIC 2015 Rc 416, NSIC 2015 Rc 422, NSIC 2015 Rc 424, NSIC 2015 Rc 426, NSIC 2015 Rc 430, NSIC 2016 Rc 432H, NSIC 2016 Rc 434, NSIC 2016 Rc 436, NSIC 2016 Rc 438, NSIC 2016 Rc 440, NSIC 2016 Rc 442, NSIC 2016 Rc 444H, NSIC 2016 Rc 446H, NSIC 2016 Rc 448H, NSIC 2016 Rc 450H, NSIC 2016 Rc 452H, NSIC 2016 Rc 454H, NSIC 2016 Rc 456H, NSIC 2016 Rc 458H, NSIC 2016 Rc 460, NSIC 2016 Rc 462, NSIC 2016 Rc 464, NSIC 2016 Rc 466, NSIC 2016 Rc 468, NSIC 2016 Rc 470, NSIC 2016 Rc 472, NSIC 2016 Rc 474, NSIC 2016 Rc 476, NSIC 2016 Rc 478, NSIC 2016 Rc 480, NSIC 2017 Rc 482SR, NSIC 2017 Rc 484SR, NSIC 2017 Rc 486H, NSIC 2017 Rc 488H, NSIC 2017 Rc 490H, NSIC 2017 Rc 492H, NSIC 2017 Rc 496H, NSIC 2017 Rc 498H, NSIC 2017 Rc 500H, NSIC 2017 Rc 502H, NSIC 2017 Rc 504H, NSIC 2018 Rc 506, NSIC 2018 Rc 508, NSIC 2018 Rc 510, NSIC 2018 Rc 512, NSIC 2018 Rc 514, NSIC 2018 Rc 516H, NSIC 2018 Rc 518H, NSIC 2018 Rc 522H, NSIC 2018 Rc 528, NSIC 2018 Rc 532, NSIC 2018 Rc 534, NSIC 2018 Rc 544H, NSIC 2018 Rc 548H, NSIC 2019 Rc 550H, NSIC 2019 Rc 552H, NSIC 2019 Rc 556, NSIC 2019 Rc 560, NSIC 2019 Rc 562, NSIC 2019 Rc 564, NSIC 2019 Rc 566, NSIC 2019 Rc 570, NSIC 2019 Rc 572, NSIC 2019 Rc 574, NSIC 2019 Rc 576, NSIC 2019 Rc 578, NSIC 2019 Rc 588H, NSIC 2020 Rc 592, NSIC 2020 Rc 596, NSIC 2020 Rc 604, NSIC 2020 Rc 616H, NSIC 2020 Rc 618H
Grade 1	NSIC 2011 Rc 21 SR, NSIC 2014 Rc 25, NSIC 2014 Rc 27, NSIC 2014 Rc 29, NSIC Rc 148, NSIC Rc 150, NSIC Rc 152, NSIC Rc 156, NSIC Rc 158, NSIC Rc 162H, NSIC Rc 164H, NSIC Rc 166H, NSIC Rc 168H, NSIC Rc 170, NSIC Rc 174H, NSIC Rc 176H, NSIC Rc 178H, NSIC Rc 180H, NSIC Rc 182, NSIC Rc 184, NSIC Rc 186, NSIC Rc 190, NSIC Rc 196H, NSIC Rc 198H, NSIC Rc 200H, NSIC Rc 202H, NSIC Rc 204H, NSIC Rc 206H, NSIC Rc 208H, NSIC Rc 210H, NSIC Rc 212, NSIC Rc 214, NSIC Rc 216, NSIC Rc 218 SR, NSIC Rc 222, NSIC Rc 226, NSIC Rc 228H, NSIC Rc 230H, NSIC Rc 232H, NSIC Rc 234H, NSIC 2011 Rc 244H, NSIC 2011 Rc 246H, NSIC 2011 Rc 248H, NSIC 2011 Rc 250H, NSIC 2011 Rc 252H, NSIC 2011 Rc 254H, NSIC 2011 Rc 256H, NSIC 2011 Rc 258H, NSIC 2011 Rc 260H, NSIC 2011 Rc 262H, NSIC 2011 Rc 264H, NSIC 2011 Rc 266H, NSIC 2011 Rc 268H, NSIC 2011 Rc 270H, NSIC 2011 Rc 272, NSIC 2011 Rc 274, NSIC 2011 Rc 276, NSIC 2011 Rc 278, NSIC 2011 Rc 280, NSIC 2011 Rc 282, NSIC 2011 Rc 284, NSIC 2011 Rc 288, NSIC 2011 Rc 290, NSIC 2011 Rc 292, NSIC 2011 Rc 294, NSIC 2012 Rc 298, NSIC 2012 Rc 302, NSIC 2012 Rc 304 SR, NSIC 2012 Rc 306H, NSIC 2013 Rc 312H, NSIC 2013 Rc 314H, NSIC 2013 Rc 316H, NSIC 2013 Rc 320H, NSIC 2013 Rc 322H, NSIC 2013 Rc 324, NSIC 2013 Rc 326, NSIC 2013 Rc 328, NSIC 2013 Rc 330, NSIC 2013 Rc 332, NSIC 2013 Rc 334, NSIC 2013 Rc 336, NSIC 2013 Rc 338, NSIC 2013 Rc 340, NSIC 2013 Rc 342 SR, NSIC 2013 Rc 344 SR, NSIC 2013 Rc 346, NSIC 2013 Rc 348, NSIC 2013 Rc 350H, NSIC 2014 Rc 352, NSIC 2014 Rc 354, NSIC 2014 Rc 360, NSIC 2014 Rc 362H, NSIC 2014 Rc 370H, NSIC 2015 Rc 396, NSIC 2015 Rc 400, NSIC 2015 Rc 418, NSIC 2015 Rc 420, NSIC 2015 Rc 428, NSIC 2017 Rc 494H, NSIC 2018 Rc 520H, NSIC 2018 Rc 524H, NSIC 2018 Rc 526H, NSIC 2018 Rc 530, NSIC 2018 Rc 536, NSIC 2018 Rc 538H, NSIC 2018 Rc 540H, NSIC 2018 Rc 542H, NSIC 2018 Rc 546H, NSIC 2019 Rc 554, NSIC 2019 Rc 558, NSIC 2019 Rc 568, NSIC 2019 Rc 580, NSIC 2019 Rc 582, NSIC 2019 Rc 584, NSIC 2019 Rc 586H, NSIC 2020 Rc 590, NSIC 2020 Rc 594, NSIC 2020 Rc 598, NSIC 2020 Rc 600, NSIC 2020 Rc 602, NSIC 2020 Rc 606, NSIC 2020 Rc 608, NSIC 2020 Rc 610, NSIC 2020 Rc 612, NSIC 2020 Rc 614H
Grade 2	NSIC 2011 Rc 23, NSIC Rc 172, NSIC Rc 220 SR, NSIC Rc 224, NSIC Rc 236H, NSIC 2011 Rc 242 SR, NSIC 2014 Rc 356, NSIC 2015 Rc 414 SR

**source: NCT data*

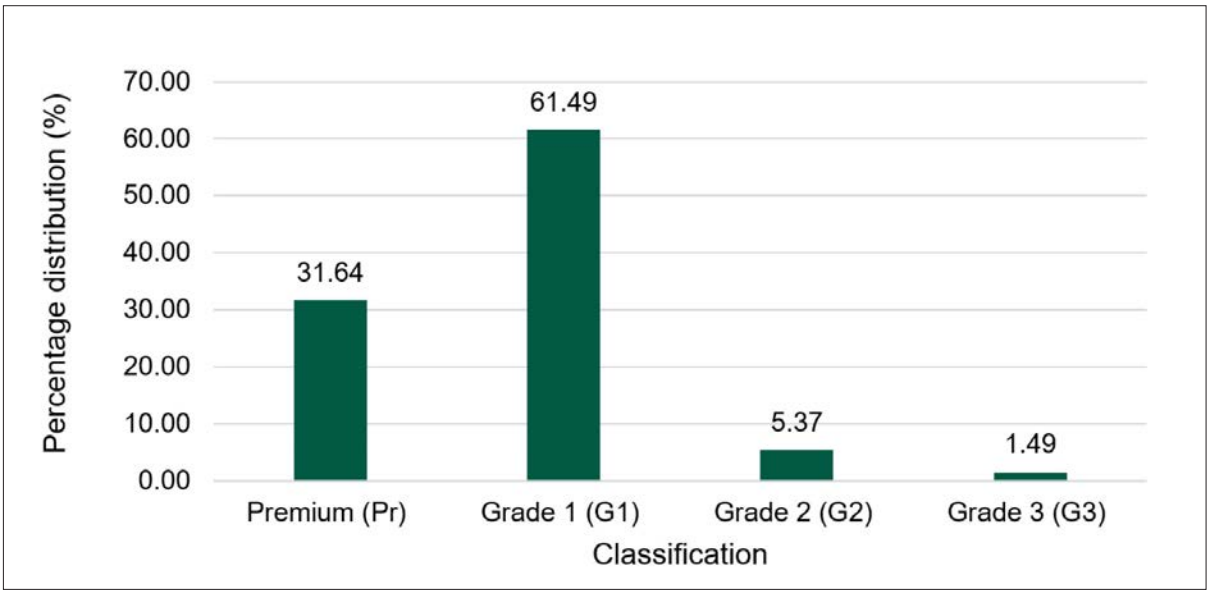

Figure 6. Percentage distribution of FGRGs in terms of total milled rice.

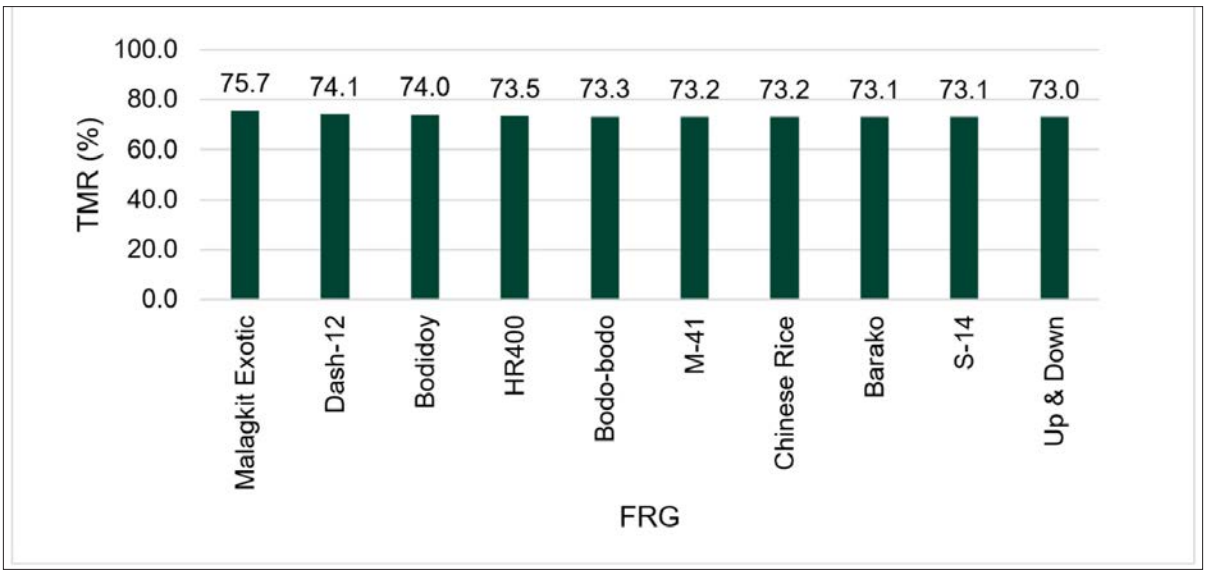

Figure 7. FGRGs with the highest total milled rice recovery.

Physical attributes

The physical attributes of the FGRGs are presented in Table 5. For grain length, the highest number (207) was obtained from the long classification, which is the general preference for this parameter among Filipino consumers. The presence of a few FGRG that were extra long (5) was surprising since this grain length classification is not common in the country due to its susceptibility to breakage, which results in lower milling potentials. It is also interesting to note that many FGRGs were categorized as medium (116). Although contrary to the common breeding objective for long grains, this is quite advantageous because medium-sized grains tend to remain whole during the milling process. The few FGRG with short grains (7) are either glutinous or japonica-type rice. As indicated in Table 6, the relatively recent registered rice varieties have mostly long and medium grain length as well.

Meanwhile, 203 samples had intermediate shape. This observation was also not expected as slender rice grains are more common. The four samples with bold shape could either be glutinous or japonica-type rice. Contrary to the FGRGs evaluated here, the registered rice varieties have more slender than intermediate grains (Table 7). The grain length and shape data support the good milling potentials earlier observed since shorter and less slender grains are more resistant to breakage during the milling process. Since the usual breeding objectives for grain length and shape are long and slender, typical for most of the registered NSIC modern rice varieties, there is a high probability that many of the FGRGs are not NSIC-released varieties. However, there is also a significant number of FGRGs with long and slender grains.

Table 5. Physical attributes of FGRGs.

Parameter	Values	Classification	Number of Samples
Grain length (mm)	7.45 and above	Extra long	5
	6.6 – 7.4	Long*	207
	5.5 – 6.5	Medium	116
	5.4 and below	Short	7
Grain shape (length/width)	More than 3.0	Slender*	128
	2.0 – 3.0	Intermediate	203
	Less than 2.0	Bold	4
Chalky grains (%)	Less than 2.0	Premium*	54
	2.0 – 5.0	Grade 1*	112
	5.1 – 10.0	Grade 2	99
	10.1 – 15.0	Grade 3	38
	-	aa	25
	-	Opaque	7

*recommended classification

Table 6. Grain length of registered rice varieties.

Grain Length Classification	Rice Varieties
Extra long	NSIC 2014 Rc 27, NSIC Rc 176H, NSIC Rc 212, NSIC Rc 214, NSIC Rc 230H, NSIC 2011 Rc 270H, NSIC 2011 Rc 280, NSIC 2011 Rc 284, NSIC 2012 Rc 302, NSIC 2012 Rc 306H, NSIC 2013 Rc 324, NSIC 2013 Rc 334, NSIC 2016 Rc 432H, NSIC 2016 Rc 434, NSIC 2017 Rc 496H, NSIC 2018 Rc 518H, NSIC 2018 Rc 520H
Long	NSIC 2014 Rc 29, NSIC Rc 148, NSIC Rc 150, NSIC Rc 150, NSIC Rc 152, NSIC Rc 152, NSIC Rc 154, NSIC Rc 156, NSIC Rc 156, NSIC Rc 158, NSIC Rc 160, NSIC Rc 166H, NSIC Rc 168H, NSIC Rc 174H, NSIC Rc 178H, NSIC Rc 180H, NSIC Rc 186, NSIC Rc 190, NSIC Rc 194, NSIC Rc 196H, NSIC Rc 198H, NSIC Rc 200H, NSIC Rc 202H, NSIC Rc 204H, NSIC Rc 206H, NSIC Rc 210H, NSIC Rc 216, NSIC Rc 218 SR, NSIC Rc 222, NSIC Rc 224, NSIC Rc 226 (DSR), NSIC Rc 226 (TPR), NSIC Rc 228H, NSIC Rc 232H, NSIC Rc 236H, NSIC 2011 Rc 238, NSIC 2011 Rc 240, NSIC 2011 Rc 244H, NSIC 2011 Rc 246H, NSIC 2011 Rc 248H, NSIC 2011 Rc 250H, NSIC 2011 Rc 252H, NSIC 2011 Rc 256H, NSIC 2011 Rc 258H, NSIC 2011 Rc 260H, NSIC 2011 Rc 262H, NSIC 2011 Rc 266H, NSIC 2011 Rc 268H, NSIC 2011 Rc 274, NSIC 2011 Rc 276, NSIC 2011 Rc 278, NSIC 2011 Rc 282, NSIC 2011 Rc 286, NSIC 2011 Rc 292, NSIC 2011 Rc 294, NSIC 2012 Rc 298, NSIC 2012 Rc 300, NSIC 2013 Rc 308, NSIC 2013 Rc 312H, NSIC 2013 Rc 314H, NSIC 2013 Rc 316H, NSIC 2013 Rc 318H, NSIC 2013 Rc 320H, NSIC 2013 Rc 322H, NSIC 2013 Rc 326, NSIC 2013 Rc 328, NSIC 2013 Rc 332, NSIC 2013 Rc 336, NSIC 2013 Rc 338, NSIC 2013 Rc 340, NSIC 2013 Rc 342 SR, NSIC 2013 Rc 344 SR, NSIC 2013 Rc 346, NSIC 2013 Rc 348, NSIC 2014 Rc 352, NSIC 2014 Rc 354, NSIC 2014 Rc 356, NSIC 2014 Rc 358, NSIC 2014 Rc 360, NSIC 2014 Rc 362H, NSIC 2014 Rc 364H, NSIC 2014 Rc 366H, NSIC 2014 Rc 368H, NSIC 2014 Rc 370H, NSIC 2014 Rc 374H, NSIC 2014 Rc 376H, NSIC 2014 Rc 378H, NSIC 2014 Rc 380H, NSIC 2014 Rc 382H, NSIC 2014 Rc 384H, NSIC 2014 Rc 386H, NSIC 2014 Rc 388H, NSIC 2014 Rc 390, NSIC 2014 Rc 392, NSIC 2015 Rc 394, NSIC 2015 Rc 398, NSIC 2015 Rc 402, NSIC 2015 Rc 404H, NSIC 2015 Rc 408H, NSIC 2015 Rc 410H, NSIC 2015 Rc 412H, NSIC 2015 Rc 418, NSIC 2015 Rc 420, NSIC 2015 Rc 422, NSIC 2015 Rc 424, NSIC 2015 Rc 426, NSIC 2015 Rc 428, NSIC 2015 Rc 430, NSIC 2016 Rc 440, NSIC 2016 Rc 442, NSIC 2016 Rc 444H, NSIC 2016 Rc 446H, NSIC 2016 Rc 448H, NSIC 2016 Rc 450H, NSIC 2016 Rc 454H, NSIC 2016 Rc 456H, NSIC 2016 Rc 458H, NSIC 2016 Rc 460, NSIC 2016 Rc 462, NSIC 2016 Rc 464, NSIC 2016 Rc 466, NSIC 2016 Rc 468, NSIC 2016 Rc 476, NSIC 2016 Rc 478, NSIC 2016 Rc 480, NSIC 2017 Rc 486H, NSIC 2017 Rc 488H, NSIC 2017 Rc 490H, NSIC 2017 Rc 494H, NSIC 2017 Rc 498H, NSIC 2017 Rc 500H, NSIC 2017 Rc 502H, NSIC 2017 Rc 504H, NSIC 2018 Rc 506, NSIC 2018 Rc 508, NSIC 2018 Rc 510, NSIC 2018 Rc 512, NSIC 2018 Rc 514, NSIC 2018 Rc 516H, NSIC 2018 Rc 522H, NSIC 2018 Rc 524H, NSIC 2018 Rc 526H, NSIC 2018 Rc 538H, NSIC 2018 Rc 540H, NSIC 2018 Rc 544H, NSIC 2018 Rc 546H, NSIC 2019 Rc 550H, NSIC 2019 Rc 552H, NSIC 2019 Rc 570, NSIC 2019 Rc 572, NSIC 2019 Rc 574, NSIC 2019 Rc 576, NSIC 2019 Rc 578, NSIC 2019 Rc 580, NSIC 2019 Rc 582, NSIC 2019 Rc 586H, NSIC 2019 Rc 588H, NSIC 2020 Rc 590, NSIC 2020 Rc 594, NSIC 2020 Rc 600, NSIC 2020 Rc 602, NSIC 2020 Rc 604, NSIC 2020 Rc 606, NSIC 2020 Rc 608, NSIC 2020 Rc 610, NSIC 2020 Rc 614H, NSIC 2020 Rc 616H
Short	NSIC 2011 Rc 21 SR, NSIC 2011 Rc 23, NSIC 2014 Rc 25, NSIC Rc 162H, NSIC Rc 164H, NSIC Rc 182, NSIC Rc 184, NSIC Rc 188, NSIC Rc 192, NSIC Rc 208H, NSIC Rc 220 SR, NSIC Rc 234H, NSIC 2011 Rc 242 SR, NSIC 2011 Rc 254H, NSIC 2011 Rc 264H, NSIC 2011 Rc 272, NSIC 2011 Rc 288, NSIC 2011 Rc 290, NSIC 2011 Rc 296, NSIC 2013 Rc 310H, NSIC 2013 Rc 330, NSIC 2013 Rc 350H, NSIC 2014 Rc 372H, NSIC 2015 Rc 396, NSIC 2015 Rc 400, NSIC 2015 Rc 406H, NSIC 2015 Rc 416, NSIC 2016 Rc 436, NSIC 2016 Rc 438, NSIC 2016 Rc 452H, NSIC 2016 Rc 470, NSIC 2016 Rc 472, NSIC 2016 Rc 474, NSIC 2017 Rc 492H, NSIC 2018 Rc 528, NSIC 2018 Rc 530, NSIC 2018 Rc 532, NSIC 2018 Rc 534, NSIC 2018 Rc 536, NSIC 2018 Rc 542H, NSIC 2018 Rc 548H, NSIC 2019 Rc 556, NSIC 2019 Rc 558, NSIC 2019 Rc 568, NSIC 2019 Rc 584, NSIC 2020 Rc 592, NSIC 2020 Rc 596, NSIC 2020 Rc 598, NSIC 2020 Rc 612, NSIC 2020 Rc 618H
Short	NSIC Rc 170, NSIC Rc 172, NSIC 2012 Rc 304 SR, NSIC 2015 Rc 414 SR, NSIC 2017 Rc 482SR, NSIC 2017 Rc 484SR, NSIC 2019 Rc 554, NSIC 2019 Rc 560, NSIC 2019 Rc 562, NSIC 2019 Rc 564, NSIC 2019 Rc 566

**source: NCT data*

Table 7. Grain shape of registered rice varieties.

