Journal of Agriculture and Technology Management (JATM)
24(2): 41-46 (July-December 2021)

Original article

Response of irrigated lowland rice *(Oryza sativa L.)* to different levels of inorganic fertilizer supplemented with vermitea

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ABSTRACT

This study was conducted to determine the appropriate levels and assess the economic profitability of rice production per hectare using inorganic fertilizer supplemented with vermitea. The experimental area was laid out in a Randomized Complete Block Design (RCBD) with three (3) replications. Each replication was divided into five (5) treatment plots, each measuring twenty (20 m^2), separated by 1.0 m and 0.5 m alleyways between replications and treatments. The following treatments designated were as follows: T_0 = No fertilizer (Control); T_1 = 90-60-60 kg ha^{-1} N, P_2O_5, and K_2O (General RR of inorganic fertilizer); T_2 = 90-60-60 kg ha^{-1} N, P_2O_5, K_2O + Vermitea; T_3 = 70-40-40 kg ha^{-1} N, P_2O_5, K_2O + Vermitea; T_4 = 50-30-30 kg ha^{-1} N, P_2O_5, K_2O + Vermitea. Results revealed that most of the agronomic characteristics of Matatag 6 variety were significantly influenced by the treatments except the number of days from sowing to heading. Rice plants applied with 70-40-40 kg ha^{-1} N, P_2O_5, K_2O were comparable with the recommended rate at 90-60-60 kg ha^{-1} N, P_2O_5, K_2O. This treatment (T_3) obtained the highest net Income of (PhP44,995.99), significantly similar to rice plants applied with the recommended rate of fertilizer (T_1) at PhP 44,893.77. While rice plants not applied with fertilizer got the lowest net income of PhP 23,100.00 because of the low yield per hectare. Thus, Matatag 6 rice variety can be grown with a minimum inorganic fertilizer application of 70-40-40 kg ha^{-1} N, P_2O_5, K_2O provided that vermitea will be applied.

KEYWORDS: *Irrigated lowland rice, inorganic fertilizer, vermitea, yield, and profitability*

1 INTRODUCTION

Rice (*Oryza sativa* L.) is a staple food for nearly half of Rice (*Oryza sativa* L.*)* is one of the most important cereal crops in the Philippines and many countries. Calories from rice account for about 50-80% of their daily calorie intake. Rice can also be processed into different industrial products such as food, snack items, brewed beverages, flour, oil, syrup, and feeds for poultry animals (Huang et al., 2015). International Rice Research Institute (IRRI, 2018) reported that the Philippines has over 3.4 million rice land. However, rice crop is grown in a different ecosystem, wherein 78% of the world's rice is under irrigated and rain-fed lowland conditions. Under these conditions, soils are saturated, flooded, and anaerobic.

The average annual production of rice is 26 Mt, and the average yield is 3.83 t per ha harvested and decreased by 18% in 2020 due to COVID 19 Pandemic. However, the Philippines still ranked eighth in world rice production in 2019 (FAOSTAT, 2020). Approximately 74.5 million Filipinos, 80% of the total population, depend on rice as their primary staple food. Thus, sufficiency in rice is one of the goals of the Department of Agriculture to cut rice importation which utilized a considerable amount of money from the government's budget. However, many problems have hindered the challenge to meet the demand for rice in the country in rice production. Low crop productivity is significantly attributed to improper fertilizer application. Farmers most commonly use inorganic fertilizer to increase yield. Using inorganic fertilizer is most efficient in terms of releasing nutrients to the soil. Therefore, it enhances and improves the growth and yield of crops, mainly when fertilizer is applied correctly at the right amount and at the right time.

However, most rice farmers cannot afford to follow the recommended dosage of synthetic fertilizers because it is expensive; thus, yield potential is not met every cropping season. With this present scenario, the combined fertilizer application is promoted to minimize the cost of inorganic fertilizer. One of the typical fertilizers as a supplement to inorganic fertilizer is the use of organic fertilizer. As a result, numerous eco-friendly fertilizers have already been studied. Formulations of granular organic fertilizers from animal waste to liquid preparation from plant extract have been evaluated to enhance the growth of crops. These alternative sources of plant nutrients are cheap, available, and ecologically safe. Compost tea is among those ecologically safe foliar fertilizers that have been tested in vegetables. Compost tea is a liquid extract made by steeping compost in water

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using various preparation methods (Scheuerell and Mahaffee 2012) and can be applied directly onto the plant surface. Historically, homemade brews were prepared by suspending a bag of compost in a container of water for up to 14 days to extract nutrients that promote health and vitality when applied to the plant. Soluble mineral nutrients and microbial byproducts in compost tea can enhance nutrient uptake from the soil and increase foliar uptake of nutrients by plants (Ingham 2015).

