CONTRACTORS

PHILRICE BICOL

TABLE OF CONTENTS

Executive Summary	Page
PhilRice Bicol	1
I. Intensified Rice-Based Agribio Systems (IRBAS)	1
II. Learning Center And Training For PhilRice Bicol Staff	3
III. PALAYABANGAN: The 10-5 Challenge	6
IV. One Stop Information Shop	8
V. Rural Transformation Movement: Gusto Namin Milyonaryo Kayo Campaign	8
VI. Best Station Contest/ Conduct of Field Day	9
VII. Upland Rice Development Program	9
Abbreviations and acronymns	13
List of Tables	15

PhilRice Bicol

Acting Branch Manager: Sailila E. Abdula

Executive Summary

PhilRice Bicol was established in 2010 and was starting to develop its R and D agenda and build strong partnerships with cities and municipalities in Region 05. PhilRice' corporate advocacy campaigns not only reached farmers but also local officials and students. The station also reached more rural farming communities through the conduct of technical briefings and participation in farmers field days. Evidently, local government units (LGU) have cast their support to all the station's activities. In 2014, PhilRice Bicol has geared toward implementation of Program-based Studies from PhilRice Central Experiment Station.

I. Intensified Rice-Based Agribio Systems (IRBAS)

MAC De Peralta, GC De Peralta, SM Oxales

In view of the goal towards rice self-sufficiency and the struggle to achieve it, farmers are challenged to intensify rice production or produce other crops that are competitive in the market. The IRBAS business plan was developed to promote an intensified and diversified crop production on-station and in nearby rice farming communities that is sustainable, ecologically efficient and socially acceptable. Through this project, farmers can attain higher profitability through crop diversification and integration of rice-based enterprises such as mushroom production, vermicomposting and duck raising.

Among the objectives of IRBAS are to intensify and diversify the crop production on-station and in nearby rice farming communities; assess the acceptability and economic performance of different rice-based enterprise; evaluate the market potential of rice-based products; and achieve a target profit of P1M per hectare per year.

The IRBAS project established in PhilRice Bicol station for its initial season was composed of three components: (1) cropping system (rice-rice-peanut production), (2) oyster and "kurakding" mushroom production and; (3) vermicomposting. Presented in Table 1 are different components of on-station IRBAS, its base products and designated areas of coverage.

Table 1. IRBAS Project Components	and their designated area of coverage.
2014.	

Component No.	Enterprise	Base Product	Value-Adding	Area (ha)	
1	Rice-Peanut	ÜÜÜÜÜ		1.00	
1		peanut seeds	peanut butter	1.00	
2	Mushroom Production	mushroom	dried mushroom	0.10	
2	Vormicomposting	vermicompost		0.10	
5	vermicomposing	ÜÜÜÜÜ			
		Total Area		1.20	

Highlights:

Cropping System

- Established NSIC Rc204H (Mestiso 20) in 1-ha area during the WS 2014.
- An adjusted yield of 3.95t/ha was attained (average grain moisture of 15.7%).

Mushroom Production

- Constructed a mushroom house (3m x 4m) with shed (3m x 4m) made of light materials.
- Produced a total of 383 oyster mushroom fruiting bags and 256 "kurakding" fruiting bags (S. commune) were produced.
- Marketed a total of 14kg fresh oyster mushroom and 5 fruiting bags as of December 11, 2014.

Vermicomposting

- Constructed a vermin house (7m x 3m) with 4 concrete bins (1m x 3m).
- Started the initial stocking of 2.5kg vermi worms per bin in rice straw-azolla-carabao manure substrate.

Others

- Planted vegetable (amplaya, kamote) and pinepapple; planted marigold and black sesame seed.
- Produced azolla in 12 plots (3m x 4m).

II. Learning Center And Training For PhilRice Bicol Staff

GA Castañeda, RT Dollentas

The Learning Center is primarily used to demonstrate integrated and diversified rice-based productions system that will provide experiential learning opportunities to learners or trainees to various on-farm option. Learning Center aims to provide experiential learning opportunities to learners or trainees (i.e. farmers, students-trainees, others) by showcasing a holistic and comprehensive technology packages through the integrated and diversified rice-based production system approach, capacity enhancement and inclusion of other available technology component that maximizes the potential of agriculture.

