PHILIPPINE RICE RICE BRODE HIGHLIGHTS 2012

National Rice Cooperative Tests (NCT)



TABLE OF CONTENTS

	Page
Executive Summary	1
National Rice Cooperative Tests (NCT)	
Abbreviations and acronymns	3
List of Figures	7

National Rice Cooperative Tests (NCT)

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Four new inbred varieties for the irrigated lowlands were approved for commercial cultivation on November 23, 2012 by the National Seed Industry Council (NSIC). Three of these varieties were bred by the PhilRice breeding team under the program on sustaining yield potential of irrigated lowland rice. These are NSIC Rc298 recommended for direct-seeding culture, NSIC Rc300 for transplanting, and NSIC Rc304SR, a japonica special rice suitable for planting under tropical conditions. The fourth variety, NSIC Rc302 is an IRRI-developed variety, also intended for the irrigated lowlands.

Highlights:

The new varieties for commercial cultivation are characterized below:

• NSIC Rc298 (Tubigan 23)

This is the first variety intentionally developed for direct seeding culture. It was bred under the line designation PR34159-13-1 with a cross PR29253-96-1/ AR32-4-58-2. It completed its 18 trials in the NCT Phase 1 Field Performance Tests from 2008 to 2010 DS. It is consistently high yielding under the direct seeding culture at an average of about 5t/ha with yield advantage of 5.0% against the check variety, PSB Rc82 a widely adaptable variety even under the direct seeding culture. In the multi-adaptation trial (MAT) for two consecutive seasons, it registered a yield advantage of 5.6% across seasons. It is generally comparable to PSB Rc82 but exhibited better adaptation in Isabela, Cagayan, Palawan, Bohol, Samar, Bukidnon, Zamboanga del Sur, Camarines Sur, and Kalinga. This early maturing variety at 104 days when direct seeded has a yield potential of 8t/ha. It is moderately resistant to white stem borer and brown plant hopper and intermediate to green leaf hopper. Against diseases, it exhibited intermediate reaction to bacterial leaf blight in five out of six sites. For blast, it is also intermediate to races in Leyte and Camarines Sur as well as to sheath blight in Leyte. As to grain quality, it has the preferred traits of intermediate amylose content, grade 1 milling recovery, and long and slender grains. It has satisfactory sensory properties with high percentage acceptability both in cooked and raw forms than PSB Rc82 and comparable to IR64.





• NSIC Rc300 (Tubigan 24) Known in the NCT as PR31379

Known in the NCT as PR31379-2B-10-1-2-1-2, this variety is a cross of PSB Rc62/PSB Rc66. This advanced breeding line which passed the 5-season testing at NCT is adapted to both transplanting and direct seeding culture. It passed the standards for yield, pest resistance, and grain quality parameters. As a transplanted crop, yield is stable across seasons and locations with a range of 5.6 to 5.9t/ha. Maximum attainable yield was recorded at 10.4 t/ha. It matures in the range of 112 to 117 days, growing from 91 to 101cm, and with productive tillers from 13 to 16. It is generally moderate to blast, bacterial leaf blight, and sheath blight but susceptible to the tungro virus. For insects, it is also moderate to yellow stem borer, brown plant hopper, and green leaf hopper but susceptible to white stem borer. It has very good milling attributes: premium milling recovery (72.2%), grade 1 head rice (48.9%) with long and intermediate grain size, and intermediate amylose ranging from 19.8 to 20.9%. Sensory qualities for raw and cooked rice are comparable to IR64.



Figure. 2. PR31379-2B-10-1-2-1-2 at full heading, and kernel quality.