Compost tea also produces plant hormones, mineralizes plant-available nutrients, fixes nitrogen, and provides beneficial microorganisms that colonize leaf surfaces (Zheljazkov and Warman, 2014). Thus, this foliar fertilizer has been cited as an option for conventional and organic growers to suppress plant pathogens. Vermitea, on the other hand, is one of the compost teas that have been used as foliar fertilizer in crops recently. This is prepared by mixing with water in a vermitea brewer at the ratio of 2:1:15 vermicast and molasses, respectively. In addition, Vermitea contains beneficial microbes that enhance crop growth. Likewise, Gamaley et al. 2018 found that vermitea enhanced plant tissue growth and mineral nutrient content. Thus, it is necessary to assess the efficacy of this tea in field conditions.

Little work has been done to assess the growth benefits of vermitea on cereal crops. Thus, this study aimed to determine the appropriate level of inorganic fertilizer, evaluate the effects of vermitea supplement on the growth and yield of lowland rice, and assess the economic profitability per hectare using inorganic fertilizer supplemented with vermitea as a foliar spray.

2 MATERIALS AND METHODS

An area of 374 m^2 was flooded for five days at a depth of 5 cm. The field was puddled twice at the weekly interval before transplanting. After the last puddling, paddies were leveled using a leveling board. Dikes were constructed to separate each treatment plot. Before land preparation, ten soil samples were collected at random depths 0-30 cm in the experimental area. The collected samples were composted, air-dried, and sieved using 2 mm wire mesh and analyzed at the Central Analytical Service Laboratory (CASL) of the PhilRootcrops, Visayas State University Visca, Baybay City, Leyte. For Initial analysis, the following parameter was analyzed: soil pH (Potentiometric method and 1:1 soil-water ratio), % organic (Walkey-Black method), % N, and available P (Olsen's sodium bicarbonate method), and exchangeable K (Ammonium acetate extraction method) contents were done.

Five soil samples were collected from each treatment plot right after harvest at a depth of 0 - 20 cm for the final soil analysis. These were composited per treatment, processed, and analyzed for the same soil chemical properties mentioned above. The experimental area was laid out in a Randomized Complete Block Design (RCBD) with three (3) replications. Each replication was divided into five (5) treatment plots measuring 4 m x 5 m (20 m^2) separated by 1.0 m and 0.5 m alleyways between replications and treatments.

The treatments were as follows: T_0- Control (no fertilizer), T_1- 90-60-60 kg ha^{-1} N, P_2O_5, K_2O (RR Inorganic Fertilizer), T_2- 90-60-60 Kg ha^{-1} N, P_2O_5, K_2O + Vermitea, T_3-70-40-40 Kg ha^{-1} N, P_2O_5, K_2O + Vermitea, T_4- 50-30-30 Kg ha^{-1} N, P_2O_5, K_2O +Vermitea. Two (2) kilograms of seeds of irrigated lowland rice (Matatag 6 variety) were sun-dried for two (2) hours. After drying, the seeds were soaked in freshwater for 24 hours and incubated for 48 hours in a warm shaded area. After incubation, the pre-germinated seeds were distributed uniformly to a wet seedbed measuring 1 m wide, 4 cm high, and 8 m long. Care was provided to the seedlings, such as irrigating the seedbed gradually and continuously to a depth of five (5) cm depending on the height of the seedlings until they were ready for transplanting. For T_1-T_4, the whole amount of P and K and the initial amount of N were applied 8-10 days after transplanting (DAT) using complete fertilizer (14-14-14). The remaining N requirement was applied using urea at 30 DAT. Vermitea application was done six (6) times at weekly intervals starting two (2) weeks after transplanting (DAT) and weekly interval until flowering (10% of the population in each plot flowered) at the rate of 300ml of vermitea per 16 liters of water, (Ingham, 2015).