Highlights:

- Established and maintained and experiential learning venue for farmers, AEWs, and other clients of PhilRice with the following components which accommodated a total of 475 PhilRice visitors composed of SUC, DAR, PLGUs/LGUs, Irrigators Association and farmers from the different municipality across the region.
 - a. Demonstrated the 6 different rice growth stages (Plot size: 250m² per growth stage) through relay rice planting during wet and dry season cropping Yields (t/ha) were also gathered from the demonstration area using NSIC Rc238.

Block #	Dry Season	Wet Season
Block 1	4.9	3.9
Block 2	6.0	3.6
Block 3	6.0	2.5
Block 4	damaged by birds, rats,	damaged by typhoon ruby;
Block 5	rice bugs.	Block5 and 6 was
Block 6	Damaged by typhoon	damaged by birds and rats

Table 2. Yield of NSIC Rc238 (t/ha) gathered from the demonstration of 6 rice growth stages in Learning Center of PhilRice Bicol Station.

- b. Showcased the following PhilRice technologies:
 - MOET set up was established
 - Modified Dapog and Wetbed method of crop establishment was demonstrated
 - Controlled Irrigation with piezometer tubes demonstrated
 - Use of Farm Machinery such as Brass Cutter

Harvester demonstrated.

- Planted insect repellants flowering plants
- (marigold) in the Learning center vacant areas.
- Demonstrated 14 newly released rice varieties
 - of both inbred and hybrids (Plot size: 200m²).
- Seven out of the 14 rice varieties demonstrated (NSIC Rc298, Rc292, Rc300, Rc302, Rc308, Rc342, Rc346, Rc240, Rc222, Rc204, PSB Rc18, SL18, SL12, SL8) survived from Tungro infestation. Infestation was noted at tillering stage. Recorded yields were as follows:

Table 3. Yield of the different rice varieties (t/ha) in Learning Center ofPhilRice Bicol Station.

Variety	Grain Yield (14%MC)
SL18	1.8
SL 12	2.3
SL8	2.6
PSB Rc18	1.9
NSIC Rc222	2
NSIC Rc240	2.6
NSIC Rc204	2.6

Yield obtained from 7 remaining varieties were due to frequent heavy rains at flowering stage. Also continuous rainshower in the month of December caused the delay in harvesting of crops that resulted in grain shattering and infestation of birds and rats.

C. Demonstrated a rice-mungbean-rice cropping pattern

Planted rice in 0.21ha and yielded 3.9t/ha. However, planting of mungbean was cancelled due to continuous rain after harvest of rice.

d. Showcased Tilapia pond refuge as modified rice-fish culture

Demonstrated 2 tilapia pond refuge with an area of 112 and 400m². Smaller pond was used as rearing place for fingerlings prior to releasing to the larger pond with a stocking density of 3 fingerlings/m². Total stock are 1200 fingerlings. Taros were planted in perimeter of the pond to maximize land use.

- e. Maintained practicum area (300m²) for trainees hands-on activities
- f. Established and maintained learning shed (4m x 6m area with a capacity of 25 to 30 farmers)
- g. Fine-tuned technology of the outstanding yielder of the Palayabangan 10-5 Challenge – not yet established
- h. Introduced and demonstrated other agri-related ventures not yet estbalished
- Enhancing capability and technical knowledge of PhilRice Bicol Staff
 - a. Conducted Appreciation Course on Rice Science and Technology for PhilRice Bicol Staff composed of 22 participants coming from Admin and R and D Staff including field workers in Nov. to Dec. 2015. Senior staff, RSTC graduates staff, and PhilRice CES experts were invited and served as facilitators and speakers for the training.
 - b. Agricultural Statistical Analysis Training conducted on Jan 16 to 21 with the participants from the R&D unit .
 - c. Workshop on Research Proposal Development and Protocol (i.e. Logframe) Development on May 21 to 23, 2014 with the participants from the R&D unit.
 - d. Mushroom Production Training on June 19 to 20, 2014 with participants from the R&D unit.