Grain Shape Classification	Rice Varieties
Slender	NSIC 2014 Rc 27, NSIC 2014 Rc 29, NSIC Rc 148, NSIC Rc 152, NSIC Rc 156, NSIC Rc 158, NSIC Rc 160, NSIC Rc 166H, NSIC Rc 168H, NSIC Rc 174H, NSIC Rc 176H, NSIC Rc 180H, NSIC Rc 186, NSIC Rc 188, NSIC Rc 190, NSIC Rc 196H, NSIC Rc 198H, NSIC Rc 200H, NSIC Rc 202H, NSIC Rc 204H, NSIC Rc 206H, NSIC Rc 210H, NSIC Rc 212, NSIC Rc 214, NSIC Rc 216, NSIC Rc 222, NSIC Rc 224, NSIC Rc 230H, NSIC Rc 232H, NSIC Rc 234H, NSIC Rc 236H, NSIC 2011 Rc 238, NSIC 2011 Rc 244H, NSIC 2011 Rc 246H, NSIC 2011 Rc 248H, NSIC 2011 Rc 250H, NSIC 2011 Rc 252H, NSIC 2011 Rc 256H, NSIC 2011 Rc 258H, NSIC 2011 Rc 260H, NSIC 2011 Rc 262H, NSIC 2011 Rc 266H, NSIC 2011 Rc 268H, NSIC 2011 Rc 270H, NSIC 2011 Rc 274, NSIC 2011 Rc 276, NSIC 2011 Rc 280, NSIC 2011 Rc 282, NSIC 2011 Rc 284, NSIC 2011 Rc 286, NSIC 2011 Rc 290, NSIC 2011 Rc 292, NSIC 2011 Rc 294, NSIC 2011 Rc 296, NSIC 2012 Rc 298, NSIC 2012 Rc 302, NSIC 2012 Rc 306H, NSIC 2013 Rc 308, NSIC 2013 Rc 316H, NSIC 2013 Rc 318H, NSIC 2013 Rc 320H, NSIC 2013 Rc 322H, NSIC 2013 Rc 324, NSIC 2013 Rc 326, NSIC 2013 Rc 332, NSIC 2013 Rc 334, NSIC 2013 Rc 336, NSIC 2013 Rc 340, NSIC 2013 Rc 344 SR, NSIC 2013 Rc 346, NSIC 2014 Rc 352, NSIC 2014 Rc 354, NSIC 2014 Rc 356, NSIC 2014 Rc 358, NSIC 2014 Rc 360, NSIC 2014 Rc 362H, NSIC 2014 Rc 364H, NSIC 2014 Rc 366H, NSIC 2014 Rc 368H, NSIC 2014 Rc 370H, NSIC 2014 Rc 374H, NSIC 2014 Rc 376H, NSIC 2014 Rc 378H, NSIC 2014 Rc 380H, NSIC 2014 Rc 382H, NSIC 2014 Rc 384H, NSIC 2014 Rc 386H, NSIC 2014 Rc 388H, NSIC 2014 Rc 390, NSIC 2014 Rc 392, NSIC 2015 Rc 394, NSIC 2015 Rc 402, NSIC 2015 Rc 404H, NSIC 2015 Rc 408H, NSIC 2015 Rc 410H, NSIC 2015 Rc 418, NSIC 2015 Rc 420, NSIC 2015 Rc 422, NSIC 2015 Rc 424, NSIC 2015 Rc 426, NSIC 2015 Rc 428, NSIC 2015 Rc 430, NSIC 2016 Rc 432H, NSIC 2016 Rc 434, NSIC 2016 Rc 436, NSIC 2016 Rc 442, NSIC 2016 Rc 444H, NSIC 2016 Rc 446H, NSIC 2016 Rc 448H, NSIC 2016 Rc 450H, NSIC 2016 Rc 452H, NSIC 2016 Rc 454H, NSIC 2016 Rc 456H, NSIC 2016 Rc 458H, NSIC 2016 Rc 460, NSIC 2016 Rc 462, NSIC 2016 Rc 464, NSIC 2016 Rc 466, NSIC 2016 Rc 468, NSIC 2016 Rc 478, NSIC 2016 Rc 480, NSIC 2017 Rc 486H, NSIC 2017 Rc 488H, NSIC 2017 Rc 490H, NSIC 2017 Rc 494H, NSIC 2017 Rc 496H, NSIC 2017 Rc 500H, NSIC 2017 Rc 504H,NSIC 2018 Rc 508, NSIC 2018 Rc 510, NSIC 2018 Rc 512, NSIC 2018 Rc 514, NSIC 2018 Rc 516H, NSIC 2018 Rc 518H, NSIC 2018 Rc 520H, NSIC 2018 Rc 524H, NSIC 2018 Rc 528, NSIC 2018 Rc 530, NSIC 2018 Rc 532, NSIC 2018 Rc 538H, NSIC 2018 Rc 544H, NSIC 2018 Rc 546H, NSIC 2019 Rc 550H, NSIC 2019 Rc 552H, NSIC 2019 Rc 558, NSIC 2019 Rc 570, NSIC 2019 Rc 574, NSIC 2019 Rc 576, NSIC 2019 Rc 580, NSIC 2019 Rc 582, NSIC 2019 Rc 586H, NSIC 2019 Rc 588H, NSIC 2020 Rc 590, NSIC 2020 Rc 600, NSIC 2020 Rc 602, NSIC 2020 Rc 606, NSIC 2020 Rc 608, NSIC 2020 Rc 610, NSIC 2020 Rc 614H, NSIC 2020 Rc 616H
Intermediate	NSIC 2011 Rc 21 SR, NSIC 2011 Rc 23, NSIC 2014 Rc 25, NSIC Rc 150, NSIC Rc 154, NSIC Rc 162H, NSIC Rc 164H, NSIC Rc 172, NSIC Rc 178H, NSIC Rc 182, NSIC Rc 184, NSIC Rc 192, NSIC Rc 194, NSIC Rc 208H, NSIC Rc 218 SR, NSIC Rc 220 SR, NSIC Rc 226 (DSR), NSIC Rc 226 (TPR), NSIC Rc 228H, NSIC 2011 Rc 240, NSIC 2011 Rc 254H, NSIC 2011 Rc 264H, NSIC 2011 Rc 272, NSIC 2011 Rc 278, NSIC 2011 Rc 288, NSIC 2012 Rc 300, NSIC 2013 Rc 310H, NSIC 2013 Rc 312H, NSIC 2013 Rc 314H, NSIC 2013 Rc 328, NSIC 2013 Rc 330, NSIC 2013 Rc 338, NSIC 2013 Rc 342 SR, NSIC 2013 Rc 348, NSIC 2013 Rc 350H, NSIC 2014 Rc 372H, NSIC 2015 Rc 396, NSIC 2015 Rc 398, NSIC 2015 Rc 400, NSIC 2015 Rc 406H, NSIC 2015 Rc 412H, NSIC 2015 Rc 416, NSIC 2016 Rc 438, NSIC 2016 Rc 440, NSIC 2016 Rc 470, NSIC 2016 Rc 472, NSIC 2016 Rc 474, NSIC 2016 Rc 476, NSIC 2017 Rc 492H, NSIC 2017 Rc 498H, NSIC 2017 Rc 502H, NSIC 2018 Rc 506, NSIC 2018 Rc 522H, NSIC 2018 Rc 526H, NSIC 2018 Rc 534, NSIC 2018 Rc 536, NSIC 2018 Rc 540H, NSIC 2018 Rc 542H, NSIC 2018 Rc 548H, NSIC 2019 Rc 554, NSIC 2019 Rc 556, NSIC 2019 Rc 568, NSIC 2019 Rc 572, NSIC 2019 Rc 578, NSIC 2019 Rc 584, NSIC 2020 Rc 592, NSIC 2020 Rc 594, NSIC 2020 Rc 596, NSIC 2020 Rc 598, NSIC 2020 Rc 604, NSIC 2020 Rc 612, NSIC 2020 Rc 618H
Bold	NSIC Rc 170, NSIC 2011 Rc 242 SR, NSIC 2012 Rc 304 SR, NSIC 2015 Rc 414 SR, NSIC 2017 Rc 482SR, NSIC 2017 Rc 484SR, NSIC 2019 Rc 560, NSIC 2019 Rc 562, NSIC 2019 Rc 564, NSIC 2019 Rc 566

**source: NCT data*

In terms of percent chalky grains, 166 FGRGs passed the recommended value of ≤5.0%, which is equivalent to Grade 1 to premium. However, the diversity in terms of amount of chalky grains is evident in Figure 8 as many of the FGRGs were under the other classifications. Chalkiness is considered a negative trait because its presence ruins the perfect translucent rice grain, which is more preferred. It is also associated with the susceptibility to cracking that results in a higher amount of broken grains. It is quite difficult to accurately identify the cause of this defect because chalkiness is affected by both genotype and environment. Meanwhile, seven FGRGs had opaque grains and were classified as such. Opacity is a unique characteristic of waxy or glutinous rice. Figure 9 shows the 10 FGRGs with the least amount of chalky grains. The top performers include Bulaw (Super 60), Pandan 2, Pinolo, and BWSI-4R.

Physicochemical properties

Table 8 summarizes the physicochemical properties of the collected FGRGs. About half of them (160) had moisture content (MC) within the recommended range (10–12%). The samples with higher MC were further dried in an oven to attain the acceptable values before subjecting them to other physicochemical analyses. Diversity in terms of AC was evident among the FGRGs as reflected by having samples in all classifications (waxy, low, very low, intermediate, and high), as depicted in Figure 10. However, it is obvious that majority (184) still belong to the intermediate-AC group with acceptable soft cooked rice texture. It is noteworthy that significant numbers of FGRGs are also under the high (24.18%) and low (18.21%) AC classifications. This is different from the registered rice varieties where intermediate AC is obviously the most dominant (Table 9).

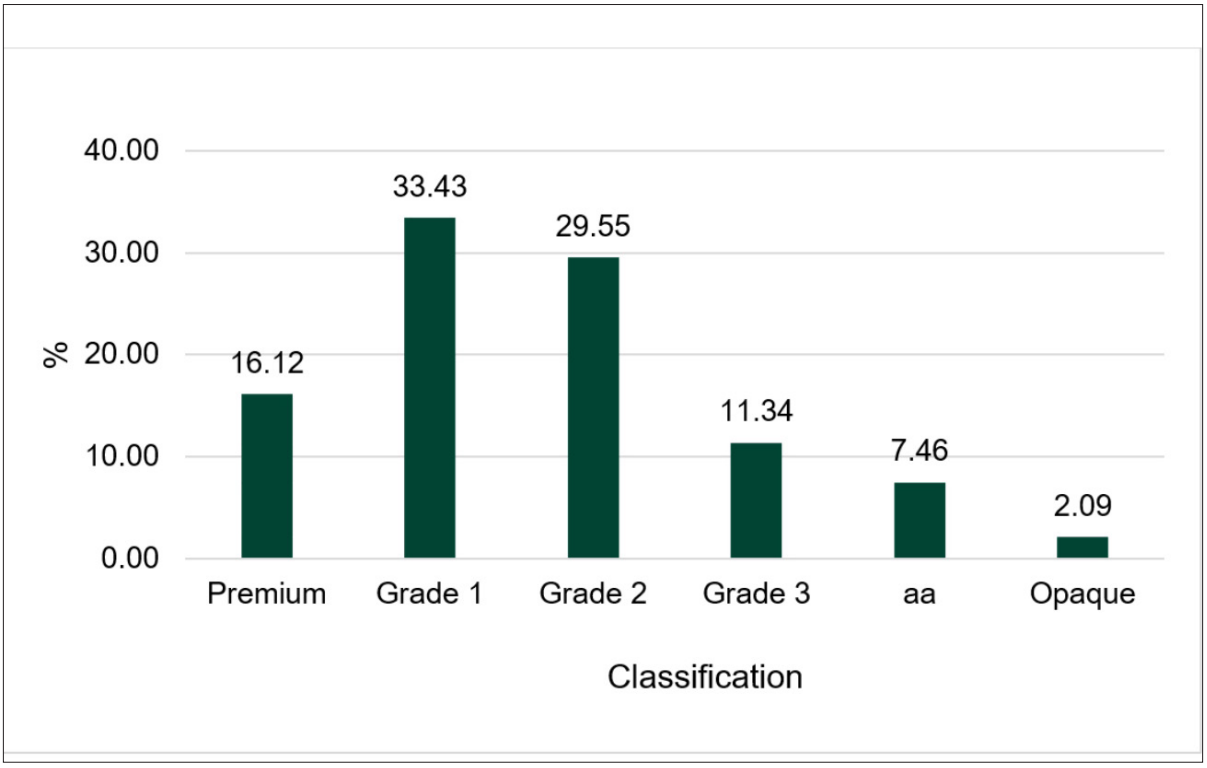

Figure 8. Percentage distribution of FGRGs in terms of % chalky grains.

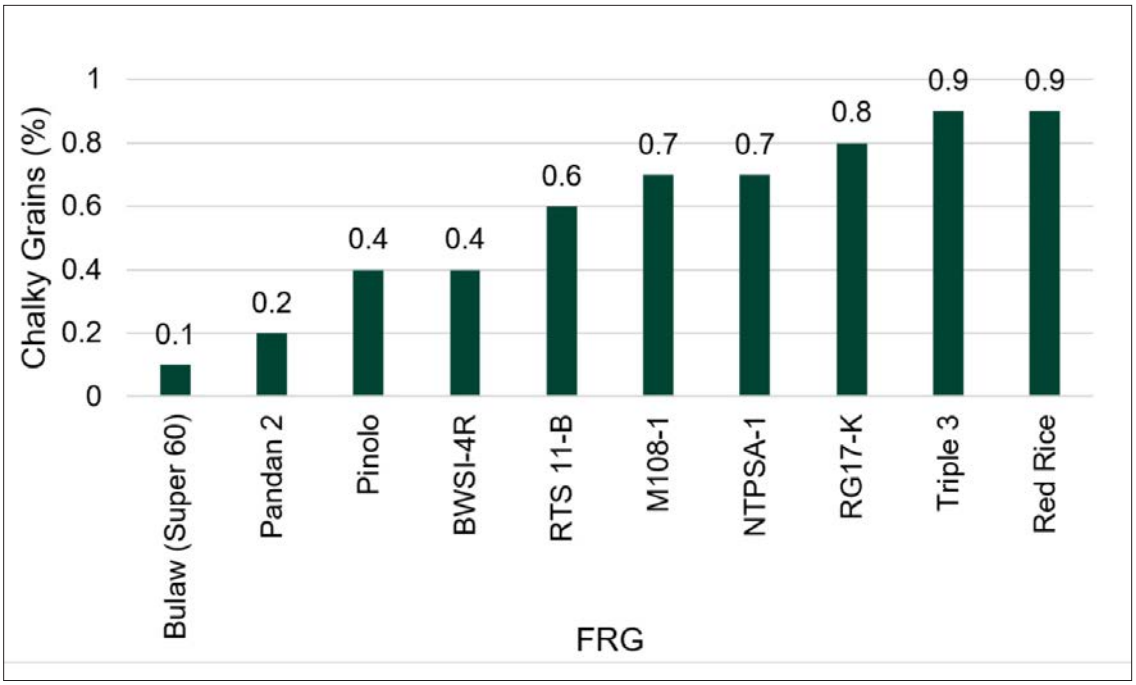

Figure 9. FGRGs with the least percent chalky grains.

Table 8. Physicochemical properties of FGRGs.

Parameter	Range/Values	Classification	Number of Samples
Moisture content (%)	Above 12		175
	10 – 12*		160
Amylose content (%)	22.1 and above	High	81
	17.1 – 22.0	Intermediate*	184
	10.1 – 17.0	Low	61
	2.1 – 10.0	Very low	7
	0.0 – 2.0	Waxy	2
Alkali-spreading value (Gelatinization temperature)	1 – 2	High	10
	3	High-Intermediate	21
	4 – 5	Intermediate*	236
	6 – 7	Low	68
Crude protein (%)	Above 9		15
	6 – 9*		317
	Below 6		3

*recommended classification

Table 9. Amylose content of registered rice varieties.

AC Classification	Rice Varieties
High	NSIC Rc 152, NSIC Rc 164H, NSIC 2011 Rc 276, NSIC 2011 Rc 282, NSIC 2011 Rc 286, NSIC 2013 Rc 340, NSIC 2014 Rc 364H, NSIC 2014 Rc 366H, NSIC 2014 Rc 374H, NSIC 2014 Rc 376H, NSIC 2014 Rc 386H, NSIC 2014 Rc 388H, NSIC 2018 Rc 532, NSIC 2019 Rc 568, NSIC 2020 Rc 596
Intermediate	NSIC 2011 Rc 23, NSIC 2014 Rc 25, NSIC 2014 Rc 27, NSIC 2014 Rc 29, NSIC Rc 148, NSIC Rc 150, NSIC Rc 150, NSIC Rc 154, NSIC Rc 156, NSIC Rc 158, NSIC Rc 162H, NSIC Rc 166H, NSIC Rc 168H, NSIC Rc 174H, NSIC Rc 180H, NSIC Rc 182, NSIC Rc 186, NSIC Rc 192, NSIC Rc 194, NSIC Rc 198H, NSIC Rc 200H, NSIC Rc 202H, NSIC Rc 204H, NSIC Rc 206H, NSIC Rc 212, NSIC Rc 214, NSIC Rc 216, NSIC Rc 222, NSIC Rc 226 (TPR), NSIC Rc 228H, NSIC Rc 230H, NSIC Rc 232H, NSIC 2011 Rc 238, NSIC 2011 Rc 240, NSIC 2011 Rc 244H, NSIC 2011 Rc 248H, NSIC 2011 Rc 250H, NSIC 2011 Rc 252H, NSIC 2011 Rc 254H, NSIC 2011 Rc 256H, NSIC 2011 Rc 258H, NSIC 2011 Rc 264H, NSIC 2011 Rc 270H, NSIC 2011 Rc 272, NSIC 2011 Rc 278, NSIC 2011 Rc 280, NSIC 2011 Rc 284, NSIC 2011 Rc 294, NSIC 2011 Rc 296, NSIC 2012 Rc 298, NSIC 2012 Rc 300, NSIC 2012 Rc 302, NSIC 2012 Rc 306H, NSIC 2013 Rc 308, NSIC 2013 Rc 310H, NSIC 2013 Rc 312H, NSIC 2013 Rc 314H, NSIC 2013 Rc 316H, NSIC 2013 Rc 318H, NSIC 2013 Rc 322H, NSIC 2013 Rc 324, NSIC 2013 Rc 326, NSIC 2013 Rc 328, NSIC 2013 Rc 332, NSIC 2013 Rc 334, NSIC 2013 Rc 336, NSIC 2013 Rc 338, NSIC 2013 Rc 342 SR, NSIC 2013 Rc 344 SR, NSIC 2013 Rc 346, NSIC 2013 Rc 348, NSIC 2013 Rc 350H, NSIC 2014 Rc 352, NSIC 2014 Rc 354, NSIC 2014 Rc 356, NSIC 2014 Rc 358, NSIC 2014 Rc 360, NSIC 2014 Rc 362H, NSIC 2014 Rc 368H, NSIC 2014 Rc 370H, NSIC 2014 Rc 372H, NSIC 2014 Rc 378H, NSIC 2014 Rc 380H, NSIC 2014 Rc 382H, NSIC 2014 Rc 384H, NSIC 2014 Rc 390, NSIC 2014 Rc 392, NSIC 2015 Rc 394, NSIC 2015 Rc 398, NSIC 2015 Rc 402, NSIC 2015 Rc 406H, NSIC 2015 Rc 408H,NSIC 2015 Rc 410H, NSIC 2015 Rc 412H, NSIC 2015 Rc 414 SR, NSIC 2015 Rc 416, NSIC 2015 Rc 418, NSIC 2015 Rc 420, NSIC 2015 Rc 422, NSIC 2015 Rc 424, NSIC 2015 Rc 426, NSIC 2015 Rc 428, NSIC 2015 Rc 430, NSIC 2016 Rc 432H, NSIC 2016 Rc 434, NSIC 2016 Rc 436, NSIC 2016 Rc 438, NSIC 2016 Rc 440, NSIC 2016 Rc 442, NSIC 2016 Rc 444H, NSIC 2016 Rc 446H,NSIC 2016 Rc 448H, NSIC 2016 Rc 450H, NSIC 2016 Rc 452H, NSIC 2016 Rc 454H, NSIC 2016 Rc 456H, NSIC 2016 Rc 458H, NSIC 2016 Rc 460, NSIC 2016 Rc 462, NSIC 2016 Rc 464, NSIC 2016 Rc 466, NSIC 2016 Rc 468, NSIC 2016 Rc 470, NSIC 2016 Rc 472, NSIC 2016 Rc 474, NSIC 2016 Rc 476, NSIC 2016 Rc 478, NSIC 2016 Rc 480, NSIC 2017 Rc 482SR, NSIC 2017 Rc 484SR, NSIC 2017 Rc 486H, NSIC 2017 Rc 488H, NSIC 2017 Rc 490H, NSIC 2017 Rc 492H, NSIC 2017 Rc 494H, NSIC 2017 Rc 496H, NSIC 2017 Rc 498H, NSIC 2017 Rc 500H, NSIC 2017 Rc 502H, NSIC 2017 Rc 504H, NSIC 2018 Rc 506, NSIC 2018 Rc 508, NSIC 2018 Rc 510, NSIC 2018 Rc 516H, NSIC 2018 Rc 518H, NSIC 2018 Rc 520H, NSIC 2018 Rc 522H, NSIC 2018 Rc 524H, NSIC 2018 Rc 526H, NSIC 2018 Rc 528, NSIC 2018 Rc 530, NSIC 2018 Rc 538H, NSIC 2018 Rc 540H, NSIC 2018 Rc 542H, NSIC 2018 Rc 544H, NSIC 2018 Rc 546H, NSIC 2018 Rc 548H, NSIC 2019 Rc 550H, NSIC 2019 Rc 552H, NSIC 2019 Rc 558, NSIC 2019 Rc 570, NSIC 2019 Rc 572, NSIC 2019 Rc 574, NSIC 2019 Rc 576, NSIC 2019 Rc 578, NSIC 2019 Rc 580, NSIC 2019 Rc 586H, NSIC 2019 Rc 588H, NSIC 2020 Rc 592, NSIC 2020 Rc 594,NSIC 2020 Rc 598, NSIC 2020 Rc 600, NSIC 2020 Rc 602, NSIC 2020 Rc 604, NSIC 2020 Rc 610, NSIC 2020 Rc 612, NSIC 2020 Rc 614H, NSIC 2020 Rc 616H
Low	NSIC Rc 160, NSIC Rc 170, NSIC Rc 172, NSIC Rc 176H, NSIC Rc 178H, NSIC Rc 184, NSIC Rc 188, NSIC Rc 190, NSIC Rc 196H, NSIC Rc 208H, NSIC Rc 210H, NSIC Rc 218 SR, NSIC Rc 220 SR, NSIC Rc 224, NSIC Rc 226 (DSR), NSIC Rc 234H, NSIC Rc 236H, NSIC 2011 Rc 242 SR, NSIC 2011 Rc 246H, NSIC 2011 Rc 260H, NSIC 2011 Rc 262H, NSIC 2011 Rc 266H, NSIC 2011 Rc 268H, NSIC 2011 Rc 274, NSIC 2011 Rc 288, NSIC 2011 Rc 290, NSIC 2011 Rc 292, NSIC 2012 Rc 304 SR, NSIC 2013 Rc 320H, NSIC 2015 Rc 396, NSIC 2015 Rc 400, NSIC 2015 Rc 404H, NSIC 2018 Rc 512, NSIC 2018 Rc 536, NSIC 2019 Rc 554, NSIC 2019 Rc 556, NSIC 2019 Rc 560, NSIC 2019 Rc 562, NSIC 2019 Rc 564, NSIC 2019 Rc 566, NSIC 2019 Rc 582, NSIC 2019 Rc 584, NSIC 2020 Rc 590, NSIC 2020 Rc 606, NSIC 2020 Rc 608, NSIC 2020 Rc 618H
Very Low	NSIC 2011 Rc 21 SR, NSIC 2013 Rc 330, NSIC 2018 Rc 534

**source: NCT data*

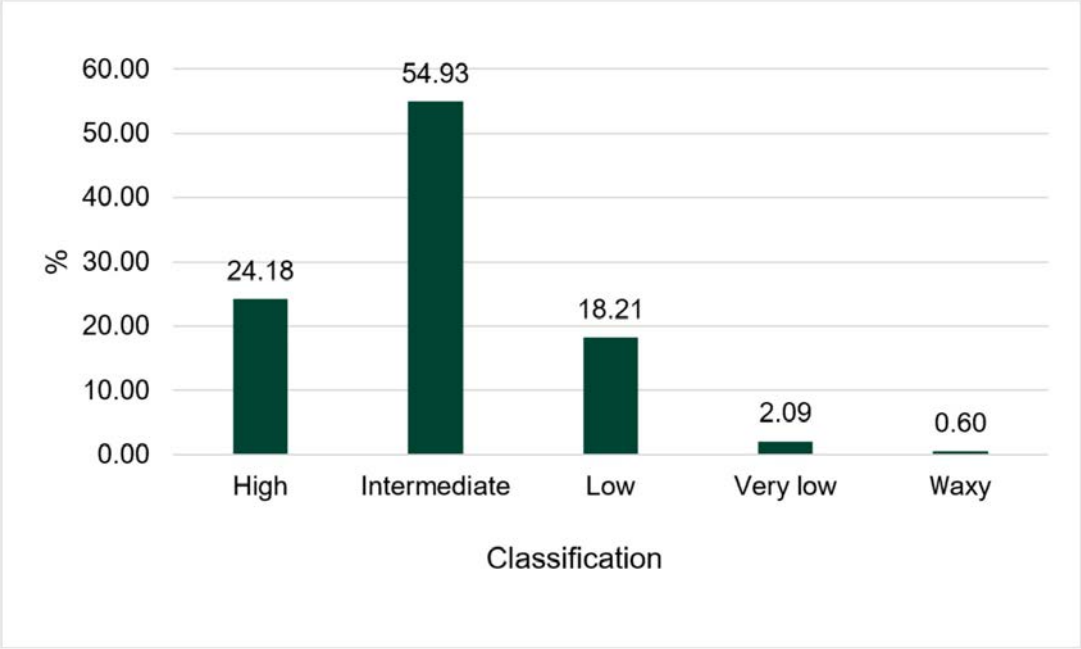

Figure 10. Percentage distribution of FGRGs in terms of amylose content.

Meanwhile, most FGRGs (304) had lower GT (intermediate and low), which indicates shorter cooking time. Very few had high-intermediate and high GT. These types of rice with both intermediate AC and GT are the most preferred by Filipino consumers due to their relatively softer cooked texture.

Lastly, the crude protein content of most of the samples (317) ranged from 6 to 9%, which are the usual values for this parameter. Only 15 had higher than 9% and three with lower than 6%. Although 6-9% may not look significant, these amounts of protein are very valuable for people who cannot afford to buy other protein-rich foods. At this instance, rice can contribute substantially to their protein requirement.

SUMMARY AND CONCLUSION

The growing population in the Philippines and the increasing per capita rice consumption necessitate higher rice production, prompting all breeding programs to continuously develop high-yielding varieties. Yield remains to be the most vital trait but the importance of grain quality for the different rice stakeholders has already been realized as demonstrated by improved quality parameters of modern rice varieties released lately. Thus, breeders now incorporate these traits in the development or improvement of rice varieties.

However, this is not exclusive for modern rice varieties as the importance of grain quality is also quite evident even among the 335 FGRGs evaluated. Good to excellent milling potentials, physical attributes, and physicochemical properties were observed. Most of them had premium and Grade 1 total milled rice and head rice recoveries; long grain length, intermediate grain shape, and premium and Grade 1 chalky grains; low to intermediate amylose content and gelatinization temperature, and 6-9% crude protein. Majority of these parameters correspond to the quality preferences of Filipinos and as such, they are targeted in the rice breeding objectives.

Although there is a wider distribution among the different classifications of the major grain quality categories, there is still a high probability that most of the FGRGs are actually released modern rice varieties or their derivatives but are only given unique names. It is therefore very important to establish the identity of these unclassified genotypes through phenotypic and genotypic means. The grain quality characterization conducted here would greatly help attain this objective. These efforts could pave the way for farmers to increase their productivity and profitability by either providing access to certified seeds of modern rice varieties with the traits they prefer or capacitate them in purifying the farmers' rice genotypes and improving their production and post-production management practices.

Lastly, great emphasis should be given to rigorous screening for grain quality in terms of milling potentials, physical attributes, physicochemical properties, cooking parameters, and sensory characteristics for the development and evaluation of rice varieties inasmuch as quality is important to all rice industry stakeholders including farmers, traders, millers, retailers, food processors, and consumers.

