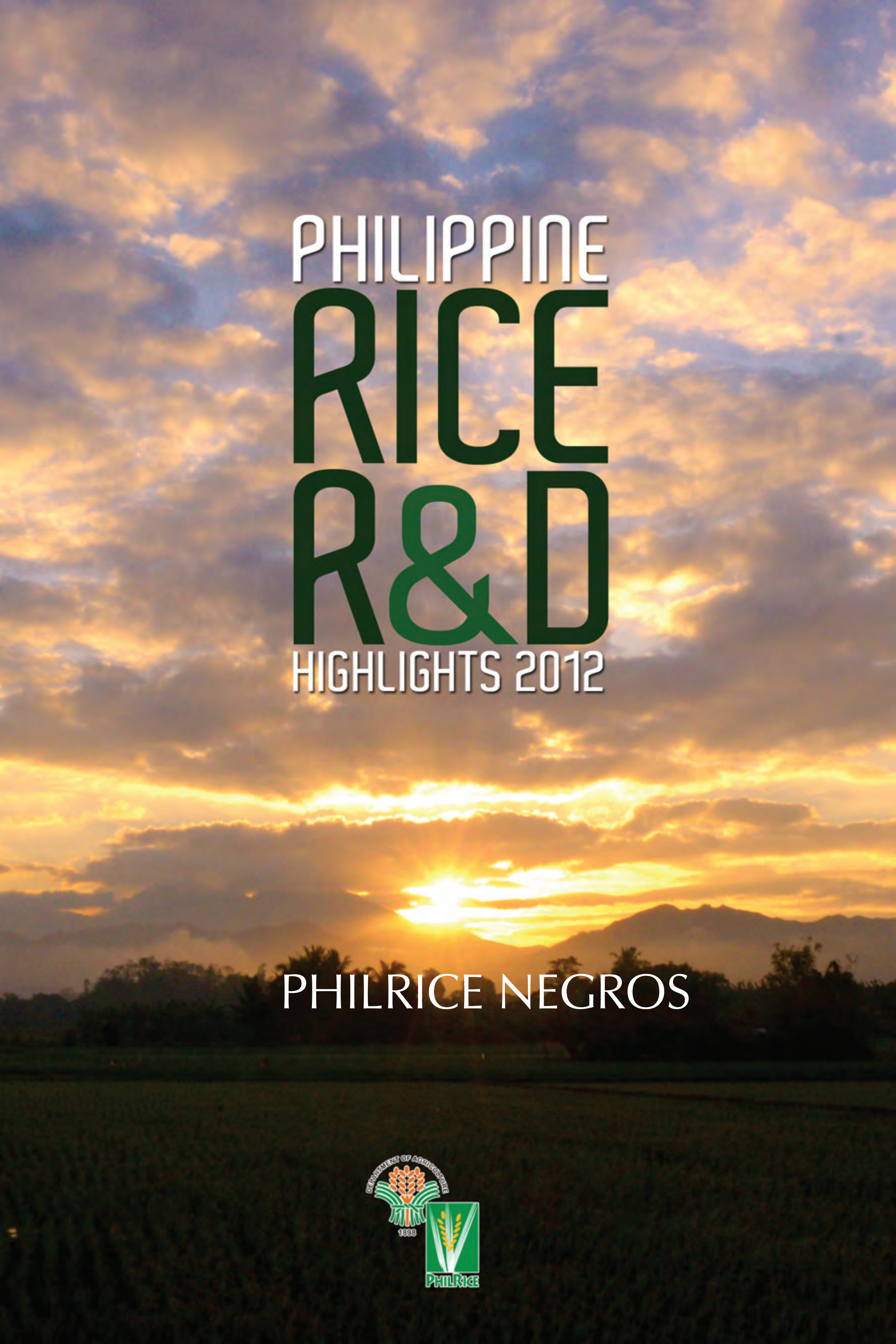

PHILIPPINE RICE R&D HIGHLIGHTS 2012

PHILRICE NEGROS

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PhilRice Negros

Branch Manager: Leo C. Javier

The PhilRice Negros Branch Station is tasked to cater to the needs, and serve as a distribution center for quality seeds of high-yielding and disease-resistant modern varieties suited for the Visayas regions. Based in Cansilayan, Murcia, Negros Occidental, the Station is mandated to develop specialty and premium rice varieties. The Station shall also develop and promote science-based organic rice farming technologies and practices.

The Station, in collaboration with the Department of Agriculture-Regional Field Unit 6 (DA-RFU6), the Local Government Units (LGUs) of Aklan, Antique, Capiz, Guimaras, Iloilo and Negros Occidental continually conducts rice variety demonstration and selection on new releases of inbred varieties in the irrigated and the rain-fed lowland rice environments throughout the Western Visayas Region during the wet season and the dry season every crop year starting in 2006. Top yielding varieties are showcased during each field day that is conducted at each site during harvest time, where local farmers who view and eventually do selection on the new releases. With this project, PhilRice is able to catalogue and demonstrate the agronomic and grain yield performances of each new release at the care of farmer partners and local agriculture technicians trained on the standards of the PalayCheck System to as many clients possible. The DA-RFU6 also is able to make the list of rice varieties to prioritize in its seed procurement and distribution program to enhance accomplishments in production output, while the various LGUs possess the information on varieties to push at each lowland rice production environment during each cropping season. During the crop year 2012 DS, consistent topyield performing varieties in the irrigated lowland environments were NSICs Rc 216, Rc222, Rc15, Rc224 and Rc188; while in the rain-fed lowlands, the top performers were NSICs Rc222, Rc224, Rc216, Rc9 and Rc11. On the WS, top yielders in the irrigated lowlands were NSICs Rc238, Rc240, Rc247, Rc226, and Rc272; while in the rainfed lowlands the top performers were NSICs Rc226, Rc218, Rc240, Rc280, and Rc282. Region-wide, the soil series that were identified to support the highgrain yields of lowland rice were San Manuel, Bantong, Guimaras, Sigcay, San Rafael, and Cadiz.

To deliver the services of the Development Sector of PhilRice to the widest area possible in the Visayas, this project would be extended to the other regions starting crop year 2013. This project could further be extended for the hybrid, the upland, and the organic production-appropriate rice varieties, too.

In the quest for attaining higher seed yield in seed production of Mestisos 19 and 20, TGMS varieties currently seed produced in 42 of the 65 hectares seed production area of PhilRice Negros, a study was conducted on the influence of planting date to flowering response of the P- and the SLines. Mestiso 19 S flowers two to 11 days later than the P Line when planted between March 15 and October 1. However, the SLine flowers earlier by 1 day when planted on November 15. The duration to flower by the two Lines narrows closer during the October to December plantings. Meanwhile, Mestiso 20 S flowers one to 13 days earlier than the PLine when planted between March 15 and November 15, except on the June 1 planting when the SLine flowers 1 day later. The difference in duration to flower between the two parents became wider starting from the June 1 planting. The zero to 2.3% fertilities of the two S Lines indicated that Mestiso 19 and Mestiso 20 are practical and feasible to be seed produced in the PhilRice Negros Research, Technology Demonstration and Seed Production Farm.

For the Station to develop an interim organic rice production protocol, the various organic rice cultures in the Negros Island were evaluated of grain yield turnover. At the second season of testing, it was apparent that no production protocol showed superior performance from the rest. Also, when the various test plots were analyzed, there was no observed build up in organic matter, P and K levels. Meanwhile in the tests of various inoculants that were intended to hasten rice straw decomposition, not one inoculant caused faster decomposition than the non-inoculated control. PhilRice should then seek an effective straw decomposer and determine the appropriate level of organic soil amendment that would enable attainment of at least a 4 ton per hectare seed yield.

The Soil Series Guide Book for Panay and Guimaras is now available, and that for Negros Island is in the draft stage. Two schedules of training for agriculture technicians on soil series identification and capabilities for Panay and Guimaras Islands were conducted in Iloilo. A total of 61 participants made successful participation.

To improve rainfed rice farming in Negros Occidental, a baseline study was made through a farmer survey on 2012. It was revealed that 78, 66 and 2% of rainfed rice farmers do transplanting while 22, 26 and 3% of them do direct-seeding during the first, second and third cropping, respectively; 91% used good seeds; 88% recycle their own or neighbor's harvest for seeds; 52% do the whole tillage in land preparation in $\leq$14 days; 70% use hand weeding for weed control; and, 53% recognized proper water management as an effective means of weed control in transplanted rice. Farmers that adopt direct seeding (29%) use chemical herbicides in weed control. A study on weed management revealed that pre-emergence and post-emergence herbicides with follow-ups of hand weeding based on WCAI were more effective in suppressing rain-fed rice weeds than using hand weeding alone. However, weed management cost was lower in hand weeding alone.

I. Selection of Rice Genotypes Suited to Drought-Prone Rainfed Lowlands

CU Seville

Approximately 55% to 65% of the total physical rice areas in the Visayas are rainfed (BAS 2009). Irrigation systems provided by the National Irrigation Administration are mostly run-off the river type, which make the 35% to 45% irrigated rice areas similar to rainfed conditions during the dry cropping season. These rainfed farmers are playing significant role in feeding the Filipino consumers. One of the problems of rainfed farmers is the shortage of water during the cropping period. Others are practicing risk aversion by cutting their farm inputs. Various efforts had been made to address the need of these drought-prone rainfed farmers. This project aimed to identify suitable genotype for drought-prone rainfed lowlands by identifying the reproductive drought tolerant lines for recommendation and breeding purposes, genotypes that are responsive to low-fertilizer rate and high-yielding genotypes with short duration maturity.

Screening of genotypes for drought tolerance at reproductive stage

CU Seville

There had been an endless effort in developing rice cultivars for high yield and drought tolerance needed by drought-prone rainfed rice farmers. Eventually, this is to contribute to the rice sufficiency of the country. The rice plant is sensitive to water stress particularly during the reproductive stage wherein the spikelet fertility, grain number and the eventual grain yield are affected. In the selection process for drought tolerant lines, a water stress condition is usually imposed. A drought-tolerant variety is one that produces a higher grain yield relative to the other cultivars under a drought stress condition (Atlin, 2003).

A field trial to select genotypes (lines) tolerant to drought condition was conducted during the dry season of CY 2012.The experiment was laid out in RCBD at two varying moisture settings: normal and stressed. Twenty genotypes selected from released varieties, traditional varieties and promising lines were used in this study. Drought was simulated by draining the field two weeks before flowering up to seven days after anthesis in the stressed condition. Data gathered include agronomic traits, grain yield, and yield components.

Highlights:

- Plant height, spikelet fertility, seed weight, and grain yield of genotypes were significantly reduced by drought-stress condition (Figure 1);
- Good yielder varieties under stressed condition include PSB Rc9,

IR77080-B-34-3, RLSDC-28-30-1, Pilit Tapol from Antique and Kabankalan at 2.9, 2.1, 2.0, 1.7 and 1.6 t/ha , respectively (Figure 2);

- The genotypes that had <50% yield reduction when subjected to water stress during the reproductive stages include Salwi (0.31%), PSB Rc9 (13%), SGYT-14-M-CES (29%), PilitTapol Antique (38%), Pilit Tapol, Kabankalan (44%), and IR77080-B-34-3 (44%).

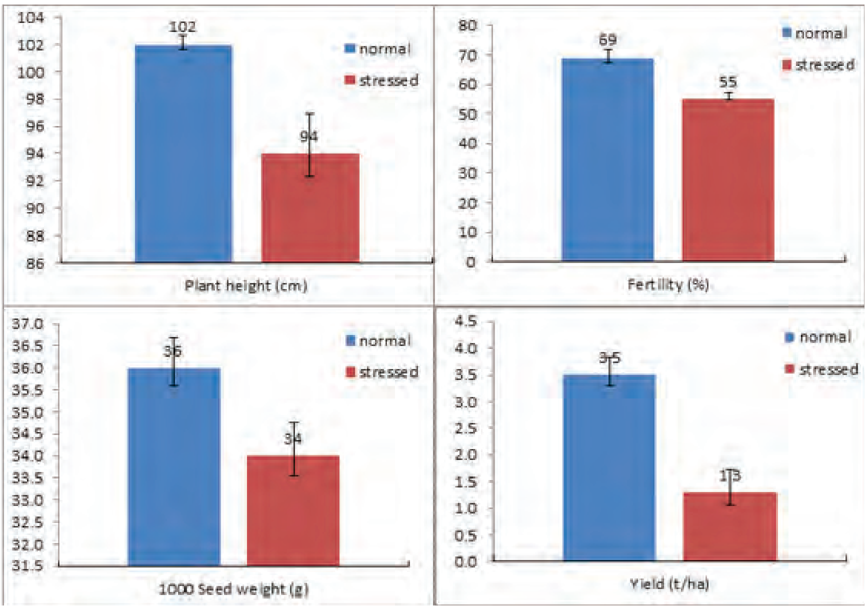


Figure 1. Traits significantly affected by water stress.

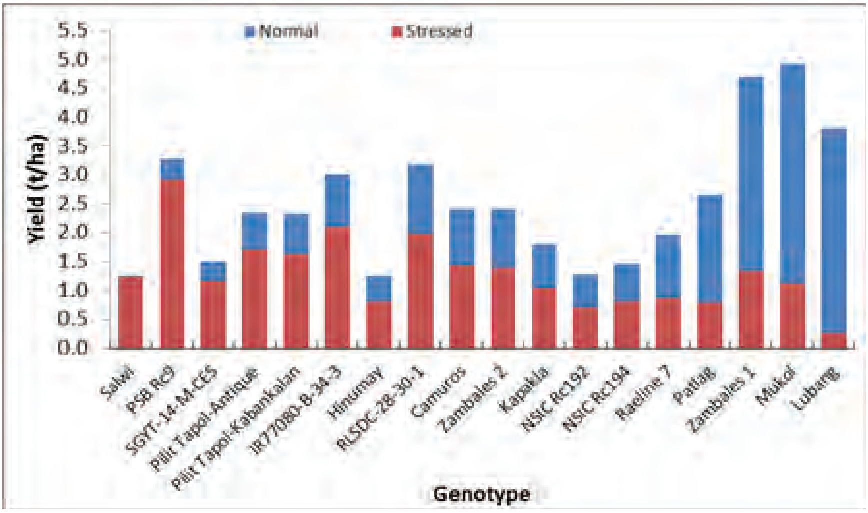


Figure 2. Grain yield performance of the various rice genotypes when subjected to normal or water stressed conditions.

Selection of genotypes for low fertilizer application rate under drought-prone rainfed lowlands
CU Seville

Among those inputs that farmers usually delimit are fertilizers and pesticides. Farmers use less amount of fertilizer to compensate for the reduced potential yield and increased risk brought about by an abiotic stress like drought. This experiment therefore was aimed to (a) identify genotypes that yield high even at low fertilizer application rates, and (b) identify the level of fertilizer application wherein production can still be profitable.

Field trials were conducted during the DS and the WS of CY 2012 at the PhilRice Negros Station experimental rainfed area. Experiment was laid out in a split-plot design, with fertilizer rate as the main plots and genotype as sub-plots. Fertilizer rates include 100, 75 and 50 percentages of the local fertilizer recommended rate (RR). Subplots include PSB Rc12, PSB Rc14, PSB Rc38, PSB Rc68, PSB Rc98, NSIC Rc192, NSIC Rc194, IRR77080-B-34-3, RLSDC-9-18-1 and RLSDC-28-30-1. During the dry season, water was withheld at 60 day afters sowing (DAS). Due to infection by the rice tungro virus (RTV), analysis of agronomic trait, grain yield and yield components were done only on genotype with less infection.

Highlights:

- Fertilizer rates had no effect in all of the parameters gathered during the dry and the wet season of 2012 (Table 1). Genotypes had significant differences in almost all of the parameters gathered, except for the panicle length during the dry season and; productive tillers and number of spikelets during the wet season. No specific interaction was observed between the genotypes and the levels of fertilizers.

- Estimated expense per hectare applied with 100% of RR was estimated to be Php23,000.00 with 46% of the cost as fertilizer input. Based on the computed combined yield of 5 genotypes, the return on investment (ROI) did not differ between fertilizer rates. On average, during the dry season, RLSDC-9-18-1 and IR77080-B-34-3 performed fairly yielding 3.5t/ha and 3.4t/ha, respectively. During wet season, highest yielders were RLSDC28-30-1 (3.1t/ha) and RLSDC-9-18-1 (3.0t/ha) (Figure 3). These lines were found responsive to fertilizer, thus, gaining higher ROI even at lower rate of fertilizer application (Figure 4).

Table 1. Rice plant responses to applied fertilizer rates at PhilRice Negros Sation Research, Technology Demonstration and Seed Production Farm, Cansilayan, Murcia Negros Occidental, during the DS and WS 2012.