Cultural Management Practices

The seedlings were transplanted fifteen (15) days after sowing at the rate of 2 seedlings per hill and a distance of 20 cm x 20 cm between hills. Missing hills was replaced one (1) week after transplanting. The first weeding operation was done in each treatment plot using a rotary weeder at 20 DAT. Second, weeding through hand weeding was done to remove weeds that grow closer to the plants at 35 DAT. Three (3) DAT, the area was irrigated at a depth of 2.5 cm to 5.0 cm. The depth of water was gradually increased depending on the growth of the rice plants starting a week after transplanting. Water was reduced to approximately a depth of 2.0 cm during weeding operation and fertilizer application. Two weeks before maturity, the whole area was drained to facilitate harvesting. Golden apple snail was controlled by handpicking. This was done before and after transplanting. Lannate was sprayed at the rate of one (1) sachet per 16 li^{-1} of water spray load. This was done during the reproductive stage to control pests in the experimental plots. Harvesting was done using sharp sickle when 85% of the grains in each panicle had ripened as indicated by yellow color and firm matured grains. All

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plants within the harvestable area (10.64 m^2), excluding the border rows and end plants in each inner row per plot, were cut at the base. Before recording the necessary data, the sample panicles were threshed, winnowed, and sun-dried to approximately 14% moisture content.

Data Gathered

A. Agronomic Characteristics

Days from sowing to heading, days from sowing to maturity, plant height (cm), and Leaf Area Index (LAI). Compute the area of each leaf following the formula:

Leaf area = width × length × 0.75

Where:
L = Length of each leaf (cm)
W = Width of each leaf measured at the broadest part (cm)
CF = Correction Factor which is equal to 0.75 (Yoshida, 1981)

$$LAI = \frac{\text{Total Leaf Area (TLA) } of\ 5\ sample\ Hills\ (cm)}{(20\ cm\ x\ 20\ cm\ x\ 5\ Hills = 2000\ cm2}$$

While fresh rice strawweight (tha^1) was gathered by removing the grains from the straws and was converted to t ha^{-1} using the formula:

$$\text{Fresh Straw Weight (t ha}^{-1}) = \frac{\text{Plot yield (Kg)}}{\text{Harvestable area (10.64 m}^2)} = \frac{10{,}000\ m^2}{1{,}000\ Kg\ t^{-1}}$$

B. Yield and Yield Characteristics

Number of productive tillers per hill, panicle length (cm), number of filled grains per panicle, weight 1000 grains (g), and grain yield (tha $^{-1}$). The weight per treatment plot was converted to per hectare using the formula:

$$\text{Grain Yield (t ha}^{-1}) = \frac{\text{Plot yield (Kg)}}{\text{harvestable area (10.64 m}^2)} = \frac{10{,}000\ m^2 ha^{-1}}{1{,}000\ Kg\ t^{-1}}$$

Harvest Index (HI)

After oven drying, the trash was separated from the grains. This was determined using this formula:

$$HI = \frac{\text{Dry weight of grains (3 samples)(kg)}}{\text{Dry weight of grains(3 samples)+ dry straw yield(3 samples)}} = \frac{\text{Economic yield}}{\text{Biological yield.}}$$

Profitability Analysis

In determining the net profit, the expenses from every treatment were subtracted from the gross Income using the formula:

Gross Income = Yield (Kgha^{-1}) × existing price of palay per kilogram

Net Profit = Gross Income – Total cost of Production

$$ROI = \frac{\text{Dry weight of grains (3 samples)(kg)}}{\text{Dry weight of grains(3 samples)+ dry straw yield(3 samples)}} =$$

3 RESULTS AND DISCUSSION

Statistical Tool Used

All the data gathered from the 10 sample plants were processed and analyzed statistically using STAR computer software, and the comparison of means was done using HSD test.

Table 1. Analysis of soil samples taken from the experimental area before and after the experiment

Treatment	Soil pH	OM (%)	Total N	P (mg kg^{-1})	K (mg kg^{-1})
Initial Analysis	6.05	5.84	0.34	20.77	255.25
Final Analysis					
T_0	5.80	5.52	0.26	11.58	247.51
T_1	5.66	5.57	0.27	12.08	171.33
T_2	5.49	5.30	0.28	13.04	158.28
T_3	5.36	5.52	0.28	9.96	166.60
T_4	5.60	5.84	0.28	12.61	210.35

Legend:

T_O - No fertilizer
T_1 - 90-60-60 kg ha^{-1} N, P_2O_5, K_2O (RR of Inorganic Fertilizer Application)
T_2 - 90-60-60 kg ha^{-1} N, P_2O_5, K_2O + Vermitea
T_3 - 70-40-40 kgha^{-1} N, P_2O_5, K_2O + Vermitea
T_4 - 50-30-30 kgha^{-1} N, P_2O_5, K_2O + Vermitea