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CHAPTER 5

Molecular Characterization of Farmer-Grown Rice Genotypes in Irrigated and Rainfed Lowland Ecosystems

Joanne D. Caguiat, John Oscar S. Enriquez, and Sailila E. Abdula

Varietal identification or characterization is one of the important steps in crop improvement to provide valuable information for the introduction and adoption of varieties. Information on the traits of the accessions is essential to ensure utilization of their maximum potential. This information is not only important in identifying varieties with desirable traits for direct utilization as potential donors for crop improvement, but also in protecting their unique traits for present and future use. Traditionally, an individual variety's identity is established through the characterization of its morpho-agronomic traits. In addition, these traits are the tools used as references in distinguishing rice varieties and other crops. Fortunately, modern technologies have been rapidly developed over the past decades that proved to be more accurate for varietal characterization and identification.

With the advent of molecular markers, characterization at the molecular level has been made possible for the past decades. Through the developed technologies, DNA fingerprints were generated and they paved the way to analyzing genetic properties of organisms. These fingerprints were used mainly for the identification of markers associated with different traits for plant breeding, genetic diversity and population structure analyses, and varietal identification and purity assessment (Nybom et al., 2014; Rower, 2013). Different molecular genotyping platforms were developed and utilized such as Randomly amplified polymorphic DNA markers (RAPD), Restriction Fragment Length Polymorphism (RFLP), Inter Simple Sequence Repeat (ISSR), and Simple Sequence Repeat (SSR) or Simple Tandem Repeat (STR), and Single Nucleotide Polymorphisms (SNPs).

SNPs are one of the most utilized molecular markers. They are biallelic in nature and are abundant in the genome, frequently occurring in high densities. SNPs also have a simple mutation model (Frascaroli et al., 2013). Moreover, numerous high-throughput and automated platforms have been developed over the years to perform high-throughput genotyping with thousands to millions of SNP markers enabling faster, cheaper, and more efficient molecular genotyping (Thomson et al., 2010). These markers are now being tested to distinguish correct varieties in farmers' fields (Kretszchmar et al., 2018; Rabbi et al., 2015; Thomson et al., 2017).

Through DNA fingerprinting, we are reporting in this study the diversity, relationship, and possible identities of collected farmer-grown rice genotypes (FGRGs) across the country.

Plant materials and DNA extraction

A panel of 335 FGRGs were collected from farmers' fields and were each given a unique PhilRice-Genebank collection number. Thirty-four nucleus and breeder seeds of the National Seed Industry Council (NSIC)-released inbred varieties (RIV) were assembled as checks and used for molecular genotyping. RIV were selected based on their popularity and seed availability at the PBBD of PhilRice. Leaf samples were collected at the reproductive stage to ensure collection from true-to-type plants since these farmers' varieties were not purified beforehand. The samples were placed in 2-ml microcentrifuge tubes and ground for genomic DNA extraction. Genomic DNA was extracted by modified cetyltrimethylammonium bromide (CTAB) method (Murray and Thompson, 1980). After grinding, 750 µL of pre-warmed 2X CTAB and 50 µL 20% sodium dodecyl sulfate (SDS) were added to the samples, mixed thoroughly with a vortex, and incubated in a water bath at 65 °C for 1 h.

The samples were cooled, followed by the addition of 750 µL chloroform, mixed using a vortex, and centrifuged at 10,000 rpm for 30 min. The aqueous phase was decanted into 1.5-mL tubes, washed with 600 µL ice-cold isopropanol, and incubated at -20 ºC overnight. The samples were then centrifuged at 10,000 rpm for 10 min. The isopropanol was decanted and the pellet was washed with 500 µL of 70% ethanol. Thereafter, the samples were centrifuged for 10,000 rpm for 3 min. The alcohol was discarded and drained. After air-drying, the pellet produced was dissolved in 100 µL of TE buffer with RNAse and incubated at room temperature for 2 to 3 h. The quality and quantity of the extracted DNA were checked using agarose gel electrophoresis and spectrophotometer. DNA samples were normalized to 50-100 ng/uL prior to molecular genotyping.

SNP genotyping and genetic analyses

The extracted DNA samples were sent to the Genotyping Services Laboratory of the International Rice Research Institute in Laguna for genome-wide SNP genotyping. The Cornell-IR LD Rice Array, commonly known as Cornell_7K_Array_Infinium_Rice (C7AIR), composed of 7,098 SNP markers distributed across the rice genome (Thomson et al., 2017), was used to generate DNA fingerprints of the farmers' rice genotypes. Markers with at least 10% missing data across the assembled panel were not included for analyses with 6,623 out of 7,098 SNP markers retained for subsequent analyses. Pairwise genetic distance (GD) of the assembled rice panel was calculated based on Nei and Takezaki's (1983) algorithm as implemented in PowerMarker 3.25 (Liu and Muse, 2005). Based on the calculated GD, neighbor-joining trees were generated as well and viewed using MEGA X (Kumar et al., 2018). Genetic similarity coefficients (f; %) were calculated from the estimated GD as follows: (f=1-GD)*100.

RESULTS

DNA fingerprinting revealed narrow genetic diversity for the panel

The DNA fingerprint of the assembled rice panel of 335 FGRGs was established using the 6,623 SNP markers distributed across the rice genome. Generally, narrow genetic diversity was observed among the FGRGs, which showed similarity coefficients (f) ranging from 51.5 to 100% with an average of 87.13%. A total of 21 out of 34 RIVs were 95 to 98% genetically similar; this is 64% of the number of reference check varieties. Comparison among collected FGRGs and RIVs revealed high levels of genetic similarity with an average of 87.21% (50.12-100%).

Estimation of genetic similarity among FGRGs and RIVs

Ninety-two FGRGs were found to have at least 95% genetic similarity with 15 out of 34 RIV checks (44.12%) based on SNP genotyping. Sixty-four (64) of these FGRGs were genetically similar to the three famous RIVs: NSIC Rc 218, PSB Rc 10, and NSIC Rc 222. The most represented genotypes (5.6% of total FGRG) contained `Diamond' in their names under different variants such as Diamond X, Double Diamond, Diamond XX, Double Diamond X, and Super Diamond X.

NSIC Rc 218

There were 24 (7.16%) FGRGs with 99-100% genetic similarity to NSIC Rc 218. This is the highest number of genotypes having the highest genetic similarity coefficient with an RIV check. The genotypes Diamond V, Sampaguita, Sampaguita (Agusan), Unknown Var 3, 1561, Destiny, Tabuk, and Double Diamond had 100% similarity and were clearly identified as NSIC Rc 218 based on fingerprint data (Table 1). Rc 218 is known for its aroma and very soft texture when cooked. The phylogeny of related FGRGs with Rc 218 is shown in Figure 1.

Table 1. FGRGs genetically similar to NSIC Rc 218 and their respective similarity coefficients based on SNP genotyping.

FGRG	Collection No.	Similarity (%)
DIAMOND V	15576	100
SAMPAGUITA	16308	100
SAMPAGUITA (AGUSAN)	16326	100
UNKNOWN VAR 3	15879	100
SAMPAGUITA	15500	100
1561	15891	100
DESTINY	15502	100
TABUK	16501	100
DOUBLE DIAMOND	16507	100
DOUBLE DIAMOND	16078	99.98
INAMID	16495	99.98
SAMPAGUITA	15948	99.92
ZAMBOANGA	15945	99.92
DIAMOND XX (DOUBLE DIAMOND)	15514	99.92
DOUBLE DIAMOND	15942	99.92
UNKNOWN 5	16189	99.92
DOUBLE DIAMOND (MLANG)	16333	99.92
SUPER KALOY (VIETNAM RICE)	15559	99.92
MILAGROSA	15605	99.92
DIAMOND X	15889	99.92
ZAMBOANGA	16422	99.92
GOLIATH	15694	99.35
DIAMOND X	16510	99.34
DIAMOND X	15606	98.28
DESTINY	16094	95.93

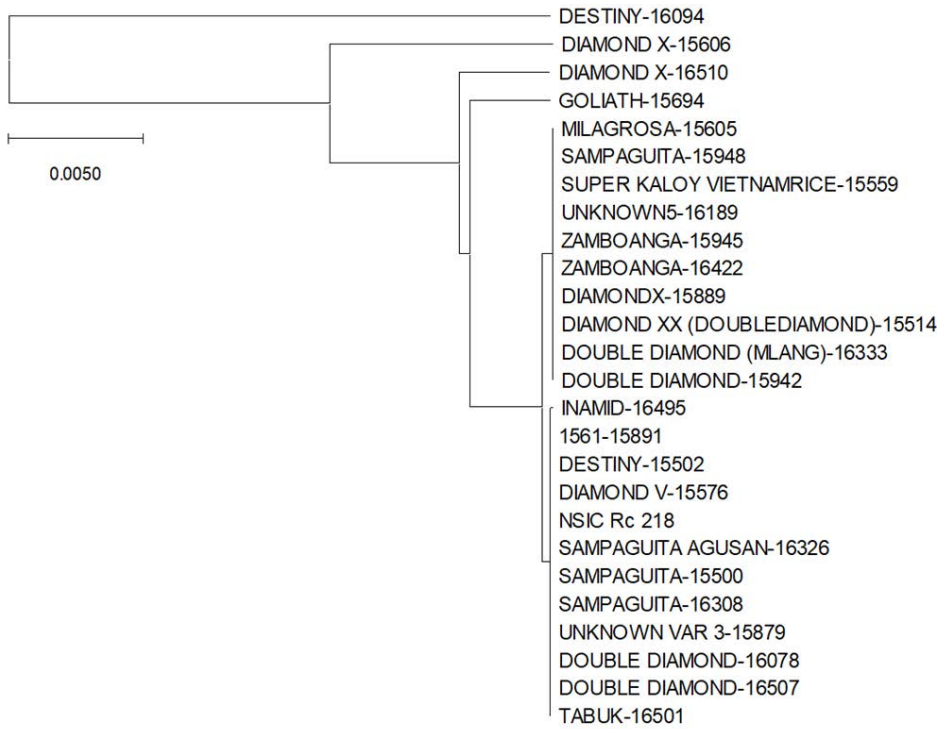

Figure 1. Phylogeny of NSIC Rc 218 and genetically similar FGRGs based on SNP genotyping.

PSB Rc 10

Twenty-nine FGRGs were found to be highly genetically similar (95-96%) to PSB Rc 10, a famous early-maturing variety. Representative genotypes were 1L29, Diamond X, Diamond X, Lawin, Genetics, Juan Rice, Ganador, Best Rice, Moryo-moryo, 216, and 75 Days (Table 2; Figure 2).

Table 2. FGRGs genetically similar to PSB Rc 10 and their respective similarity coefficients based on SNP genotyping.

FGRG	Collection No.	Similarity (%)
1L29	15565	96.41
DIAMOND X	16510	96.29
DIAMOND X	15512	96.09
LAWIN	15977	95.88
GENETICS	15572	95.81
JUAN RICE	16060	95.75
GANADOR	16063	95.70
BEST RICE	15885	95.53
MORYO-MORYO	16424	95.49
216	16399	95.48
75 DAYS	16509	95.44
M3	15850	95.34
GANAR	16038	95.34
DESTINY	16042	95.34
BELENA 205	15583	95.33
IL-29	15513	95.33
MASIGASIG 88	16503	95.33
DREAM RICE	15570	95.33
SUPER DIAMOND	15558	95.33
MESTIZA	15886	95.33
DESTINY	16093	95.32
GANAR	15650	95.32
GSR 12	15976	95.31
TOP RICE	15556	95.31
COMBAT	15969	95.31
MALAYA	16190	95.28
TRIPLE 1	15592	95.22
GLOBAL SUPER RICE	15970	95.12
DIAMOND X	15560	95.05

NSIC Rc 222

A total of 37 (11.04%) FGRGs had 95-97.5% similarity with NSIC Rc 222, popularly known to be one of the highest-yielding released varieties (NCT). The FGRGs identified to be highly similar (>97%) to Rc 222 included 1L29, Diamond X, Ganador, Diamond X, Super DX and Lawin (Table 3). The phylogeny of these entries depicting the relatedness is shown in Figure 3.

Table 3. FGRGs genetically similar to NSIC Rc 222 and their respective similarity coefficients based on SNP genotyping.

FGRG	Collection No.	Similarity (%)
1L29	15565	97.49
DIAMOND X	16062	97.43
GANADOR	16063	97.33
DIAMOND X	16510	97.21
SUPER DX	16425	97.17
LAWIN	15977	97.15
DIAMOND X	15560	96.98
BEST RICE	15885	96.93
DESTINY	16042	96.82
SUPER DIAMOND	15558	96.81
BELENA 205	15583	96.81
IL-29	15513	96.81
MESTIZA	15886	96.81
DREAM RICE	15570	96.81
GANAR	15650	96.81
MASIGASIG 88	16503	96.81
COMBAT	15969	96.80
DESTINY	16093	96.80
TOP RICE	15556	96.80
GSR 12	15976	96.80
SUPER DX	15401	96.75
MALAYA	16190	96.72
TRIPLE 1	15592	96.69
GANAR	16038	96.65
DIAMOND X	15512	96.58
WINNER RICE	16061	96.52
UNIVERSAL RICE	15552	96.33
GLOBAL SUPER RICE	15970	96.23
DREAM RICE	15575	96.06
M3	15850	95.95
DIAMOND	15840	95.95
GENETICS	15572	95.70
TRIPLE R	15517	95.52
OFFSPRING	16307	95.51
DIAMOND X	15563	95.40
IMPROVED 222	16075	95.28
KINAVITE	16035	95.06
C-4	16505	95.04
M5-BD	16370	95.01

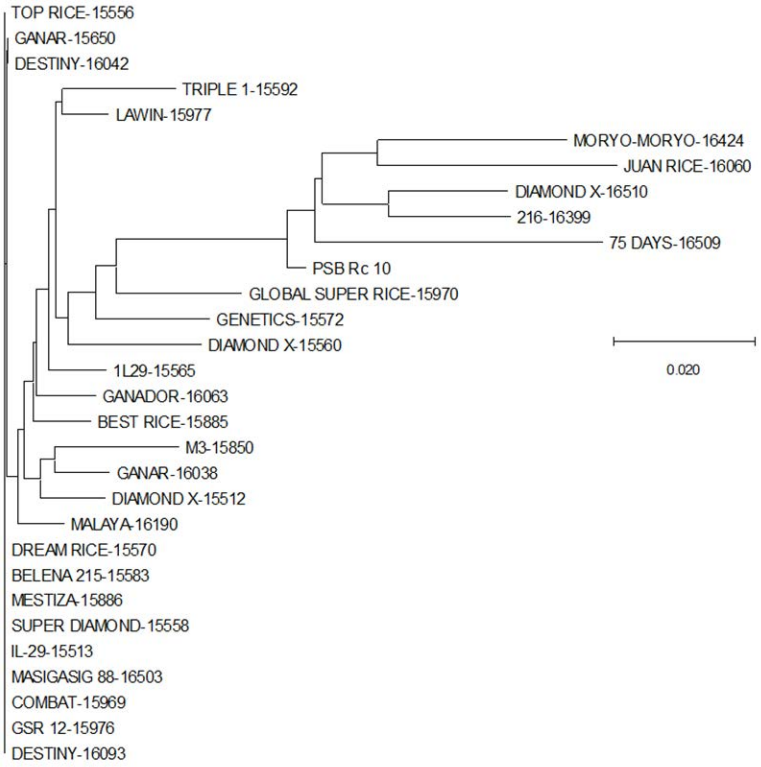

Figure 2. Phylogeny of PSB Rc 10 and genetically similar FGRGs based on SNP genotyping.

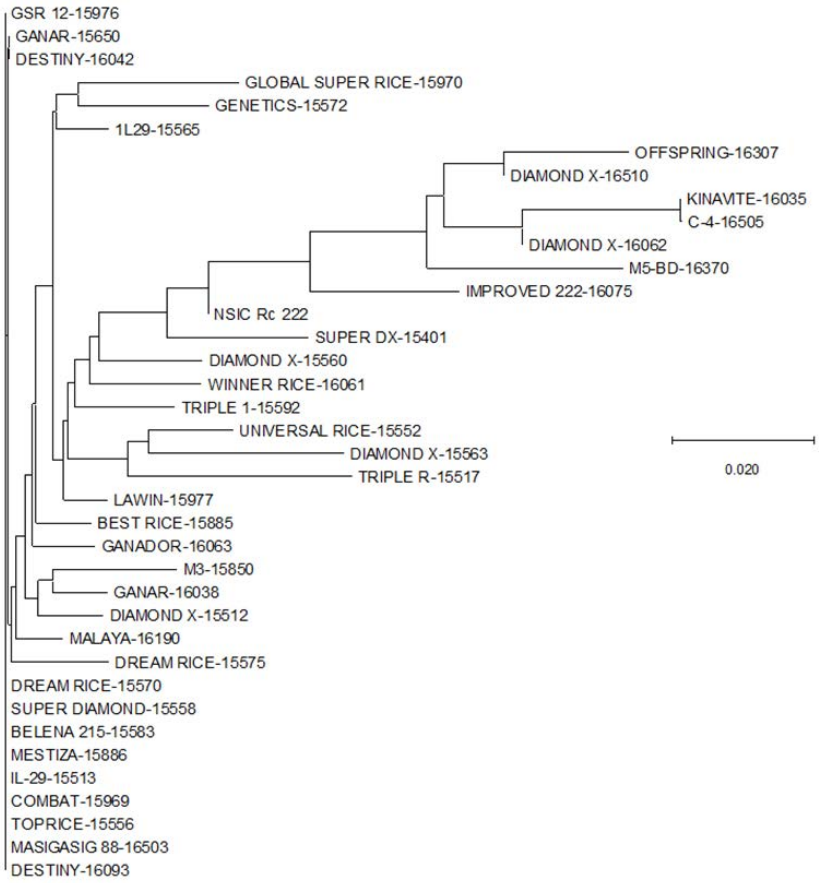

Figure 3. Phylogeny of NSIC Rc 222 and genetically similar FGRGs based on SNP genotyping.

Various RIVs

Eight FGRGs had ≥95% genetic similarity with NSIC Rc 148, seven with NSIC Rc 294 (Table 4, Figure 4), six with NSIC Rc 216, and five with NSIC Rc 138 (Table 5, Figure 5). The FGRG R5 (15599) is genetically similar to PSB Rc 3; Aerobic Rice (15657) and Balaki (15659) to PSB Rc 9, and Aerobic Rice (15635) and Diamond X (15636) to NSIC Rc 23 (Table 6, Figure 6). In addition to the list, Tudy Tudy (16514) showed 100% similarity with NSIC Rc 122 (Table 7, Figure 7), and Moryo-moryo (15954) with NSIC Rc 400 (Table 8, Figure 8).

Table 4. FGRGs related to NSIC Rc 148 and NSIC Rc 294 and their respective similarity coefficients.

FGRG	Collection No.	Similarity (%)	
		NSIC Rc 148	NSIC Rc 294
UP & DOWN	15877	98.65	96.08
M5-BD	16370	97.62	96.33
EXCEL RICE	15571	97.15	95.21
BWS-6W	16344	97.15	95.2
DIAMOND X	16510	96.71	96.23
EL GRANDE	16303	95.77	94.31
PALAY CHU	16304	95.29	95.05
DIAMOND X	16076	95.26	93.86
DIAMOND X	16062	94.83	95.26

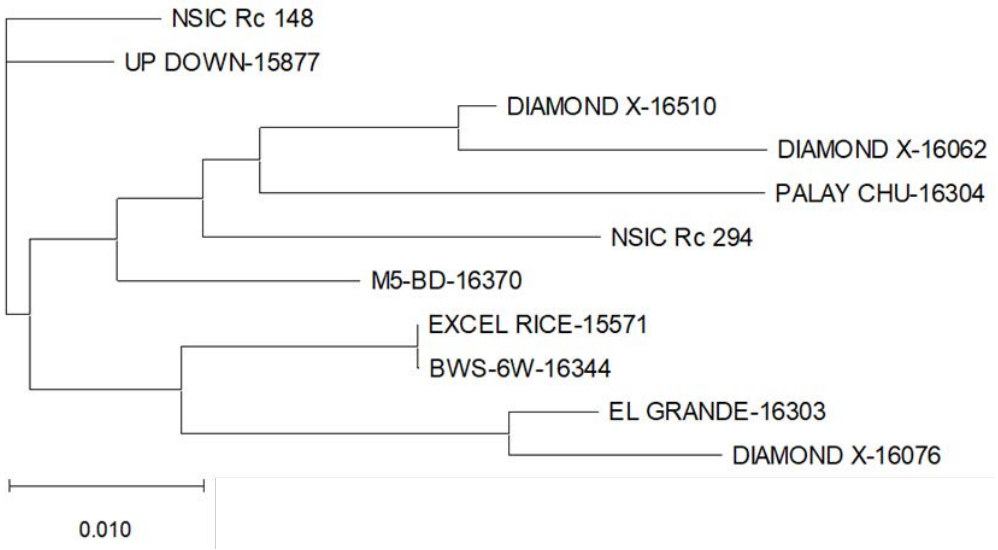

Figure 4. Phylogeny of NSIC Rc 148 and NSIC Rc 294 and closely related FGRGs.

Table 5. FGRGs related to NSIC Rc 138, Rc 128, Rc 216, and Rc 224 and their respective similarity coefficients.

FGRG	Collection No.	Similarity (%)			
		NSIC Rc 138	NSIC Rc 128	NSIC Rc 216	NSIC Rc 224
DIAMOND X	16062	97.53	93.46	98.80	94.06
KINAVITE	16035	98.18	92.17	96.06	93.33
C-4	16505	98.16	92.20	96.04	93.38
UNKNOWN VAR 2	15878	95.46	91.74	95.14	93.00
OFFSPRING	15501	94.70	91.93	94.54	90.78
ARIGATO	16318	92.83	97.22	92.07	90.25
ARIGATO	15941	92.48	96.89	91.75	90.05
DIAMOND X	16510	96.65	95.60	98.51	95.38

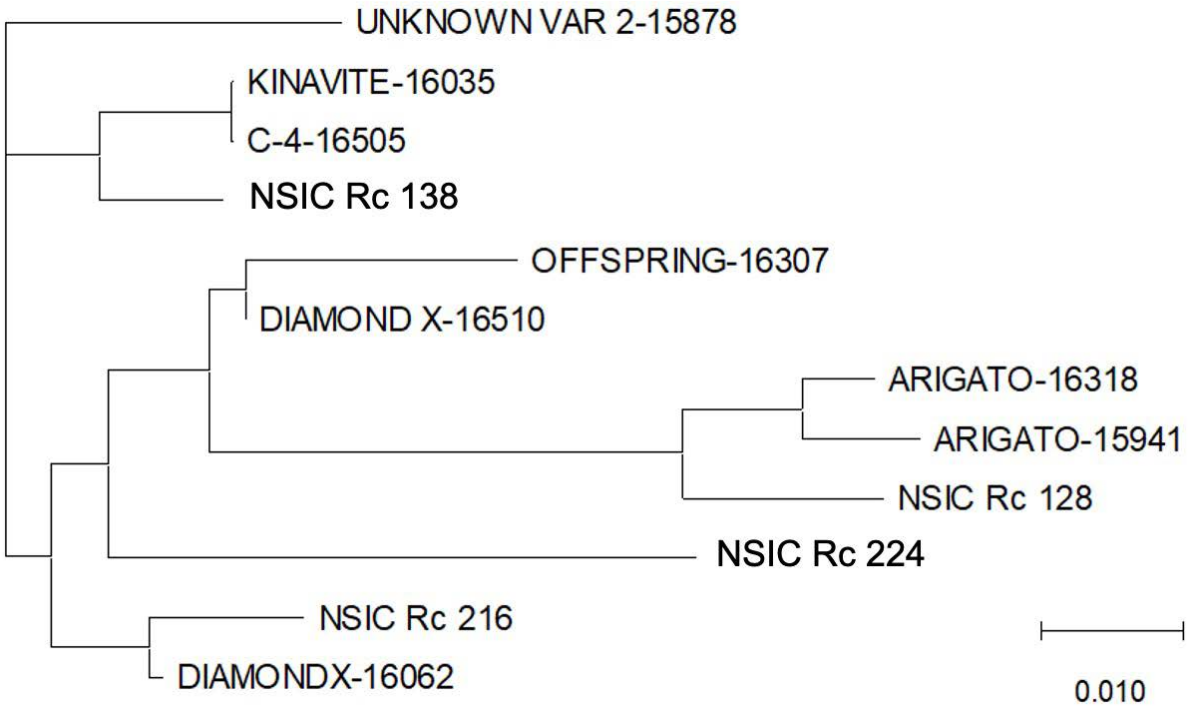

Figure 5. Phylogeny of NSIC Rc 138, Rc 128, Rc 216, and Rc 224 and closely related FGRGs.

Table 6. FGRGs related to PSB Rc 3, NSIC Rc 9, NSIC Rc 23, and NSIC Rc 25 and their respective similarity coefficients.