FERTILIZER RATE	Days to heading		Plant height (cm)		Productive tiller (no)		Panicle length (cm)		Spikelets (no.)		Grain Yield (t/ha^{-1})		ROI (%)	
	DS	WS	DS	WS	DS	WS	DS	WS	DS	WS	DS	WS	DS	WS
100%	78	85	95	110	12	10	24	25	130	149	2.6	3.0	31	46
75%	78	83	92	104	10	11	23	25	124	158	2.7	2.6	44	42
50%	78	84	91	105	10	10	24	24	119	137	2.6	2.5	52	49
Test of Significance														
Fertilizer Rate	ns	ns	ns	ns	Ns	ns	ns	ns	ns	ns	Ns	ns	ns	ns
Genotype (G)	**	**	**	**	**	ns	ns	**	**	ns	**	**	**	**
Rx G	ns	ns	ns	ns	Ns	ns	ns	ns	ns	ns	Ns	ns	ns	ns

Table 2. Grain yield (t ha-1) response to the levels of ferilizer applied at PhilRice Negros Station Research, Technology Demonstration and Seed Production Farm, Cansilayan, Murcia Negros Occidental during DS and WS 2012.

	Genotype	100% RR		75% RR		50% RR	
		DS	WS	DS	WS	DS	WS
1	PSB Rc68	1.5 ±0.35	2.4±0.38	1.6±0.24	2.1±0.41	2.3±0.43	2.4±0.10
2	PSB Rc98	1.9±0.41	2.2±0.01	2.3±0.03	1.9±0.23	2.1±0.26	2.4±0.25
3	RLSDC-28-30-1	2.7±0.19	3.6±0.57	2.3±0.26	3.0±0.56	2.5±0.39	2.6±0.45
4	IR77080-B-34-3	3.3±0.27	3.5±0.39	3.7±0.26	2.7±0.04	3.1±0.33	2.2±0.66
5	RLSDC-9-18-1	3.8±0.17	3.2±0.16	3.6±0.32	3.0±0.67	3.1±0.19	2.8±0.42
	Mean	2.6	3.0	2.7	2.6	2.6	2.5
	$HSD_{0.05}$ Genotype	1.3	Ns	1.3	ns	Ns	ns

Values are mean±standard error (SE)

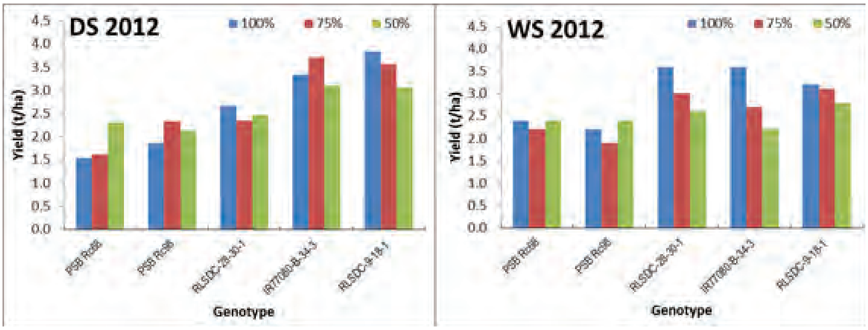


Figure 3. Average yield performance 5 rice genotypes under 3 levels of fertilization rates during the DS and WS 2012 at PhilRice Negros, Cansilayan, Murcia, Negros Occidental.

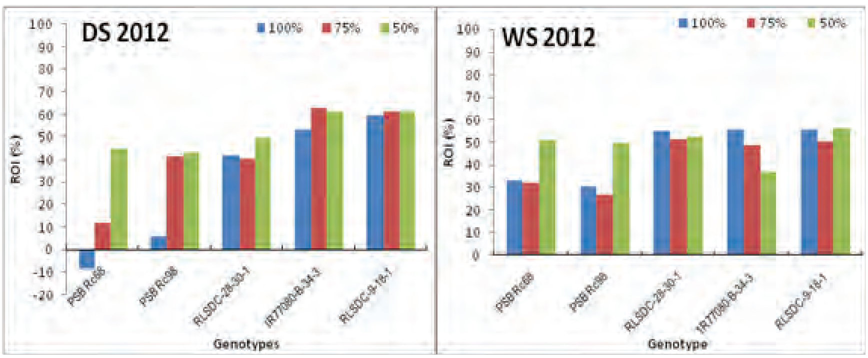


Figure 4. ROI (%) of 5 genotypes under 3 rates of fertilizers in PhilRice Negros, DS-WS2012.

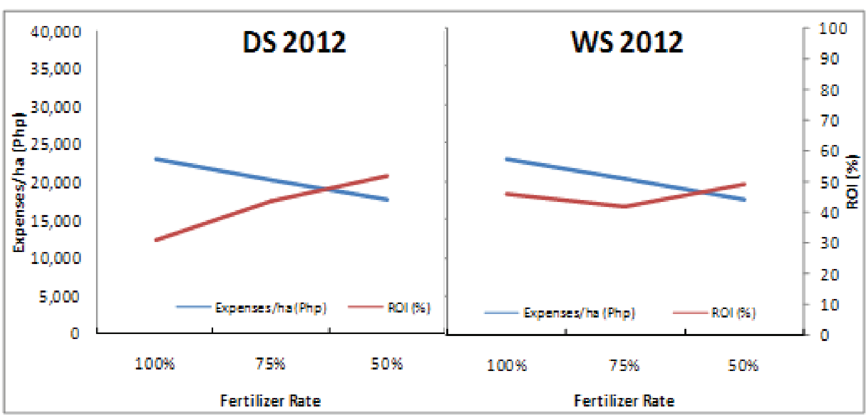


Figure 5. Average ROI (%) and production expenses (ha-1) of 5 genotypes under 3 rates of fertilizers in PhilRice Negros, DS-WS2012.

II. Soil Survey and Characterization of the Visayas for Rice Production

RT Dollentas

This project hopes to translate the information in the soil survey report into a form that can easily be understood by the agricultural experts, researchers, as well as the farmers. It promises to develop a guidebook that farmers, researchers, and other end-users can use for proper soil series identification. It intends to develop a comprehensive database related to characteristics and behavior of major soil series. Given such information, researcher and farmer can easily exchange information related to farm problem identification, and in finding solution to the problem as well in the selection of appropriate crop and/or agricultural production system. With the soil series identified and classified, the guidebook can serve as vehicle of transfer for site specific technology. Furthermore, allocation and optimization of land use, especially in the selection of crop/cropping pattern/production system, can be done more systematically.

Characterization and evaluation of soils in the Visayas for rice production

RT Dollentas, JEAD Bibar

The Visayas has 5.67 million hectares of land area or 18.9% of the total land area of the Philippines. Only about 920,000 ha (16.2%) are devoted for lowland rice production with average rice yields of 3.7t/ha for irrigated and 2.6t/ha for rainfed lowlands (BAS, 2010). These yields were lower compared with the national average yields of 4.3t/ha and 2.8t/ha, respectively, and even lower than the potential average yields of about 5t/ha (3.7 to 12t/ha). This means that factors needs to be explored to further increase production in the Visayas.

Soil is one of the important components in the agricultural production system. It supports plant life through anchorage and supply of essential nutrients. The capacity of the soil to produce a certain crop also relies on the appropriate management needed by the rice crop based on the capacity or quality of the soil. Evaluation of soil properties and assessing its qualities when used for crop production can improve farm strategies, increase crop yield, and enhance productivity.

The project implemented in the Visayas since CY 2011 aimed (a) to develop a simplified guide on the identification of soil series in the Visayas, and (b) provide information on its quality when used for crop production, suitability to different crops, management requirements, and taxonomic classification.

Highlights:

- Secondary data on soils were collected and compiled for the provinces of Bohol and Negros Islands in 2011. Soil survey report and other pertinent available information especially those with analysis on the physico-chemical and mineralogical properties of the soil were collated. Information were used as basis in the interpretation of inherent soil fertility (acidity, OM, P, K, CEC, BS, salinity) and physical soil qualities (relief, water holding capacity, drainage, permeability, tilth, stoniness, rooting depth, and flooding), soil-related constraints to crop production, and crop management recommendations including cropping pattern. Taxonomic classification was also conducted for each soil individual.

- In 2012, a draft of the soil series field book was developed for Negros island (Negros Occidental and Negros Oriental) containing a total of 25 Soil Series (10 soils of the lowland and 25 soils of the upland, hills, and mountains). The soil series fieldbook intended for Negros Island was also developed for Siquijor Island since its three major soil series (Lugo, Bolinao, and Faraon) can also be found under the former island.

- In May 2012, the soil series guidebook developed for Panay and Guimaras Islands was validated at Iloilo involving 61 participants from the municipalities of Region VI. Results of field validation survey indicated that the field book was accurate in identifying soils in the field, only with some minor revisions, especially in printing as well as inclusion of glossary to define some terms that are too technical for the non-soil experts.

III. Improving the Seed Production Yield in PhilRice Negros
CA Endino

Rice yield averages of the station since June 2008 until November 2009 were only at the 2.5t/ha-1 mark. These lowyield averages could be due to previous transformation of the seed production areas from sugarcane plantation to rice paddies that required several earth movements and affected soil fertility. However, soil fertility is not the only constraint of production in the station. Pests and diseases were also a common occurrence at different parts of the seed production areas, which also contribute to yield losses. Although yield losses due to pests may not be very significant per production area, it is still contributory to the generally lowyield average of the station. Hence, it is also imperative to take a closer look on the interaction of various pest constraints in relation to production situations, and determine yield losses due to various yield limiting/reducing factors.

The project aimed to increase the seed production yield of the station so that it may further widen its credibility among the stakeholders in the area and increase the profitability of PhilRice Negros. It is composed of five studies wherein soil nutrient and pest occurrences are given emphasis. Three out of five studies had been completed. Studies on plant health assessment and longterm fertility status of the soil are still continuing.

Plant Health Assessment at Philrice Negros Seed Production Area
CA Endino, IMG Ciocon and DKM Donayre

Using the International Rice Research Institute (IRRI) survey portfolio, rice varieties planted at the PhilRice Negros Station Seed Production Area were assessed for three years, consisting of 3 wet cropping seasons and 3 dry cropping seasons. This study aimed to generate trends on pest prevalence, profile injuries due to diseases, animal pest and weeds; and contribute to the development of pest management techniques in producing high quality seeds at PhilRice Negros.

The survey started in 2011 WS, wherein 17 inbred and 4 hybrid rice varieties under conventional production system were under assessment. Thirteen and 33 rice varieties were assessed during the dry and wet seasons of CY 2012, respectively.

Highlights:

2012 DS

- Major constraints affecting the farm production areas of PhilRice Negros were: insufficient water; severe infestation of weeds especially Hydrolea zeylanica, Sphenoclea zeylanica, Paspalum distichum, and Leptochloa chinensis; rice tungro; rice bug; and rodent damage.

- Areas planted with NSIC Rc222 were highly infested with Hydrolea zeylanica plus stressed by drought during the reproductive stage that resulted to low grain yield (2.81t/ha) of the crop. Lowest yields were recorded for PSB Rc10 (0.67t/ha) and NSIC Rc192 (0.71t/ha) with high incidence and damage of rice bugs and rats.

- Varieties with severe infection by tungro were PSB Rc82 (89.3%), NSIC Rc218 (70%), PSB Rc10 (41.7%), NSIC Rc170 (36.7%) and NSIC Rc160 (14.7%), as shown in Figure 6.

WS2012

- Incidences of weeds (Hydrolea zeylanica, Paspalum distichum, Leptochloa chinensis and Sphenoclea zeylanica) and tungro were top most problems in seed production areas.

- Eleven out of 35 varieties had varying levels of tungro incidence (Figure 7).

- Bacterial leaf blight, bacterial leaf streak, narrow brown spot, leaf blast, leaf scald, and brown spot were the prevalent diseases affecting the foliage (Figure 8).

- Sheath rot, sheath blight, neck blast, false smut, collar blast, and panicle blight were the prevalent diseases affecting the tillers, panicles and grains, respectively (Figure 9).

- Injuries due to defoliators (leaf folder, whorl maggot, cutworms) and stemborers were recorded.

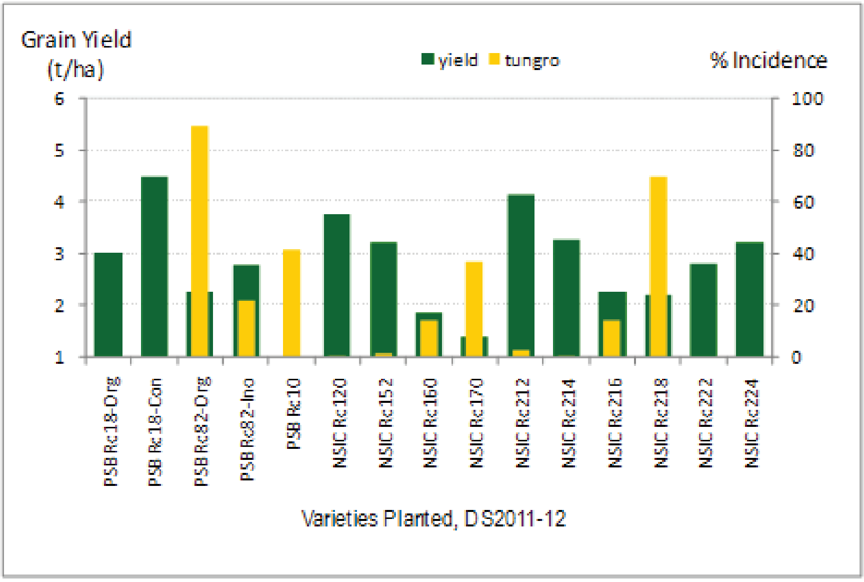


Figure 6. Rice grain yield and incidence of tungro among the observed varieties during the dry season of CY 2011-2012. PhilRice Negros Station Research, Technology Demonstration and Seed Production Farm.

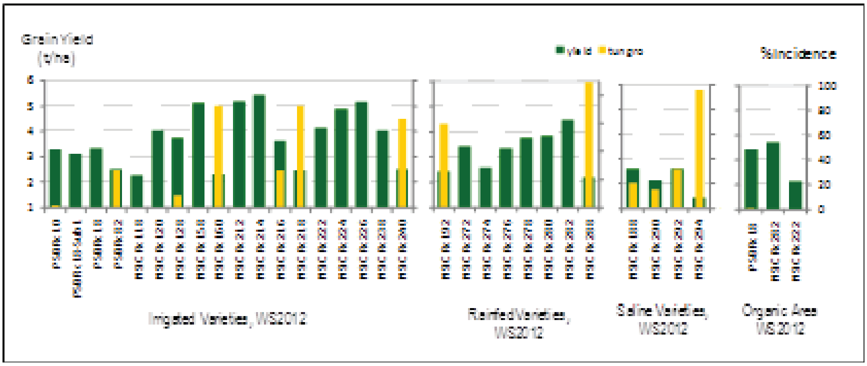


Figure 7. Rice grain yield and incidence of tungro among the observed varieties during the wet season of CY 2012. PhilRice Negros Station Research, Technology Demonstration and Seed Production Farm.

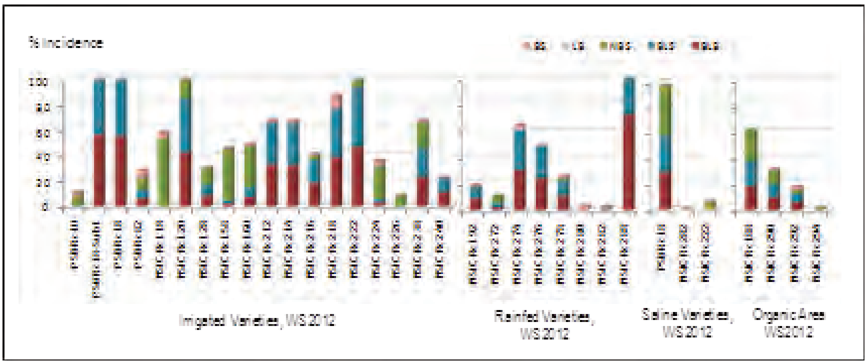


Figure 8. Incidence of various diseases affecting the leaves on the different rice varieties. PhilRice Negros Station Research, Technology Demonstration and Seed Production Farm. (BLB – bacterial leaf blight, BLS – bacterial leaf streak, NBS – narrow brown spot, LB – leaf blast, LS – leaf scald, BS – brown spot).