III. PALAYABANGAN: The 10-5 Challenge

SM Oxales

The 10-5 challenge aims to raise the rice production standard to 10t/ha yield at PhP5.00 input cost for every kilogram of palay produced. Current average yield is 4t/ha while input cost is PhP11/kg of palay. This new initiative also aims to provide opportunities for all players in the rice sector to show what they can do to improve yield and reduce production cost. Palayabangan: The 10-5 Challenge supports the goal of the Food Staples Sufficiency Program of the country and the advocacies of the National Year of Rice to help increase farmers' productivity, make them globally competitive and boost their morale.

Highlights:

For DS 2014

Table 4. Participating entries for Palayabangan: The 10-5 Challenge for DS2014.

Name	Type of Participant	Name of Representative
1.Edgar Pesebre	Individual farmer(competing)	
2.Bayer Crop Science	Seed Company (competing)	Alkeen Ingal
3.PhilRice	Organization (Non-competing)	RCastro/DMujar

Table 5. Summary of production	n cost per pa	articipant*	(D5, 2014)
Particulars	Bayer	Pesebre	PhilRice
A. Material Cost			
Seeds	1,860.00	150.00	560.00
Fertilizer	2,016.22	22.00	1,527.81
Chemical	675.00	0.00	385.00
TOTAL	4,551,22	172.00	2,472.81
B.Labor Cost			
Seedling Care	400.00	352.50	87.50
Land Preparation	3,500.00	1,200.00	1,200.00
Crop Establishment	1,900.00	800.00	600.00
Crop Care and maintenance	493.00	237.50	1,847.50
Harvesting	1,373.75	0.00	1,200.00
Threshing	340.00	0.00	25.00
Total	8,006.75	2,590.00	4,690.00
C. Fuel	0.00	180.00	37.50
D. Irrigation Fee	137.60	114.00	114.00
E. Food	0.00	200.00	0.00
F. Transportation Cost	0.00	125.00	90.00
TOTAL COST OF PRODUCTION	12,	3,267.00	7,674.31
	695.56	-	-
Yield (kg ha-1 at 14% MC)	3,476	**	4,179
Computed Production Cost (Php/kg)	3.65	**	1.84

Table 5. Summary of production cost per participant* (DS, 2014)

*Unofficial computation of SMOxales, Production Cost Monitor

For WS 2014

Table 6. Participating Entries for Palayabangan: The 10-5 Challenge fo	r Wet
Season 2014.	

Name	Type of Participant	Representative	
1.Edgar Pesebre	ÜÜÜÜÜÜÜÜÜÜÜÜÜÜ	Edgar Pesebre	
2. Gem Agrologic	Chemical company/competing	Marwin Villacorta	
3.Pioneer Hi Bred	Seed Company/competing	Nelson Paraguision/Philip Nacario	
4. Nature Rescue	Chemical Company/competing	Nelson Paraguison/Maui Manlapaz	
5.Syngenta Phil	Chemical Company/competing	Dindo Seniedo	
6. SL Agritech	Chermical Company/ competing	Garry Jay Muertigue	
7. Bayer Crop Science	Chemical Company/competing	Alkeen Ingal	
8. PhilRice Research	Government/Non-competing	Glenn de Peralta	
9. PhilRice Development	Government/non-competing	Shiela M. Oxales	

Table 7. Yield and production cost per hectare.

Rank	Participants	Variety Used	Grain yield (kg/ha at 14% MC)	ÜÜÜÜÜ
1	Bayer Crop Science	Arize Bigante Plus	5704.858	8.4
2	Pioneer Hibreed	PHB73	5770.866	8.8
	PhilRice	NSIC Rc238, CS		
3	Development		5173.745	7.2
4	Syngenta Phil	Frontline Gold	5193.023	8.9
5	Nature Rescure	Arize Bigante Plus	4792.797	10.7
6	Edgar Pesebre	Sub 11, Good seed	3733.734	8.0
7	PhilRice Research	M20	3404.747	11.3
8	Gem Agrologic	Arize Bigante Plus	1949.115	21.2
9	ÜÜÜÜÜ	SL 18	1246.259	27.0

- No entry were able to attain the 10 ton yield and 5 pesos per kg production cost. However, Bayer Crop Science is the consistent highest yielder using Arize Bigante Plus variety.
- Rat and bird infestation and water availability are the major reasons for not attaining the target yield.