FGRG	Collection No.	PSB Rc 3	NSIC Rc 9	NSIC Rc 23	NSIC Rc 25
BALAKI	15659	93.55	100.00	94.81	97.21
AEROBIC RICE	15657	93.55	100.00	94.81	97.21
AEROBIC RICE	15635	90.03	94.88	99.84	92.90
DIAMOND X	15636	89.58	94.43	99.78	92.86
AEROBIC	16040	93.40	93.66	90.29	92.56
R5	15599	99.89	93.47	89.87	91.07
BURDAGOL	15892	91.58	92.48	90.74	91.55
PINOLO	16194	93.89	92.45	88.86	90.85
INTAN/MIRACLE	16195	93.53	91.58	88.41	90.28

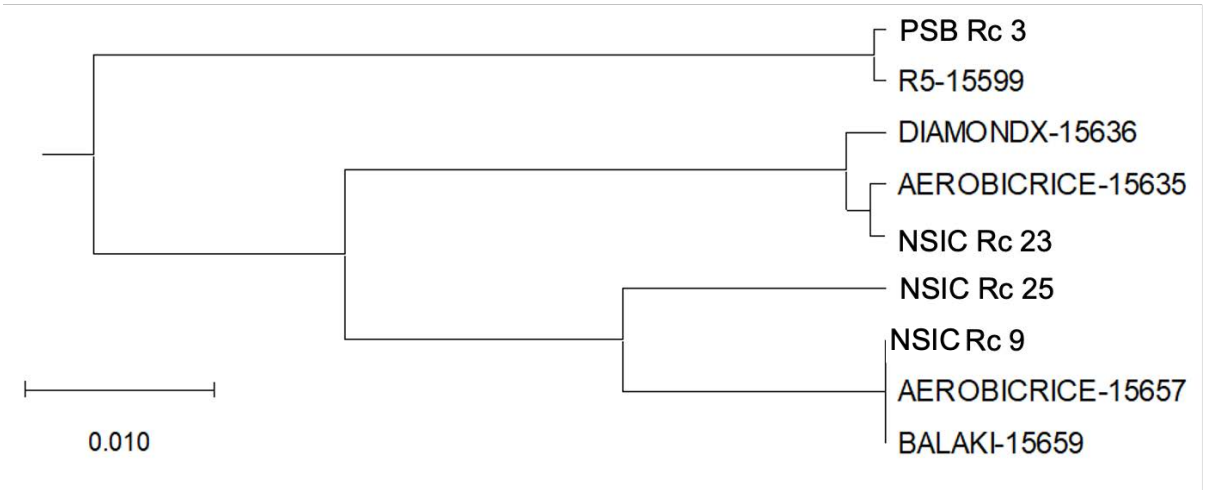

Figure 6. Phylogeny of PSB Rc 3, NSIC Rc 9, NSIC Rc 23, and NSIC Rc 25 and closely related FGRGs.

Table 7. FGRGs related to NSIC Rc 122 and their respective similarity coefficients.

FGRG	Collection No.	Similarity (%)
TUDY-TUDY	16514	100
ANGELICA	16337	94.50
SAIGON	15849	93.88

Table 8. FGRGs related to NSIC Rc 400 and their respective similarity coefficients.

FGRG	Collection No.	Similarity (%)
MORYO-MORYO	15954	100
MORYO-MORYO	16424	96.67
JUAN RICE	16060	93.07
MILAGROSA	16079	91.45

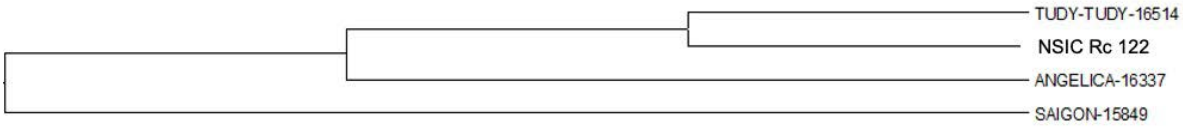

Figure 7. Phylogeny of NSIC Rc 122 and closely related FGRGs.

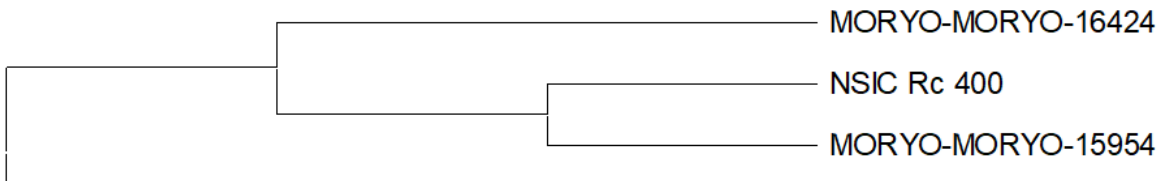

Figure 8. Phylogeny of NSIC Rc 400 and closely related FGRGs.

Genetically similar FGRGs

Pairwise similarity coefficients revealed that 17 FGRGs are 99.9 to 100% genetically similar. Representatives include Sampaguita, Diamond XX (Double Diamond), Double Diamond, Super Kaloy (Vietnam Rice), Unknown 5, Milagrosa, Double Diamond (Mlang), Diamond X, and Zamboanga (Table 9). These FGRGs with similar identity based on genotypic data were collected from various locations in the country. Results proved that renaming of farmers' genotypes is rampant.

Table 9. Identified FGRGs that are 100% genetically similar based on SNP genotyping.

FGRG	Collection No.
SAMPAGUITA	15948
DIAMOND XX (DOUBLE DIAMOND)	15514
DOUBLE DIAMOND	15942
SUPER KALOY (VIETNAM RICE)	15559
UNKNOWN 5	16189
MILAGROSA	15605
DOUBLE DIAMOND (MLANG)	16333
DIAMOND X	15889
ZAMBOANGA	16422
TABUK	16501
DOUBLE DIAMOND	16507
1561	15891
UNKNOWN VAR 3	15879
SAMPAGUITA	15500
SAMPAGUITA	16308
DIAMOND V	15576
SAMPAGUITA (AGUSAN)	16326

DISCUSSION

Establishing the genetic identity of RIVs and FGRGs is of utmost importance for proper dissemination and deployment of varieties adapted to specific growing ecosystems and for adequate policy and strategy development as well. However, to properly assess the FGRGs' true identity, genetic identity of check RIVs must be established first, along with the seed source references. Kretzschmar et al. (2018) highlighted the importance of accurate genetic identification and establishment of seed references in their study as they were able to verify the significant lack of authenticity among modern varieties planted across Bangladesh. DNA fingerprinting provided important insights on the genetic identity and relationship among the collected FGRGs and RIV checks as well.

An evaluation of genetic correlations among FGRGs and RIVS showed an average of 87.21% similarity coefficient, with multiple FGRGs identified to be 99-100% similar to RIVs. Since there are still no established guidelines in assessing the genetic identity of varieties in the Philippines, we considered a threshold of 99% similarity to be genetically identical. Considering that the assembled panels of collected FGRGs are hypothesized to be related to the released varieties or modern breeding lines, the obtained values are expected. Of the collected FGRGs, 7.16% were observed to have 99-100% similarity coefficients with the soft-textured and aromatic NSIC Rc 218. Thus, these FGRGs can be declared as NSIC Rc 218.

A similar study was conducted by Yamano et al. (2017) where they identified 7% of the seed samples collected from farmers' fields in Bangladesh having 99-100% similarity with submergence-tolerant rice varieties. Furthermore, 5.97% of the collected FGRGs were found to be identical. This result reveals similar preferences of farmers despite the different labels/ names given to rice varieties. These varieties may have been collected and renamed by farmers for their personal use. Furthermore, it gives insights on the dissemination and adaptation of rice varieties in different rice-growing environments in the country.

RECOMMENDATIONS

DNA fingerprinting was successfully employed to provide molecular genotyping of FGRGs and RIVs in this study. Through similarity coefficients calculated based on DNA polymorphisms, relationships between and among FGRGs and RIVs were elucidated. The genetic identity of FGRGs and RIV checks as reference varieties was established as well. Molecular genotypic data divulged that multiple collected FGRGs were identical to RIVs and other FGRGs. Most of the FGRGs possessing similar names such as "Diamond" were found to be identical despite having been collected from many provinces. Multiple FGRGs from different provinces were also found to be highly similar despite having respective names, thereby providing insights on how seeds are disseminated and what varieties farmers prefer to cultivate.

An efficient naming and varietal identification system of RIVs in the Philippines is important and should be reconsidered to enable farmers to easily retain the real identity of the varieties they use in the field. The use of farmers' non-standard nomenclature system is not reliable since most of the names were based on farmers' preferences or on the brands coming from marketing entities. Unfortunately, assessing the correct varietal identity using morphological characterization alone is difficult. There is thus a need to establish a standard reference system using molecular markers to back up the phenotypic evaluation or grow-out data. Furthermore, policies must be updated to address the utilization of non-accredited seeds and to protect intellectual property as well.

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CHAPTER 6

Reactions to Pests and Diseases of Farmer-Grown Rice Genotypes

Isagane V. Boholano, Aldrin Y. Cantila, Jose Arnel E. Cordova, Sailila E. Abdula

Filipino farmers often change rice variety by procuring new seeds or by saving their own harvest in exchange with other farmers. Released varieties are tested in DA-PhilRice research stations to showcase their initial performance and simultaneously promote the variety. However, farmers are not convinced with the commercial varieties and mostly prefer farmer-grown rice genotypes (FGRGs). One of the reasons is the limited access to seeds (released varieties) along with their complete genetic or phenotypic information (www.knowledgebank.irri.org)

Rice farmers are knowledgeable about plant attributes and use these as criteria in selecting the best plants in the field (Hancock, 1992; Longley et al., 1993). These attributes would later be used as the FGRG name, which also relate to their agronomic performance such as flowering time, earliness and yield with or without inputs, or to their adaptation towards environmental factors; type of soil or resistance to certain pests and diseases. FGRGs may have unique genetic traits against insect pest and diseases, as well as adaptation to environmental changes like drought, soil salinity, which eventually leads to better (increased) yield and nutritional value. FGRGs are undocumented genetic resources, containing important genes that could help improve rice breeding and development.

Thus, evaluation of insect pests and disease resistance in all collected FGRGs in the Philippines is necessary to identify resistance and susceptibility. The study evaluated 335 FGRGs obtained from irrigated and rainfed areas against major insect pests and diseases at the DA-PhilRice Midsayap and Negros Branch Stations.

A. Leaf blast (*Pyricularia grisea*)

Spreader rows of susceptible check CO39 were planted around the nursery plot. Five grams of seeds per entry were planted in a 50 cm row with 10 cm spacing. Every 10 rows of a test entry, one row each of the standard susceptible check IR72, resistant check, and susceptible check CO39 were planted. Test plants were evaluated at 30-35 days after sowing (NSIC, 1997) using the rating scale below (Table 1).

B. Bacterial leaf blight (BLB)

Collected FGRGs were subjected to BLB tolerance screening through the clipping method. At 45 days after transplanting (DAT), 1-2 cm of the leaf tip was cut with a pair of scissors previously dipped in a bacterial suspension of 109 cfu/ml. The assessment of disease severity started at 14 days after inoculation using the rating scale below (Table 2).

C. Sheath blight (*Rhizoctonia solani*)

Transplanted in the field at 20 x 20 cm between rows were 25-day-old seedlings at 10 hills per entry. Every 10 rows of a test entry, one row each of the standard susceptible check IR20 and the local susceptible check TN1 were planted. At 45-60 DAT, inoculation was done by placing cultured organisms in between tillers. Two weeks after inoculation, disease was evaluated using the rating scale in Table 3.

D. Rice tungro virus (modified field)

Spreader rows using susceptible check (TN1 or NSIC Rc160) were transplanted as border one month before transplanting the test entries. When the spreader rows showed infection, 20-25-day-old seedlings of the test entries were transplanted in the inner rows perpendicular to the spreader rows.

Table 1. Rating scale for rice blast screening used in the study, 2019 Wet Season.

Rating Scale	Description	Disease Reaction
0	No lesions observed	
1	Few small brown specks of pinhead size	Resistant (R)
2	Larger brown specks	
3	Small, round, necrotic gray spots about 1-2 mm in diameter with brown margin	
4	Elliptical lesion 1-2 cm long, usually confined to the area of the two main veins, range of 1-5 lesions on a leaf	Intermediate (I)
5	Range of 6-10 lesions on a leaf or less than 10% of leaf area infected	
6	Average of 11-25% leaf area infected	
7	Average of 26-50% leaf area infected	Susceptible (S)
8	Average of 51-75% leaf area infected	
9	Average of above 75% leaf area infected	

Table 2. Rating scale for bacterial leaf blight screening used in the study, 2019 Wet Season.

Rating Scale	Description	Disease Reaction
	Lesions from cut tip cover 1-5% of the leaf	
3	Lesions from cut tip show blight chlorotic symptoms, 6-24% lesion area	Resistant (R)
5	Downward length of lesion from cut tip covers 1/4 to 1/2 leaf area with chlorotic symptoms, 25-50% lesion area	Intermediate (I)
7	Downward length of lesions from cut tip may extend 3/4 of leaf with chlorotic symptoms, 51-75% lesion area	Susceptible (S)
9	Lesions cover > 75% of the leaf and reaching the leaf sheath	

Table 3. Rating scale for sheath blight screening used in the study, 2019 Wet Season.

Rating Scale	Description	Disease Reaction
0	No infection observed	
1	Lesions limited to lower 1/4 of leaf sheath area	Resistant (R)
3	Lesions present at the lower 1/2 of leaf sheath area	
5	Lesions present on more than 1/2 of leaf sheath area; Slight infection on lower 3rd or 4th leaves	Intermediate (I)
7	Lesions present on more than 3/4 of the leaf sheath; Severe infection on upper leaves	
9	Lesions reaching top of tillers; severe infection on all leaves and some plants died	Susceptible (S)

The test entries were evaluated at 45-60 DAT using the scale in Table 4.

Table 4. Rating scale for rice tungro virus screening used in the study, 2019 Wet Season.

Percent Infection	Disease Reaction
0 - 25% infection	Resistant (R)
26 - 50% infection	Intermediate (I)
51 - 100% infection	Susceptible (S)

E. Stem borer (SB) and Rice Black Bug (RBB)

Schedule of planting should coincide with the peak of the SB and RBB populations in the area. Seedlings of FGRGs aged 21 days old were transplanted 1-2 plants per hill at 20 cm spacing between hills and rows. Each plot consisted of three 3-meter rows each with 15 hills, or 45 hills per plot replicated three times. Five rows of susceptible variety (preferably TN 1 and/or IR 8) were planted as border rows 15 days before transplanting the test entries. Test entries were scored at 10 days before harvest for whiteheads damage. The incidence of SB was recorded on all the 20 hills per culture. The total tillers and number/percent whiteheads were worked out using the following formula:

$$\% \text{ Whiteheads} = \frac{\text{Total number of whiteheads}}{\text{Total number of tillers}} \times 100$$

Based on the damage rating and scale, the status of the FGRGs was determined by following the rating scale in Table 5.

Table 5. Rating scale for stem borer and rice black bug screening used in the study, 2019 Wet Season.

Rating Scale	Whitehead	Disease Reaction
0	No injury	
1	1-5 %	Resistant (R)
3	6-10 %	
5	11-15 %	Intermediate (I)
7	16-25 %	
9	26 and above	Susceptible (S)

RESULTS AND DISCUSSION

Of the 335 FGRGs tested against major pests and diseases (Figure 1), 39 showed resistance to rice blast, 12 to sheath blight, 13 to BLB, and 21 to tungro disease. None was resistant to RBB and SB. Most of the resistant genotypes had adult plant resistance that manifested at the maximum tillering stage of the crop. Additionally, 70 entries showed intermediate reaction to SB, 71 to RBB, 56 to rice blast, 68 to sheath blight, 67 to BLB, and 73 to rice tungro.

Among the 335 FGRGs, 58 showed multiple reactions (intermediate to resistant) to certain pests and diseases (Table 6). These materials could be used in hybridization programs for varietal improvement against the rice stem borer, RBB, rice blast, BLB and tungro. As breeding for resistance to pathogens or insect pests entails assembling and maintaining sources of resistance genes, the backcross method of breeding is commonly used to transfer the genes into adapted cultivars after a desirable source has been found.

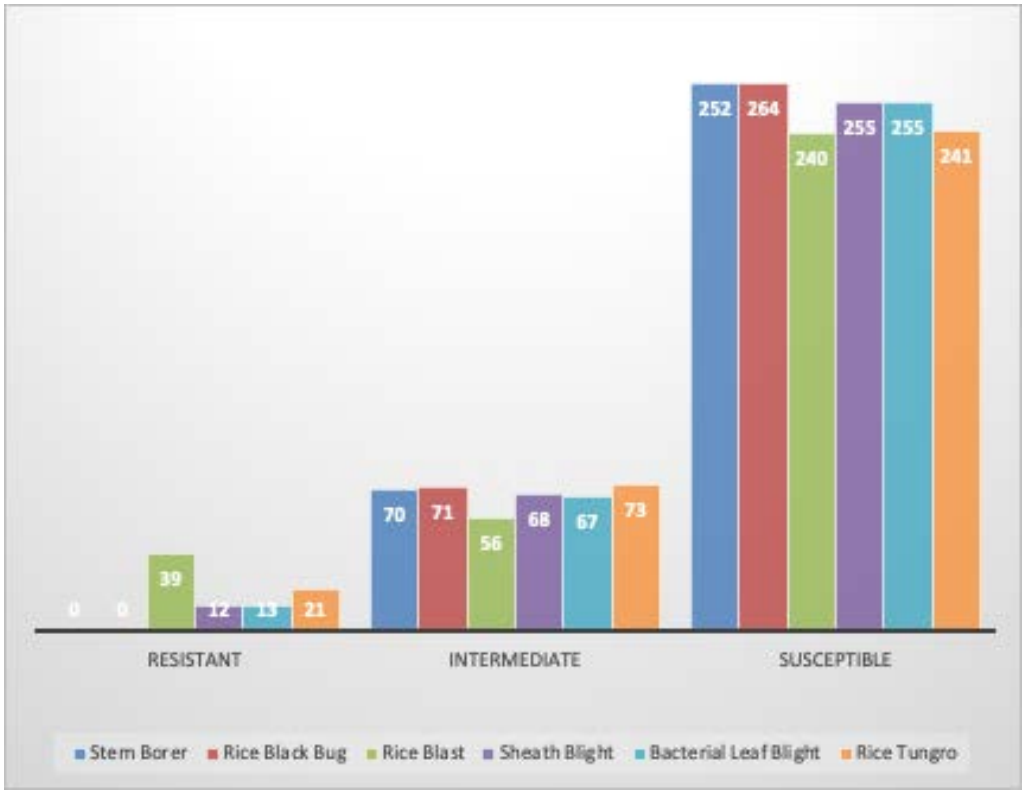

Figure 1. FGRGs evaluated against major pests and diseases in rice.

Furthermore, breeding for pest resistance differs fundamentally from breeding for other traits because the introduced resistance may cause a change in the evolving and variable pest or pathogen population (Acquaah, 2012). The genes for resistance cannot be identified unless the plant containing the genes is interacting with the pathogen or insect pest in an environment where plants are normally susceptible to disease. Plant breeders must develop a segregating population with adequate diversity to include the desired combination of genes of interest.

However, a major problem in breeding for resistance to disease and insect pests is the fact that, over time, the crop cultural environment changes (e.g., different production methods and inputs) as well as pathogens and pests (through evolution). Breeders need to keep up with these changes by developing new cultivars with appropriate resistance genes, in order to ensure the stability of crop production, by preventing the development of destructive epiphytotic infestations, and to reduce the annual loss of products from pathogens and pests (McDonald et al., 2002). The breeder should guard against breeding highly resistant cultivars that have no economic worth. A good strategy is to breed for middling resistance with high yield.

Many FGRGs were evaluated in this project, and showed intermediate to resistant reactions against the major pests and diseases in rice (Table 7). To this end, breeding for polygenic horizontal resistance is the most desirable strategy since it accounts for most middling resistance. It should be pointed out that some single-gene resistance effects do not confer immunity on the cultivar (Johnson,1984).

Therefore, the information revealed from this project could be helpful in rice pest and disease management, and in utilizing these resistant and intermediate genotypes for further resistance breeding programs.

Table 6. FGRGs with multiple reactions, from intermediate to resistant, against major insect pests and diseases.

Passport Data			Rating and Reaction											
Index	Collection No.	Name	Blast		Sheath Blight		Bacterial Leaf Blight		Rice Tungro (% Infection)		Stem Borer		Rice Black Bug	
11	15496	M3 BARAKO	-	-	5	I	5	I	20	R	-	-	-	-
12	15497	PEDRO	-	-	5	I	5	I	20	R	-	-	5	I
14	15499	M3	3	R	5	I	5	I	15	R	5	I	5	I
17	15502	DESTINY	3	R	5	I	5	I	25	I	5	I	5	I
24	15512	DIAMOND X	3	R	5	I	5	I	30	I	5	I	5	I
25	15513	IL-29	3	R	5	I	5	I	35	I	5	I	5	I
33	15556	TOP RICE	3	R	5	I	5	I	30	I	5	I		
37	15560	DIAMOND X	3	R	5	I	5	I	30	I	5	I	5	I
38	15561	DIAMOND X	3	R	5	I	5	I	45	I	5	I	5	I
40	15563	DIAMOND X	3	R	5	I	5	I	45	I	5	I	5	I
42	15565	1L29	3	R	5	I	5	I	35	I	5	I	5	I
45	15570	DREAM RICE	3	R	5	I	3	R	35	I	5	I	5	I
47	15572	GENETICS	1	R	5	I	5	I	15	R	-	-	5	I
49	15574	BELENA 215	3	R	5	I	5	I	35	I	5	I	5	I
54	15579	GREEN SUPER RICE NO.8	-	-	5	I	5	I	25	R	7	I		
56	15581	DIAMOND X	5	I	5	I	5	I	35	I	5	I	5	I
62	15599	R5	3	R	5	I	5	I	35	I	7	I		
64	15606	DIAMOND X	5	I	3	R	3	R	45	I	5	I	5	I
67	15636	DIAMOND X	5	I	3	R	3	R	35	I	5	I	5	I
68	15650	GANAR	5	I	3	R	3	R	35	I	5	I	5	I
88	15839	BULAW	3	R	5	I	5	I	20	R	-	-	5	I
98	15850	M3	3	R	5	I	5	I	20	R	-	-	5	I
107	15886	MESTIZA	3	I	5	I	5	I	45	I	5	I	5	I
110	15889	DIAMOND X	5	I	3	R	3	R	40	I	5	I	5	I
115	15894	DASH 9	3	R	5	I	3	R	40	I	7	I	5	I
137	15969	COMBAT	3	I	5	I	5	I	45	I	5	I	5	I
154	16062	DIAMOND X	3	I	5	I	5	I	40	I	5	I	5	I
155	16063	GANADOR	5	I	3	R	3	R	40	I	5	I	5	I
166	16075	IMPROVED 222	3	R	3	R	3	R	30	I	5	I	5	I
168	16077	VIETNAM	3	R	5	I	9	S	25	R	5	I	5	I
171	16080	MESTISA	5	I	3	R	3	R	35	I	5	I	5	I
178	16087	M3	3	R	3	R	5	I	30	I	5	I	5	I
184	16093	DESTINY	3	I	5	I	5	I	45	I	5	I	5	I
185	16094	DESTINY	5	I	3	R	3	R	40	I	5	I	5	I
221	16312	BOTOY	5	I	5	I	5	I	40	I	5	I	5	I
222	16313	M3-BARAKO	5	I	5	I	5	I	40	I	5	I	5	I
224	16315	M3-BANGA	5	I	5	I	5	I	40	I	5	I	5	I
257	16348	C4 TYSAN	-	-	5	I	5	I	45	I	5	I	5	I
258	16349	CAROVAN	-	-	5	I	5	I	25	R	5	I	5	I
259	16351	DIWATA	-	-	5	I	5	I	25	R	5	I	5	I
294	16392	TRES MARIAS	5	I	5	I	5	I	45	I	5	I	5	I
296	16394	TAP 1	3	R	5	I	5	I	45	I	5	I	5	I
301	16400	112-4	3	R	-	-	5	I	20	R	5	I	5	I
302	16418	R.I.300	3	R	3	R	5	I	20	R	5	I	5	I
303	16419	DCL-300	3	R	5	I	5	I	45	I	5	I	5	I
305	16421	RTS-12-B	5	I	5	I	5	I	50	I	5	I	5	I
309	16426	RTS 12A	5	I	5	I	5	I	25	R	-	-	-	-
310	16427	RED 18	3	R	5	I	3	R	35	I	5	I	5	I
311	16428	M3 (SURALLAH)	-	-	5	I	5	I	25	R	5	I	5	I
317	16436	INBRED-300	5	I	5	I	5	I	45	I	5	I	5	I
318	16437	BARAKO 64	3	R	5	I	5	I	25	R	5	I	5	I
321	16497	VIETNAM RICE	-	-	-	-	3	R	25	R	5	I	5	I

Note: R- Resistant, I- Intermediate, S- Susceptible

Table 6. (continuation)

Passport Data			Rating and Reaction											
Index	Collection No.	Name	Blast		Sheath Blight		Bacterial Leaf Blight		Rice Tungro (% Infection)		Stem Borer		Rice Black Bug	
323	16499	75 DAYS	-	-	5	I	5	I	-	-	5	I	5	I
327	16504	TRIPLE 2	5	I	5	I	5	I	45	I	5	I	5	I
332	16509	75 DAYS	-	-	3	R	5	I	25	R	5	I	5	I

Table 7. Results of evaluation on collected FGRGs in the Philippines against major insect pests and diseases, 2019 WS.