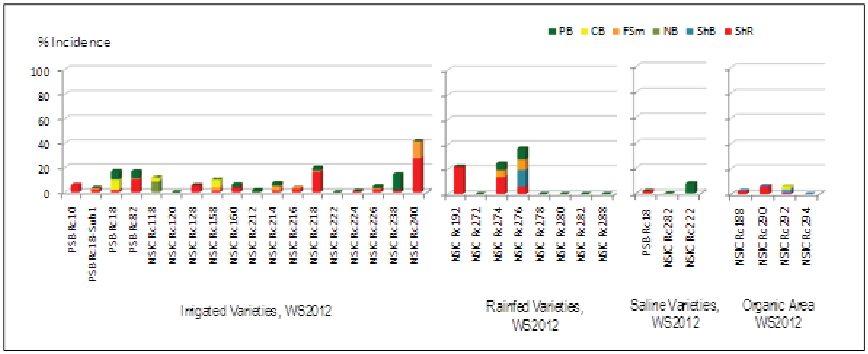


Figure 9. Incidence of various diseases affecting the tillers on the different rice varieties PhilRice Negros Station Research, Technology Demonstration and Seed Production Farm. (ShR – sheath rot, ShB – sheath blight, NB – neck blast, FSm – false smut, CB – collar blast, PB- panicle blight).

Recommendations based on the results:

a. Thorough land preparation must be strictly imposed to avoid or reduce the problems on weeds. Plowing and/or dry land preparation is recommended after every cropping to destroy stubbles that serve as host to various pests.

b. Avoid planting of varieties that are susceptible to tungro. If there is the need to produce those susceptible variety, maximum crop protection must be done from sowing to harvesting.

c. Diseases occur mostly during the wet season, hence, the right amount of fertilizers applied at the right time must be strictly observed.

d. More studies are needed to be explored for effective management of Hydrolea zeylanica, Paspalum distichum, Leptochloa chinensis, tungro and rice bug.

Development of a computational method for field fertilizer rates based from MOET biomass results

AOV Capistrano, JEAD Bibar, DKMDonayre, CA Endino, IMG Ciocon

The development of the MOET kit paved the way towards an efficient but easy evaluation of the soil nutrient status of individual rice fields. It can identify soil nutrient deficiencies in a shorter period of time without having to sacrifice one cropping season for evaluation like in the case of the Nutrient Omission Plot Technique (NOPT). However, it is limited to nutrient deficiency identification and does not prescribe actual fertilizer rates for correcting the deficiencies. Recommendations for corrective action for the limiting nutrients therefore becomes the significant responsibility of technical persons like Agricultural Extension Workers (AEWs), but they may also have difficulties in formulating fertilizer rates on the absence of other relevant information. This study, aimed to develop, validate and generate a simple recommendatory computer program that will precisely calculate the fertilizer requirement of a particular field based on its MOET results.

An experiment composed of two treatments (1-MOET FCP prototype of computation method, and 2-MOET kit pack) was conducted at PhilRice Negros this WS 2012. Each treatment that has 180 square meters area was arranged in RCBD with three replications. Fertilizer recommendations of the two treatments were computed based on MOET results made prior to the establishment of the study. Rate of nutrients needed and fertilizer recommendations based on MOET-FCP is shown in Figure 10. For MOET kit pack, fertilizer recommendations were based on NPK and S deficiencies. Yield at harvest was gathered and analyzed using TTEST. FTEST was also utilized to compare analysis of means between treatments.

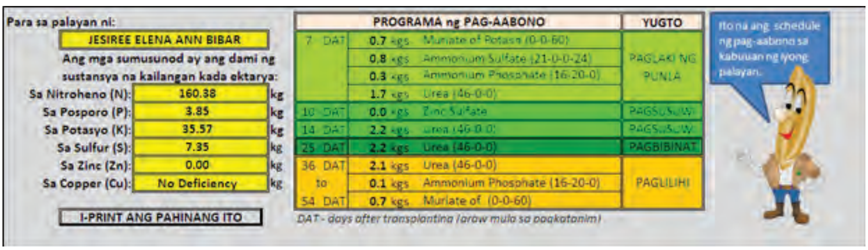


Figure 10. Rate of nutrients needed and fertilizer recommendations based on MOET-FCP.

Highlights:

- T-test analysis revealed that mean yields of NSIC Rc226 in plots applied with fertilizers based on MOET-FCP and MOET kit pack were not significantly different ($t=-1.01$, $p=0.3714$) as shown in Figure 11.

- Rate of N applied based on MOET-FCP was higher than the rate of N based on MOET kit pack recommendation (Figure 12). Higher rates of P and S, on the other hand, were applied on plots following the recommendations of MOET kit pack compared to MOET-FCP.

- Costs of nutrient management following the recommendations of MOET-FCP were higher compared to MOET-kit pack (Table 3).

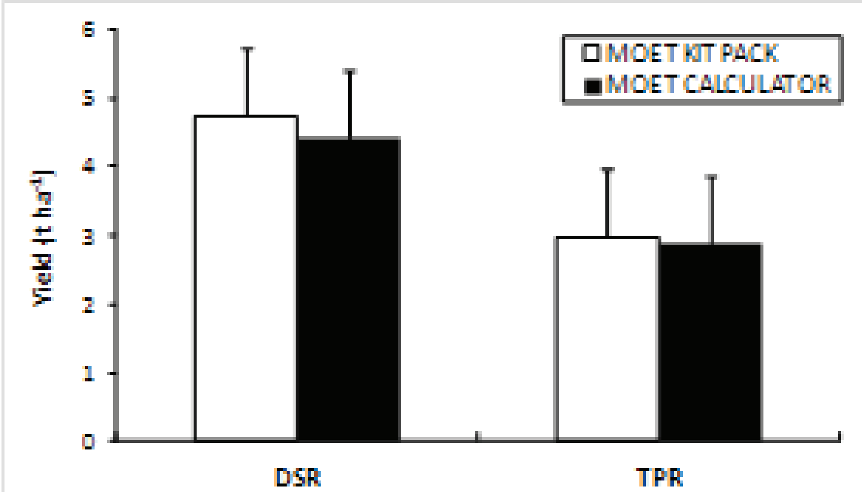


Figure 11. Mean yield of NSIC Rc226 under MOET-FCP and MOET kit pack fertilizer recommendations.

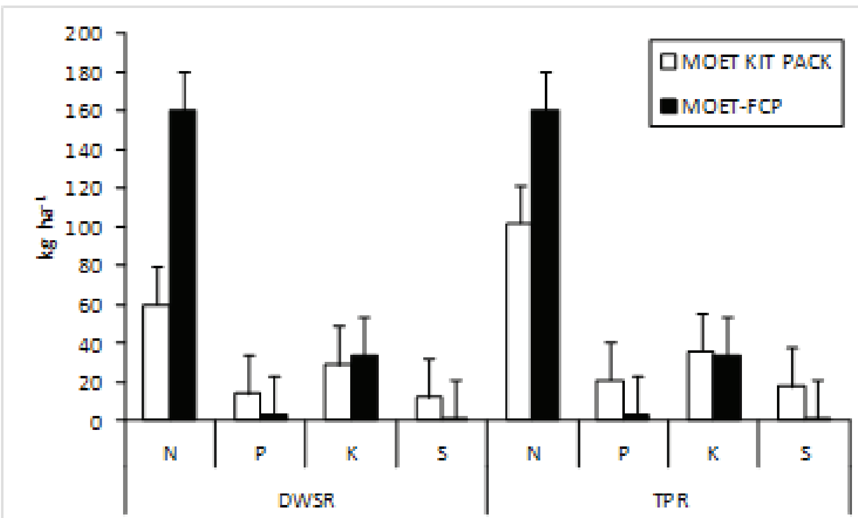


Figure 12. Rate of nutrients applied based on MOET-FCP and MOET kit pack fertilizer recommendations.

Table 3. Nutrient management costs based on MOET-FCP and MOET kit pack fertilizer recommendations.

	Direct-seeded Rice			Transplanted Rice		
	Fertilizer Cost (Php)	Labor cost (Php)	Total	Fertilizer Cost (Php)	Labor cost (Php)	Total
MOET KIT PACK	5,236.00	50.63	5,286.63	8,131.40	50.63	8,182.03
MOET-FCP	9,643.68	129.38	9,773.06	9,643.68	129.38	9,773.06

Monitoring rice productivity in a long-term inorganically fertilized field at PhilRice Negros

DKM Donayre, AOV Capistrano

At PhilRice Negros, the conventional method of producing rice seeds was implemented, which utilizes synthetic fertilizers every season. Though organic materials were annually incorporated into the soil of the seed production areas, synthetic fertilizers were still the major source of nutrients for fertilizing the rice crops. However, continuous application of inorganic fertilizers may have impacts on productivity as well as sustainability in the long term, as it may threaten sustained soil fertility in the future.

A study was conducted at PhilRice Negros to monitor the productivity and sustainability of rice monocropped areas in the long-term to prevent future nutrient imbalances. Specifically, this long-term study aimed to analyze yield trends of inorganically fertilized field, and determine nutrient imbalances and changes in fertility that may occur due to prolonged use of inorganic/synthetic fertilizers. The study that had been implemented since 2011 WS was arranged in RCBD with three replications. Different fertilizer treatments are shown below in Table 4

Table 4. Experimental treatments

Fertilizer Treatments	N (kg ha^{-1})		P (kg ha^{-1})	K (kg ha^{-1})	Time of N Application (days after transplanting)									
					0		14		24		42		55-65	
	DS	WS	DS/WS	DS/WS	DS	WS	DS	WS	DS	WS	DS	WS	DS	WS
Control	0	0	0	0	-	-	-	-	-	-	-	-	-	-
PK	0	0	50	35	-	-	-	-	-	-	-	-	-	-
NP	131	105	50	0	38	35	-	-	38	35	38	35	17	-
NK	131	105	0	35	38	35	-	-	38	35	38	35	17	-
NPK 1	131	105	50	75	38	35	-	-	38	35	38	35	17	-
NPK 2 (SSNM)	149	119	30	70	-	-	52	26	39	26	39	40	19	26

DS – dry season, WS – wet season

Highlights:

- Yields of PSB Rc10 and PSB Rc18 varied among cropping seasons (Figure 13).
- Plots of supplied with P and K had lower yields compared to plots with no fertilizer (control).
- In terms of effect on grain yields, however, analysis revealed that there were no significant differences between treatments on both rice varieties (Table 5).
- No interpretation or correlation yet had been drawn relating yield trends with nutrient imbalances and changes in soil fertility due to prolonged use of inorganic/synthetic fertilizers, since the study has not yet been completed till wet season CY 2013.

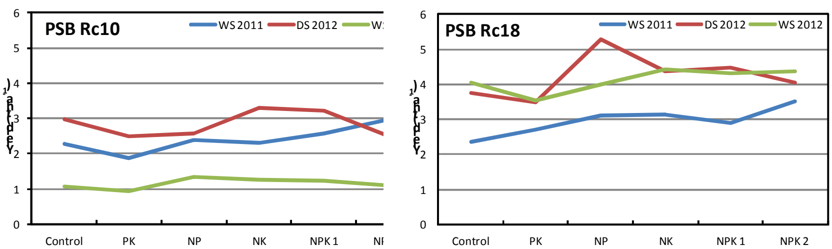


Figure 13. Yield of PSB Rc10 and PSB Rc18 under longterm inorganic fertilization at PhilRice Negros.

Table 5. Yield of PSB Rc10 and PSB Rc18 under longterm inorganic fertilization at PhilRice Negros

Treatments	Yield (t/ha^{-1})					
	PSB Rc10			PSB Rc18		
	WS 2011	DS 2012	WS 2012	WS 2011	DS 2012	WS 2012
Control	2.28 ab	2.98 a	1.07 a	2.35 b	3.75 bc	4.06 a
PK	1.87 b	2.49 a	0.93 a	2.70 ab	3.48 c	3.55 a
NP	2.38 ab	2.57 a	1.33 a	3.11 ab	5.28 a	4.00 a
NK	2.29 ab	3.29 a	1.27 a	3.13 ab	4.37 a-c	4.42 a
NPK	2.58 ab	3.20 a	1.22 a	2.90 ab	4.48 ab	4.32 a
NPK (SSNM)	2.98 a	2.49 a	1.11 a	3.51 a	4.04 bc	4.38 a
P	*0.0236*	*0.9521*	*0.1143*	*0.0405*	*0.0008*	*0.4200*
cv (%)	*12.77*	*49.06*	*14.36*	*12.24*	*7.75*	*13.20*

Means with same letters are not significantly different at 5% level of significance using HSD.

IV. Maximizing the Potential of SxP Technology for Hybrid rice F1 Seed production

ACS Suñer

Flowering synchronization of seed (S) and pollen (P) parents is necessary to maximize F1 seed production of two-line hybrid rice seed production. Days to flowering of hybrid parental lines differ under different environments and time. This project aimed to determine the days of flowering of Mestiso 19 and 20 parental lines at different months of establishment under the PhilRice Negros Station environment.

Determining the influence of planting dates on the flowering behavior of two-line hybrid parental lines in Negros Occidental

CU Seville, ACS Suñer, LC Javier

Hybridization using TGMS lines is greatly affected by changes in environmental temperatures. TGMS lines exhibit male sterility at warm environment and cannot produce seeds by itself, and thus are used as female parent in S x P hybrid seed production. At temperatures lower than the critical sterility point, however, TGMS will produce inbred seeds and contaminate F1 seeds. Panicle initiation should, therefore, coincide with the warm month to avoid selfed seed set in the TGMS. In order for the flowering of the two parental lines in S x P seed production to synchronize and achieve high percentage of fertilization, the flowering behavior of parental lines of the newly released varieties should be tested on local conditions where it will be commercially produced. Hence, this study was conducted to (a) determine the right seeding interval at a particular week of the month, and (b) determine the percent fertility of the S line under the Male Sterility-Inducing Environment (MSE).

The study was conducted at the PhilRice Negros Station from March to December 2012 by planting schedules of the two parental lines of NSIC Rc202H (Mestiso 19) and NSIC Rc204H (Mestiso 20).

Highlights:

- Mestiso 19 male parent flowers 2 to 11 days earlier than its female parent when planted from March 15 to October 1, 2012. A shift in the days to flowering of two parentals was observed when planted on November 15, 2012. Likewise, flowering intervals became closer towards the last quarter of the year (Table 6 & Figure 14).

- Mestiso 20 female parent flowers earlier than its male parent when planted from March 15 to November 15 except when planted on June 1. Intervals of flowering between the two parents apparently became longer from the June 1, 2012 planting.

- Minimum and maximum temperatures from the start of panicle initiation ranged from 19.9 to 24.8 oC, and 24.9 to 33 oC, respectively. Solar radiation ranged from 116 to 325 W/square meters , with the lowest and highest radiation during the last week of September and third week of October, respectively (Figure 15).

- Percentage of fertility of the two sterile lines ranged from zero to 2.3% only, thus, indicating that Mestiso 19 and Mestiso 20 are safe to produce under PhilRice Negros environmental conditions (Figure 16).

Table 6. Days to 50% heading of Mestiso19 and Mestiso 20 hybrid parental lines at PhilRice Negros, 2012.

Entries	15-Mar	1-Apr	15-Apr	1-May	15-May	1-Jun	15-Jun	15-Jul	1-Aug	15-Aug	1-Sep	15-Sep	1-Oct	1-Nov	15-Nov
TG101 M	92	89	87	82	96	82	82	84	80	81	78	79	80	80	80
PRUP TG101	96	95	92	88	101	93	88	89	84	82	81	79	82	80	79
TG102 M	100	95	91	88	102	86	89	93	89	88	89	85	91	91	90
PRUP TG102	97	93	91	87	94	93	88	89	83	81	80	78	80	79	77

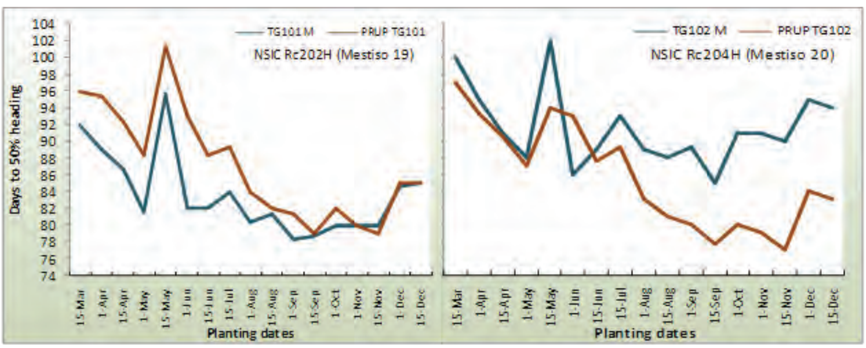


Figure 14. Heading interval between S and P lines of Mestiso19 and Mestiso 20 at PhilRice Negros Station, CYV 2012.