• NSIC Rc302 (Tubigan 25)

This variety was evaluated and passed the NCT under line designation IR79643-39-2-2-3 for five seasons in the NCT Phase 1 and two seasons in the MAT. It is a cross involving two IR lines, namely IR72904-65-1-3 / IR73102-137-2-2-2. It is generally high yielding as direct-seeded crop during the DS with yield advantage of 14.8%. When transplanted, it is comparable to PSB Rc82. This early maturing variety (115 days as transplanted and 106 days as direct seeded) showed intermediate reaction to blast, BLB, and ShB and moderate reaction to GLH and BPH in majority of the test sites in Isabela, Laguna, Leyte, Iloilo, and North Cotabato. It was characterized with intermediate amylose content with extra long and slender grains, fair brown rice and milling recovery ,and less inferior eating quality than IR64.



Figure 3. IR79643-39-2-2-3 at early reproductive stage and kernel quality

• NSIC Rc304SR (Japonica 3)

This japonica type variety was evaluated in the NCT as PR34126-B-1 with parents, PJ9 /PR27137-CR153. It exhibited high yield advantage of 34.2% during the WS against the check variety MS11. It matures in the range of 112 to 115 days or 113 days on the average. It has intermediate reaction to BLB in all test sites and sheath blight in four out of six sites. Blast resistance was observed in Isabela, Laguna, and North Cotabato but

not in Leyte. Typically japonica short and bold grain type, it exhibited good milling and head rice recovery, low amylose content, and good eating quality. Its glossy, cohesive, tender and smooth texture, and tastiness contributed to is high preference.



Figure 4. PR34126-B-15 at early heading stage and kernel quality

As to seed availability, the breeder seed stock conforms to the requirements of the National Seed Industry Council. Aggressive seed purification and production activities are being pursued to facilitate seed dissemination and distribution. Package of cultivation technologies is still to be made.

Abbreviations and acronymns

ABA – Abscicic acid Ac – anther culture AC – amylose content AESA – Agro-ecosystems Analysis AEW – agricultural extension workers AG – anaerobic germination AIS – Agricultural Information System ANOVA – analysis of variance AON – advance observation nursery AT – agricultural technologist AYT – advanced yield trial BCA - biological control agent BLB - bacterial leaf blight BLS – bacterial leaf streak BPH – brown planthopper Bo - boron BR - brown rice BSWM - Bureau of Soils and Water Management Ca - Calcium CARP - Comprehensive Agrarian Reform Program cav – cavan, usually 50 kg CBFM - community-based forestry management CLSU - Central Luzon State University cm - centimeter CMS - cystoplasmic male sterile CP - protein content CRH – carbonized rice hull CTRHC - continuous-type rice hull carbonizer CT - conventional tillage Cu - copper DA - Department of Agriculture DA-RFU - Department of Agriculture-**Regional Field Units** DAE - days after emergence DAS – days after seeding DAT - days after transplanting DBMS - database management system DDTK - disease diagnostic tool kit DENR - Department of Environment and Natural Resources DH L- double haploid lines DRR – drought recovery rate DS – dry season DSA - diversity and stress adaptation DSR - direct seeded rice DUST - distinctness, uniformity and stability trial DWSR – direct wet-seeded rice EGS – early generation screening EH – early heading

EMBI – effective microorganism-based inoculant EPI – early panicle initiation ET – early tillering FAO – Food and Agriculture Organization Fe – Iron FFA - free fatty acid FFP - farmer's fertilizer practice FFS - farmers' field school FGD – focus group discussion FI - farmer innovator FSSP - Food Staples Self-sufficiency Plan g – gram GAS - golden apple snail GC - gel consistency GIS - geographic information system GHG - greenhouse gas GLH - green leafhopper GPS - global positioning system GQ - grain quality GUI – graphical user interface GWS - genomwide selection GYT – general yield trial h – hour ha – hectare HIP - high inorganic phosphate HPL - hybrid parental line I - intermediate ICIS - International Crop Information System ICT - information and communication technology IMO - indigenous microorganism IF - inorganic fertilizer INGER - International Network for Genetic Evaluation of Rice IP - insect pest IPDTK – insect pest diagnostic tool kit IPM – Integrated Pest Management IRRI – International Rice Research Institute IVC - in vitro culture IVM - in vitro mutagenesis IWM - integrated weed management JICA – Japan International Cooperation Agency K – potassium kg – kilogram KP – knowledge product KSL - knowledge sharing and learning LCC - leaf color chart LDIS - low-cost drip irrigation system LeD – leaf drying LeR – leaf rolling lpa – low phytic acid LGU - local government unit