Passport Data			Rating and Reaction											
Index	Collection No.	Name	Blast		Sheath Blight		Bacterial Leaf Blight		Rice Tungro (% Infection)		Stem Borer		Rice Black Bug	
1	15400	BARAKO	7	S	5	I	7	S	60	S	5	I	7	S
2	15401	SUPER DX	7	S	5	I	7	S	55	S	5	I	7	S
3	15402	DCL-300	3	R	7	S	9	S	85	S	5	I	9	S
4	15403	IRIG	7	S	7	S	9	S	65	R	7	I	9	S
5	15455	INDEX 6	7	S	9	S	9	S	85	S	7	S	9	S
6	15456	DASH-12	5	I	7	S	9	S	75	S	9	S	9	S
7	15457	3-MILLION	5	I	7	S	9	S	35	I	9	I	7	S
8	15458	M-41	7	S	7	S	9	S	70	S	7	S	7	S
9	15459	BODIDOY	9	S	7	S	9	S	30	I	9	S	9	S
10	15495	HR400	9	S	9	S	9	S	35	I	9	S	7	S
11	15496	M3 BARAKO	9	S	5	I	5	I	20	R	9	S	9	S
12	15497	PEDRO	7	S	5	I	5	I	20	R	7	S	5	I
13	15498	SINANDOMING	3	R	7	S	9	S	75	S	7	S	9	S
14	15499	M3	3	R	5	I	5	I	15	R	5	I	5	I
15	15500	SAMPAGUITA	9	S	9	S	9	S	65	S	7	S	7	S
16	15501	OFFSPRING	9	S	9	S	9	S	70	S	9	S	9	S
17	15502	DESTINY	3	R	5	I	5	I	25	I	5	I	5	I
18	15503	INDIAN RICE	9	S	7	S	7	S	75	S	9	S	9	S
19	15504	EL GRANDE	5	I	7	S	7	S	70	S	9	S	9	S
20	15505	KULAPO	5	I	9	S	7	S	25	R	7	S	7	S
21	15506	ZAMBOANGA RICE	3	R	7	S	7	S	75	S	7	S	7	S
22	15507	TITO-TITO	9	S	7	S	9	S	60	S	7	S	9	S
23	15508	S-14	7	S	7	S	9	S	30	I	9	S	7	S
24	15512	DIAMOND X	3	R	5	I	5	I	30	I	5	I	5	I
25	15513	IL-29	3	R	5	I	5	I	35	I	5	I	5	I
26	15514	DIAMOND XX (DOUBLE DIAMOND)	7	S	7	S	7	S	60	S	9	S	9	S
27	15515	GSR 2	7	S	9	S	5	I	85	S	7	S	9	S
28	15517	TRIPLE R	7	S	9	S	9	S	80	S	7	S	9	S
29	15552	UNIVERSAL RICE	5	I	5	I	9	S	70	S	7	S	9	S
30	15553	JDF 300 PLUS	7	S	7	S	7	S	75	S	9	S	7	S
31	15554	711	7	S	7	S	7	S	75	S	9	S	9	S
32	15555	JAPANIRI	3	R	7	S	9	S	55	S	7	S	7	S
33	15556	TOP RICE	3	R	5	I	5	I	30	I	5	I	7	S
34	15557	TRIPLE 3	9	S	7	S	5	I	60	S	7	S	9	S
35	15558	SUPER DIAMOND	5	I	5	I	9	S	30	I	5	I	7	S
36	15559	SUPER KALOY (VIETNAM RICE)	9	S	7	S	9	S	75	S	7	S	9	S
37	15560	DIAMOND X	3	R	5	I	5	I	30	I	5	I	5	I
38	15561	DIAMOND X	3	R	5	I	5	I	45	I	5	I	5	I
39	15562	HIGH RICE	9	S	7	S	9	S	75	S	9	S	9	S
40	15563	DIAMOND X	3	R	5	I	5	I	45	I	5	I	5	I
41	15564	SUPPER DIAMOND X	7	S	7	S	7	S	75	S	7	S	7	S

Note: R- Resistant, I- Intermediate, S- Susceptible

Table 7. (continuation)

Passport Data			Rating and Reaction											
Index	Collection No.	Name	Blast		Sheath Blight		Bacterial Leaf Blight		Rice Tungro (% Infection)		Stem Borer		Rice Black Bug	
42	15565	1L29	3	R	5	I	5	I	35	I	5	I	5	I
43	15566	46	7	S	7	S	7	S	75	S	7	S	7	S
44	15567	401	7	S	9	S	7	S	65	S	7	S	9	S
45	15570	DREAM RICE	3	R	5	I	3	R	35	I	5	I	5	I
46	15571	EXCEL RICE	7	S	7	S	9	S	30	I	7	S	9	S
47	15572	GENETICS	1	R	5	I	5	I	15	R	7	S	5	I
48	15573	AS 411	7	S	7	S	9	S	65	S	7	S	9	S
49	15574	BELENA 219	3	R	5	I	5	I	35	I	5	I	5	I
50	15575	DREAM RICE	7	S	7	S	9	S	75	S	7	S	9	S
51	15576	DIAMOND V	9	S	9	S	7	S	65	S	9	S	7	S
52	15577	JFD 300 PLUS	9	S	9	S	7	S	60	S	9	S	7	S
53	15578	R-DANNY	3	R	9	S	7	S	85	S	7	S	7	S
54	15579	GREEN SUPER RICE NO.8	7	S	5	I	5	I	25	R	7	I	7	S
55	15580	JAPANIRI	7	S	5	I	5	I	35	I	7	S	9	S
56	15581	DIAMOND X	5	I	5	I	5	I	35	I	5	I	5	I
57	15582	MAHARLIKA	7	S	7	S	7	S	65	S	7	S	5	I
58	15583	BELENA 215	7	S	9	S	9	S	75	S	9	S	5	I
59	15589	GSR 8	7	S	5	I	7	S	30	I	7	I	9	S
60	15591	REALINE	7	S	7	S	7	S	20	R	7	I	5	I
61	15592	TRIPLE 1	5	I	7	S	7	S	75	S	9	S	9	S
62	15599	R5	3	R	5	I	5	I	35	I	7	I	7	S
63	15605	MILAGROSA	5	I	3	R	5	I	65	S	7	S	9	S
64	15606	DIAMOND X	5	I	3	R	3	R	45	I	5	I	5	I
65	15625	BASMATI	7	S	7	S	7	S	75	S	9	S	9	S
66	15635	AEROBIC RICE	9	S	9	S	9	S	75	S	9	S	9	S
67	15636	DIAMOND X	5	I	3	R	3	R	35	I	5	I	5	I
68	15650	GANAR	5	I	3	R	3	R	35	I	5	I	5	I
69	15651	BULAW	9	S	9	S	7	S	80	S	7	S	7	S
70	15652	RED RICE	9	S	7	S	9	S	60	S	7	S	7	S
71	15653	BLACK RICE	7	S	7	S	7	S	75	S	9	S	7	S
72	15654	BLONDE	7	S	7	S	7	S	60	S	7	S	9	S
73	15655	BOLAO	7	S	9	S	9	S	60	S	7	S	9	S
74	15657	AEROBIC RICE	9	S	9	S	7	S	60	S	9	S	7	S
75	15659	BALAKI	7	S	7	S	9	S	30	I	9	S	9	S
76	15660	BURDAGOL	7	S	5	I	5	I	35	I	7	S	7	S
77	15661	JASMIN	7	S	7	S	3	R	45	I	9	S	9	S
78	15662	JASMIN	7	S	7	S	3	R	25	R	7	S	7	S
79	15663	SINANDOMENG	9	S	7	S	7	S	75	S	9	S	9	S
80	15664	90 DAYS	3	R	9	S	5	I	45	I	7	S	9	S
81	15665	SENORITA	7	S	9	S	9	S	75	S	9	S	9	S
82	15666	POKPOKLO	7	S	9	S	9	S	75	S	9	S	9	S
83	15667	SINANLANG-ANG	7	S	7	S	9	S	75	S	7	S	7	S
84	15694	GOLIATH	7	S	9	S	7	S	75	S	7	S	7	S
85	15695	CHINESE RICE	5	I	7	S	7	S	75	S	9	S	9	S
86	15837	UNKNOWN	5	I	9	S	9	S	60	S	9	S	9	S
87	15838	(GUINOBAT) SIROMA	5	I	7	S	5	I	75	S	9	S	9	S
88	15839	BULAW	3	R	5	I	5	I	20	R	7	S	5	I
89	15841	SPEED 75	5	I	9	S	5	I	45	I	9	S	9	S
90	15843	BINOKAYO	9	S	9	S	7	S	65	S	9	S	9	S
91	15844	75	9	S	9	S	7	S	60	S	9	S	9	S

Table 7. (continuation)

Passport Data			Rating and Reaction											
Index	Collection No.	Name	Blast		Sheath Blight		Bacterial Leaf Blight		Rice Tungro (% Infection)		Stem Borer		Rice Black Bug	
92	15845	BURDAGOL	9	S	9	S	9	S	75	S	7	S	7	S
93	15846	GIFTS 12	7	S	9	S	9	S	70	S	7	S	9	S
94	15847	KAPULA	5	I	9	S	9	S	60	S	7	S	7	S
95	15848	SINANDOMENG	5	I	9	S	7	S	60	S	7	S	7	S
96	15849	SAIGON	7	S	7	S	7	S	60	S	9	S	9	S
97	15850	M3	3	R	5	I	5	I	20	R	7	S	5	I
98	15851	MINDANAO	5	I	9	S	7	S	60	S	7	S	9	S
99	15876	UNKNOWN	9	S	9	S	9	S	75	S	7	S	9	S
100	15877	UP & DOWN	9	S	9	S	9	S	75	S	9	S	9	S
101	15878	UNKNOWN VAR 2	9	S	9	S	7	S	60	S	7	S	7	S
102	15879	UNKNOWN VAR 3	9	S	9	S	9	S	70	S	9	S	9	S
103	15881	RC 85	5	I	7	S	7	S	70	S	7	S	7	S
104	15882	MALAGKIT (EXOTIC)	9	S	9	S	9	S	70	S	9	S	9	S
105	15883	EARLY DAVID	3	R	5	I	5	I	35	I	7	S	9	S
106	15885	BEST RICE	9	S	9	S	9	S	70	S	9	S	9	S
107	15886	MESTIZA	3	I	5	I	5	I	45	I	5	I	5	I
108	15888	TANAKA	9	S	9	S	9	S	65	S	9	S	9	S
109	15889	DIAMOND X	7	S	9	S	9	S	70	S	9	S	9	S
110	15890	I8 (VN)	5	I	3	R	3	R	40	I	5	I	5	I
111	15891	1561	3	R	5	I	5	I	30	I	7	S	7	S
112	15892	BURDAGOL	7	S	7	S	7	S	75	S	9	S	9	S
113	15893	KINADOY (PUTI)	9	S	9	S	9	S	65	S	9	S	9	S
114	15894	DASH 9	5	I	7	S	7	S	45	I	9	S	9	S
115	15895	129	3	R	5	I	3	R	40	I	7	I	5	I
116	15896	TRIPLE 8	9	S	9	S	9	S	60	S	7	S	7	S
117	15897	KINADOY (BULIK)	7	S	9	S	9	S	60	S	7	S	9	S
118	15938	MALAYSIAN RICE	7	S	7	S	7	S	75	S	9	S	7	S
119	15939	INDEX-2	7	S	7	S	7	S	70	S	9	S	9	S
120	15940	INDONESIAN RICE	7	S	9	S	7	S	60	S	9	S	9	S
121	15941	ARIGATO	7	S	9	S	7	S	70	S	7	S	9	S
122	15942	DOUBLE DIAMOND	5	I	7	S	9	S	35	I	7	S	9	S
123	15943	INBRED 300	7	S	7	S	7	S	55	S	7	S	9	S
124	15944	RED RICE	7	S	9	S	9	S	75	S	7	S	9	S
125	15945	ZAMBOANGA	7	S	9	S	9	S	75	S	7	S	9	S
126	15946	PILIT	9	S	9	S	9	S	75	S	7	S	9	S
127	15948	SAMPAGUITA	7	S	7	S	9	S	75	S	7	S	9	S
128	15950	RTS 11-A	7	S	7	S	7	S	75	S	9	S	9	S
129	15952	ANGELICA	7	S	7	S	7	S	75	S	7	S	9	S
130	15953	RED RICE	7	S	9	S	9	S	75	S	7	S	7	S
131	15954	MORYO-MORYO	7	S	9	S	9	S	60	S	9	S	7	S
132	15955	BODO-BODO	9	S	9	S	9	S	75	S	7	S	7	S
133	15957	RED RICE	9	S	7	S	7	S	75	S	9	S	7	S
134	15958	BULAW	9	S	9	S	7	S	75	S	7	S	9	S
135	15960	BULAW (SUPER 60)	9	S	7	S	9	S	75	S	7	S	9	S
136	15963	OPTIMUS	9	S	9	S	7	S	75	S	7	S	9	S
137	15969	COMBAT	3	I	5	I	5	I	45	I	5	I	5	I
138	15970	GLOBAL SUPER RICE	9	S	7	S	7	S	75	S	9	S	7	S
139	15976	GSR 12	9	S	7	S	9	S	60	S	9	S	7	S
140	15977	LAWIN	9	S	7	S	9	S	60	S	9	S	7	S
141	16030	KAMANSING	9	S	9	S	7	S	70	S	7	S	9	S
142	16032	CABER	9	S	9	S	9	S	65	S	9	S	7	S

Table 7. (continuation)

Passport Data			Rating and Reaction											
Index	Collection No.	Name	Blast		Sheath Blight		Bacterial Leaf Blight		Rice Tungro (% Infection)		Stem Borer		Rice Black Bug	
143	16033	BULAW	9	S	9	S	9	S	65	S	7	S	7	S
144	16034	BULAW (WHITE)	9	S	9	S	7	S	25	R	9	S	7	S
145	16035	KINAVITE	9	S	9	S	9	S	65	S	5	I	7	S
146	16037	BLONDE	3	R	5	I	5	I	65	S	7	S	9	S
147	16038	GANAR	5	I	3	R	5	I	65	S	7	S	7	S
148	16040	AEROBIC	7	S	7	S	9	S	65	S	7	S	7	S
149	16041	MILAGROSA SELECTION	5	I	7	S	5	I	45	I	9	S	7	S
150	16042	DESTINY	9	S	9	S	9	S	40	I	7	S	7	S
151	16043	LAKATAN	5	I	7	S	7	S	70	S	7	S	9	S
152	16060	JUAN RICE	5	I	5	I	7	S	70	S	7	S	9	S
153	16061	WINNER RICE	5	I	9	S	9	S	70	S	9	S	7	S
154	16062	DIAMOND X	3	I	5	I	5	I	40	I	5	I	5	I
155	16063	GANADOR	5	I	3	R	3	R	40	I	5	I	5	I
156	16064	JAPANIRI	7	S	9	S	9	S	65	S	9	S	7	S
157	16065	GSR	7	S	7	S	9	S	65	S	9	S	9	S
158	16067	PUKPUKLO	7	S	9	S	9	S	65	S	9	S	9	S
159	16068	IMELDA RICE	7	S	7	S	9	S	65	S	9	S	7	S
160	16069	BONGKITAN	7	S	9	S	9	S	70	S	9	S	7	S
161	16070	CARGIL	7	S	9	S	9	S	55	S	7	S	9	S
162	16071	WAG-WAG PINO	7	S	9	S	9	S	75	S	9	S	9	S
163	16072	RAMINAD	7	S	9	S	9	S	60	S	7	S	9	S
164	16073	WAG-WAG	5	I	5	I	7	S	70	S	7	S	9	S
165	16074	R5	5	I	5	I	9	S	70	S	9	S	9	S
166	16075	IMPROVED 222	3	R	3	R	3	R	30	I	7	S	7	S
167	16076	DIAMOND X	7	S	9	S	9	S	75	S	7	S	7	S
168	16077	VIETNAM	3	R	5	I	9	S	25	R	5	I	5	I
169	16078	DOUBLE DIAMOND	7	S	9	S	9	S	75	S	7	S	7	S
170	16079	MILAGROSA	9	S	7	S	9	S	75	S	9	S	9	S
171	16080	MESTISA	5	I	3	R	3	R	35	I	5	I	5	I
172	16081	KAIMPAS	7	S	9	S	9	S	70	S	9	S	9	S
173	16082	MASHAW	7	S	7	S	7	S	70	S	9	S	9	S
174	16083	REGOM	7	S	7	S	7	S	70	S	9	S	9	S
175	16084	MIRACLE	7	S	9	S	9	S	70	S	9	S	9	S
176	16085	DALAGANG BUKID	7	S	7	S	7	S	70	S	9	S	9	S
177	16086	RED 18	5	I	5	I	5	I	65	S	5	I	7	S
178	16087	M3	3	R	3	R	5	I	30	I	5	I	5	I
179	16088	VIETNAM	9	S	9	S	9	S	75	S	9	S	9	S
180	16089	ROSANA	9	S	9	S	9	S	75	S	9	S	9	S
181	16090	BORIT	7	S	7	S	7	S	60	S	7	S	9	S
182	16091	URAB	7	S	9	S	9	S	75	S	9	S	9	S
183	16092	ROSANA	7	S	9	S	9	S	75	S	9	S	9	S
184	16093	DESTINY	3	I	5	I	5	I	45	I	5	I	5	I
185	16094	DESTINY	5	I	3	R	3	R	40	I	5	I	5	I
186	16095	LOS BAÑOS	9	S	9	S	9	S	65	S	9	S	9	S
187	16096	KAYOPO	5	I	7	S	7	S	35	I	9	S	9	S
188	16097	KADATO	3	R	5	I	5	I	65	S	7	S	9	S
189	16098	66 PUWA	5	I	5	I	5	I	40	I	7	S	9	S
190	16099	KATAGO	9	S	7	S	7	S	65	S	9	S	5	I
191	16100	MILAGROSA	9	S	9	S	9	S	70	S	7	S	7	S
192	16185	Rc BATO	9	S	9	S	9	S	70	S	7	S	9	S
193	16187	ATONG	7	S	9	S	7	S	70	S	5	I	7	S

Table 7. (continuation)

Passport Data			Rating and Reaction											
Index	Collection No.	Name	Blast		Sheath Blight		Bacterial Leaf Blight		Rice Tungro (% Infection)		Stem Borer		Rice Black Bug	
194	16188	AZOR 5	7	S	9	S	7	S	70	S	7	S	9	S
195	16189	UNKNOWN 5	7	S	9	S	9	S	70	S	7	S	9	S
196	16190	MALAYA	7	S	9	S	9	S	70	S	7	S	7	S
197	16192	PINO 45	7	S	9	S	9	S	65	S	9	S	7	S
198	16193	MINADRE	7	S	9	S	9	S	65	S	9	S	9	S
199	16194	PINOLO	7	S	9	S	9	S	65	S	9	S	9	S
200	16195	INTAN/MIRACLE	7	S	9	S	9	S	65	S	9	S	9	S
201	16196	UP & DOWN	5	I	5	I	5	I	45	I	7	S	7	S
202	16198	UNKNOWN 1 (80 DAYS)	7	S	9	S	9	S	70	S	9	S	7	S
203	16203	DALING-DALING	9	S	9	S	9	S	70	S	9	S	9	S
204	16294	MASBATE	9	S	9	S	9	S	70	S	9	S	9	S
205	16295	SUPER NINI	7	S	9	S	9	S	70	S	9	S	9	S
206	16296	SOPER NINI	7	S	7	S	9	S	70	S	9	S	9	S
207	16297	MIRACLE	7	S	7	S	7	S	70	S	9	S	9	S
208	16298	PEDRO	9	S	9	S	9	S	70	S	9	S	9	S
209	16300	ZAMBOANGA RICE	9	S	9	S	7	S	65	S	9	S	9	S
210	16301	INDEX 2	9	S	7	S	9	S	75	S	7	S	9	S
211	16302	BUGOS	7	S	9	S	5	I	75	S	7	S	7	S
212	16303	EL GRANDE	9	S	5	I	5	I	45	S	7	S	9	S
213	16304	PALAY CHU	9	S	5	I	5	I	65	S	7	S	7	S
214	16305	S-14	7	S	5	I	5	I	35	I	7	S	9	S
215	16306	WHITE TONNER	7	S	5	I	5	I	35	I	7	S	9	S
216	16307	OFFSPRING	7	S	5	I	5	I	40	I	9	S	9	S
217	16308	SAMPAGUITA	9	S	7	S	9	S	75	S	7	S	9	S
218	16310	INDEX 6	7	S	9	S	9	S	65	S	9	S	9	S
219	16313	M3-BARAKO	5	I	5	I	5	I	40	I	5	I	5	I
220	16314	YANAM	7	S	9	S	7	S	70	S	7	S	7	S
221	16315	M3-BANGA	5	I	5	I	5	I	40	I	5	I	5	I
222	16316	SENORITA PILIT	7	S	9	S	9	S	75	S	9	S	9	S
223	16317	M 41	9	S	9	S	9	S	75	S	9	S	9	S
224	16318	ARIGATO	9	S	7	S	9	S	75	S	9	S	9	S
225	16319	ELON-ELON	9	S	9	S	9	S	75	S	9	S	9	S
226	16320	RV8	9	S	7	S	9	S	75	S	9	S	9	S
227	16321	MALAYSIAN RICE	9	S	9	S	7	S	75	S	9	S	9	S
228	16322	HR-400	3	R	5	I	9	S	75	S	7	S	7	S
229	16323	CHICHONG	9	S	9	S	9	S	75	S	9	S	9	S
230	16324	INDIAN RICE	5	I	9	S	9	S	75	S	9	S	9	S
231	16325	ML	7	S	9	S	5	I	30	I	7	S	5	I
232	16326	SAMPAGUITA (AGUSAN)	7	S	9	S	9	S	65	S	9	S	9	S
233	16327	BODO-BODO (AGUSAN)	7	S	9	S	9	S	75	S	9	S	9	S
234	16329	3 MILLION	9	S	9	S	5	I	45	I	5	I	5	I
235	16330	U.S.A.	9	S	9	S	9	S	75	S	9	S	9	S
236	16331	BOTOY-BOTOY	9	S	9	S	7	S	65	S	7	S	7	S
237	16332	INDONESIAN RICE	9	S	7	S	9	S	80	S	9	S	9	S
238	16333	DOUBLE DIAMOND (MLANG)	9	S	9	S	9	S	80	S	9	S	9	S
239	16334	PLATOON X	7	S	9	S	9	S	80	S	9	S	9	S
240	16335	DASH 12	7	S	9	S	9	S	80	S	9	S	9	S
241	16336	ABANGAY	7	S	9	S	9	S	80	S	9	S	9	S
242	16337	ANGELICA	7	S	9	S	9	S	80	S	9	S	9	S
243	16338	ANGELO I	7	S	9	S	9	S	80	S	9	S	9	S

Table 7. (continuation)

Passport Data			Rating and Reaction											
Index	Collection No.	Name	Blast		Sheath Blight		Bacterial Leaf Blight		Rice Tungro (% Infection)		Stem Borer		Rice Black Bug	
244	16339	BISADA	9	S	7	S	9	S	80	S	9	S	9	S
245	16340	BES I	9	S	9	S	9	S	80	S	9	S	9	S
246	16341	BWSI-3B	7	S	9	S	9	S	80	S	9	S	9	S
247	16342	BWS-WY	7	S	7	S	9	S	80	S	9	S	9	S
248	16343	BWSI-4R	7	S	7	S	9	S	80	S	9	S	7	S
249	16344	BWS-6W	9	S	9	S	9	S	80	S	9	S	9	S
250	16345	BWS3-3B	7	S	9	S	9	S	80	S	9	S	9	S
251	16346	BWSI-4B	7	S	7	S	9	S	80	S	9	S	9	S
252	16347	BISADA	7	S	7	S	9	S	80	S	9	S	7	S
253	16348	C4 TYSAN	9	S	9	S	9	S	80	S	9	S	9	S
254	16349	CAROVAN	9	S	9	S	9	S	80	S	9	S	9	S
255	16351	DIWATA	7	S	9	S	9	S	80	S	9	S	9	S
256	16352	DAHILI	7	S	9	S	9	S	80	S	9	S	9	S
257	16353	EC3	7	S	5	I	5	I	45	I	5	I	5	I
258	16354	EC2	7	S	5	I	5	I	25	R	5	I	5	I
259	16356	JASMINE R	9	S	5	I	5	I	25	R	5	I	5	I
260	16357	KAOLOB	7	S	7	S	9	S	75	S	7	S	5	I
261	16358	KAMOROS	5	I	9	S	9	S	65	S	9	S	9	S
262	16360	L2B2 VI	7	S	7	S	7	S	75	S	7	S	7	S
263	16361	M90 SG	9	S	7	S	9	S	80	S	9	S	9	S
264	16362	MANISI	7	S	9	S	9	S	80	S	9	S	9	S
265	16364	M108-1	7	S	9	S	9	S	80	S	9	S	9	S
266	16365	M31-VF	7	S	9	S	9	S	80	S	9	S	9	S
267	16366	MANGO SINGKET	9	S	9	S	9	S	80	S	9	S	9	S
268	16367	M420-1	9	S	7	S	9	S	65	S	7	S	7	S
269	16370	M5-BD	9	S	7	S	9	S	75	S	9	S	9	S
270	16371	M105-R	5	I	5	I	9	S	40	I	7	S	7	S
271	16372	M126-1	7	S	9	S	9	S	80	S	9	S	9	S
272	16373	MINONING	7	S	9	S	9	S	80	S	9	S	9	S
273	16374	MINDORO-5R	7	S	7	S	7	S	80	S	7	S	7	S
274	16375	MINDORO	7	S	9	S	9	S	80	S	5	I	5	I
275	16376	NTPSA-1	9	S	5	I	9	S	40	I	5	I	5	I
276	16377	PANDAN 1	9	S	9	S	5	I	40	I	5	I	5	I
277	16378	PANDAN 2	7	S	9	S	9	S	80	S	9	S	7	S
278	16379	PANGASINAN	7	S	9	S	9	S	80	S	9	S	9	S
279	16380	PILIT CARABAO	9	S	9	S	9	S	80	S	9	S	9	S
280	16382	PK P2-6	7	S	9	S	9	S	80	S	9	S	9	S
281	16383	PILI-RG	5	I	7	S	9	S	80	S	9	S	9	S
282	16384	PKPDWARF	7	S	9	S	9	S	25	R	9	S	9	S
283	16385	PANAKA	9	S	9	S	9	S	75	S	9	S	5	I
284	16386	RG17-K	9	S	9	S	9	S	75	S	9	S	5	I
285	16387	SAN CARLOS	7	S	9	S	9	S	5	I	5	I	5	I
286	16388	SNC-13	7	S	9	S	5	I	45	S	5	I	5	I
287	16389	SANIP- R	7	S	9	S	9	S	9	S	9	S	9	S
288	16390	SALKET	7	S	9	S	9	S	45	I	9	S	9	S
289	16391	SNR-2	9	S	9	S	9	S	45	I	5	I	5	I
290	16392	TRES MARIAS	5	I	5	I	5	I	45	I	5	I	5	I
291	16393	TANURA	5	I	9	S	9	S	45	I	5	I	5	I
292	16394	TAP 1	3	R	5	I	5	I	45	I	5	I	5	I
293	16395	XOR	7	S	9	S	5	I	45	I	5	I	5	I
294	16396	147-2	7	S	9	S	9	S	75	S	9	S	9	S