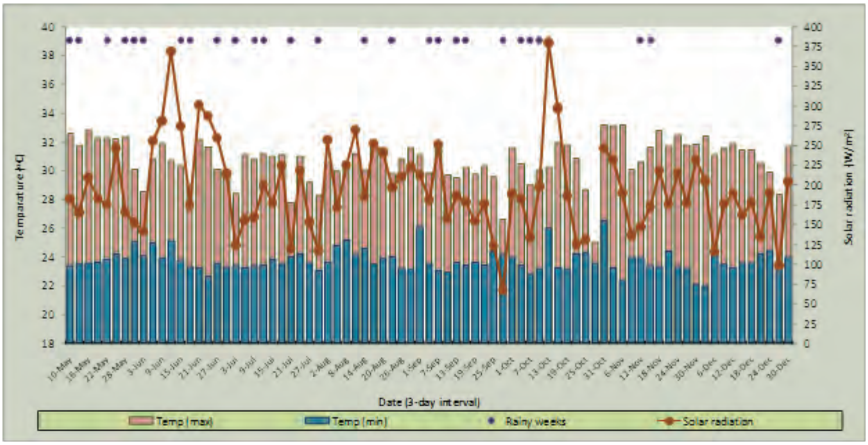


Figure 15. Minimum and maximum temperatures, solar radiation and rainfall pattern observed in PhilRice Negros Station Research, Technology Demonstration and Seed Production Farm, Cansilayan, Murcia, Negros Occidental.

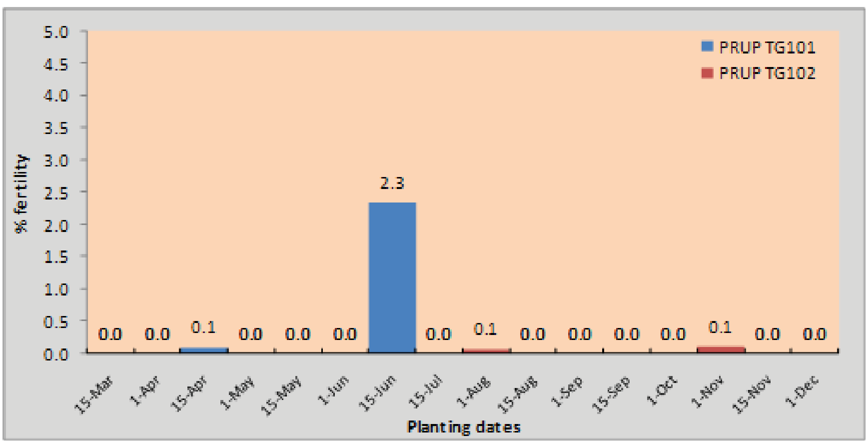


Figure 16 Percentage of spikelet fertility of the 2 S lines observed in PhilRice Negros Station Research, Technology Demonstration and Seed Production Farm, Cansilayan, Murcia, Negros Occidental.

V. Development of Weed Control Strategies for Rainfed Rice Ecosystem of Negros

DKM Donayre

In Negros Occidental and Negros Oriental alone, 35,051 and 4,322 hectares of these provinces were considered rainfed areas in 2010 with an average yield of 3.40 and 2.26t/ha, respectively (BAS, 2010). Under rainfed condition, yield potential of rice is not that easy to achieve, since risks wait along the way unpredictably. When water becomes limiting especially during near drought conditions, growth and development of different weed species are enhanced and could reach up to the level that can significantly cause economic yield loss. Weed identification and weed biology, and knowing farmers' weed management practices are considered pre-requisites for development of effective weed control strategies. For without these, employing any weed control tactics will become meaningless. This project aimed to determine the different weed species and existing weed management practices mostly used by farmers in rainfed lowland ricefields of Negros, and to evaluate different weed management techniques for rainfed rice ecosystem of Negros.

Major weeds and farmers' weed management practices in rainfed rice ecosystem of Negros

DKM Donayre, CA Endino, CU Seville, and IMG Ciocon

This study was conducted to a) determine the different weed species in rainfed lowland rice areas of Negros, b) determine the most dominant weed species in rainfed lowland ricefields of Negros, and c) determine the existing weed management practices mostly used by farmers in rainfed lowland ricefields of Negros. Surveys were conducted on rice areas of Hinigaran and Sipalay City, Negros Occidental; and Bayawan City, Negros Oriental with known rainfed conditions. From January to February 2012, a total of 58 farmers from the sites who were tilling rainfed farms were randomly selected and interviewed using a guided questionnaire. Data collected were fused in previous data collected from Guihulngan, Negros Oriental; and Bago City and San Carlos City of Negros Occidental (n=71).

Highlights:

- Most respondents used transplanting method.
- Ninety one percent of the respondent used only good seeds.
- Eighty eight percent of respondents acquired rice seeds either from their own harvests or from their neighboring farmers
- Fifty two percent of the respondents tilled their ricefields in < 14

DAT/DAS.

- Fimbristylis miliacea was the most commonly encountered weed species in the rainfed ricefields of Negros followed by Cyperus spp. (C. difformis and C. iria), Monochoria vaginalis,Ludwigia sp. (L. octovalvis and L. perennis), and Echinochloa spp. (E. glabrescens, E. colona and E. crus-galli).

- Seventy percent and 53% of respondents said that handweeding and proper management of water were their major means of weed control in transplanted rice while 17% and 5% of them used herbicides and mechanical handweeder.

- Twenty nine percent of the respondents that follow direct-seeding said that herbicide was their major way of combating different rainfed rice weeds. Only 14% and 5% of them mentioned about using handweeding and proper management of water.

- The chemical 2, 4-D, pretilachlor, and butachlor + propanil (in decreasing order) were the top 3 commonly used herbicides against rainfed riceweeds of Negros.

Evaluation of weed control techniques for rainfed riceweeds of Negros
DKM Donayre

A second trial was conducted at PhilRice Negros during dry season CY 2012 to evaluate different weed management techniques for rainfed riceweeds of Negros. To simulate farmers' land preparation practices in rainfed ricefields, experimental field plots were prepared within 2 weeks coinciding the onset of rain on December CY 2011. A 100-square meter plot in each treatment [1- Unweeded (control), 2- Handweeding alone @ 15, 20, 25, 30, 35, 40 and 45, 3- Pre-emergence herbicide (preticlachlor @ 450 g ha-1) @ 3 DAS, and 4- Post-emergence herbicide (bispyribac-sodium @ 31.65 g ha-1) @ 8 DAS] was prepared. Except for unweeded plots, weed control action indicator (WCAI) was utilized in each treatment as aid in assessing whether additional handweeding was still needed. The experiment was arranged in RCBD with four replications. Rain water was solely used in the study as source of irrigation. Pre-germinated seeds of PSB Rc10 were directly-seeded in each plot. Identity, density and weights of different weed species at 15, 30, 45 DAS, and yield at harvest were gathered.

Highlights:

- Based on unweeded plots, Leptochloa chinensis L.for grasses; C. difformis L., C. iria L., Fimbristylismiliacea (L.) Vahl, and F. dichotoma (L.) Vahl for sedges; and Ludwigia (L. octovalvis (Jacq.)

Raven and L. perennis L.] for broadleaves, were the most dominant weed species in terms of density and relative fresh weight at 15, 30 and 45 DAS.

- Plots treated with pre-emergence and post-emergence herbicides with follow-ups of handweeding based on WCAI had lower weed density and weed weights (Figure 17).

- PSB Rc10 yield was higher than handweeding alone plot, but did not differ significantly on plots treated either with pre-emergence or post-emergence herbicides (Figure 18).

- Weed management cost in plots treated with handweeding alone was lower compared to plots treated with either pre-emergence or post-emergence herbicides (Table 7).

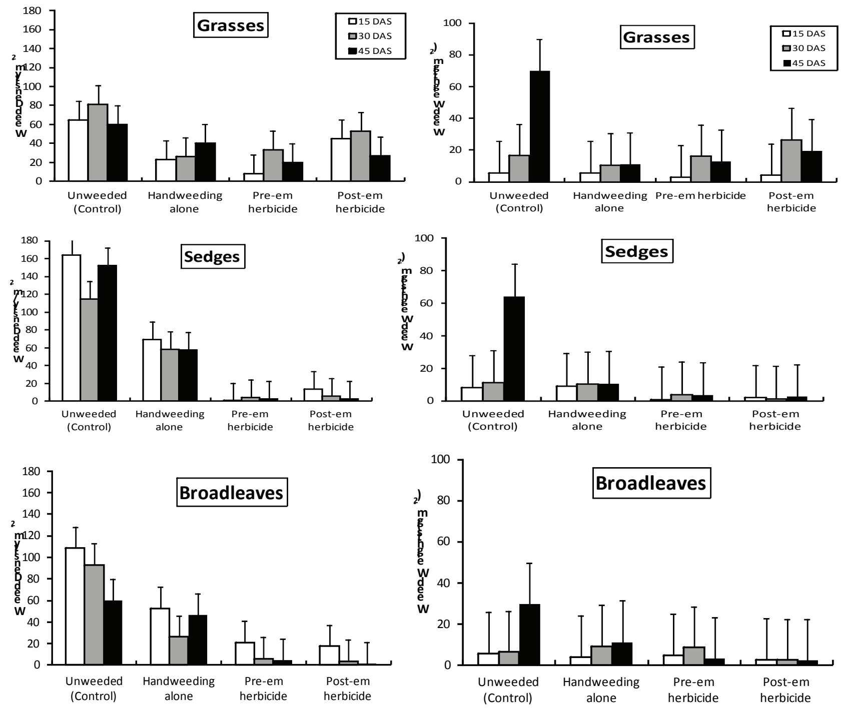


Figure 17. Density and weight of weeds as affected by weed control techniques under rainfed condition.

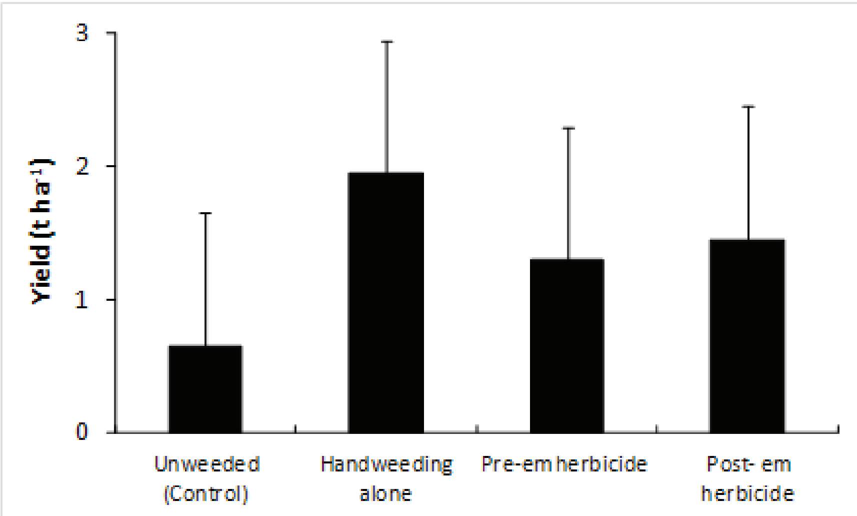


Figure 18. Yield of PSB Rc10 as affected by weed control techniques under rainfed condition. Treatment means were compared at 5% level of significance using HSD.

Table 7. Weed management cost as affected by weed control techniques under rainfed condition.

Treatments	No. of HW spent [1]	No. of Mandays ha^{-1}	Cost of Mandays (Php ha^{-1})[2]	Cost of units used[3]	Total
Unweeded (Control)	-	-	-	-	-
Handweeding alone	3	18.75	4,687.50	-	4,709.25
Pre-emergence herbicide	2	15.63	3,907.50	1,125.00	5,050.13
Post-emergence herbicide	2	15.63	3,907.50	939.00	4,864.13

1 – Handweeding (HW) based on weed control action indicator (WCAI)
2 – P250.00 per manday
3 – Units in liter

VI. Development of Cultural Management Options for Organic Rice Production

EM Libetario

Application of additional organic materials is one of the feasible nutrient management options for rice farmers in order to improve the conditions of their soil. Organic farming has also become very popular because of the awareness by many consumers on pesticide contaminations on food products, human and animal health safety, and environment contaminations. Because of this awareness, some local farmers tend to shift their farming systems from the conventional to organic farming system. In the

Philippines, Republic Act 10068, or the Organic Agriculture Act of 2010, was created to promote ecologically sound, socially acceptable, economically viable and technically feasible production of food and fishes. The law also includes the application of organic fertilizers produced from farm biomasses, and supplemental applications of fermented plant extracts to aid in crop growth and better yield.

However, it has been concluded by many authors that the effects of application of organic materials on soil properties are most important in the upland areas. Certain known effects of organic materials on the yield and growth of rice and the additional effects of mineral fertilizers were studied by other researchers, and the best results were from the complementary use of mineral fertilizers and organic manures. Moreover, since organic farming promotes no use chemical pesticides, occurrence of insect pests, diseases and weeds may become prevalent and difficult to manage, especially if infestation or infection goes high. Thus, proper management of organic materials and farm wastes must be developed to optimize the benefits that can be obtained from these organic inputs. Along with this, specific investigations on such management practices and organic rice cultures are needed to better understand the potentials and risks in engaging into such system of rice cultivation. This project aims to develop and evaluate management strategies using organic inputs and cultures for improving rice and soil productivities in the Visayas.

Efficacy trial of various compost inoculants for rice straw decomposition
JEAD Bibar

Rice straw is the organic residue most common in rice fields. It is a farm waste after harvest and is usually burned after threshing. Some farmers incorporate rice straws into the soil during land preparation. This straw then becomes additional organic fertilizer. Rice straw as source of organic matter and soil nutrients is known to improve soil fertility especially when incorporated three to 4 weeks in advance and completely degraded before transplanting. The rate of degradation and nutrient enhancement of composted rice straw could even be facilitated by the use of inoculants. Some tested inoculants are already commercially available to farmers at low-cost. This study was conducted at the PhilRice Negros experimental area to assess the effect of commercially-available compost inoculants in the decomposition of rice straw.

Highlights:

- Rice straw used in 2012 had lower carbon to nitrogen (C/N) ratio of 32.6 due to higher N content relative to rice straw used in 2011, which has 54.9. Five compost inoculants were used as treatments. A treatment of rice straw alone was added as control.

- After 4 weeks of incubating rice straws with compost inoculants, C/N ratios decreased to values ranging from 17.5 to 20.3 in 2011, and 15.5 to 18.8 in 2012 (Figure 19. However, the C/N ratios of inoculated and uninoculated rice straws did not differ significantly in both 2011 and 2012 trials.

- Total soil nitrogen (%N) increased in all treatments during the 4-week incubation of soils mixed with fresh rice straws and compost inoculants (Figure 21). However, organic matter (Figure 19), phosphorus (Figure 22) and potassium (Figure 23) did increase for 2 weeks then decreased or leveled off thereafter. This increase in nutrient contents during the 2 weeks of incubation could be attributed to the release of nutrients during the initial decomposition of the rice straw.

- Nutrient contents of rice straw and compost inoculant-treated soils did not differ significantly different with that of rice straw alone treatment. Some of the soil properties such as soil pH, OM and available K, were even of higher values in the control treatment pots than those with inoculants. This can be due to the higher microbial activities in soil with inoculated rice straws than in the no treatment control soil. Soil microorganisms influence nutrient cycles, including mineralization and immobilization due to active enzymatic activities. The various component microorganisms in the inoculant may also have varying metabolism requirements that may have influenced rice straw degradation and soil properties.

- Results show that treating rice straws with compost inoculants have no significant effect on the degree of rice straw decomposition. However, further investigations should be done to determine the biochemical properties of compost inoculants, and its influence on the transformation and release of nutrients from inoculated rice straws in the soil.

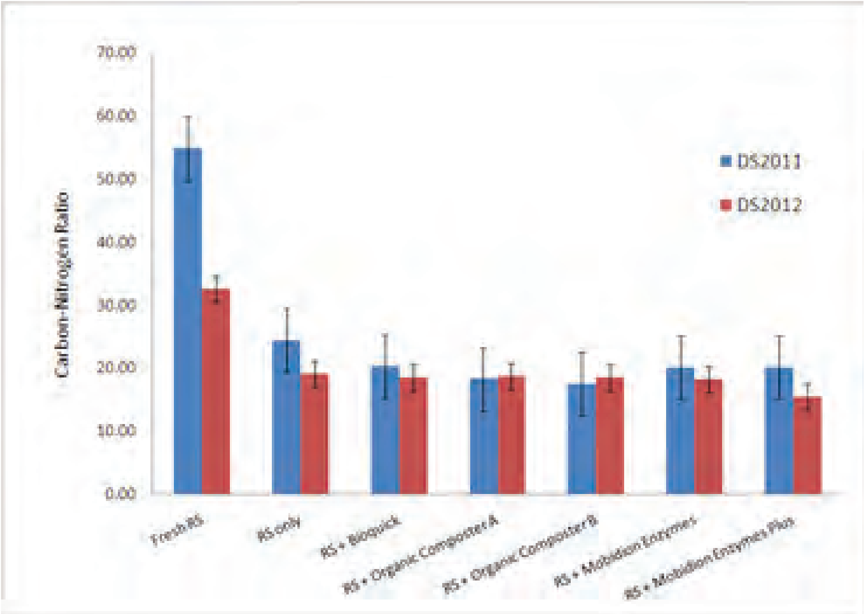


Figure 19. Carbon to nitrogen (C/N) ratios of rice straws applied with different compost inoculants after 4 weeks incubation.