IV. One Stop Information Shop

RT Dollentas, SM Oxales

PhilRice has established the One Stop Information Shop to provide easy access to information on rice for clients (farmers, students, etc.) including PhilRice Bicol staff and to promote and disseminate new knowledge and technologies on rice and rice-based production through participation in major festivals in Region 5.

Highlights:

- Established OSIS at the station were IEC and KMP materials were displayed, maintained, and distributed to farmers, AEWs, and SUCs visiting the station. It has served and accommodated a total of 475 farmer visitors.
- KMP materials were also distributed during field days as requested by LGUs across the municipality.
- Joined a total of 6 major fiesta celebration across the region displaying IEC and KMP materials during exhibits.
- Established temporary IEC materials at University of Eastern Philippines (UEP) in Samar.

V. Rural Transformation Movement: Gusto Namin Milyonaryo Kayo Campaign

RT Dollentas

The Rural transformation movement aims to support the attainment of inclusive and sustainable growth in the rice-based farming communities (standard goal: 1 million gross income per hectare per year) by establishing a critical mass of champions who will rally the said cause. The campaign specifically aims to enhance farmers' perceptions, attitudes, practices, and life chances with rice-based agriculture as a driver for inclusive and sustainable growth in rural, farming communities

Highlights:

• Launched on November 11, 2014 with 250 attendees composed of farmers from 5 immediate Baranggays of the PhilRice Bicol Station, Provincial Agriculture Officers, representative from DA-RFO5, SUCs and Congressman of 3rd District of Albay, Hon. Fernando V. Gonzalez, and Mayor and Former Mayor of the City of Ligao as our Special Guests. Technical Briefing on RTM and Wall commitment signing was conducted.

• Displayed RTM collaterals at the station and distributed IEC campaign collateral (Tshirts and Posters) to the stakeholds across the region including DA-RFO8, DA-ATI RTC 8, and UEP in Samar.

VI. Best Station Contest/ Conduct of Field Day

Highlights:

- WS 2014 Field Day conducted on June 2, 2014 with the theme Satuyang Bag-ong Katabang sa Pag-abot kan 1
 Milyong Kita Kada Ektarya Kada Taon. This was conducted simultaneously with the launching of PhilRice BDD building and seed processing facility. The event was attended by an estimated total of 250 participants from composed of farmers, AEWs, SUCs, and heads of the different agencies under the Department of Agriculture from across the region.
- DS 2014 Field Day was conducted on Nov. 11, 2014 (see highlights for RTM).

VII. Upland Rice Development Program

AE Comprado

The main goal of upland rice development program is to establish a community-based seeds system for traditional upland rice varieties and promote a "farming systems approach" anchored on sustainable agricultural practices. Specifically URDP aims to: (1) Harness the potential of the upland rice ecosystem as one of the major sources of the country's rice supply; (2) Promote sustainable farming systems and practices in the upland communities and thereby increase the farmers' income; (3) Develop the upland communities as self-sufficient food communities; and (4) Establish a seed propagation program and protocols for traditional and modern rice varieties released for cultivation in the upland ecosystem.

Highlights:

•

Generated master list of upland rice farmers for 2014.

Province	Upland Rice Area (Ha)	Upland Farmers
Camarines Norte	488.50	94
Camarines Sur	1723.93	430
Albay	1483.77	1688
Sorsogon	165.25	200
Masbate	3211.04	1859
Total	7072.50	4271

Table 8. Area and Number of Upland Rice Farmers per Province, 2014.

• Provide seed assistance to upland rice farmers

Table 9. Amount of seeds distributed per province.

Variety	Camarines Norte	Camarines Sur	Albay	Sorsogon	Masbate	PhilRice Station	Total
NSIC Rc23	80	60	80	100	100		420
Pink Dinorado		4			1		5
Galo		2				3	5
Pinilisa		2				3	5
Binernal		4				1	5

• Established farmer-managed Palayamanan Model Farms

Table 10. Name of farmer cooperators and location were PalayamananModel Farms were established in 2014.