Final analysis revealed that the soil pH, % OM, total N, available P (mg kg^{-1}), and exchangeable K (mg kg^{-1}) were decreased regardless of the treatments applied with different levels of inorganic fertilizer and supplemented with vermitea. Therefore, the decrease in soil pH could be attributed to the increasing release of acids from the applied inorganic fertilizer resulted in the soil becoming more acidic. On the other hand, the decline in % OM and total N indicated that crop removal and losses occurred due to surface runoff during water irrigation and drainage. Likewise, the decrease in P (mg kg^{-1}) and K (mg kg^{-1}) could be attributed to the process of mineralization thus, efficiently utilized by the growing rice plant and some were lost caused by heavy rains.

Agronomic Characteristics

Table 2 shows the agronomic characteristics of irrigated lowland rice applied with inorganic fertilizer supplemented with vermitea as a foliar spray. The treatments significantly influenced most of the agronomic characteristics evaluated of Matatag 6 except

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on the number of days from sowing to heading. However, treatments applied with fertilizer regardless of the levels and sources (with or without supplement of vermitea) were not significantly affected by the treatments. The result suggested that plants without fertilizer application are inferior in growth over the plants applied with fertilizer. This is a fact now that most farm soils are not fertile anymore, and when planted with crops, it will not give a good yield (Mercado et al., 2011).

nitrogen fertilizer at a rate of 50- 90 kg ha^{-1}.

The result of the study can also be attributed to the findings of Keeling et al. (2013) on the use of vermitea, which has provided a significant contribution to crop production. Vermitea is a source of foliar and organic nutrients and contains chelated micronutrients for easy plant absorption of nutrients for both plant and microbial uptake. Thus, a high amount of the applied nutrients was utilized by the plants for their development. Several studies have already found vermitea to improve the growth of crops. Moreover, they observed that the application of vermicompost tea on oil rapeseed plants at an early stage of growth increased both root development and plant growth, as also manifested by the Matatag 6 rice plant under this study.

Table 2. Agronomic characteristics of irrigated lowland rice (NSIC Rc120**)** to different levels of inorganic fertilizer supplemented with vermitea

Treatment	Days from sowing to heading	Days from sowing to maturity	Plant height (cm)	Leaf Area Index	Fresh strawweight (t ha-^{1})
T_0	57.00	73.00 b	87.10 b	0.15 b	9.67 b
T_1	57.00	78.00 a	99.63 a	0.24 a	12.67 a
T_2	57.00	78.00 a	99.67 a	0.27 a	13.30 a
T_3	57.00	78.00 a	96.97 a	0.24 a	11.90 a
T_4	57.00	78.00 a	98.66 a	0.25 a	12.96 a
CV %	0	2.90	3.38	20.78	15.72

Means with the same letter in a column and row are not significantly different at 5% level, HSD

Legend:
T_O - No fertilizer
T_1 - 90-60-60 kg ha^{-1} N, P_2O_5, K_2O (RR of Inorganic Fertilizer Application)
T_2 - 90-60-60 kg ha^{-1} N, P_2O_5, K_2O + Vermitea
T_3 - 70-40-40 $kgha^{-1}$ N, P_2O_5, K_2O + Vermitea
T_4 - 50-30-30 $kgha^{-1}$ N, P_2O_5, K_2O + Vermitea

On the other hand, the result of the study showed a uniform trend on all agronomic characteristics of rice plant (Matatag 6). These results suggested that rice plants applied

with 50-30-30 kg ha^{-1} N, P_2O_5, K_2O, 70-40-40 kg ha^{-1} N, P_2O_5, K_2O and 90-60-60 kg ha^{-1} N, P_2O_5, K_2O supplemented with vermitea were not significantly different to the treatment received the recommended rate of inorganic fertilizer of 90-60-60 kg ha^{-1} N, P_2O_5, K_2O. This result further suggested that rice plants thrive even applied with minimum levels of 50-30-30 kg ha^{-1} N, P_2O_5, K_2O of granulated inorganic fertilizer provided that vermitea will be supplemented at the weekly interval from planting up to panicle initiation. These results are correlated with the findings of Cantoneros and Tamayo (2014) that most of the agronomic characteristics of rice plant (number of days from planting to maturity, plant height cm, LAI, and straw yield) did not vary significantly when applied with different levels of