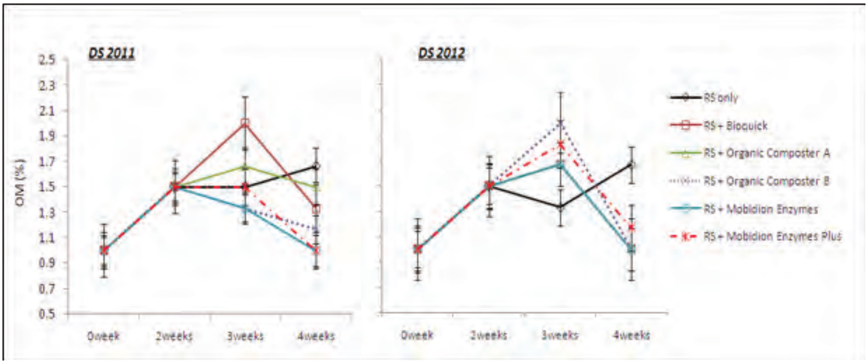


Figure 20. Organic matter content of soils with inoculated rice straw during 4-week incubation.

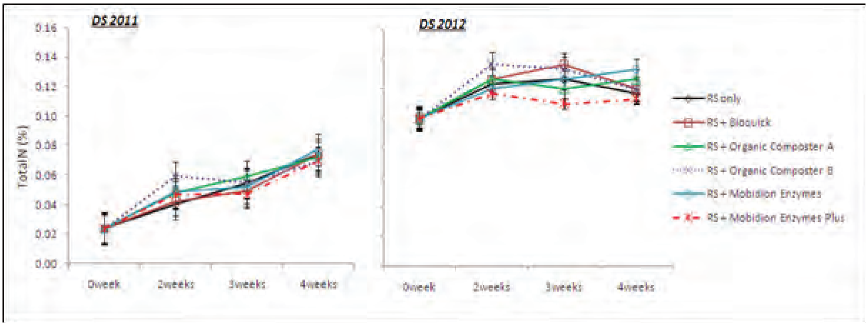


Figure 21. Total nitrogen content of soils with inoculated rice straw during 4-week incubation.

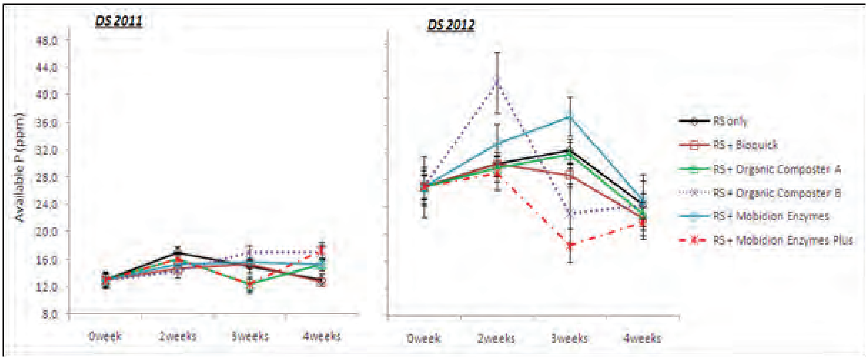


Figure 22. Available phosphorus content of soils with inoculated rice straw during 4-week incubation.

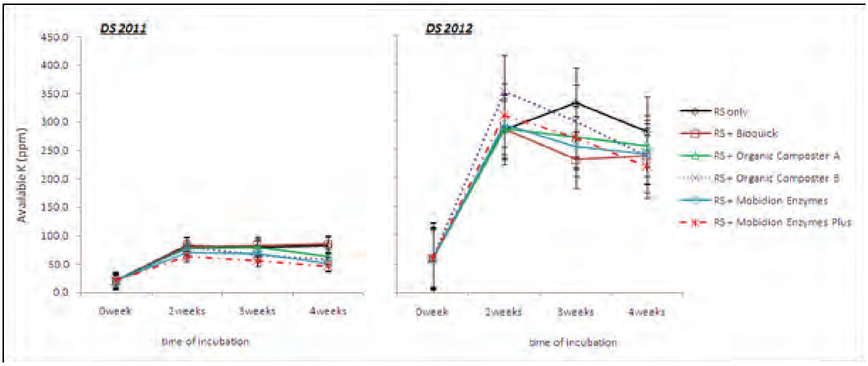


Figure 23. Available potassium content of soils with inoculated rice straw during 4-week incubation.

Effect of rice straw treated with different compost inoculants on soil properties and rice yield
JEAD Bibar

Rice straw is a major source of organic matter and nutrients in rainfed rice soils. It is the most common farm waste and readily available to farmers. However, its complete decomposition after soil incorporation is important to minimize the harmful effects of decomposition products (e.g. organic acids) to rice seedlings. Rice straw degradation may be enhanced using inoculants that are already commercially-available for farmers. This study aimed to determine the effects of inoculated rice straw on grain yield of rainfed rice and on the soil properties.

Highlights:

- Starting WS 2011 to WS 2012, fresh rice straw treated with compost inoculants were incorporated into lowland soil at 2 t/ha-1 14 days before transplanting (14DBT). Six compost inoculants were used as treatments. Treatments without rice straw and rice straw alone were added as control treatments. Soil samplings were conducted at vegetative phase of rice for analysis of soil properties.

- During WS 2011 and DS 2012, grain yields of PSB Rc14 were low, ranging from 1 to 1.5 t/ha-1 (Figure 24). However, this was primarily due to high infection of rice tungro virus disease.

- In WS 2012, grain yields ranged from 3.5 to 4.3 t/ha-1 with the use of NSIC Rc272, a rainfed rice variety known to be resistant to rice tungro virus disease. However, grain yields did not differ significantly among treatments.

- Soil properties (pH, organic matter, available phosphorus and available potassium) varied in dynamics in each season but did not differ significantly among treatments (Figures 25-28). Dynamics of soil chemical properties could have been influenced by the soil moisture in each season because of its effect on the transformations, availability and release of nutrients.

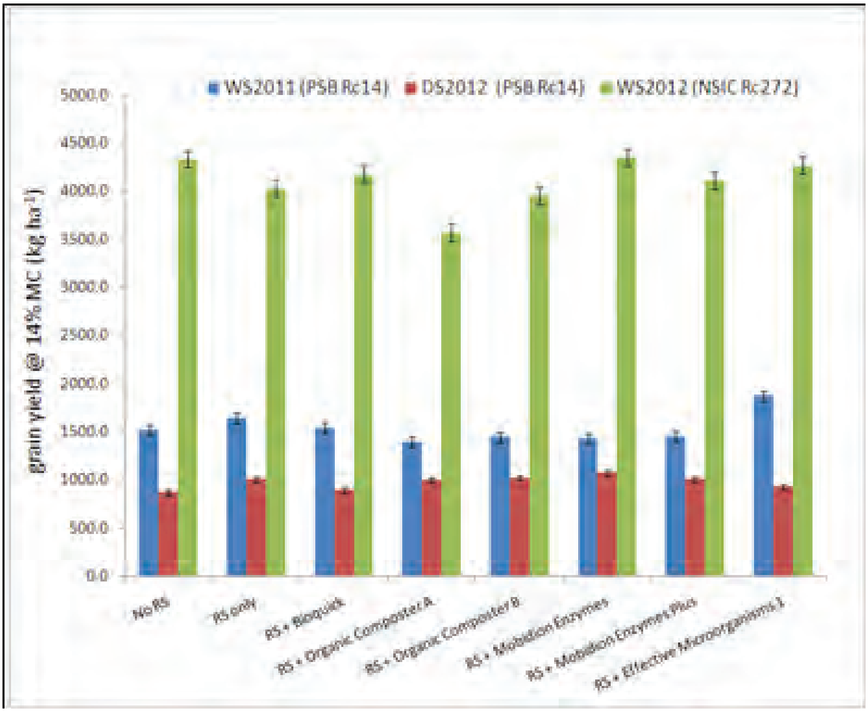


Figure 24. Grain yield of lowland rice from plots applied with rice straw and different compost inoculants, WS 2011 - WS 2012, PhilRice Negros research and seed production farm.

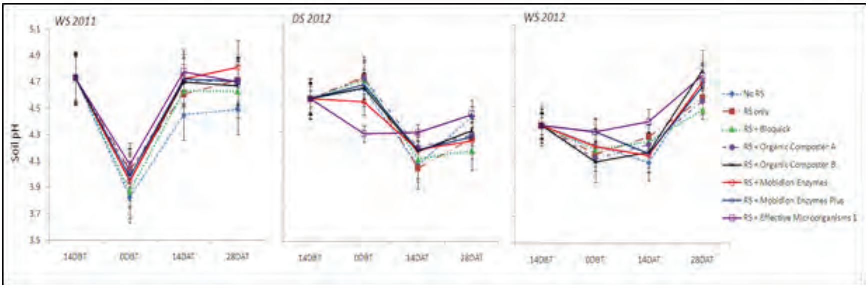


Figure 25. pH of soils with rice straws and compost inoculants at various sampling periods, WS 2011 - WS 2012.

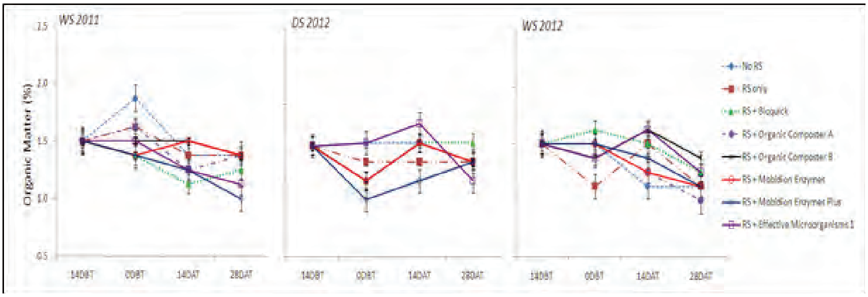


Figure 26. Organic matter content of soils with rice straws and compost inoculants at various sampling periods, WS 2011 - WS 2012.

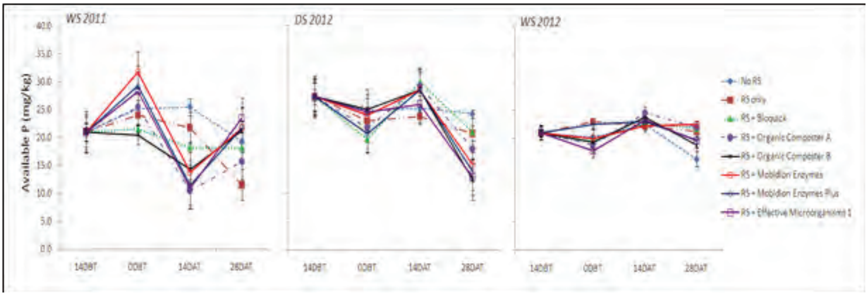


Figure 27. Available phosphorus content of soils with rice straws and compost inoculants at various sampling periods WS 2011 - WS 2012.

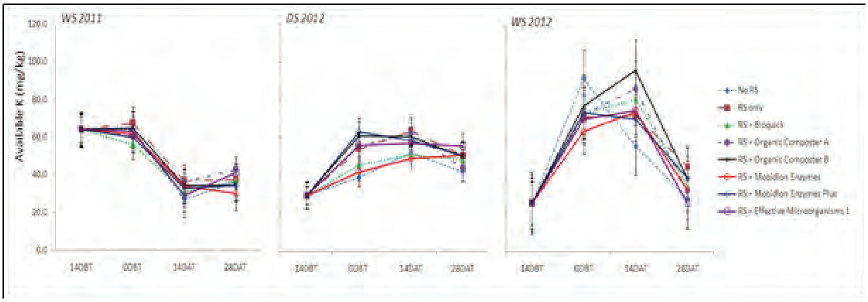


Figure 28. Available potassium content of soils with rice straws and compost inoculants at various sampling periods, WS 2011 - WS 2012.

Evaluation of the effects of various organic rice cultures in Negros Island
JEAD Bibar, EM Libetario

Organic farmers are encouraged to produce their own concoctions (fermented solutions) prepared from different organic materials through microbiological processes. These are then applied as fertilizers or soil amendment. Organic rice farmers have claimed that after at least five years of organic farming, rice yields had stabilized and are comparable to yield level of conventionally-produced rice. However, information and relevant data are limited for the scientific community to confirm these testimonies. Moreover, organic rice farmers in Negros and their organic farming systems are not well documented. Thus, it is appropriate for PhilRice Negros to identify the various organic rice cultures promoted within the Negros Island and evaluate them through appropriate experimental research inside the station. This study aimed to evaluate the effect of various organic cultures on grain yield of rice and the soil properties of the growing medium.

A survey of the various organic rice cultures around Negros Island was conducted on 2011. The cultures were then duplicated in the PhilRice Negros Station's research and seed production farm. Survey data indicated that all lowland organic rice systems had similar management practices, except for sources of nutrients and pesticides. The organic culture systems used as treatments were: Sagay (20 bags OF/ha + organic foliars); Canlaon (60bags OF/ha); Hinoba-an (40 bags OF/ha + organic foliars); Bayawan (100 bags OF/ha + organic foliars); and, Bago (40 bags OF/ha + organic foliars). The different organic rice practitioners were following the same system of developing their own organic fertilizers and foliars, yet they differ in the source of raw materials and the rate of application for lowland rice. A treatment of chemical fertilizer based on site specific nutrient management was added as control starting on 2012 DS. Soil properties in the trail site were measured before the start of each cropping season. These are shown in Figure 29, with data from soil samples taken during 2011 WS as the initial characteristic before the start of organic culture.

Table 8. Nutrient composition of the various organic fertilizers used in the study.

Source of Organic Fertilizer	Total N (%)	OM (%)	Available P (mg/kg)	Available K (mg/kg)
Sagay	0.70	4.0	276	1400
Canlaon	1.02	4.0	483	6400
Hinoba-an	0.82	4.5	380	980
Bayawan	2.35	4.5	512	1620
Bago	1.00	4.5	367	3400

Highlights:

- After two seasons of continuous organic rice culture, no build-up of organic matter, phosphorus or potassium contents in the soils was observed for any of the organic rice cultures.

- Plant growth and foliar color of Camuros and PSB Rc10 in 2011 WS and 2012 DS, respectively, were uneven within plots.

- All organic culture treatments did not equal to the levels of plant growth and grain yields of chemical fertilizer treatment. However in 2013 WS, grain yield of NSIC Rc120 was highest under the Bayawan and the Bago organic systems (Figure 30) among the organic culture systems.

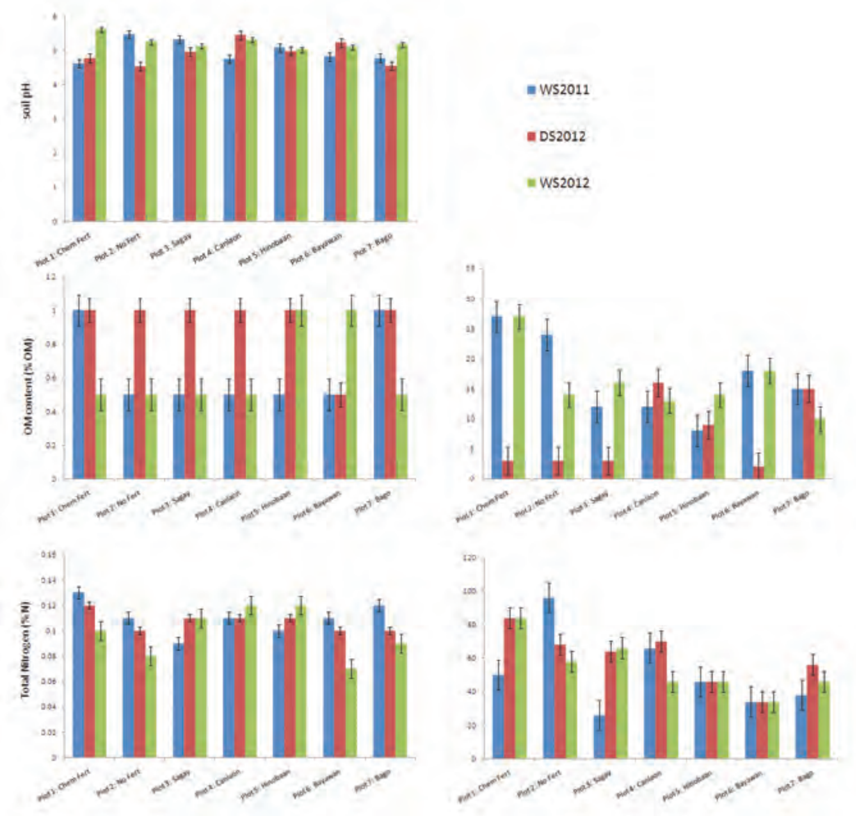


Figure 29. Soil properties after application of different organic inputs and crop establishment, 2011 WS - 2012 WS, PhilRice Negros research and seed production farm.