LSTD - location specific technology development m – meter MAS - marker-assisted selection MAT - Multi-Adaption Trial MC - moisture content MDDST - modified dry direct seeding technique MET – multi-environment trial MFE – male fertile environment MLM - mixed-effects linear model Mg – magnesium Mn – Manganese MDDST – Modified Dry Direct Seeding Technique MOET – minus one element technique MR - moderately resistant MRT – Mobile Rice TeknoKlinik MSE – male-sterile environment MT – minimum tillage mtha-1 - metric ton per hectare MYT – multi-location yield trials N – nitrogen NAFC – National Agricultural and Fishery Council NBS – narrow brown spot NCT – National Cooperative Testing NFA - National Food Authority NGO – non-government organization NE – natural enemies NIL – near isogenic line NM – Nutrient Manager NOPT - Nutrient Omission Plot Technique NR – new reagent NSIC - National Seed Industry Council NSQCS – National Seed Quality Control Services OF – organic fertilizer OFT - on-farm trial OM - organic matter ON – observational nursery OPAg - Office of Provincial Agriculturist OpAPA – Open Academy for Philippine Agriculture P - phosphorus PA - phytic acid PCR – Polymerase chain reaction PDW - plant dry weight PF – participating farmer PFS – PalayCheck field school PhilRice – Philippine Rice Research Institute PhilSCAT - Philippine-Sino Center for Agricultural Technology PHilMech – Philippine Center for Postharvest Development and Mechanization PCA – principal component analysis

PI – panicle initiation PN – pedigree nursery PRKB – Pinoy Rice Knowledge Bank PTD – participatory technology development PYT – preliminary yield trial QTL – quantitative trait loci R - resistant RBB – rice black bug RCBD - randomized complete block design RDI – regulated deficit irrigation RF - rainfed RP – resource person RPM - revolution per minute RQCS - Rice Quality Classification Software RS4D - Rice Science for Development RSO - rice sufficiency officer RFL – Rainfed lowland RTV - rice tungro virus RTWG – Rice Technical Working Group S – sulfur SACLOB – Sealed Storage Enclosure for Rice Seeds SALT – Sloping Agricultural Land Technology SB – sheath blight SFR – small farm reservoir SME – small-medium enterprise SMS – short message service SN – source nursery SSNM – site-specific nutrient management SSR – simple sequence repeat STK – soil test kit STR – sequence tandem repeat SV – seedling vigor t – ton TCN – testcross nursery TCP – technical cooperation project TGMS – thermo-sensitive genetic male sterile TN – testcross nursery TOT – training of trainers TPR – transplanted rice TRV – traditional variety TSS – total soluble solid UEM – ultra-early maturing UPLB - University of the Philippines Los Baños VSU – Visayas State University WBPH – white-backed planthopper WEPP - water erosion prediction project WHC – water holding capacity WHO – World Health Organization WS - wet season WT – weed tolerance YA – yield advantage Zn – zinc ZT – zero tillage

List of Figures

	Page
Figure 1. PR34159-13-1 at early reproductive stage, and kernel quality.	2
Figure. 2. PR31379-2B-10-1-2-1-2 at full heading, and kernel quality.	3
Figure 3. IR79643-39-2-2-3 at early reproductive stage and kernel quality	3
Figure 4. PR34126-B-15 at early heading stage and kernel quality	4

7



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

We accomplish this mission through research and development work in our central and seven branch stations, coordinating with a network that comprises 58 agencies and 70 seed centers strategically located nationwide. To help farmers achieve holistic development, we will pursue the following goals in 2010-2020: attaining and sustaining rice self-sufficiency; reducing poverty and malnutrition; and achieving competitiveness through agricultural science and technology.

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

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