Yield, Yield Components, and Harvest Index

Table 3 presents the yield components, and harvest index of irrigated lowland rice to different levels of inorganic fertilizer supplemented with vermitea. Among the five parameters evaluated on the yield and yield components of Matatag 6 variety, three (3) parameters (number of productive tillers $hill^{-1}$, weight 1000 grains, and total grain yield (t ha^{-1}) were significantly affected by the treatments. The result showed that rice plants applied with 70-40-40 kg ha^{-1} N, P_2O_5, K_2O and 90-60-60 kg ha^{-1} N, P_2O_5, K_2O supplemented with vermitea were comparable yield performance to the treatment applied with the recommended rate of inorganic fertilizer (90-60-60 kg ha^{-1} N, P_2O_5, K_2O). These results further suggested that rice plant NSIC Rc120 can produce more productive tillers per hill when applied with inorganic fertilizer at the rate of 70-40-40 kg ha^{-1} N, P_2O_5, K_2O provided that it is supplemented with vermitea as a foliar spray at the one-week interval from two (2) weeks after planting up to panicle initiation. Mislos (2015) found that plants with nitrogen fertilizer from 60 to 120 kg N ha^{-1} gave a higher

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number of productive tillers than those without N fertilizer. Likewise, grains were significantly heavier, resulting in a higher yield of 60-120 kg N ha^{-1} than when N was deprived to the plants. On the other hand, the least number of productive tillers were observed in treatments applied with minimum levels of inorganic fertilizer at the rate of 50-30-30 kg ha^{-1} N, P_2O_5, K_2O (T_4) and 70-40-40 kg ha^{-1} N, P_2O_5, K_2O (T_3) supplemented with Vermitea which is comparable to the treatments that did not receive fertilizer (control plot). These results can be attributed to the low amount of nutrients present in the granulated inorganic fertilizer, which did not compensate for the number of nutrients required by the rice plants for its normal vegetative development thus, resulting in a low number of productive tillers produced per hill.

significantly influenced by the treatments. The result showed a similar trend in the number of productive tillers per hill. Treatments applied with a higher level of inorganic fertilizer (T_1-T_3) supplemented with vermitea gave the highest yield as compared to treatments applied with a lesser amount of inorganic fertilizer (T_4) 50-30-30 kg ha^{-1} N, P_2O_5, K_2O + Vermitea and (T_0) no fertilizer applied. The minimum amount of nutrients in T_4 did not compensate for the needed nutrients required by the rice plant for continued supply of nutrients until full-grain filling and development, as well as on treatments that did not receive additional nutrients (Pant et al. 2013). Thus, it resulted in a low yield compared to the treatments applied with enough nutrients. This result is attributed to the greater availability of nutrients from inorganic fertilizer applied in T_1-T_3 than plants without fertilizer.

Table 3. Yield and yield components and harvest index of irrigated lowland rice applied with inorganic fertilizer supplemented with vermitea

Treatment	Number of productive tillers $hill^{-1}$	Panicle length (cm)	Number of filled grains $panicle^{-1}$	Weight (g) 1000 grains	Grain Yield (tha^{-1})	Harvest Index
T_0	7.10 b	20.30	52.53	23.80 b	2.00 c	0.45
T_1	11.40 a	22.23	58.33	25.87 a	3.70a	0.49
T_2	11.90 a	22.13	56.87	25.53 a	3.57a	0.45
T_3	10.00 ab	22.90	59.93	25.10 a	3.67a	0.47
T_4	8.13 b	21.73	51.93	23.57 b	2.67b	0.45
CV %	7.92	14.55	13.70	3.19	19.93	5.64

Means with the same letter in a column and row are not significantly different at 5% level, HSD

Legend:

T_O - No fertilizer
T_1 - 90-60-60 kg ha^{-1} N, P_2O_5, K_2O (RR of Inorganic Fertilizer)
T_2 - 90-60-60 kg ha^{-1} N, P_2O_5, K_2O + Vermitea
T_3 - 70-40-40 $kgha^{-1}$ N, P_2O_5, K_2O + Vermitea
T_4 - 50-30-30 $kgha^{-1}$ N, P_2O_5, K_2O + Vermitea