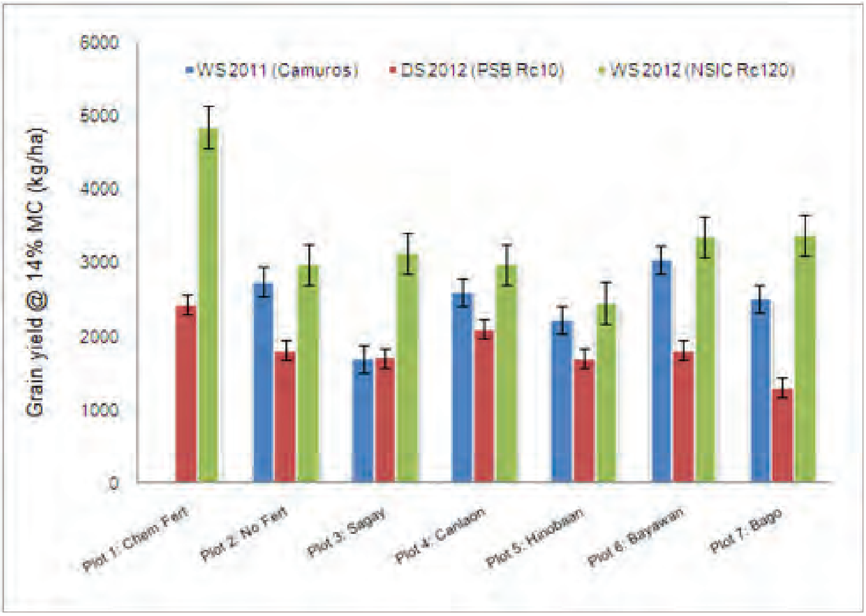


Figure 30. Grain yield of lowland rice after application of organic inputs based on different organic rice cultures documented in Negros Island, 2011 WS - 2012 WS, PhilRice Negros research and seed production farm.

Pest assessment in organic rice ecosystem of Negros
DKM Donayre, CA Endino, IMG Ciocon

One of the requirements in achieving effective and economical control for rice pests is to know the nature and behavior of your pests in the field. If organic farming is highly promoted in Negros, occurrence, incidence and severity of pests in organic rice areas must be determined to select control strategies that are effective and economical. This study was conducted to: a) determine the abundance of insect pests, diseases and weeds in organically grown rice of Negros; and, b) determine their occurrence and distribution in organically grown rice.

Highlights:

- In 2011 WS, broadleafed-weeds were the most dominant group in three organic rice areas in Bago City, with Hydrolea zeylanica and Fimbristylis miliacea as the most dominant broadleaf and sedge, respectively.

- Narrow brown spot was the most common injury-causing element across sites followed by stem borer white heads.

- For 2012 DS, pest assessment was conducted in the six-hectare organic rice seed production area of PhilRice Negros. Hydrolea zeylanica and Paspalum distichum were the most prevalent weeds in the PhilRice Negros Station.

- Rice tungro virus was the most common disease, while green leaf hoppers and rice bugs were the most dominant injuring pest of organic rice in the station.

VII. Varietal Demos and the Palayamanan Model: A Showcase of PhilRice Technologies in the Visayas
EM Libetario

A number of rice varieties are released every year for the irrigated and rainfed environments. These continually add up to the already many varieties available in the field. The fact that many PSB Rc varieties (e.g. PSB Rc10, PSB Rc18) are still popular among rice farmers is indicative of newer releases with better yield potentials or qualities may not have seen field test planting for farmers to see and select, and can be due to poor information dissemination. In the field, PhilRice is identified more on variety than in any other rice production technologies. It is necessary for PhilRice to lead in demonstrating and showcasing the new releases of rice to the various rice production environments in the country, if only for a new variety to have the chance of being seen and selected by intended client farmers before this is replaced by a newer variety or the seeds become unavailable. To address this concern, the PhilRice Negros Station has embarked on a continually implemented Development Section-led variety demonstration and selection project in collaboration with the DA- RFU6 and the Provincial, City, and Municipal LGUS, the major stakeholders. PhilRice would catalogue and demonstrate the agronomic and grain yield performances of each new release at the care of farmer partners and local agriculture technicians trained on the standards of the PalayCheck System to as many clients possible. The DA-RFU6 would be able to make the list of rice varieties to prioritize in seed procurement and distribution program to enhance accomplishments in production output, while the various LGUs possess the information on varieties to push at each lowland rice production environment during each cropping season. PhilRice extracts further information on yield performance of the various variety entries by the major rice production appropriate soil series, and the pest prevalence by production environment by season over the various soil series through superimposed studies and observation by the Research staff of the PhilRice Negros Station.

Meanwhile, in the advocacy of increasing productivity for the whole farm, a Palayamanan Model appropriate for the local agro-ecological, social and economic environments needs to be showcased. PhilRice

Negros maintains a Palayamanan Farm as model for a three-hectare rice farm for a family as envisioned in the Agrarian Reform Program of the Philippine Government. This is located at the Station's Research, Technology Demonstration and Seed Production Farm.

Yield performance evaluation of newly-released rice varieties grown on the different soil series in Region 6

CA Endino, IMG Ciocon, DKM Donayre, JEAD Bibar, RT Dollentas, AOV Capistrano, LC Javier, EM Libetario, E Oyson and MO Olanday

This study was aimed to showcase and determine the best performing varieties in Region 6 through demonstration of newly released rice varieties grown in different soil series for a more site-specific recommendation and efficient adoption of those new rice varieties. With help of collaborating agencies, varietal demonstration sites were carefully selected based on soil series. Sites with no known soil series were validated through the use of Soil Series Guidebook for Panay, Guimaras and Negros Islands. To simulate farmers' practices in the community, planting dates and method of crop establishment were followed. Ten newly released varieties were established in a 0.5-hectare farm divided into several plots. Farmers' preferred varieties were also included as check variety. Performance of each variety in relation to productivity, nutrient deficiencies and toxicities, and reaction to pests were recorded. Grain weight of each variety was obtained from 3 crop cut samples measuring 2 x 5 meters (grain weight after 16 hours sun-drying) and then converted to tons per hectare at 14% moisture content.

In dry season (December 2011 – May 2012), 9 rice varieties (NSIC Rc224, NSIC Rc222, NSIC Rc220, NSIC Rc188, NSIC Rc17, NSIC Rc15, NSIC Rc11, NSIC Rc9 and PSB Rc28) together with the top three results of the previous variety demo were evaluated for grain yield performance and reaction to major pest and diseases at 15 sites of Western Visayas, representing 11 different soil series in the provinces of Aklan, Antique, Capiz, Guimaras, Iloilo and Negros Occidental. In wet season 2012 (June-October 2012), new sets of varieties were showcased (NSIC Rc218, NSIC Rc226, NSIC Rc238, NSIC Rc240, NSIC Rc272, NSIC Rc274, NSIC Rc276, NSIC Rc278, NSIC Rc280 and NSIC Rc282). These were planted around 29 sites representing 18 different soil series across the Western Visayas.

Highlights:

2011 – 2012 Dry Season

- Mean grain yield of all varieties across sites were 2.7 t/ha for the rainfed, and 3t/ha for the irrigated lowland, respectively.

- Top five performing varieties under irrigated lowland were NSIC Rc216, NSIC Rc222, NSIC Rc15, NSIC Rc224 and NSIC Rc188.

Meanwhile, NSIC Rc222, NSIC Rc224 NSIC Rc216, NSIC Rc9 and NSIC Rc11 were the top varieties in grain yield performance under rainfed condition.

2012 Dry Season

- Top five performing varieties across irrigated lowland ecosystem were NSIC Rc238, NSIC Rc240, NSIC Rc274, NSIC Rc226, and NSIC Rc272 (Table 9). Meanwhile, top five performing varieties across rainfed ecosystem were NSIC Rc226, NSIC Rc218, NSIC Rc240, NSIC Rc280, and NSIC Rc282.

- Table 10 shows the top performing varieties per province during wet season CY 2012.

- Soil series that supported the highest grain yield of lowland rice were San Manuel, Bantog, Guimaras, Sigcay, San Rafael and Cadiz.

- Showcase of varieties through farmer's field days were conducted in vardemo sites of Sipalay City, Sagay City, Ilog and PhilRice Negros, Negros Occidental; San Lorenzo, Guimaras Island; and Bugasong, Antique.

Table 9. Top yield performing lowland rice varieties across 15 sites of Western Visayas for CY 2012.

Rank	Irrigated-lowland DS 2012	Yield	Rainfed DS 2012	Yield
1	NSIC Rc216	3.77	NSIC Rc222	3.26
2	NSIC Rc222	3.61	NSIC Rc224	3.07
3	NSIC Rc15	3.34	NSIC Rc216	3.03
4	NSIC Rc224	3.19	NSIC Rc9	2.74
5	NSIC Rc188	3.08	NSIC Rc11	2.65
Rank	**Irrigated-lowland WS 2012**	**Yield**	**Rainfed WS2012**	**Yield**
1	NSIC Rc238	4.96	NSIC Rc226	4.46
2	NSIC Rc240	4.83	NSIC Rc218	4.26
3	NSIC Rc274	4.62	NSIC Rc240	4.05
4	NSIC Rc226	4.60	NSIC Rc282	3.57
5	NSIC Rc272	4.48	NSIC Rc280	3.56

Table 10. Top yield performing lowland rice varieties among provinces of Western Visayas, wet season of CY 2012.

	Neg. Occ	Guimaras	Aklan	Iloilo	Antique	Capiz
Rank	Irrigated					
1	NSIC Rc226	NSIC Rc274	NSIC Rc282	NSIC Rc272	NSIC Rc240	no set-up
2	NSIC Rc238	NSIC Rc226	NSIC Rc278	NSIC Rc240	NSIC Rc238	-
3	NSIC Rc274	NSIC Rc238	NSIC Rc238	NSIC Rc218	NSIC Rc272	-
4	NSIC Rc218	NSIC Rc218	NSIC Rc274	NSIC Rc280	NSIC Rc218	-
5	NSIC Rc240	NSIC Rc240	NSIC Rc280	NSIC Rc238	NSIC Rc274	-
Rank	Rainfed					
1	NSIC Rc226	NSIC Rc282	NSIC Rc226	NSIC Rc218	NSIC Rc240	NSIC Rc240
2	NSIC Rc238	NSIC Rc218	NSIC Rc240	NSIC Rc226	NSIC Rc276	NSIC Rc276
3	NSIC Rc240	NSIC Rc226	NSIC Rc218	NSIC Rc276	NSIC Rc218	NSIC Rc218
4	NSIC Rc282	NSIC Rc280	NSIC Rc280	NSIC Rc240	NSIC Rc238	NSIC Rc238
5	NSIC Rc278	NSIC Rc238	NSIC Rc272	NSIC Rc282	NSIC Rc278	NSIC Rc278

Operating and managing the PALAYAMANAN model farm under its original concept

DKM Donayre, AOV Capistrano, EM Libetario

The Palayamanan Model in PhilRice Negros has been in operation since the year 2005. Since its establishment, it has been a showcase of a simple farming system aimed at achieving food security for rice farming households. It has sparked interest and inspired various guests and visitors of the station, often resulting in replication of the farming system in their own fields. Apart from the objective of securing the supply of safe and nutritious food for the rice farming households, the Palayamanan Model also highlighted nutrient recycling and recovery within the various components of the farm, making it a genuine model of sustainable farming. However, the elevation of the Palayamanan concept as a business enterprise veered it away from its original concept. Thus, it was recently agreed to return the management of the Palayamanan Model to the research unit of PhilRice Negros, and again serve its purpose as a showcase of a working farming systems to its visitors.

The main objective of this study was to operate and manage the Palayamanan Farm Model under its original concept for PhilRice Negros' various visitors to appreciate. Specifically, the Farm Model aimed to showcase the (1) nutrient recycling that utilizes the various farm wastes generated within the farm, (2) a continuous food supply for the rice farming household, (3) special traditional rice and organic vegetables for niche markets, and (4) an ecologically sound but economically viable farming system.

Highlights:

- PSB Rc222 was successfully established and harvested during dry and wet seasons 2012. To further minimize cost of production, rice plants were established through direct-seeding method under rainfed conditions.
- Two new trellises for cucurbit plants were constructed to increase diversity of vegetable crops.
- Radish, tomato, eggplant, chili, sweet pepper, leaf onion, okra, sweet potato, saluyot, upo, squash, ampalaya, patola, kangkong, papaya, corn, and banana had been simultaneously planted to showcase diversified crops.
- Tilapias in fish pond were raised and maintained thoroughly through organic feeds (rice bran).
- A new nipa hut was installed for holding visitors and conduct of meetings relating to diversified farming systems.
- Leftovers of crop stubbles (after harvest) were used as organic fertilizers for the next succeeding planted crops. No synthetic fertilizers were used inside the model farm.

Enhancing Rice Productivity in Region VI (Western Visayas) through Identification of New, Locally-Adapted Cultivars and Site-Specific Soil and Crop Fertility Management
DKM Donayre

There are several factors that affect yield of rice in a particular ricefield. Among these are soil, climate, pest pressures and cultural management of farmers that are highly varied from one site to another. For any rice cultivar to attain its maximum potential and bring about significant profit to the farmers, the interaction effect of these factors with any rice cultivar needs to be identified. The simplest way to identify cultivar, soil, climate and pest interaction is via a localized varietal adaptability trial. Though it is a fact that before a variety is released by the National Seed Industry Council (NSIC), it has undergone several multi-location trials within the Philippines. However, it may not be enough to conclude that the variety is adapted to all rice areas in the country since trial sites are not that extensive. Furthermore, indigenous pest pressures also vary across locations and are highly influenced by farmers' management practices. Thus, the interaction effect between varietal yield performances with the local pest pressures will also be different across sites. In terms of nutrient management, varietal and nutrient interaction effects would also be varied, as farmers often neglect soil diagnosis resulting to improper fertilizations and soil management. This project aimed to identify and recommend new rice varieties that are high-yielding and suitable to the local soil, climate, pest and disease conditions as well as site specific fertilizer rates for rice farmers of Region 6 (Western Visayas).

Performance evaluation of newlyreleased rice varieties grown in different soil series in Region VI

CA Endino, EM Libetario, IMG Ciocon, DKM Donayre, JEAD Bibar, RT Dollentas, AOV Capistrano, LC Javier, MO Olanday, and E Oyson

This study was a collaborative project between PhilRice, DARFU6, Provincial, City and Municipal LGUs of Aklan, Antique, Capiz, Guimaras, Iloilo and Negros Occidental. This study was aimed to showcase and determine the best performing varieties in Region 6 through demonstration of newlyreleased rice varieties grown in different soil series for a more site-specific recommendation and efficient adoption of those new rice varieties. With the help of collaborating provincial and municipal agencies, 29 varietal demonstration (vardemo) sites were carefully selected based on soil series as shown in Figure 31. Sites with no known soil series were validated through the use of Soil Series Guidebook for Panay, Guimaras and Negros Islands. To simulate farmers' practices in the community, planting dates and method of crop establishment were followed. Ten newlyreleased varieties (NSIC Rc218, NSIC Rc226, NSIC Rc238, NSIC Rc240, NSIC Rc272, NSIC Rc274, NSIC Rc276, NSIC Rc278, NSIC Rc280 and NSIC Rc282) were established in a 0.5-hectare farm divided into several plots. Farmers' preferred varieties were also included as check variety. Performance of each variety in relation to productivity, nutrient deficiencies and toxicities, and reaction to pests were recorded. Grain weight of each variety was obtained from three crop cut samples measuring 2 x 5 m (grain weight after 16 hours sun-drying) and then converted to tons per hectare at 14% moisture content.