Table 7. (continuation)

Passport Data			Rating and Reaction											
Index	Collection No.	Name	Blast		Sheath Blight		Bacterial Leaf Blight		Rice Tungro (% Infection)		Stem Borer		Rice Black Bug	
295	16397	169-2	7	S	7	S	9	S	75	S	9	S	9	S
296	16399	216	7	S	7	S	7	S	75	S	9	S	7	S
297	16400	112-4	3	R	9	S	5	I	20	R	5	I	5	I
298	16418	R.I.300	3	R	3	R	5	I	20	R	5	I	5	I
299	16419	DCL-300	3	R	5	I	5	I	45	I	5	I	5	I
300	16420	IRIG	7	S	9	S	9	S	75	S	9	S	9	S
301	16421	RTS-12-B	5	I	5	I	5	I	50	I	5	I	5	I
302	16422	ZAMBOANGA	7	S	9	S	9	S	75	S	9	S	9	S
303	16424	MORYO-MORYO	7	S	9	S	9	S	75	S	7	S	7	S
304	16427	RED 18	3	R	5	I	3	R	35	I	5	I	5	I
305	16428	M3(SURALLAH)	9	S	5	I	5	I	25	R	5	I	5	I
306	16429	THAILAND RICE	7	S	9	S	9	S	80	S	9	S	9	S
307	16431	TARA RICE	7	S	9	S	9	S	80	S	9	S	9	S
308	16433	RTS 11-B	7	S	9	S	7	S	65	S	9	S	9	S
309	16434	RTS 13	7	S	7	S	9	S	65	S	9	S	9	S
310	16435	TOTONG	9	S	9	S	9	S	75	S	9	S	5	I
311	16436	INBRED-300	5	I	5	I	5	I	45	I	5	I	5	I
312	16437	BARAKO 64	3	R	5	I	5	I	25	R	5	I	5	I
313	16495	INAMID	3	R	9	S	9	S	45	I	5	I	5	I
314	16496	RJ 40	5	I	9	S	9	S	75	S	9	S	9	S
315	16497	VIETNAM RICE	9	S	9	S	3	R	25	R	5	I	5	I
316	16498	DOUBLE DIAMOND	3	R	9	S	9	S	65	S	5	I	5	I
317	16499	75 DAYS	9	S	5	I	5	I	80	S	5	I	5	I
318	16501	TABUK	9	S	9	S	9	S	80	S	9	S	9	S
319	16502	BELINA 219	9	S	9	S	9	S	80	S	9	S	9	S
320	16503	MASIGASIG 88	5	I	9	S	9	S	80	S	9	S	9	S
321	16504	TRIPLE 2	5	I	5	I	5	I	45	I	5	I	5	I
322	16505	C-4	9	S	9	S	5	I	45	I	9	S	9	S
323	16506	HI-NOON	9	S	9	S	9	S	70	S	9	S	9	S
324	16507	DOUBLE DIAMOND	7	S	9	S	9	S	70	S	9	S	9	S
325	16508	SAN JOSE	3	R	9	S	9	S	70	S	9	S	9	S
326	16509	75 DAYS	7	S	3	R	5	I	25	R	5	I	5	I
327	16510	DIAMOND X	7	S	5	I	5	I	65	S	9	S	9	S
328	16511	RYAN RICE	7	S	9	S	9	S	65	S	9	S	9	S
329	16512	MAGNOLIA	7	S	9	S	9	S	65	S	9	S	9	S
330	16513	B5	7	S	9	S	9	S	65	S	7	S	7	S
331	16514	TUDY-TUDY	7	S	9	S	7	S	65	S	9	S	9	S
332	16515	JANJANONG	7	S	9	S	7	S	65	S	9	S	9	S
333	16517	V5	9	S	7	S	7	S	65	S	9	S	9	S
334	16537	NITOY	9	S	9	S	7	S	65	S	9	S	9	S
335	16538	7 TONNER	9	S	9	S	9	S	80	S	9	S	9	S

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CHAPTER 7

Grains to Gains: Profiling Farmer-Grown Rice Genotypes in the Philippines

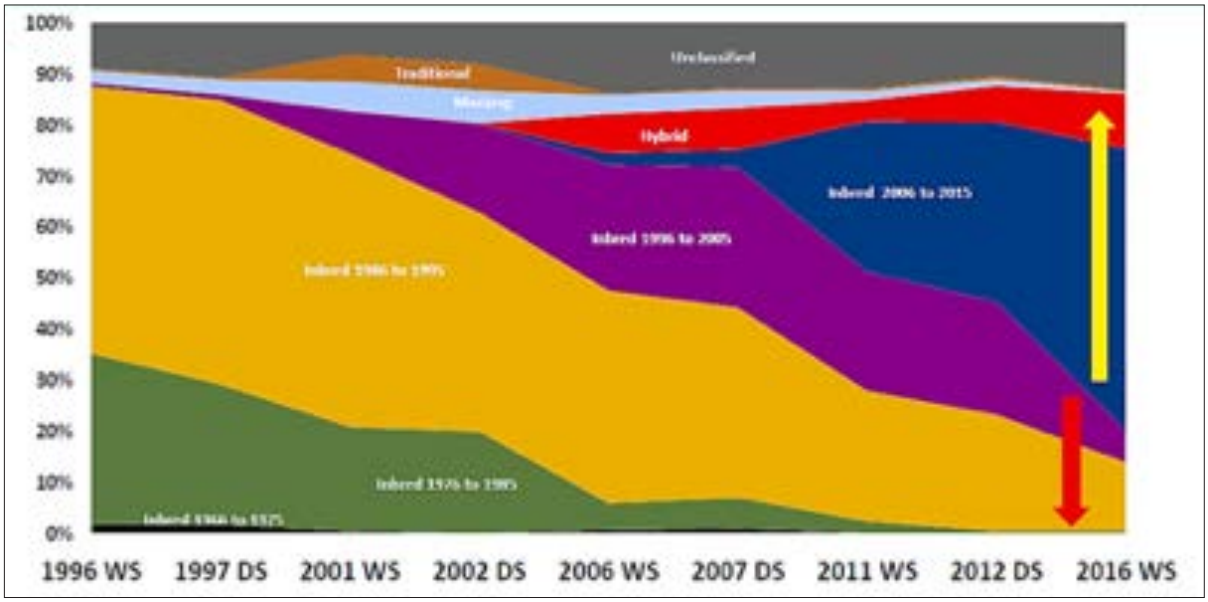
Rhemilyn Z. Relado-Sevilla, Roseleen M. Capiroso, Imelda A. Arida, and Jesusa C. Beltran

From 1955 onwards, 387 rice varieties were approved and released by the National Seed Industry Council (NSIC) (Palanog et al., 2020) for different ecosystems, locations, crop establishment methods, and seasons. Majority are for the irrigated lowland ecosystem. These rices are products of breeding programs of IRRI, DA-PhilRice, and UPLB. However, a study profiling 16,233 accessions and collections at the DA-PhilRice Genebank found that genetic materials differ in terms of biological status/classification from these improved rice cultivars (Ferrer et al., 2020).

Philippine traditional rice varieties (TRV) composed one group and two interesting other categories are "unspecified germplasm" and "farmers' lines". Totaling 6,898, these endemically cultivated TRV are mostly tied with social, cultural, and religious practices and are passed from one generation to the next (e.g. Sajise et al., 2012). The "unspecified germplasm" and "farmers' lines" warrant close attention given that they now number close to a thousand (Ferrer et al., 2020). More importantly, some of these materials are popular but their origins and traceability are yet to be established, hence "unspecified" or "farmers' lines".

A quinquennial rice-based farm household survey (RBFHS) done by the Socioeconomics Division of DA-PhilRice assessed farmers' varietal use. Varieties were then grouped as to their release dates to photographically present their "entry" and "exit" based on the adoption pattern observed in farmer fields. Figure 1 shows the varietal group share from the 1996-1997 RBFHS round to the most recent 2016-2017.

Based on the plotted results, rice farming households do replace varieties. For example, inbred varieties released from 1986 to 2005 enjoyed greater share during the earlier survey rounds but declined in the succeeding rounds. On the contrary, newly developed hybrid and inbred varieties released in 2006-2015 were seen steadily rising given the trend in their percent shares.



Source: Rice-based Farm Household Survey 2016-2017 (Austria, 2018)

Figure 1. Trends in Variety Group Share, RBFHS 1996-2017.

The "unclassified" varieties should be highlighted for reasons that they are not reported as traditional or NSIC-released varieties. Moreover, they have a seemingly stable share over the years, which is 12% at the latest results. The data cannot tell whether these are released varieties but are just differently named for popularization, rice lines that are still under study or are yet to be released, or other genotypes that are not part of the formal seed system. These "unclassified" varieties are collectively named throughout this book as "farmer-grown rice genotypes" (FGRG).

The interest in FGRGs spans decades of their documented presence in farmer fields (Truong et al., 2007; Launio et al., 2015). These genetic resources are an enigma to the Philippine formal seed system and looked up to as "key" to desirable varietal traits that are prized by farmers and consumers. This chapter documents FGRG by addressing the following: 1) profile farmer-producers, 2) present characteristics of their farms, 3) identify their sources and reasons for use, 4) show cost and returns of some genotypes, 5) highlight name origins from key informant interviews, and 6) recommend policies concerning them.

MATERIALS AND METHODS

To complement the research presented in the previous chapters, data in this chapter focus on the same rice-producing provinces where FGRGs samples were previously collected. The sources of the FGRGs samples were almost the same ones interviewed. The process ensured a holistic evaluation from genes to grains to gains. The survey period covered the July-December 2016 and January-June 2017 harvests, which were gathered by hired data collectors using structured questionnaires. Simple descriptive statistics such as percentages and averages were employed.

Interviewed were 295 farmers geographically distributed in the selected provinces. Figure 2 shows the project location sites by DA-PhilRice Branch Stations' areas of responsibility (AOR). A total of 44 provinces were surveyed in 15 regions using purposive sampling as there are no existing records of farmers who planted FGRG.

For sampling distribution, 35 samples were set for each branch station, except for DA-PhilRice CES that had 50 target respondents since its AOR is Region 3, the country's Rice Granary with the largest annual rice area harvested of more than 711,000 ha (PSA, 2021).

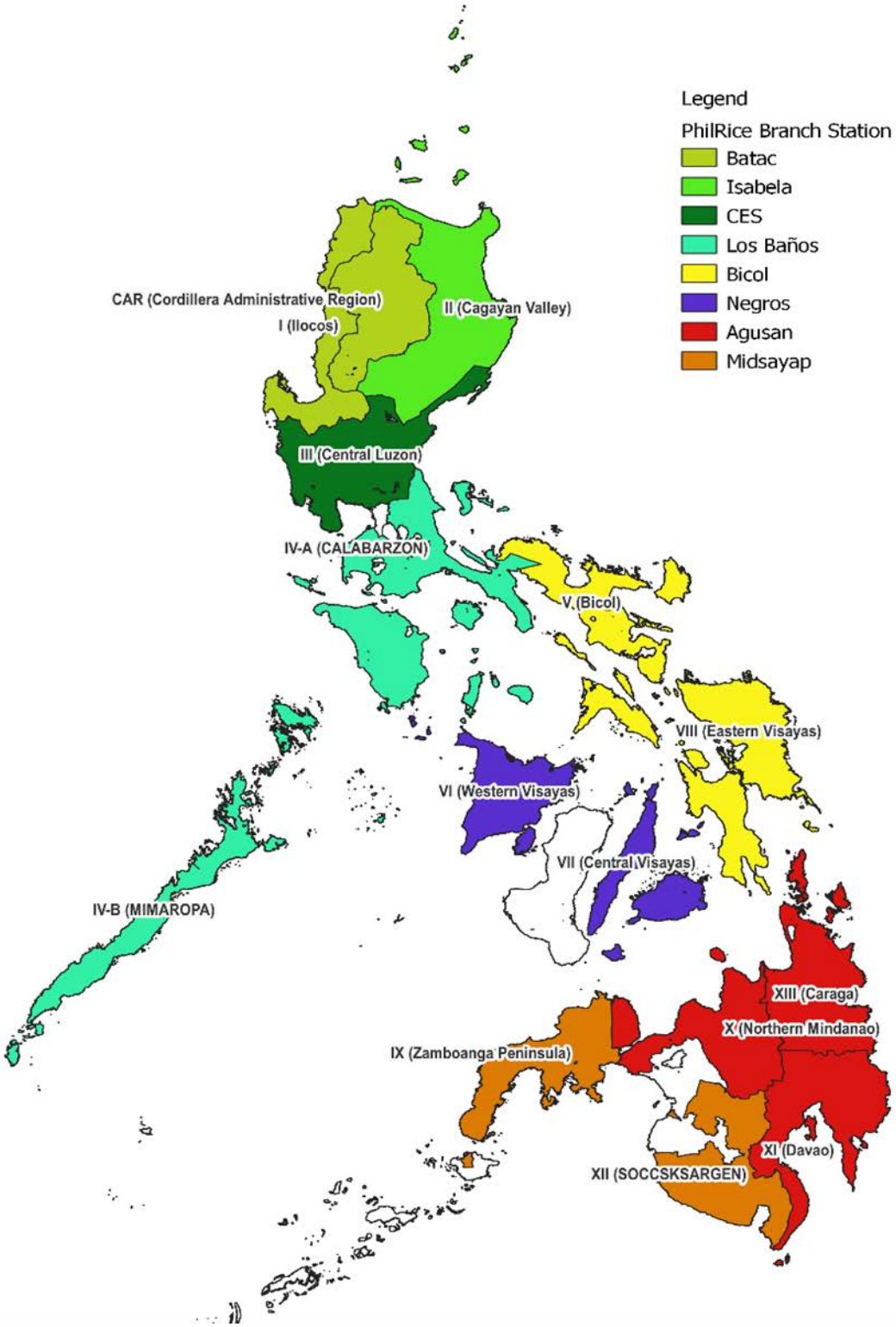


Figure 2. Regions where the surveys were conducted.[1]

[1]*Some provinces are not covered in the survey: Region 1 (Pangasinan), Region 9 (Zamboanga del Norte & Sibugay), and Region 12 (Sarangani & General Santos City).*

RESULTS AND DISCUSSION

Farmers' profile

Table 1 shows the sociodemographic characteristics of the FGRGs farmers, who average 53 years old and with 27 years of farming experience. They spent 9 years in school, or equivalent to high school education. Majority are males (78%) and married (88%). Rice farming is the primary source of income of 92% of them, with a share of 71% to total household income. Other income sources include non-agricultural and non-rice crop sources, among others. Some 82% of them have participated in rice-related seminars/training, and 77% are members of rice-based organizations. As to tenurial status, 55% of farmers own the land they cultivate. Owners have more control in managing their farms and implementing crop management practices that they prefer (e.g. Gavian and Fafchamps, 1996; Abdulai et al., 2011). These sociodemographic characteristics do not significantly differ from those reported in other studies, such as in the latest findings of RBFHS 2016-2017 (Baltazar, 2018).

Table 1. Profile of farmers planting FGRGs, 2016-2017.

Age (in years)	53
Years of schooling	9
Farming experience (years)	27
Household size	5
Gender (% farmers)	
Male	78
Female	22
Civil status (% farmers)	
Married	88
Widow/er	5
Single	5
Separated	1
No response	1
Tenurial Status (% owners)	55
Share of household gross income (%)	
Rice farming	71
Non-agriculture (employment, business, etc.)	10
Non-rice crop farming	7
Livestock/poultry farming	4
Off-farm income	3
Others	5
Rice-related seminars/training (% farmers)	82
Rice-related farm organizations (% farmers)	77

Farm profile

On average, farmers cultivated 1.29 hectares (ha), of which 1.21 ha is allotted to rice production (Table 2). Interestingly, this is subdivided into 10 smaller plots per hectare for FGRGs production. Hence as a consequence, more FGRGs were planted and the area mimics an experimental field. This observation confirms previous research that FGRG are widely planted by farmers (Launio et al., 2015).

Some 46% of the farmer-respondents sourced water from national or communal irrigation systems (NIS/CIS). Most farmers had access to water, except those from Ilocos Region who are primarily rain-dependent. Others (22%) access water from rivers and streams while 17% are dependent on rain; the remaining 15% have small-scale irrigation systems (SSIS) (e.g., shallow tube wells, open-dug wells, small farm reservoirs, and small water-impounding projects).

Consequently, various cropping patterns are reported given the status of irrigation. Some 72% of them practiced the rice-rice cropping in a year. Only a few (11%) engaged in various rice-vegetable patterns depending on season and 4% had the rice-rice-rice pattern.

Table 2. Profile of farms planted to FGRGs, 2016-2017.

Average total rice area (ha)	1.21
Average total FGRG area (ha)	1.18
Percentage FGRG area to total rice area	97
Ecosystem (%)	
Rainfed	10
Irrigated	90
Sources of water (%)	
NIS/CIS	46
SSIS*	15
Rain	17
Natural**	22
Cropping pattern (%)	
rice-rice	72
rice-fallow	13
rice-rice-rice	4
others	11

*SSIS (STWs, Open-dug wells, SFR, SWIP).
**Natural (rivers, streams, free-flowing).

Farm yields

Table 3 lists the top-yielding FGRGs per region. During 2016 WS, the highest reported yield was 9.6 t/ha, which was achieved by Nitoy in Central Visayas. The reported FGRGs yields were above the average of 3.8 t/ha for the same period (PSA, 2018). In 2017 DS, the highest-performing FGRG was IR-46 in Cagayan Valley with 10.8 t/ha. However, it is also notable that some FGRGs had yielded below the average 4.1 t/ha for the same season (PSA, 2018). Figures 3 and 4 present the mapped yields of FGRGs across all regions for both 2016 WS and 2017 DS where WS yields were higher. The FGRGs are considered by farmers to be high-yielding when production is 2.7 t/ha to 6.6 t/ha or averages 5.5 t/ha.

Table 3. Top-yielding FGRGs, by region, 2016-2017.

Region (n=295)	All Ecosystems			
	2016 Wet Season (WS)		2017 Dry Season (DS)	
	Top-yielding FGRG	Yield (t/ha)	Top-yielding FGRG	Yield (t/ha)
CAR (Cordillera)	Vietnam rice	8.3	Double Diamond X	4.9
1 (Ilocos Region)	Double Diamond X	9.2	RJ40	5.3
2 (Cagayan Valley)	711	7.8	IR-46	10.8
3 (Central Luzon)	Triple R	7.6	Simatar	7.4
4-A (CALABARZON)	Engo	5.0	RENIE	6.6
4-B (MIMAROPA)	Dona Cita	8.6	Tanaka	6.9
5 (Bicol Region)	Vietnam rice	6.4	Vietnam rice	7.1
6 (Western Visayas)	Destiny	6.2	Milagrosa	2.4
7 (Central Visayas)	Nitoy	9.5	Milagrosa	4.1
8 (Eastern Visayas)	Sinandomeng	5.0	M3	5.2
9 (Zamboanga Peninsula)	Sinandomeng	5.0	Sampaguita	6.5
10 (Northern Mindanao)	Red rice	6.5	Red rice	6.4
11 (Davao Region)	White tonner	6.7	Texas	7.6
12 (SOCCSKSARGEN)	206	8.2	206	7.8
13 (Caraga)	10-tonner	5.0	Super 60	3.3

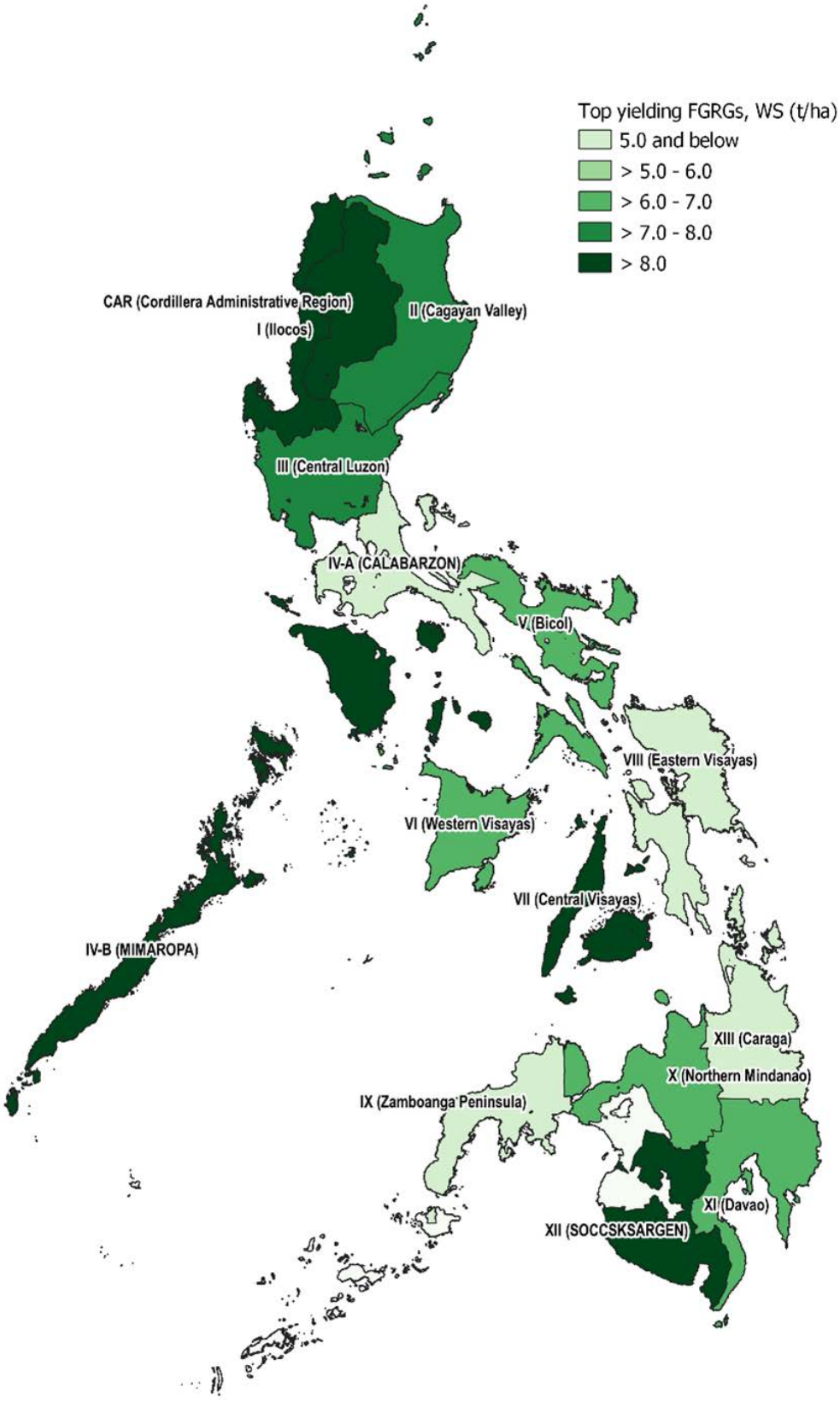


Figure 3. Yield range of FGRGs, 2016 WS (t/ha).