Province	Palayamanan Site	Farmer Cooperator	
Camarines Norte	Matango, Vinzons	Nestor Lamadrid	
	Aguit-it Vinzons	Ramer Marabe	
Camarines Sur	Caranday, Baao	Analy Saniel	
	Sta. Teresa, Baao	Luis Bagaporo	
Albay	Sta. Cruz, Polangui	Wenifredo Salem	
	Itaran, Polangui	Itaran Farmers Association	
Sorsogon	Casay, Casiguran	Efren Hayagan	
	Inlagadian, Casiguran	Felipe Din Jr.	
Masbate	Palobandera, Cawayan	Alfonso Ompoc Jr.	
	Cayabon, Milagros	Danilo Magbalon	

• Documented some agronomic characteristics of rice used in the varietal trial

Table 11. Agronomic Characteristics of Upland rice Varieties grown in

 Upland areas in Bicol, WS 2014.

NAME OF VARIETIES PLANTED	AREA PLANTED (ha)	Area (m²)	HEIGHT (cm)	YIELD (t/ha)	MATURITY (DAS)		
1. Matango, Vinzons Camarines Norte							
Red Rice	0.15	1500	81	0.67	113		
Dinorado	0.08	800	115	1.00	113		
NSIC Rc23	0.09	900	100	1.30	106		
*varietal trial in Aguit-it Vinzons – no data yet, date of establishment (October 2014)							
1. Sta. Teresa Baao Camarines Sur							
Red Rice	0.12	1188	87	3.00	120		
Dinorado	0.06	572	127	1.80	115		
NSIC Rc23	0.14	1386	107	2.60	110		
Black Rice	0.13	1320	120	3.75	123		
2. 000000=000000							
Red Rice	0.13	1260	85	3.60	115		
Dinorado	0.04	420	115	3.75	120		
NSIC Rc23	0.08	820	86	3.50	110		
Black Rice	0.08	750	101	3.50	110		
Rautong	0.03	310	108	2.20	130		
Katorsa	0.04	352	135	2.50	130		
3. Sta. Cruz Pola	ngui Albay						
Red Rice	0.09	912	81	1.40	109		
Dinorado	0.03	285	110	2.33	109		
NSIC Rc23	0.03	285	102	2.74	109		
Black Rice	0.02	152	97				
Bulao	0.02	176	69	2.16	109		
Rautong	0.01	93	126				
4. Itaran, Polang	jui Albay		<u>.</u>				
Red Rice	0.02	230	78		108		
Dinorado	0.02	249	126	2.41	108		
NSIC Rc23	0.02	235	123	3.40	108		
Katorsa	0.02	227	105		123		
MS16	0.02	249	78	3.21	108		
5. Palobandera, Cawayan Masbate							
ÜÜÜÜÜ	0.03	300		1.90			
Dinorado	0.03	300		1.00			
NSIC Rc23	0.03	300		2.80			
Black Rice	0.03	300		1.80			

*Demo sites in Gorong-gorong, Nabua, Camarines Sur, Casay and Inlagadian, Casigurar were damaged by typhoon Glenda

12 Rice R&D Highlights 2014

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 Tables

	Page
Table 1. IRBAS Project Components and their designated areaof coverage. 2014.	2
Table 2. Yield of NSIC Rc238 (t/ha) gathered from thedemonstration of 6 rice growth stages in Learning Center ofPhilRice Bicol Station.	3
Table 3. Yield of the different rice varieties (t/ha) in LearningCenter of PhilRice Bicol Station.	4
Table 4. Participating entries for Palayabangan: The 10-5Challenge for DS 2014.	6
Table 5. Summary of production cost per participant* (DS,2014).	6
Table 6. Participating Entries for Palayabangan: The 10-5Challenge for Wet Season 2014.	7
Table 7. Yield and production cost per hectare.	7
Table 8. Area and Number of Upland Rice Farmers perProvince, 2014.	10
Table 9. Amount of seeds distributed per province.	10
Table 10. Name of farmer cooperators and location werePalayamanan Model Farms were established in 2014.	10
Table 11. Agronomic Characteristics of Upland rice Varietiesgrown in Upland areas in Bicol, WS 2014.	11



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