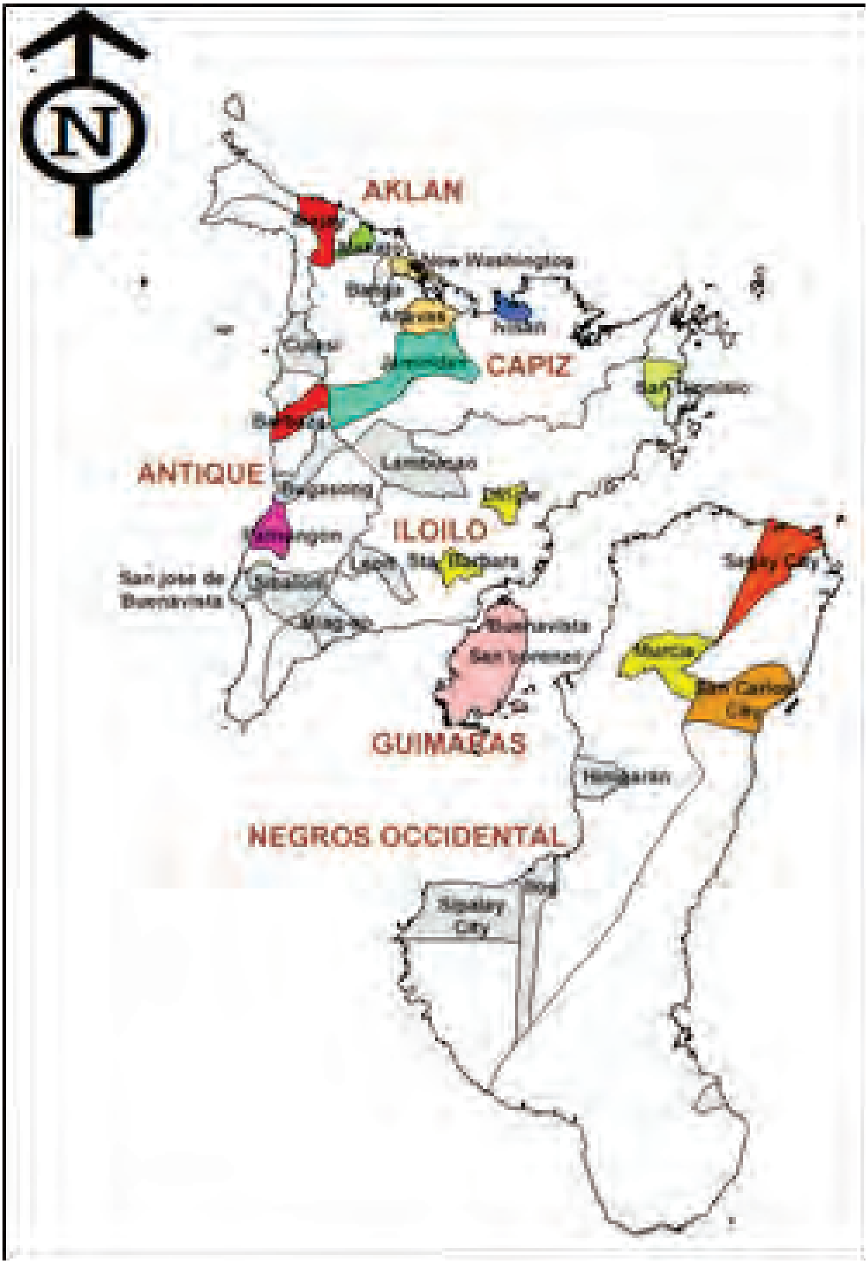


Figure 31. Map of Region VI showing the 29 vardemo sites and respective soil series.

Highlights:

- Vardemo sites in Culasi, Antique and Lambunao, Iloilo had been seriously damaged by heavy occurrence of rain and series of typhoons during the months June to July. Likewise, four varieties did not survived in San Jose, Antique due to heavy occurrence of rain.

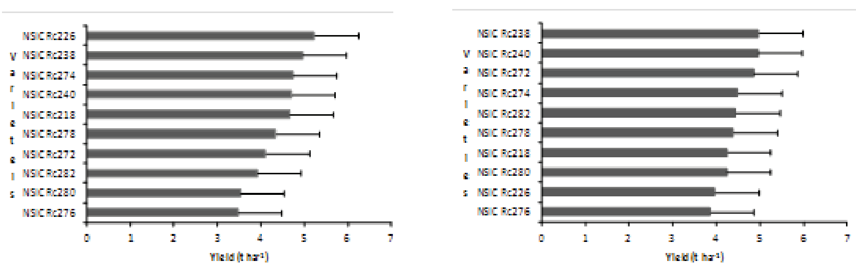
- NSIC Rc226, NSIC Rc238 and NSIC Rc240 were the top three performing varieties across irrigated lowland ecosystem (Figure 32).

- NSIC Rc218, NSIC Rc226 and NSIC Rc240 were the top three performing varieties across rainfed ecosystem (Figure 33).

- Top five performing varieties across irrigated lowland ecosystem, regardless on the type of crop establishment, were (decreasing order) NSIC Rc238>NSIC Rc240>NSIC Rc274> NSIC Rc226> and NSIC Rc272 (Table 11). Meanwhile, top five performing varieties across rainfed ecosystem were NSIC Rc226> NSIC Rc218>NSIC Rc240>NSIC Rc280> and NSIC Rc282.

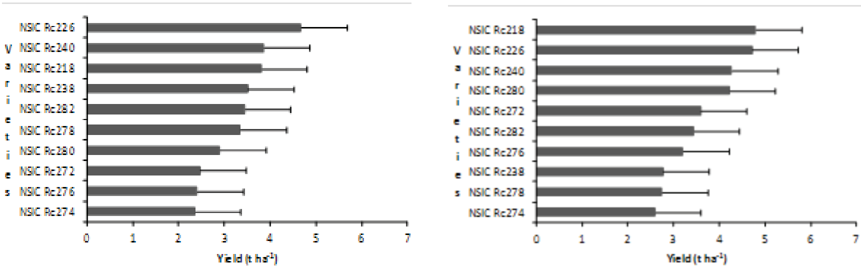
- Yield of different rice varieties varied among different soil series of the region. Rice varieties performed well under San Manuel, Bantog, Guimaras, Sigcay, San Rafael and Cadiz.

- No trend yet has been drawn on the relationship of the performance of different rice varieties with different soil series of Western Visayas. Another season of establishment is needed.



Transplanted, Irrigated Lowland   Direct-seeded, Irrigated Lowland

Figure 32. Mean yield of newly-released rice varieties across irrigated lowland sites of Western Visayas.



Transplanted, Rainfed   Direct-seeded, Rainfed

Figure 33. Mean yield of newly-released rice varieties at two different establishment methods across rainfed sites of Western Visayas.

Table 11. Mean yield of newly-released rice varieties across two ecosystems of Western Visayas.

Irrigated lowland ecosystem	Mean yield (t/ ha^{-1})	Rainfed ecosystem	Mean yield (t/ ha^{-1})
NSIC Rc238	4.96	NSIC Rc226	4.69
NSIC Rc240	4.83	NSIC Rc218	4.29
NSIC Rc274	4.62	NSIC Rc240	4.06
NSIC Rc226	4.60	NSIC Rc280	3.56
NSIC Rc272	4.48	NSIC Rc282	3.44

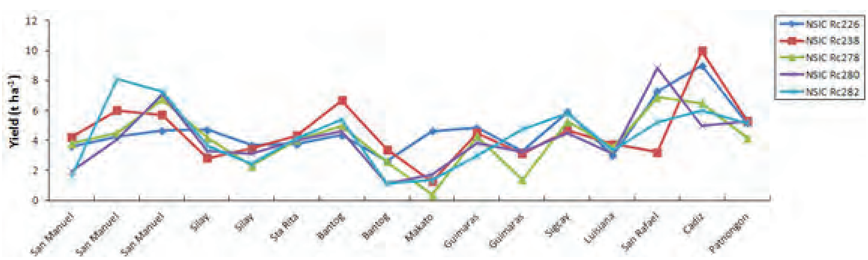


Figure 34. Mean yield of newly-released rice varieties across soil series of Western Visayas (Varieties were selected based on resistance to tungro).

Rice pest incidence and farmers' pest management practices in Western Visayas

DKM Donayre, CA Endino, IMG Ciocon

Pest monitoring and assessment are essential tools in developing or immediate recommendation of appropriate, effective and cost-efficient management actions against occurrence of key pests. In addition, knowing the existing farmers' pest control practices can also help evaluate whether their pest management techniques/strategies are effective or needs room for improvement. Likewise, it also helps to understand their needs, constraints, knowledge, attitudes and practices. Information on farmers' needs can also be transformed into researchable problems and results can be recommended back to farmers. The objectives of this study were to (1) assess the distribution, occurrence and severity of key pests in vardemo sites of Western Visayas, (2) gather information about the prevailing pest management strategies used by most rice farmers in Western Visayas, (3) recommend appropriate pest control measures against key pests of Western Visayas.

A multi-stage sampling was used to randomly select 10 rice farmers near vardemo sites. Rice farmers were interviewed using the guided questionnaire. To determine the major pests commonly damaging/injuring and verify farmers' response based on questionnaire, rice varieties in each vardemo site were sampled for pest identification, and quantification of incidence and severity. A combination of pest sampling methods [Survey Portfolio by Savary et al. (2005), Standard Evaluation System by IRRI (2002), Weed Vegetation Analysis by Moody (1995), and Philippine Rice Production Manual by PhilRice (2003)] were used in this study. Data gathered were recorded and analyzed. Other important parameters like soil type, topography, type of climatic conditions, field coordinates (GPS), etc. which have direct or indirect relations with pest occurrence were also recorded.

Highlights:

- Top three dominant weed species commonly sampled in vardemo sites were Fimbristylis miliacea, Ludwigia octovalvis, and Hydrolea zeylanica, followed by (in decreasing order) Sphenochlea zeynalica, Leptochloa chinensis, Echinochloa glabrescens, Cyperus iria, Cyperus rotundus, Ischaemum rugosum, Basilicum sp., Echinochloa crus-galli, Ipomoea aquatica and weedy rice (Oryza sativa).

- White heads and defoliation due to rice stemborer and leaffolder were the most common injuries caused by insect pests, respectively.

- Tungro and bacterial leaf blight (causal org. - Xanthomonas oryzae pv. oryzae) were the most dominant diseases around vardemo sites in terms of incidence and severity followed by bacterial leaf streak (X.o.pv. oryzicola), narrow brown spot (Cercospora oryzae), brown spot (Bipolaris oryzae), sheath blight (Rhizoctonia solani), sheath rot (Sarocladium oryzae), leaf blast (Pyricularia oryzae), false smut (Ustilaginoidea virens), and grain discolorations (unknown causal organism).

- Newly -released rice varieties planted across vardemo sites had varying reactions to local diseases and insect pests (Table 12).

- Varieties showing resistance to tungro (based on maximum incidence) were NSIC Rc238, NSIC Rc278, NSIC Rc280 and NSIC Rc282 (Figure 35).

- Varying range of tungro and bacterial leaf blight infections had been observed across 29 vardemo sites. However, there were sites were tungro and bacterial leaf blight infestations/infections were not observed such as in San Carlos in Negros Occidental; Ivisan in Capiz; New Washington, Banga, and Altavas in Aklan; and Sta Barbara and Leon in Iloilo.

- Bacterial leaf streak was observed in vardemo sites of San Lorenzo, Guimaras; Ilog, Negros Occidental; Sibalom, Antique; and Sta Barbara, Iloilo. Although high incidence of bacterial leaf streak (1% to100%) was observed in all varieties, the severity of infection was very low (scale=1).

- Narrow brown spot was observed only in vardemo sites of San Lorenzo, Guimaras; and Murcia, Negros Occidental with incidence of 1% to100%. Severity of infection, however, was very low (scale=1). On the other hand, brown spot was observed only in Sipalay, Cauayan, Hinigaran and Murcia of Negros Occidental; Dingle, Iloilo; and Altavas, Aklan. A 100% incidence was observed in all varieties but severity of infection was between 1 to3 scales. Moreover, sheath blight was only recorded in vardemo sites of Sipalay, Hinigaran and Murcia of Negros Occidental with 100% incidence but with severity infection only between 1 to3 scales.

- Sheath rot was observed in Sipalay, Cauayan, Hinigaran and Murcia of Negros Occidental with an incidence of 5% to 100% in all varieties and severity of infection of 5 to 7 scales. Leaf blast, on other hand, was observed in San Lorenzo, Guimaras; Ilog, Negros Occidental; Altavas, Aklan; and Leon of Iloilo with an incidence of 5% to 100% in all varieties. The severity of infection, however, was very low (scale=1).

- High incidence of tungro was observed especially for those susceptible varieties that were transplanted under irrigated lowland

and directly-seeded rice plants established under rainfed condition (Figure 36).

- High incidence and severity of infection of bacterial leaf blight among all rice varieties (Figure 36). Likewise, high incidence of bacterial leaf blight had been observed among rice varieties transplanted or direct-seeded under irrigated lowland condition (Figure 37).

- Data on common pests and farmers' pest practices were still in the process of encoding and analysis. There were still questionnaires, too, that had not yet been submitted by other collaborating municipalities.

Table 12. Reactions of newly-released varieties to local rice diseases and insect pests across vardemo sites.

Insect/Disease/ injuries	NSIC Rc 218	NSIC Rc 226	NSIC Rc 238	NSIC Rc 240	NSIC Rc 272	NSIC Rc 274	NSIC Rc 276	NSIC Rc 278	NSIC Rc 280	NSIC Rc 282
Tungro	S	R	R	S	I	S	I	R	R	R
Bacterial leaf blight	I	S	I	I	S	I	S	S	S	S
Bacterial leaf streak	R	R	R	R	R	R	R	R	R	R
Narrow brown spot	R	R	R	R	R	R	R	R	R	R
Brown spot	R	R	R	R	R	R	R	R	R	R
Sheath blight	R	R	R	R	R	R	R	R	R	R
Sheath rot	R	I	R	S	I	I	I	R	R	I
Leaf blast	R	R	R	R	R	R	R	R	R	R
Grain Discoloration	I	R	R	R	R	R	R	R	R	R
Leaffolder	R	R	R	R	R	R	R	R	R	R
Stemborer	NS	I	I	I	MR	R	R	R	R	R

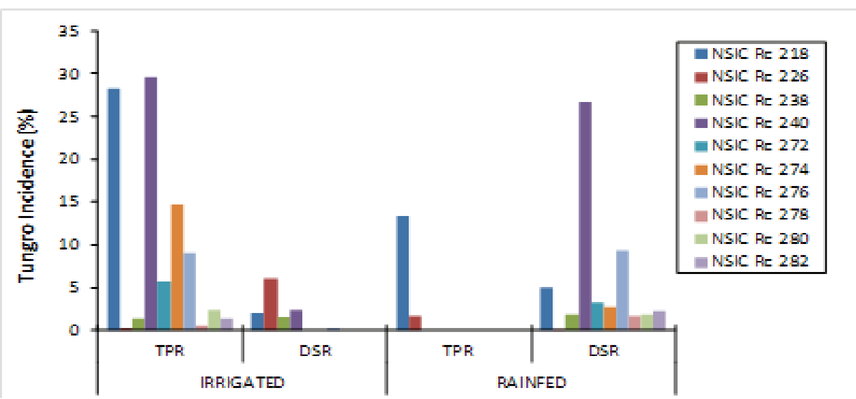


Figure 35. Incidence of tungro in relation to establishment methods and rice ecosystems across vardemo sites.