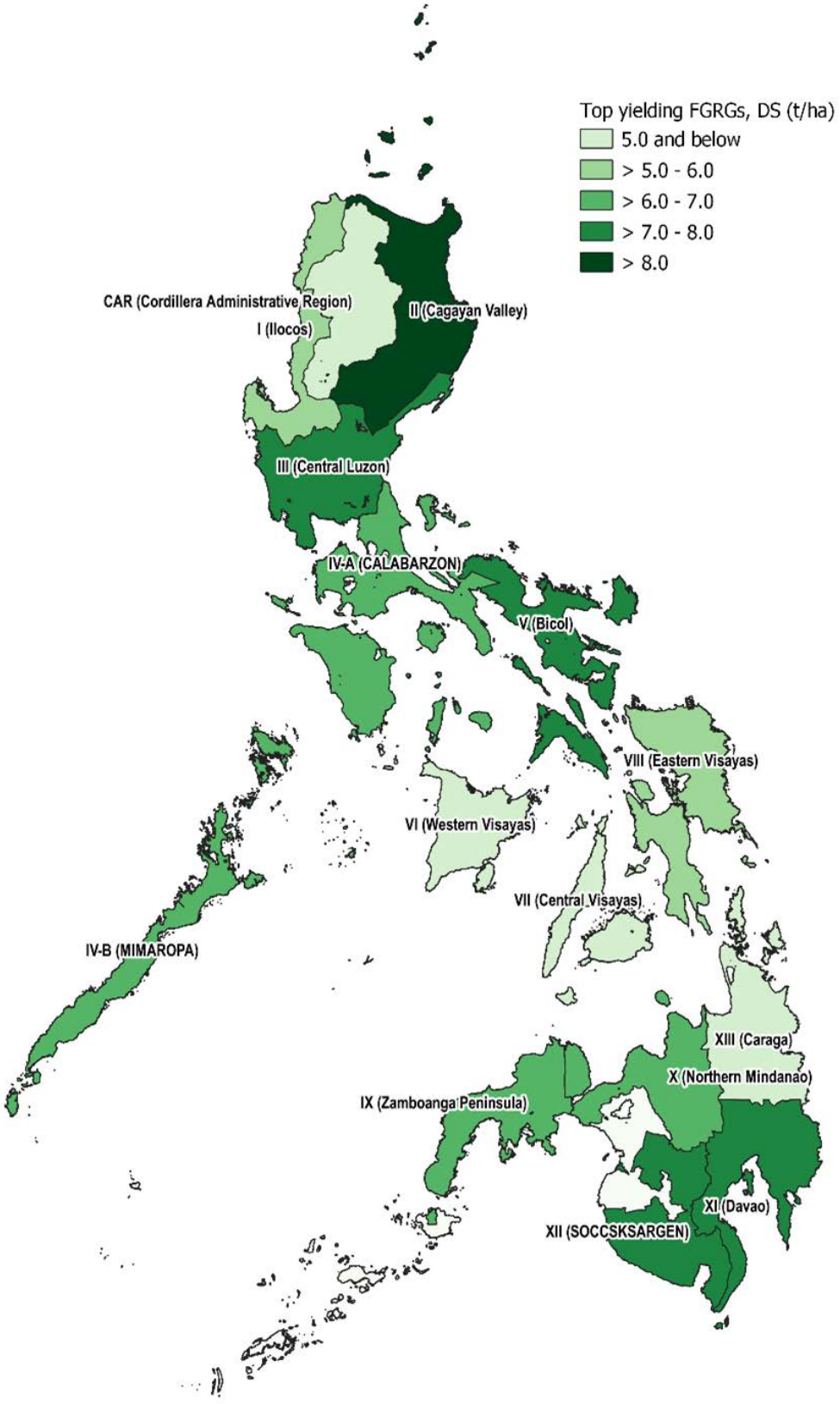


Figure 4. Yield range of FGRGs, 2017 DS (t/ha).

Material Input-Use and Management Practices

Seed class, source, and crop establishment

Various varietal characteristics are considered when choosing rice varieties. Some 86% of the farmers reported planting numerous FGRG since 2011. Tables 4 and 5 enumerate these FGRG planted in 2016 WS and 2017 DS. Two main reasons cited for cultivating them were good eating quality (63%) and yield performance (52%). Other reasons were eagerness to try something new (5%), more accessible (4%), market preferences/consumer demand (3%), recommended by traders/millers (2%), and other varietal attributes/ characteristics (i.e. high milling recovery with ~65-75%; early maturity with ~85-95 days; long/heavy/ whole grains, etc.), resistance to diseases/pests/ drought, and price.

In addition, farmers claimed that these FGRG are recommended in their respective locations. Hence, location-specificity is likewise considered. Further prodding revealed that 12.3% of farmer-respondents still prefer released varieties with NSIC Rc 222 on top of the list. Other varieties mentioned were PSB Rc 18 (5.1%), Rc 160 (4.4%), SL-8H (3.7%), and Diamond X (3.4%). With different considerations, farmers consequently kept and maintained their own seeds.

Table 4. FGRGs planted in the wet season (WS), 2016.

Planting Season	Item	Genotypes
Wet season (WS)	0 - A	28, 75, 84, 129, 206, 711, 1561, 10 Tonner, 66 Puwa, 7 Toner, 75 days, 80 days, 90 days, Aerobic rice, ALA 18, Ambisyosa, Angelica, Ardani, Arigato, Armat, Aromatic rice
	B - C	B5, Baganon, Balaki, Banaybanay, Barako 64, BBC, Belina 219, Blonde, Bodo-Bodo, Bongkitan, Borit, Brown rice, Bulaw, Burdagol, C12, C18, C4, Caber, Camansing, Combat
	D	Dalagang Bukid, DAS 1, Dash 9, DCL 300, Denewel, Destiny, Diamond X, Dinorado, Doña Cita, Double Diamond X, Dream rice
	E - G	Early David, Eleven, ENGO, Ganar, Garcela, Genetics, Gifts 12, Golden, Goliath, GSR 8
	H - J	High Rice, Hinoon, Hirig, IL-29, Inamid, Index, Index-6, Irig, Janjanong, Japaniri, Jasmin, JFD 300, JFD 300 plus, Juna rice
	K - L	Kadato, Kaimpas, Kapula, Katago, Katiban, Kennedy, Kinaduy Bulik, Kinaduy Puti, Lakatan, Lawin, Los Baños, Lubang, Luzviminda
	M	M11, M3, Magnolia IR66, Makaipu, Malagkit, Maragusto, Masagana, Mashaw, Masigasig 88, Masmate, McMoon, Mestisa, Milagrosa, Milo, Mindanao, Miracle, ML, Moryo-Moryo
	N - O	Nitoy, Offspring, Optimus
	P - Q	P10, Parerutang, Pedro, Pilit, Pinulo, Plastic, Platoon, Quadro Alas
	R	R-40, R-5, Raeline, Raminad, Rc 30, Rc 85, Rc Bato, Rc Leo, Raeline, Red 18, Red 64, Red rice, Regom, RJ40, Rosana, Ryan Rice
	S	S-14, SAF 44, Sampaguita, San Jose, Señorita, Shamcy, Simatar, Sinandomeng, Siniroma, Squad, Super 11, Super 222, Super 60, Super 69, Super Angelica, Super Diamond X, Super Kaloy, Super Nini, Super Nene, Super rice
	T	Tabuk, Taebaegbyeo, Tanaka, Tara rice, Texas, Thailand rice, Top rice, Totong, Triple 1, Triple 2, Triple 3, Triple 8, Triple R, Tudytudy
	U - Z	Ultimax, Universal rice, Unknown, Up and Down, Urab, US 88, V5, Vietnam rice, W8, Wagwag, White tonner, Yolanda, Zamboanga Rice

Table 5. FGRGs planted in the dry season (DS), 2017.

Planting Season	Item	Genotypes
Dry Season (DS)		DS only
	0 - C	72, 2009 global (inbred), Alira, Badjang, Belena 215, California, Chinese Rice
	G - I	GSR 12, GSR 21 57-10, Habal-Habal, Habilis, Hybrid US 82, IR-46
	K - P	Kinavite, Malaya, Melanie, Pino-45
	R - T	R Danny, Rc OLOY, Red Tonner, RENIE, Tapul
		Also planted in WS
	-	84, 206, 66 Puwa
	A - C	Ambisyosa, Baganon, Banaybanay, Belina 219, Bodo-Bodo, Bongkitan, Brown rice, Bulaw, Burdagol, C12, C18, C4, Caber
	D - I	Dalagang Bukid, Dash 9, Diamond X, Dinorado, Double Diamond X, Eleven, Gifts 12, Golden, Goliath, GSR 8, Inamid, Index
	J - L	Janjanong, Japaniri, Kadato, Katago, Katiban, Kinaduy Bulik, Kinaduy Puti, Lawin, Lubang
	M - P	M3, Magnolia IR66, Maragusto, Mashaw, Mestisa, Milagrosa, Milo, Miracle, ML, Optimus, P10, Parerutang, Pedro
	R - S	Raeline, Rc 30, Red rice, Regom, RJ40, Ryan Rice, S-14, SAF 44, Sampaguita, Señorita, Simatar, Siniroma, Super 222, Super 60
	T - Z	Taebaegbyeo, Tanaka, Texas, Top rice, Triple R, Unknown, Up & Down, Vietnam rice, Wagwag, Yolanda, Zamboanga Rice

Table 6. FGRGs planted, by area and season.

CAR	Apayao and Abra	13	7
1	Ilocos Norte, Ilocos Sur, and La Union	16	8
2	Cagayan, Isabela, and Nueva Vizcaya	20	9
3	Aurora, Bataan, Bulacan, Nueva Ecija, Pampanga, Tarlac, and Zambales	32	15
4A	Batangas, Laguna, and Quezon	6	5
4B	Occidental Mindoro, Palawan, and Romblon	24	9
5	Albay, Camarines Norte, Camarines Sur, Masbate, and Sorsogon	12	10
6	Negros Occidental	10	7
7	Bohol and Negros Oriental	23	10
8	Leyte and Western Samar	8	5
9	Zamboanga City	5	6
10	Bukidnon and Misamis Oriental	9	5
11	Davao del Norte, Davao del Sur, Davao Oriental, and Davao de Oro	12	7
12	North Cotabato, South Cotabato, and Sultan Kudarat	13	12
13	Agusan del Norte, Agusan del Sur, and Surigao del Sur	15	3

During WS, farmers are able to plant more FGRG because of available water source compared to DS. FGRG names do not follow conventions and are unique.

Looking at where FGRG were planted and what areas had the highest number, Table 6 shows that Central Luzon had the most where 32 for WS and 15 for DS were enumerated. This is interesting given the fact that Central Luzon is where the DA-PhilRice Central Experiment Station is located and where seed growers proliferate. In total, 181 were planted during WS, 22 in the DS along with 74 other FGRG that were also reported during WS cropping. Exploration regarding varietal replacement revealed that farmers changed what they have grown four times in the last 5 years. Moreover, on average, they used the same seeds for three times.

Table 7 outlines the characteristics of top FGRG cultivated by farmer-respondents, mostly farmer/good seeds at a seeding rate of 83.93 kg/ha at PhP27.84/kg, which is cheaper than certified seeds (PhP38/kg). However, less certified seeds can suffice in a hectare (40-kg/ha) (DA-PhilRice, 2021).

In terms of seed source, FGRG were accessed from: 1) co-farmers mainly through seed exchange (53%), 2) own produce selected after every cropping season (24%), and 3) various sources such as seed growers (8%), DA technicians (2%), or paddy traders (2%). Figure 5 shows the top source by region. Most regions in Visayas and Mindanao accessed FGRG from their co-farmers. In Luzon, top sources identified were own produce, seed growers, and DA/technicians (CAR, Ilocos, some parts of Central Luzon, CALABARZON, MIMAROPA, and Bicol regions). Among those who produced their own seeds, 50% reported practicing seed purification.

Table 7. Characteristics of top farmer-grown rice genotypes, by region, 2016 WS-2017 DS.

Region (n=295)	Top FGRGs	FGRGs			
		Maturity (days)	Top Reason/s	Seeding Rate (kg/ha)	Price/kg (Php)
All Regions	All FGRGs	107	Good eating quality; high-yielding	83.93	27.84
Cordillera	Double Diamond X	115	Good eating quality; high-yielding	30.00	20.00
I Ilocos Region	V5	107	Good eating quality; high-yielding	53.33	33.64
II Cagayan Valley	Diamond X	110	High-yielding; good eating quality; resistant to pest/diseases	53.74	39.32
III Central Luzon	Diamond X	108	High-yielding; good eating quality; physical attributes (i.e. long grain)	142.10	30.14
IVA CALABARZON*	ENGO	110	High-yielding	104.00	19.23
IVB MIMAROPA	Genetics	115	High-yielding; good attributes (i.e. heavy grains)	80.00	64.14
V Bicol Region	Bulaw	94	Good eating quality; high-yielding; market's preference	115.77	22.29
VI Western Visayas*	Destiny	114	High-yielding	19.00	70.00
VII Central Visayas	Milagrosa	113	Good eating quality; high-yielding; resistant to lodging	45.00	22.89
VIII Eastern Visayas	Kapula	117	Good eating quality; high-yielding	92.00	21.12
IX Zamboanga Peninsula	Sampaguita	116	High-yielding; good eating quality	43.33	30.19
X Northern Mindanao*	Red Rice	120	Good eating quality; market's preference	50.00	18.00
XI Davao Region	Double Diamond X	113	Good eating quality; high-yielding; market's preference/ recommended by traders or millers/ physical attributes (high milling recovery ~70%)	72.83	30.95
XII SOCCSKSARGEN	M3	94	High-yielding; good eating quality	96.67	18.77
XIII Caraga	Bodo-Bodo	103	High-yielding; good eating quality; physical attributes (high milling recovery ~70%)	62.86	22.27

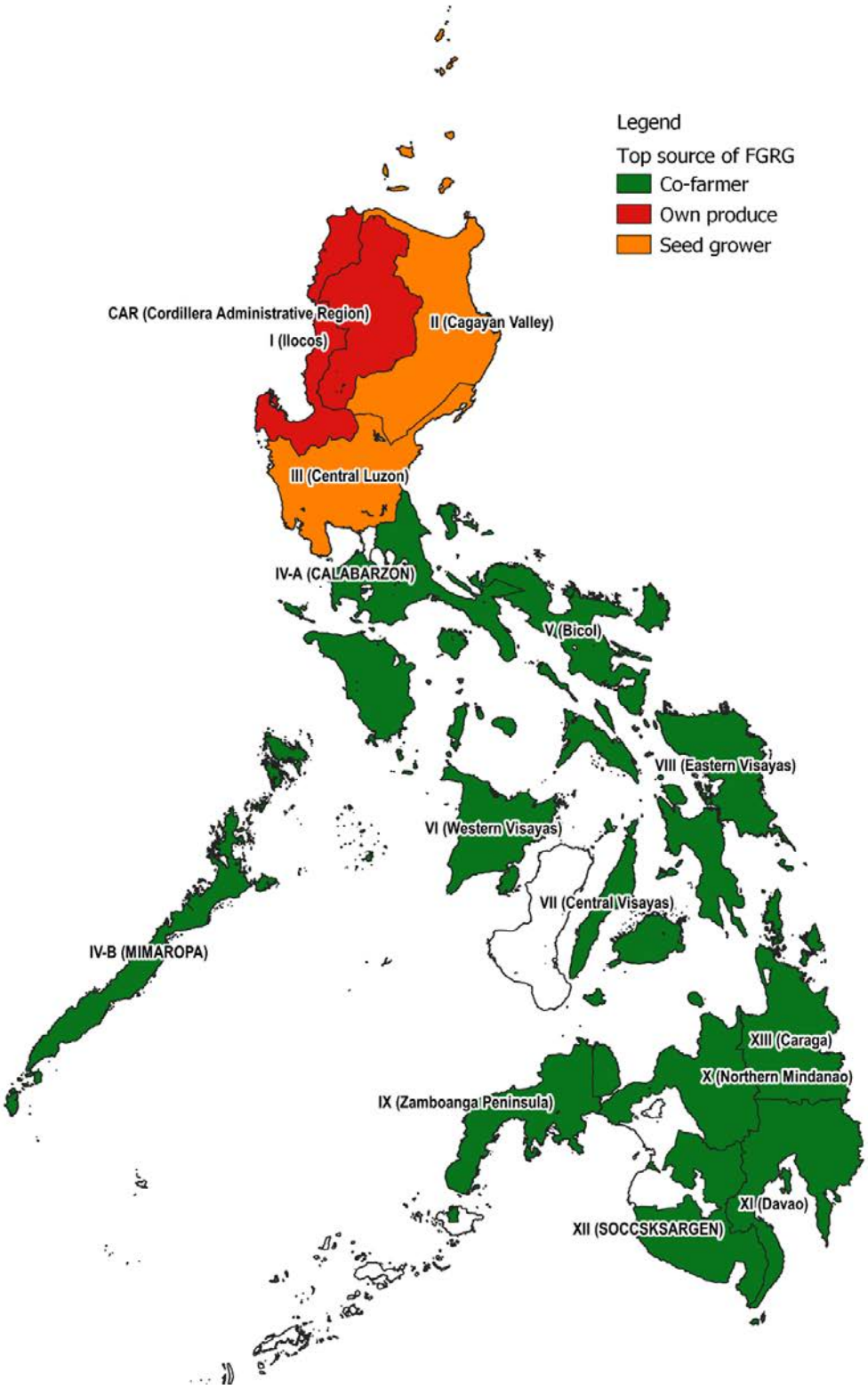


Figure 5. Top source of FGRGs, 2016-2017.

Transplanting was the mode of crop establishment for majority (70%) of the farmers; wet direct seeding at 25%. Farmers reported that the FGRGs they planted matured 107 days after transplanting (Table 7).

Fertilizer use and management

The FGRGs farmers applied inorganic fertilizers: 2016 WS NPK rates were at 77-24-22 kg/ha; 2017 DS at 75-22-21 kg/ha (Table 8). Highest rate for N was observed in CALABARZON at 118 kg/ha for 2016 WS and the lowest were in Zamboanga Peninsula and Caraga at 49 kg/ha. In 2017 DS, Ilocos Region utilized the most N at 135 kg/ha followed by Central Luzon (115 kg) and CAR (108 kg). Western Visayas and Caraga used the least amount of N at 42 kg/ha or less. N applications in other regions ranged from 53 kg to 82 kg in WS and 53 kg to 85 kg in DS.

Table 8. Amount of fertilizer used by FGRG farmers, by season, 2016-2017.

Item	ALL ECOSYSTEMS	
	2016 WS (n=277)	2017 DS (n=106)
N (kg/ha)	77	75
P (kg/ha)	24	22
K (kg/ha)	22	21

Western Visayas applied the highest P at 35 kg/ha for WS and MIMAROPA at 37 kg/ha for DS. K application was highest in Davao Region at 38 kg/ha (WS) and CAR at 49 kg/ha (DS).

Pesticide use and management

Despite years of experience in cultivating rice, specifically FGRGs, farmers (23%) claimed that insect pests and diseases are also a top problem confronting them prompting them to use chemicals. They used herbicides, insecticides, fungicides, rodenticides, and molluscicides. Herbicides constituted the largest cost share among farm chemicals at 37% to 44% during the two seasons. Insecticides cost 34% in 2016 WS and 30% in 2017 DS; fungicides and rodenticides at both less than 10%.

In MIMAROPA and Bicol Regions, herbicide share was the highest during 2016 WS and 2017 DS with 44% to 66% of the total chemical cost. For Central Visayas and Ilocos, insecticide share was the highest in both seasons (48% to 91%). Western Visayas focused on molluscicide during 2017 DS (100%); herbicide (25%) and insecticide (71%) combined during 2016 WS. Central Luzon combined herbicide (39%) and insecticide (32%) in WS; herbicide (35%), insecticide (25%), and molluscicide (29%) in DS. The same cannot be said of other regions.

Labor use and mechanization

The FGRGs farmers employed 65 person-days labor per hectare (pd/ha) in 2016 WS and 58 pd/ha in 2017 DS for seedling management to threshing (Table 9). Fertilizer and chemical application along with irrigation were usually done by the operator, family, and exchange (OFE) laborers. With this, crop care and maintenance totalled 15.6 pd/ha (2016 WS) and 12.5 pd/ha (2017 DS), including hired labor. Meanwhile, harvesting and threshing required the most labor input (OFE and hired labor person-days) at 18.6 pd/ha in 2016 WS, and 16.8 pd/ha in 2017 DS.

Crop establishment is next with 16.8 pd/ha (2016 WS) and 15.3 pd/ha (2017 DS). Farmers engaged in contracting hired permanent labor and combine harvester. The payment for contracts is largely through a percentage share of the gross harvest, which ranges from 8% to 12% based on existing rates.

Table 9. Labor requirement of FGRGs production, by cropping season, 2016-2017.

Item	ALL ECOSYSTEMS	
	2016 WS (n=277)	2017 DS (n=106)
Hired labor (pd/ha)*	47	42
Seed management	0.7	0.7
Land preparation	7.8	7.8
Crop establishment	15.4	14.3
Crop care and maintenance	6.3	4.2
Harvesting and threshing	17.2	15.1
Operator, family & exchange (pd/ha)	17	15
Seed management	0.6	0.5
Land preparation	4.4	3.9
Crop establishment	1.4	1.0
Crop care and maintenance	9.3	8.3
Harvesting and threshing	1.4	1.7
Total labor (pd/ha)	65	58

*pd stands for person-day, which is equivalent to an eight-hour work day

Costs and returns of planting FGRGs

Table 10 details the costs and returns of cultivating FGRGs. In both survey periods, yields were above 4.5 t/ha, hence gross returns were at PhP80,287 for 2016 WS and PhP80,746 for 2017 DS. Labor cost constituted the major expense of FGRG production, with harvesting and threshing incurring the most. The total cost per ha of producing FGRG was at PhP50,742 for 2016 WS and PhP51,436 for 2017 DS.

The computed unit cost per kg of FGRGs (wet paddy) in 2016 WS was PhP10.50/kg and PhP10.84/kg in 2017 DS. During the same periods, national average cost per kg for WS and DS were PhP11.50 and PhP10.51, respectively (PSA, 2019). Net profit was higher across seasons since farmers benefitted further when FGRGs were perceived as special rices by buyers.

Table 10. Costs and returns of planting FGRGs, wet paddy, 2016-2017.

Item	ALL ECOSYSTEMS	
	2016 WS (n=277)	2017 DS (n=106)
Returns		
Yield (kg/ha)	4,833	4,744
Paddy price (PhP/kg)	16.61	17.02
Gross Returns	80,287	80,746
Costs (PhP/ha)		
Seeds	2,438	2,585
Fertilizers	6,545	5,937
Chemicals	2,237	2,006
Hired labor	21,271	21,609
Operator, Family, & Exchange (OFE)	1,940	2,093
Land rent*	11,275	13,357
Interest on capital	1,140	695
Other costs**	3,896	3,154
Total cost of production (PhP/ha)	50,742	51,436
Cost per unit (PhP/kg)	10.50	10.84
Net returns from rice farming (PhP/ha)	29,545	29,310

*Note: Land rent was based from RBFHS 2016 WS-2017 DS costs and returns.
**Other costs include animal, machine, fuel & oil (AMF), food, irrigation, transportation, repairs, and other input costs.

With costs and returns known, the succeeding discussion presents the profitability of the top three widely used FGRGs (Diamond X, Double Diamond X, and Bulaw) that were cultivated in irrigated ecosystems (Tables 11 & 12).

Table 11. Costs and returns of top 3 FGRGs, wet paddy, 2016.

Item	ALL ECOSYSTEMS		
	Diamond X (n=19)	Double Diamond X (n=19)	Bulaw (n=19)
Returns			
Yield (kg/ha)	5,570	5,261	3,712
Paddy price (PhP/kg)	15.54	18.78	15.63
Gross Returns	86,570	98,790	58,000
Costs (PhP/ha)			
Seeds	3,136	2,164	2,772
Fertilizers	6,318	7,287	5,911
Chemicals	2,975	2,213	2,417
Hired labor	20,115	30,576	20,639
Operator, Family, & Exchange (OFE)	920	1,696	1,400
Land rent*	11,942	11,942	11,942
Interest on capital	905	4,456	192
Other costs**	4,329	2,896	4,150
Total cost of production (PhP/ha)	50,640	63,230	49,423
Cost per unit (PhP/kg)	9.09	12.02	13.31
Net returns from rice farming (PhP/ha)	35,930	35,560	8,577

Note: Ranking is based on the most number of farmers that used the FGRGs;
*Land rent was excerpt from RBFHS 2016 WS-2017 DS costs and returns
**Other costs include animal, machine, fuel & oil (AMF), food, irrigation, transportation, repairs, and other input costs.

Table 12. Costs and returns of top 3 FGRGs, wet paddy yield, 2017.

Item	ALL ECOSYSTEMS		
	Diamond X (n=19)	Double Diamond X (n=19)	Bulaw (n=19)
Returns			
Yield (kg/ha)	6,097	5,753	4,913
Paddy price (PhP/kg)	15.38	21.10	16.63
Gross Returns	93,792	121,388	81,679
Costs (PhP/ha)			
Seeds	3,861	2,465	2,764
Fertilizers	8,020	6,534	5,000
Chemicals	3,296	1,270	2,013
Hired labor	14,611	25,851	22,204
Operator, Family, & Exchange (OFE)	4,896	2,143	849
Land rent*	13,801	13,801	13,801
Interest on capital	377	-	-
Other costs**	3,423	976	4,922
Total cost of production (PhP/ha)	52,285	53,040	51,553
Cost per unit (PhP/kg)	8.58	9.22	10.49
Net returns from rice farming (PhP/ha)	41,507	68,348	30,126

Note: Ranking is based on the most number of farmers that used the FGRGs;
*Land rent was excerpt from RBFHS 2016 WS-2017 DS costs and returns
**Other costs include animal, machine, fuel & oil (AMF), food, irrigation, transportation, repairs, and other input costs.