On the other hand, the weight of 1000 dried grains significantly influenced the treatments. Treatments (T_3) 70-40-40 kg ha^{-1} N, P_2O_5, K_2O and (T_4) 90-60-60 kg ha^{-1} N, P_2O_5, K_2O supplemented with vermitea were statistically comparable to (T_1) 90-60-60 kg ha^{-1} N, P_2O_5, K_2O (RR of inorganic fertilizer). These results suggested a similar response in terms of weight of 1000 dried grains when Matatag 6 rice variety was fertilized with 70-40-40 kg ha^{-1} N, P_2O_5, K_2O inorganic fertilizer supplemented with vermitea. The presence of enough nutrients in these treatments provided the needed amount of nutrients to the rice plants resulted in the heavyweight of 1000 grains as compared to treatments applied with the low amount of nutrients (50-30-30 kg ha^{-1} N, P_2O_5, K_2O + Vermitea) and treatment that did not receive fertilizer (T_0) as control plot.

Likewise, grain yield (t ha^{-1}) of Matatag 6 is

Moreover, Ghulam et al. (2017) reported that the fertilizer levels applied on Mestizo 7 at 100-30-30 kg NPK/ha and 70-30-30 kg NPK/ha were comparable in increasing the grain yield (t ha^{-1}). These yields were twice those of the unfertilized plants.

Cost and Return Analysis

The different treatments influenced the cost and return analysis of irrigated lowland rice (Table 4). Treatment (T_3) obtained the highest net income of (44,995.99), followed by plants applied with RR fertilizer (T_1) PhP 44,893.77, T_2 (PhP 38,838.77), T_4 (PhP 26,602.94) and T_0 (PhP 23,100.00). On the other hand, treatment (T_0) which is not applied with fertilizer, got the lowest net income. ROI is a profitability ratio that calculates the profits of an investment as a percentage of the original cost. Results revealed that rice plants applied with 70-40-40 kg ha^{-1} N, P_2O_5, K_2O + Vermitea obtained the highest return on investment (ROI) at 140%. It means that in every 1 peso invested. There is a gain of PhP1.40 pesos followed by the plants applied with the recommended fertilizer rate at 90-60-60 kg ha^{-1} N, P_2O_5, K_2O with 136%.

Table 4. Cost and Return analysis of irrigated lowland rice to vermitea as a foliar fertilizer supplement to inorganic fertilizer.

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Treatment	Dried Grain Yield (tha^{-1})	Gross return (PHP)	The total cost of Production	Net Income (PHP)	ROI (%)
T_0	2.00	42,000.00	18,900.00	23,100.00	122.22
T_1	3.70	77,700.00	32,806.23	44,893.77	136.84
T_2	3.57	74,970.00	36,131.23	38,838.77	107.49
T_3	3.67	77,070.00	32,074.01	44,995.99	140.28
T_4	2.67	56,070.00	29,467.06	26,602.94	90.27

Computation was based on the current market price of palay at Php 21.00 kg^{-1}

Legend:

T_O - No fertilizer
T_1 - 90-60-60 kg ha^{-1} N, P_2O_5, K_2O (RR of Inorganic Fertilizer Application)
T_2 - 90-60-60 kg ha^{-1} N, P_2O_5, K_2O + Vermitea
T_3 - 70-40-40 $kgha^{-1}$ N, P_2O_5, K_2O + Vermitea
T_4 - 50-30-30 $kgha^{-1}$ N, P_2O_5, K_2O + Vermitea

4 CONCLUSION AND RECOMMENDATION

Based on the study results, the study found a significant increase in growth characters of Matatag 6 rice variety when applied with fertilizer regardless of sources and levels. Likewise, the yield was increased when applied at a minimum of 70-40-40 kg ha^{-1} N, P_2O_5, K_2O and supplemented with vermitea. Vermitea as foliar spray supplement to inorganic fertilizer can increase most agronomic parameters of irrigated lowland rice. However, the yield and components only increased when the plants were applied up to 70-40-40 kg ha^{-1} N, P_2O_5, K_2O + Vermitea. Treatment (T_3) obtained the highest net income of PhP 44,995.99) followed by (T_1) at PhP 44,893.77. While T_0 not applied with fertilizer got the lowest net income (PhP 23,100.00) because of low yield per hectare. Metatag 6 rice variety being a farmer`s selection, it is very resilient to climatic conditions. Therefore, this early maturing variety can be grown with a minimum inorganic fertilizer 70-40-40 kg ha^{-1} N, P_2O_5, K_2O, provided that vermitea will be applied.

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