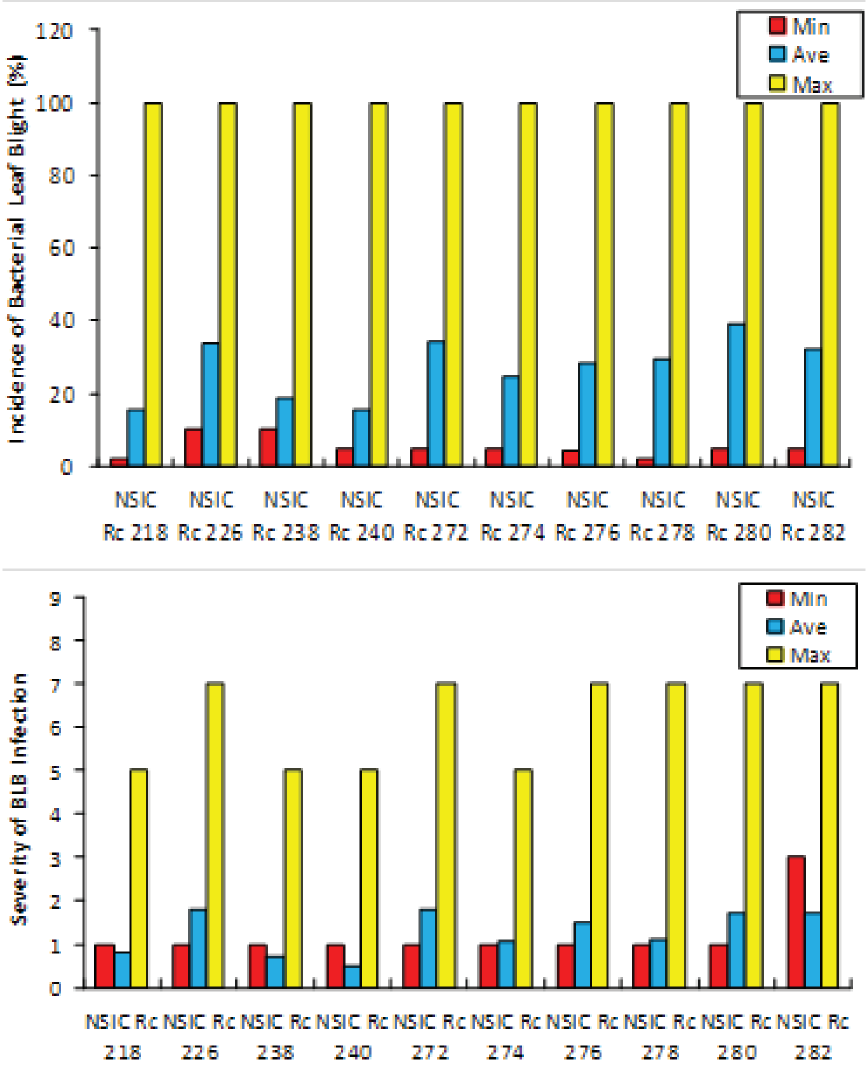


Figure 36. Incidence and severity of bacterial leaf blight among rice varieties.

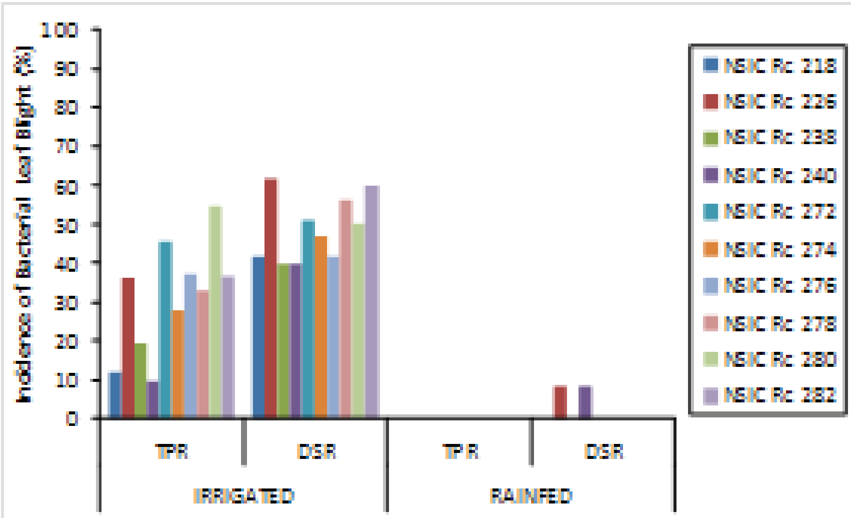


Figure 37. Incidence of bacterial leaf blight in relation to establishment methods and rice ecosystems across vardemo sites.

Development a computational method for field fertilizer rates based from MOET biomass results
JEAD Bibar, AOV Capistrano

The development of the MOET kit paved the way towards an efficient but easy evaluation of the soil nutrient status of individual rice fields. It can identify soil nutrient deficiencies in a shorter period of time without having to sacrifice one cropping season for evaluation. However, it is limited to nutrient deficiency identification, and does not prescribe actual fertilizer rates to be used for correcting the deficiencies. Recommendations for corrective action for the limiting nutrients therefore becomes the significant responsibility of technical persons like Agricultural Extension Workers (AEWs), but they may also have difficulties in formulating fertilizer rates in the absence of other relevant information. The biomass collected from a MOET set-up and used to analyze deficiencies can be adequate information for formulating actual fertilizer rates with the help of basic assumptions such as harvest indexes and nutrient uptakes per unit of grain yield. This information together with the basic assumptions may make computing for field fertilizer rates from MOET biomass very much possible, but may be technically challenging for ordinary farmers or AEWs with a different knowledge backgrounds. Thus, there is a need to develop a simple computer program that can be an additional feature/facet of the MOET kit pack which can compute appropriate field fertilizer rates based on MOET biomass. This study aimed to validate the efficiency of the field fertilizer rates generated by the MOET Fertilizer Calculator Prototype (MOET-FCP) in farmers' fields.

This study was super-imposed in Study 1. Two months prior to crop establishment in the field, a MOET set-up was established at each site. Forty-five days after establishment, biomass of each rice plant was recorded and utilized as input data for the MOET-FP. Farmers' preferred variety were used in this study. The plot (approximately 500 square meters) where the farmers' variety was planted was divided in two with 30-centimeter wide and 20-cm high bund. The front half of the plot was applied with fertilizer rates based on the MOET-FCP result (dosages and schedules included) while the other half was applied based on MOET kit pack recommendation. Yield cuts and yield components were gathered from both MOET-FCP and MOET kit pack plots at maturity.

Highlights:

- Due to delay on the delivery of fertilizer inputs, only 7 sites out of 29 had been tested in this study. These were the vardemo sites of Cauayan, Sipalay, and Murcia (two sites), Negros Occidental; Sta Barbara and Miag-ao, Iloilo; and Banga, Aklan.

- The seven sites had varying nutrient deficiencies. With the use of MOET-FCP, fertilizer recommendations for each site were calculated as shown in Figures' –38-40.

- Based on MOET-kit pack, all sites in Negros had NPK and S deficiencies; N and P for Sta. Barbara, and N and Cu for Miag-ao, Iloilo; and finally N deficiency for Banga, Aklan. Different fertilizer rates were applied in each site based on MOET-kit pack recommendations.

- T-test analysis, however, revealed that the mean yield of all rice varieties under MOET-FCP (4.83 ha-1) and MOET kit pack (4.99 t/ha-1) fertilizer recommendations were not significantly different at 5% level of significance (t= -0.16, p=0.8761) as shown Table 13. The F-test analysis also had the same result: no significance at 5% level (F=1.30, p=0.7555).

- Based on the results, adjustments had been made immediately for the fertilizer recommendations in MOET-FCP in preparation for the establishment of the second trial on dry season CY 2012-2013.

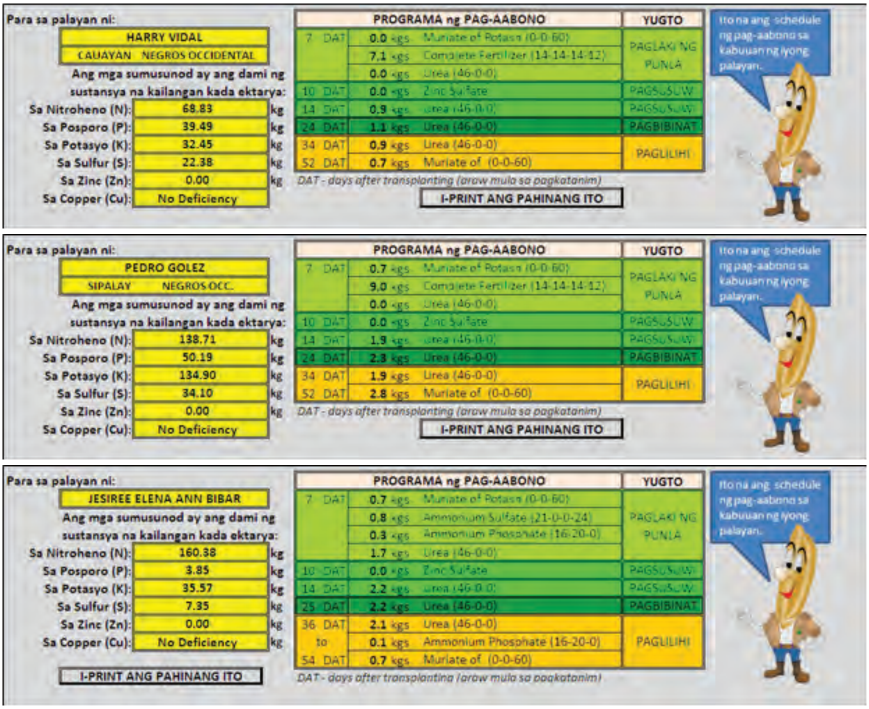


Figure 38. Rate of nutrients needed and fertilizer recommendations based on MOET-FCP for the four sites in Negros Occidental.

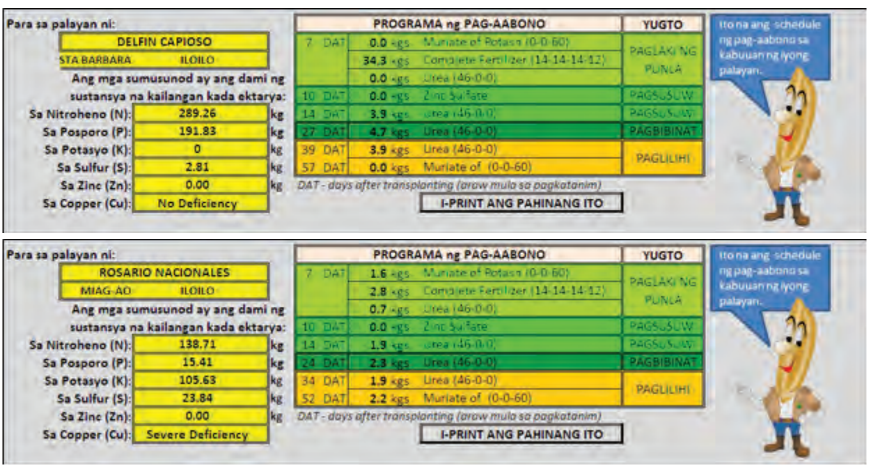


Figure 39. Rate of nutrients needed and fertilizer recommendations based on MOET-FCP for the two sites Iloilo.

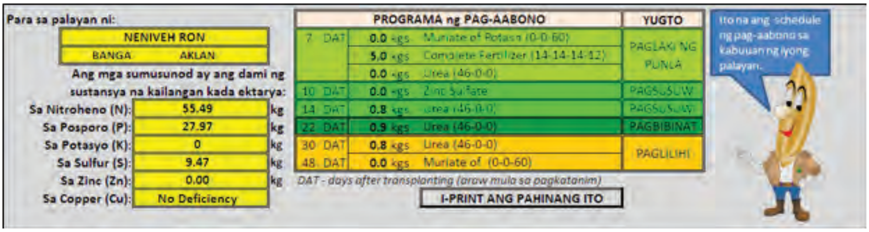


Figure 40. Rate of nutrients needed and fertilizer recommendations based on MOET-FCP for the only site in Aklan.

Table 13. Average yields of test varieties across sites planted under MOET-FCP and MOET-kit pack fertilizer recommendations.

No.	Site	MOET-FCP	MOET kit pack	Rice Variety
1	Cauayan	5.86	8.79	NSIC Rc216
2	Murcia 1	2.88	2.98	NSIC Rc226
3	Murcia 2	4.42	4.75	NSIC Rc226
4	Sipalay	4.42	3.36	NSIC Rc212
5	Sta Barbara	3.17	3.77	PSB Rc82
6	Miag-ao	5.07	5.53	PSB Rc14
7	Banga	8.00	5.75	Unknown
Average		**4.83**	**4.99**	-

Training and validation of field book on soil characterization for improved productivity of rice and other crops in Region 6
RT Dollentas

Soil is a medium for plant growth. Soil, however, varies from one place to another. This variation in terms of characteristics and behaviors affects crop growth, and ultimately crop yield. Soil identification and characterization are essential components in improving production of crops. A common system of identifying soil type is based on soil survey reports, which contain information on the characteristics and spatial distribution of soils in a particular province. A soil survey report, however, is too complicated for an ordinary farmer and even agricultural extensionists to utilize effectively as basis for understanding soils. Hence, a a Soil Series Field Book/ Guidebook was created mainly aimed to translate soil survey reports into sets of information simple enough for any layman to understand. The Soil Series Guidebook was a product of a collaborative efforts of PhilRice and ASC-UPLB way back in 2006. The project had been extended to other provinces such as those in Region 6. In fact, a prototype guidebook for the identification of soils in Panay and Guimaras Islands had been already developed but needs validation in the field before final dissemination to the end-users.

This project was aimed to (1) validate the efficacy of the guidebook in identifying soils in fields of Panay, (2) train local agriculturists how to use the guidebook for characterization and identification of soils in the field, and (3) help local agriculturists in assessing the performance of soils when used for crop production, specifically rice.

Highlights:

- Two trainings focusing on the use of soil series guidebook for Panay and Guimaras Islands had been successfully conducted at Jaro and Janiuay, Iloilo (Figure 41). Sixty-one individuals (MAOs, agricultural technicians, college students and professors) participated the training and validation.

- The training included lectures on soil series, soil characterization, and soils in relations to crop production, hands-on exercises on soil texture and soil test kit, and demonstration of the procedures on use of the guidebook. Participants of the training rated the guidebook according to quality indicators (Table 14).

- Field validations and assessment surveys of the guidebook indicated that the prototype field book can be used as a tool for accurate identification and validation of soil series in the field.

- Evaluators also commented that soil series fieldbook is, indeed, a valuable tool for crop production and effective for validating, and mapping the type of soils in their area even up to the barangay level.

- Based on the training, information contained in the prototype guidebook need further revisions in terms of the considerations in the conduct of soil sampling as affected by the type of ecosystem and landscape position, and the incorporation of glossary for some terminologies. In addition, organization of information will be re-structured for it to become more comprehensible to the end-users. In addition, some information such as fertilizer recommendations for some important crops and fertility capability classification (FCC) were suggested for inclusion into the guidebook.

Figure 41. Images showing field lectures and trainings during the validation of soil series guidebook for Panay and Guimaras Islands.

Table 14. Results on the evaluation of the soil series field book for Panay and Guimaras Islands.

Quality Indicators	Rating/ Percentage										
Content	1	%	2	%	3	%	4	%	5	%	Total Respondents*
Accuracy	0	-	0	-	16	27	29	49	14	24	59
Usefullness	0	-	0	-	2	3	15	25	43	72	60
Instructional plan											
Stated the objectives	0	-	0	-	3	5	26	43	31	52	60
Content presentation	0	-	0	-	5	8	31	53	23	39	59
Learner application	0	-	0	-	5	8	28	47	27	45	60
Learner reflection	0	-	0	-	7	12	25	42	27	46	59
Met the objectives	0	-	0	-	4	7	21	36	34	58	59
Learner interaction	0	-	0	-	4	7	26	45	28	48	58
Integration into the learning environmment	0	-	0	-	4	7	25	44	28	49	57
Technical production											
General design characteristics	0	-	0	-	7	13	24	43	25	45	56
Visual quality	0	-	0	-	15	26	27	47	15	26	57
Included supplemental materials											
Provided introductory information	0	-	0	-	10	18	23	41	23	41	56
Clarifies and summarizes content	0	-	0	-	6	11	34	62	15	27	55

Economic Profile, Cultural Management Practices, Farming Systems, and Economics of Production among Upland Rice Farmers in the Province of Negros Occidental

DKM Donayre, MAS Oren (WESVIARC)

Negros Occidental has upland rice areas of 2,928.73 hectares comprising 24% of the total upland areas of the whole Western Visayas. To enhance the productivity of upland rice in the province of Negros Occidental, gathering the socio-economic data/information about the upland rice farmers is a main consideration. Farming situation which would include practices, technology needs and production related problems needs to be identified. This could be a basis in upgrading the production potential of upland rice farmers in these provinces. This project was conducted to document and generate information on socio-economic characteristics and indigenous farming practices of upland rice farmers in the Province of Negros Occidental. The specific objectives of this project were to (a) establish the socio-demographic and economic profile of upland rice farmers, (b) document the indigenous cultural and management practices employed by upland rice farmers, and (c) identify production problems and technological needs of upland rice farmers.

A survey was conducted in December 2012 on upland rice areas of Negros Occidental. Rice farmers raising indigenous upland rice varieties were selected for the interview. Descriptive method was used to describe the socio-demographic and economic profile of the farmer respondents by means, frequencies and percentages. Data were analyzed and computed using SPSS program.

Highlights:

- Five areas in Negros Occidental were found producing upland rice. These were within the municipalities/cities of Kabankalan City, Candoni, Cauayan, Ilog, and Sipalay City (Figure 42).

- A total of 360 upland rice farmers were selected and interviewed during the survey (Figure 43).

- Data gathered are still in the process of analysis.

Figure 42. Map of Negros Occidental showing the municipalities and cities that have large areas of upland rice.

Figure 43. Farmer interviews in upland areas of Negros Occidental

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

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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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