Diamond X performed well in both seasons with averages of 5.57 t/ha for 2016 WS and 6.1 t/ha for 2017 DS. The bulk of expenses went to hired labor cost. Gross returns were high. Net returns were higher in DS at PhP41,507 than in WS at only PhP35,930/ha. This is primarily due to the significant decrease in cost for harvesting and threshing for hired labor in DS; permanent hired labor cost was also significantly lower than in the WS.

The second FGRG: Double Diamond X yields higher than the national average. It is also notable that it has price advantage for both seasons over Diamond X and Bulaw, which is mainly due to its good eating quality as stated in Table 7. This resulted in highest net returns of PhP68,348 in 2017 DS. The bulk of the cost was attributed to hired labor, specifically for harvesting and threshing. Higher net profit was obtained during 2017 DS; the same trend as that of Diamond X.

On the other hand, the yields of Bulaw for 2016 WS and 2017 DS were lower. However, the major cost component was still total labor cost, of which hired labor cost ate up the highest share. Net returns were significantly higher in DS than in WS.

FGRG stories: snippets from survey and key informant interviews

When farmer-respondents were probed with regard to FGRGs names, 64% stated that they had no idea how they got the names especially that released varieties were named in a standardized manner. Some 11% of them responded that FGRGs are named based on their prominent characteristics, such as reddening of leaves, grain color, aroma, shape, etc. Others carried the names of those who introduced them, place of origin, or major events that coincided with the time of their introduction. Examples: BBC or Baby Boy Concepcion (name of person), Thailand and Los Baños (places of origin), Lakatan (Kapampangan for malagkit/sticky/glutinous), Makaipo (shattering), and Moryo-moryo (local term for unknown). Other fascinating FGRG names were Pres. Kennedy and Habal-habal (motorcycle taxi). Interestingly, farmers (61%) signified awareness of the existing system in naming/registering varieties and expressed concurrence with the process.

Key informant interviews were done to understand the process of naming and gain a wider perspective on how varieties are accessed. Asked were four questions that centered on farmers' 1) naming and sourcing of FGRGs, given that these are not released by NSIC and are assumed to be not traditional varieties; 2) awareness of the formal process of registering seeds and the persistence of having "popularized" names; 3) preference in choosing varietal names; and 4) recommendations to disseminate information faster on released rice varieties.

First was a seed grower from Mallig, Isabela who got unlabelled seed samples from IRRI in Laguna, which he reproduced. Since the variety had no name, he coined the acronym BTL, which are his initials. The rice genotype was promoted and marketed as such, especially among fellow members of his cooperative. It was used by some farmers in Mallig and nearby towns because of its good yield and resistance to lodging. However, it was found to be susceptible to BLS and BLB during WS, which resulted in an eventual decline in utilization.

Second, according to a farmer-turned-agricultural extension worker in Burgos, Isabela, FGRG proliferated there from 2008 to 2011. This happened because a seed company, "Fullgrain," opened business in the municipality. It was during this period that "Diamond X" and "Double Diamond X" became widely planted. The manager reportedly got the seeds from a plant breeder in Nueva Ecija. The seeds were reproduced and packed without proper identification, which were then delivered to some offices and distributed to farmers.

The seeds were described as hybrid varieties but could be replanted even up to three generations inasmuch as they were claimed to be breeder seeds. The 20-kg packed seeds cost PhP5,000 to PhP5,500 or PhP250/kg to PhP275/kg. Variation in prices was attributed to the additional amount they have charged to cover for their incentives. The varieties became available and acceptable to farmers due to their high yield and good eating quality. With the success of the previous varieties, Fullgrain launched additional varieties such as "Infinity Rice", "Super Double Diamond X", "Super Rice," and some other varieties.

Third, in Region 3, majority of farmers who planted FGRGs acquired them from seed growers in the area. FGRGs were "recommended" by seed growers or exchanged among farmers themselves. For example, one of the prominent seed growers was also strategically located near the PhilRice Central Experiment Station. Since these seed growers are well-known, they produced rice seeds released by NSIC, newly promoted, accessed from their networks, or named by them.

Fourth, in contrast, the FGRGs in Regions 4-A and 4-B had names entirely different from those of the released varieties. According to a key staffer of a local

government unit, FGRGs in the regions are named after the farmers (e.g., Kinadoy, Binadong, Rc Leo, Azor 5, etc.) or after major traits that they possess (e.g., Early David, Rc Bato, Super 69, etc.). Since farmers practice seed purification and selection, the rice seeds that they have chosen as best were designated as new rice genotypes (e.g., Up and Down, 129 [a mixture from NSIC Rc128]).

Further, Mindoro and Narra, Palawan farmers are frequent users of FGRGs. The most famous FGRGs sare Genetics, which came from Nueva Ecija, and Diamond X or Double Diamond of unknown origin. Farmers claimed that they bought the rice seeds at higher cost. However, farmers reported having no contact with agents and seed distributors after the purchase. With purification and selection, farmers were able to continuously use the FGRGs, given their good performance and desirable responses to environmental stresses. The local staffer attested that informal naming of these rice seeds is uncontrollable since there are no sanctions despite the presence of a formal system of releasing and naming rice varieties.

Fifth, Bulaw in Bicol Region got its name from the color of the rice - golden brown or yellow. Just like other FGRGs, Kinavite, was named as such because the rice seeds came from Cavite. From the farmers' perspective, the names do not really matter; it is performance that is important. Seed exchange is prevalent throughout the informal seed system, without strict regard to naming conventions.

Sixth and last, Mindanao farmers accessed seeds from neighbors, adjacent communities, elite lines, and off-types after observing the crop performance or following the recommendations of traders, retailers, and seed producers. In some areas, FGRGs are kept for cultural reasons. For example, Bodo-bodo is claimed to be passed from their ancestors in Agusan Del Sur. But, in South Cotabato, M3 came from PhP3M for its good performance in producing grains.

Looking closely at these snippets, one can surmise that most of the farmers prefer popular names in lieu of formal names because of easy recall (Truong et al., 2007; Laborte et al., 2013). In the process, certification and authenticity are not issues. More importantly, rice farmers will try seeds that are said to have higher yields and good eating quality (Adesina and Forson, 1995; Najeeb et al., 2018; Jin et al., 2020). Moreover, informal naming of varieties happens not only at the farmer level, but also mostly on the side of seed growers. Popularizing the names of varieties, from the perspective of seed growers, increases market share, enhances advertising, and creates interest among target clients. Rice farmers even indicated that varietal names should be printed in large fonts on the sacks and not on the tags. Variety names should be used, not the number associated with them. Rice farmers suggested names, such as Maria Lambot, Boy Ani, or Tigas-Dami as samples of names that can be easily remembered.

In a nutshell, rice farmers mentioned three aspects that should be addressed. First, DA-PhilRice and LGUs should conduct intensive information awareness campaigns about names of varieties. These include 1) putting conspicuous labels of varieties to let farmers know of their names, especially in cases when they get seeds to plant in their farms, and 2) updating farmers of newly released varieties with emphasis on varietal characteristics. Second, they emphasized to make varietal names simple and short. Lastly, rice farmers should only be encouraged to buy/use high-quality seeds to be sure about names of varieties. Varietal labels should be large and printed on the package itself, on sacks when purchased, or on plastic packaging when repacked or given as token.

CONCLUSION AND RECOMMENDATIONS

Farmers' access and plant FGRGs with major consideration of their advantages, either in terms of high yield performance or being a special rice with price premium. Moreover, access to FGRGs seeds is seen to be more convenient, given that major modes in accessing them are through seed exchange or from their co-farmers. Perhaps, in the absence of seed growers that sell released rice varieties, the presence of private seed companies (agents, dealers, traders, and cooperatives) that market their own seed products also facilitated the access and adoption of FGRGs. This situation results in the proliferation of FGRGs and encourages disregard of the varietal registration process and the corresponding standard naming process.

On the other hand, the presence of FGRGs and convenient naming practices confront the formal registration process and encourage them to find ways of "popularizing" registered varietal names, instead of the "NSIC or PSB followed by a number" nomenclature. However, there should be stringent measures that can penalize individuals or groups that intentionally mislabel a registered variety for personal and economic gains.

Rice stakeholders seem not to take seriously the standard naming process in releasing varieties. A massive information and education campaign can be

done to communicate the importance of conforming to the process, especially if these varieties are already released. To do otherwise would mean intentional untruthful labeling of the rice seed products. Such mislabeling has negative effects, especially when government agencies conduct surveys to know the percentage utilization of the released varieties. To ensure traceability and encourage varietal truthfulness, the naming of rice genotypes should follow standard procedures and avoid "popularization" that compromises truthful labeling.

With regard to breeding activities, the perceptions of the FGRG adopters regarding their preferred varieties should be considered. If released varieties perform inferior to the FGRG, then non-adoption happens. Earlier chapters revealed that FGRG are genetically similar to or different from released varieties. If these were genetically different, breeders can use them as breeding materials. Preferred characteristics such as high yield, good eating quality, and resistance to pests and diseases, among others, can be given priority.

In light of farming communities that keep on using FGRG but have no major source of these genotypes, development planners could give assistance through seed purification and community seed banks. Training activities that center on these processes can be given to these communities. In the process, highlighting the importance of using high-quality seeds should be stressed.

On a significant positive note, the government's implementation of the Rice Competitiveness Enhancement Fund (RCEF) in 2019, through its Seed Program, is an opportunity to curb proliferation and usage of FGRG in major rice-producing provinces (Department of Agriculture, n.d.). The program promotes and distributes certified seeds of inbred rice varieties, mobilizes and strengthens local seed production, supports variety development, and strengthens farmer organizations. With these, farmers' options on planting materials are now confined to the newly approved and location-specific varieties that the program offers.

Further, as RCEF Seed Program covers 42 provinces with low to medium yield in 2021, greater rice areas are covered. On the other hand, the concurrent promotion of and support for hybrid rice production in 15 rice-producing provinces with relatively higher yield, through the National Rice Program of the Department of Agriculture, is another critical complement (Department of Agriculture, n.d.). These thrusts warrant further study on its impacts on whether FGRG utilization eventually declines or its proliferation continues in program areas.

Thus, this study has shown that the presence of FGRG in farmer fields signifies preferences of certain characteristics unique to these genotypes, merits understanding of their social and scientific origins, and warrants socioeconomic profiling of the farmer-producers.

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CHAPTER 8

Implications to R4D and Industry of Cultivating Farmer-Grown Rice Genotypes in the Philippines

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The Rice Strategic Plan

Various initiatives to boost rice production and the rice industry in the Philippines have allowed the country to promote and accelerate the development of the seed industry, and to conserve, preserve, and develop the plant genetic resources of the nation. The Seed Industry Development Act of 1992 (RA 7308) declared the seed industry as a million-dollar investment. The agricultural sector contributes 14% to the country's gross domestic product and 13 million workers (32 %) comprise the labor force.

Rice is the staple food of Filipinos. The Department of Agriculture, in partnership with PhilRice and other DA agencies, aggressively promotes the use of modern rice technologies. Yet, in spite of billions of government money spent for this purpose, 100% rice-sufficiency has not been achieved.

PhilRice continues its efforts to enhance national rice R4D capabilities in generating and promoting improved, appropriate, and sustainable rice and rice-based technologies. To pursue more appropriate R4D efforts, PhilRice has developed its strategic plan for 2017-2022, guided by its vision of a rice-secure Philippines, with partners as key stakeholders.

To help realize its goals, PhilRice pursues seven strategic outcomes: (1) increased productivity, cost effectiveness, and profitability of rice farming in a sustainable manner; (2) improved rice trade through efficient postproduction, better product quality, and reliable supply and distribution system; (3) enhanced value, availability, and utilization of rice, diversified rice-based farming products, and by-products for better quality, safety, health, nutrition, and income; (4) science-based and supportive rice policy environment; (5) advanced rice science and technology as continuing sources of growth; (6) enhanced partnerships and knowledge management for rice research for development (R4D); and (7) strengthened institutional capability of PhilRice (www.philrice.gov.ph).

Role of Farmer-Grown Rice Genotypes (FGRGs) in the Rice Industry and Implications to Millers and Consumers

FGRGs still loom large in the realm of the seed industry. As discussed in Chapter 2 of this book, several reasons shed light on their existence in the market. In general, they proliferate as a marketing strategy geared toward promising an increase in yield and income of the farmers. Majority of them are found in the major rice-growing areas in the country. Efforts from both

government and private seed companies are being exerted to bridge yield gaps in the industry.

Increasing the national yield of rice becomes crucial with the adoption of new varieties and other yield-enhancing technologies that aim to achieve a 10-50% improvement. To date, our national average yield is 4 t/ha. From 1990 to 2020, 325 rice varieties (inbred and hybrid) have been released by the National Seed Industry Council (NSIC), cutting across major rice ecosystems in the country (Table 1). New varieties have attained yields of as high as 10-14 t/ha. But, in spite of the massive promotion of good and high-yielding quality rice, farmers still plant genotypes as collected and presented in the previous chapters. This is partially explained by the limited sources of high-quality seeds supposedly produced by seed growers.

More than 4,000 seed growers (SGs) are accredited by the Bureau of Plant Industry through the National Seed Quality Control Services. However, they are mostly located in major rice-producing areas such as Nueva Ecija and Isabela. Access of rice farmers to certified seeds (CS) in some remote areas is still limited. Thus, farmers continue to use either recycled seeds or seeds obtained from neighbors, after which they are given names that they like or are simply descriptions of the material. This results in either an increase or decrease in yield. These genotypes are usually unclassified and have not been rigorously tested in multilocation environments. More often, they are susceptible to pests and diseases and not adapted to a wide range of farming conditions. The consequence is crop failure. A study conducted by DA-PhilRice has shown that high usage of good-quality seeds can increase yield by at least 10% for inbred and up to 25% for hybrid varieties.

FGRG play a major role in the rice industry despite being unclassified because many farmers still cultivate them. These are readily available and they possess desirable traits that farmers prefer. Milled rice is classified into four categories:(1) special rice, which includes glutinous, aromatic, japonica, pigmented, and those with excellent eating and nutritive quality; (2) premium rice, which meets the highest grade requirements (less than 10% broken kernel); (3) well-milled rice (WMR) with fewer than 20% of broken kernels; and (4) regular-milled rice (RMR), which has been milled with 20-40% broken kernels.

According to PSA (2019), special rice is priced about one-third higher than RMR, whereas premium rice is about one-fifth higher. It has been noted in this book that some collected rice genotypes are premium and may command higher prices in the market, with better specific adaptability, excellent eating quality, and resistance to biotic and abiotic factors in specific regions. Thus, farmers have continued to plant these rice genotypes from generation to generation, and from one season to another.

This book has shown that many rice genotypes resemble the nationally released varieties as reflected by their similarity coefficients through DNA testing and analysis as discussed in Chapter 4. Different names may have implications not only to consumers but also to researchers. Farmers may perceive a variety to be different, but it is in fact the same variety released by the NSIC. The right of consumers to know the correct names may be compromised and may result in the violation of RA 7394 or the Consumer Act of the Philippines on mislabeling. Non-uniform rice genotypes may affect milling. To attain the highest yield of white rice, uniform sizes are recommended to minimize broken grains on top of other postharvest operations. Higher percent head rice recovery commands a higher price.

Increasing Competitiveness of Rice Farming in the Philippines

In February 2019, Republic Act 11203, also known as the Rice Tariffication Law, was passed by Congress, which aims to modernize the rice agricultural sector as a way of making it globally competitive. Under this law, P10 billion is being allotted annually to the rice competitiveness enhancement fund (RCEF). These funds will be used for certified seeds, farm mechanization, training and extension, and credit assistance. The seed program is being implemented in 42 provinces throughout the country.

In addition to RCEF implementation, other provinces not covered by RCEF are being devoted to the hybrid rice program under the stewardship of the Department of Agriculture. With these aggressive climate-smart interventions of the government to increase rice production, it is expected that adoption of good-quality seeds will help farmers increase their harvest.

Impact of FGRGs on the Philippine Rice Seed System

The FGRGs have been widely used and are adapted to local farm conditions because of the myriad of characteristics that they possess. They have been in the farm for many years and may have been adapted to changing climatic conditions. Weather patterns across the country's rice ecosystems may play a role in the

performance of FGRGs; if farm conditions are suitable and if they were the only available material owned by the farmer, continuous use is the best option. This can only happen in remote areas of the countryside, where distribution of high-quality seeds is impossible.

Farmers usually save seeds for the next cropping either for home consumption or for the market. FGRGs with excellent eating quality are usually preserved even if they yield low. Farmers can still sell them at a premium price because of the 'new name' that describes the product, but this does not take long because purity maintenance is difficult when such varieties are planted repeatedly over the years. The result is poor performance of the FGRGs. In some cases, due to mixtures, the genotype can perform well and be renamed again, until it proliferates.

These scenarios have great impact on the country's seed system, particularly in safeguarding the registry of seeds and maintaining the quality control system that are in place. If not controlled, unclassified seeds will proliferate in the market and consumers might not be able to afford them. In the end, farmers are at a loss because they cannot avail of the seed distribution program of the government and the FGRG seeds may not be stable over time. Besides, there are regulatory requirements for or non-approval at all of the exportation of unclassified seeds if the Philippines needs to sell rice to other countries. FGRGs have not undergone standard testing at the national and regional levels and thus may create more problems in the long term.

Impact of FGRGs on Rice Variety Development

Rice variety development and improvement has been proven to address the population's key concerns on food security, availability, and income. Farmers' perceptions of the kind of seeds they want may not always be prioritized by breeders, which lead to lower or non-adoption of these released rice varieties. Sometimes, the released varieties have poor performance, thus dampening the decision to acquire high-quality seeds. Breeders should therefore consider the high-performing farmers' rice genotypes for further study. Through time, these genotypes may have evolved in farmers' fields and now possess traits that contribute to their high performance — e.g., resistance to pests and diseases, lodging, and drought; high yield, and good eating quality, not to mention other traits.

Farmers' knowledge of high-quality seeds must also be strengthened in every community. In the study, only one of two farmers practices seed purification. This can lead to low performance in the field and seed quality is most likely compromised. Government agencies involved in the training of farmers through seminars, information campaigns, and other related activities should be supported and must have skilled staff to make farmers understand better the idea of using quality seeds.

FGRGs are among the key components in any breeding program due to their heterogeneity, potentially wide range of abiotic and biotic stress adaptability, and good quality traits. With Agriculture 4.0, which uses modern tools, characterization of unique collections is essential to provide valuable information for use in developing new varieties with traits that can enable the crop to survive under climate-stressed conditions. It has been shown in many studies that pre-breeding activities are a prerequisite in the development of successful varieties. A few rice genotypes in this collection have shown unique genetic features and may become new sources of desirable traits for crop improvement in the future. Further, these FGRGs should be phenotypically purified, DNA-fingerprinted, and their genetic purity and similarities to registered varieties assessed. The genetic traits must be further studied.

Lessons Learned from the Collection of FGRGs

Divergent lessons were learned from the nationwide collecting missions led by researchers and partner-LGUs, farmers, and agricultural workers. One is seed-saving and free seed-exchange among farmers in a community. This is a respected tradition in the countryside as part of the informal seed system. Due to limited supply and lack of access to seed sources (legitimate seed growers) of certified seeds in a community, farmers have no other choice but plant seeds coming from neighboring farms or use saved seeds or the unclassified ones they had bought. More often, this can lead to crop failure in the long term. This has an advantage in the short term because farmers would be assured of seeds for the next cropping season.

With the enforcement of RTL and increasing rice competitiveness together with recent developments in information technology, various means of communication, efficiency in the delivery of technologies, and support of the Department of Agriculture, farmers can now benefit from using and propagating high-quality certified seeds.

Proliferation of unclassified and unregistered seeds, named as FGRGs in this book, should be discouraged because majority of them are only similar or inferior to the released varieties. A very popular registered variety known for its aroma and excellent eating quality trait, NSIC Rc 218, is sold to poor farmers at a higher price

and is named as “Double Diamond X”, “Sampaguita”, “Diamond V”, “Tabuk”, etc. (Chapter 5, Table 1). Another very popular high-yielding variety, NSIC Rc 222, is similar to many varieties in the market such as “Diamond X”, “Super Diamond”, “Dream Rice”, “Best Rice”, “Ganador”, “Destiny”, “IL29”, etc. (Chapter 5, Table 3), which are again sold by many seed growers at a higher price (Figure 1). These are advertised as line varieties with certification and of high-quality seeds. Other seed growers do not advertise but often they are introduced during business transactions. An early-maturing popular variety, PSB Rc 10, had 95% genetic similarity with FGRG “75 days”, 94% with “Bulaw” and “Up & Down”, 93% with “Mindanao” and “Speed” (Chapter 2, Rice Collections), and many more.

The collection of FGRG helped researchers understand the characteristics or traits that farmers prefer. Breeders may already know this because most of them are farmer-agriculturists, are raised in farming communities or have parents who are farmers themselves. Two very important traits are preferred by farmers: high yield and good grain quality. Other traits such as resistance to biotic and abiotic stresses, short maturity, adaptation to local conditions, availability of financial support, and other social factors also play a major role.

Policy Recommendations

There must be a policy to strengthen the main sources of high-quality seeds, such as the seed growers, to ensure continuous growth in the seed industry. Seed growers are often the main players why most of the released varieties are named differently. To add value to the existing varieties or genotypes, these are labelled as improved types or something that will catch attention by giving popular names, or high-yielding. Given such a policy, any violators can be duly penalized for misnaming or misusing already released varieties for their own benefit.

Through DNA fingerprints and analyses, newly identified FGRGs with distinct traits not similar to the released varieties are important sources of genes for rice improvement. They have to be fully characterized under the Genetic Resources Division (GRD) using DA-PhilRice protocols and be made available to breeders. The source and the material itself can also be listed under the new NSIC guidelines for traditional variety (if it is a traditional variety) or registered but has to undergo the National Cooperative Tests for evaluation and recommendation.

CONCLUSION

This book has shown that many rice genotypes collected are similar to PSB (Philippine Seed Board) and NSIC (National Seed Industry Council) - released rice varieties with the exception of a few. The major reasons for using FGRGs are high yield, good eating quality, pest and disease resistance, and easy access.

It is recommended that studies/interventions be pursued. It is essential that only FGRGs with unique traits and true genetic identity are conserved and elucidated using advanced technology to determine their genetic worth. This book should help breeders get informed of the list of these materials with complete characterization for pre-breeding activities and later for mainstream variety improvement. Seeds collected were conserved in the Genetic Resources Division of DA-PhilRice and further characterized in the field and in the laboratory using modern genetic tools. Regional rice preferences and breeding must be enhanced for location-specific recommendations. This has been spearheaded by the Rice Technical Working Group (RTWG) on variety recommendation by region and at national levels.

Under the Next Generation project of IRRI and DA-PhilRice, performance of released varieties is demonstrated through participatory varietal selection (PVS) across regions. Farmers themselves select the varieties they prefer and make recommendations to regional seed growers for seed multiplication and commercialization. In this way, farmers have easy access to newly released varieties, enabling them to buy at a reasonable price.

In areas lacking in seed growers and access to certified and high-quality seeds is limited, the LGU should spearhead the development of their own local seed industry framework and services. Training programs on seed purification for informal seed systems in areas where seed growers do not operate, should be enhanced. There should be aggressive promotion of rice and rice-based technologies in farming communities to achieve rice security in the country.

Table 1. Philippine Seed Board (PSB) - (now the National Seed Industry Council [NSIC]-registered rice varieties in the Philippines from 1990 to 2022 (PhilRice, 2022).

Irrigated lowland	89	1990-2022	120	1998-2021
Rainfed lowland	51	1990-2022		
Rainfed (drought)	1	2009		
Rainfed (submergence)	2	2009-2020		
Upland	10	1990-2014		
Saline-irrigated lowland	47	1995-2022		
Cool elevated	10	1995-2019		
High temperature	2	2020		
Special purpose		2009-2019		
Glutinous	6	2004-2017		
Aromatic	5	2004-2013		
Japonica	7	2009-2019		
High zinc	3	2016-2022		
Pigmented	5	2021		
Traditional variety	4	1995-1997		
Golden Rice	1	2022		
Total	243		120	

Figure 1. An example of a business signboard from a seed grower (name withheld) along a highway in Nueva Ecija selling unclassified lines/varieties such as “Diamond X”, “Super Diamond X”, “Double Diamond X”, “Offspring”, “Destiny”, “L300”, “Ganador”, and “Dream Rice”.

Glossary

Breeding line – a genetically identical homozygous individual that, when intercrossed, produces only offspring that are identical to their parents. Term used by breeders to indicate selected individuals in a population. It is neither a cultivar nor a variety.

Cultivar – a cultivated variety that has been selected for desirable characteristics and propagated but does not produce true-to-type-seeds.

DNA fingerprint – refers to the deoxyribonucleic acid (DNA) base-pair pattern of an individual that makes it different from other individuals.

Farmer-grown rice genotype – rice that is cultivated by farmers with unique or local name and is not registered under the formal seed system.

Genotype – refers to the genetic constitution of an individual governed by intrinsic traits or characters.

Phenotype – observable traits of an individual which are normally attributed to the effect of environment and genotype interaction.

Similarity coefficient – a measure of similarity of an individual or two sets of data with a range from 0 to 100%.

Variety – a group of plants within species with distinguishing characteristics that produces true-to-type-seeds.

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