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EVALUATION OF DIFFERENT WATER APPLICATION METHOD FOR PROMISING AEROBIC RICE (Oryzastiva L.) VARIETY (PSBRc9)

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ABSTRACT

Study was conducted to evaluate the different water application method for promising aerobic rice (Oryzasativa L.) variety. (PSBRc9). This was conducted at Nagbalayong, Morong, Bataan from November, 2014 to March, 2015. Treatments used for the experiments were 2 planting methods, the P1 (transplanting) and P2 (broadcasting) and 3 water application methods, the W1 (flooding), W2 (furrow) and W3 (drip). The rice variety used for this study was PSBRc9 (AP0).Highest plants were observed from broadcasting under flooding method and most number of tillers was attained in transplanted rice under flooding irrigation. Longest panicle was also observed from transplanted rice under flooding irrigation and most number of grains per panicle was harvested from this treatment. Grain yield in terms of weight was observed from transplanting under flooding irrigation method. Irrigating the field using flooding irrigation in transplanting method can increase the number of tillers, number of productive tillers, panicle length, number of fillers grains per treatment, number of filled grains, weight of 1000 grains in grams and grain yield in kilograms per treatment in comparison to furrow and drip irrigation. In conclusion, based on average plant height of the PSBRc9 rice variety the highest plant height was attained by broadcasting method of planting under flooding method of irrigation.

Keywords: Aerobic rice, transplanting, broadcasting, flooding, furrow, drip, Bataan Philippines

Introduction

Importance of the Study

Rice (*Oryzasative L.*) is the major food in the world most especially for Asian countries but it is also the solitary main user of freshwater. It is typically grown-up under submerged soil situation and requires more water compared with other crops. It provides food safety and livelihoods for millions of people.

Water is the most limited natural resources, due to letdown of rains and over manipulation of ground water. The failing water resources tell a bad situation for a low long puddled rice cultivation. Now, farmer must look for other methods of cultivation for growing rice to fight water scarcity.

There are so many ways to produce more rice with less water for food safety. The test is to empower farmers to develop production system the declining water availability in rice production. In the contest between increasing world population and food production, water saving application is the solution to intensify crop production. This is optional in areas where

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water is too limited or inadequate to allow established irrigated rice farming. Aerobic rice culture as a water-saving production system is a solution to save water availability in the farm. Under aerobic situation, the cultivation of rice is characterized by aerated soil environment during the entire period crop growth.

Objectives of the Study

The general objectives of the study was to evaluate the different water application method for promising aerobic rice variety PSBRc9 (APO). Specifically, the study aims to determine:

1. Growth rate
2. Yield components
3. Water used

Scope and Delimitation of the Study

The scope of the study was to evaluate the different water application method for promising aerobic variety PSBRc9 (APO). The evaluation and assessment of data for the study was limited up to harvesting stage.

Time and Place of the Study

This study was conducted form November, 2014 to March, 2015 at Nagbalayong, Morong, Bataan.

MATERIALS AND METHODS

1.1 Conceptual Framework

Aerobic rice technology is a new type of rice of farming method that is aerobic-soil-adapted and input responsive. It grows well in non-puddled and non-saturated soils with water content.

Figure 1 illustrates the general framework of the study to identify the potential yield of aerobic rice from the process of the study

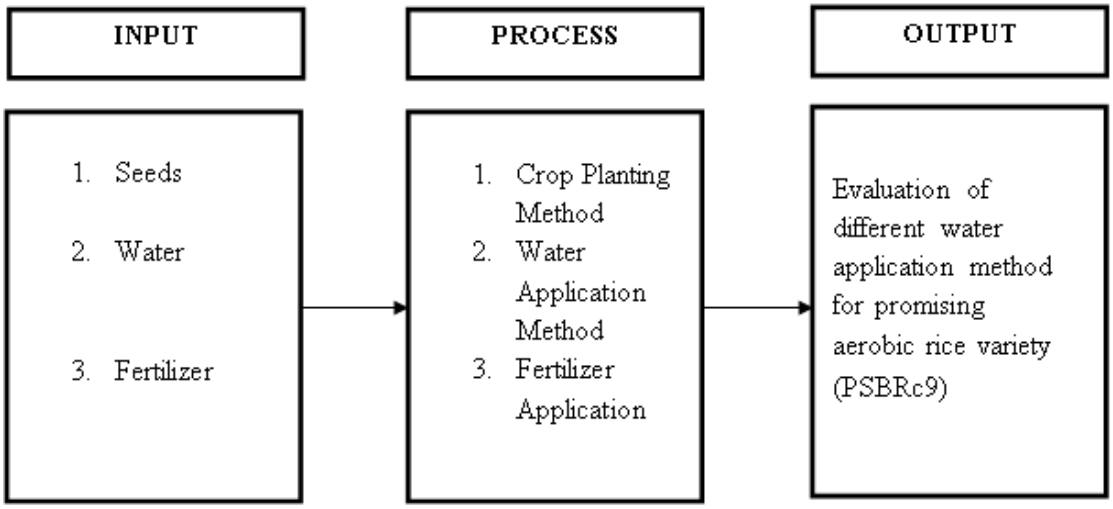

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Figure 1. Conceptual framework of the study

2.1 Materials and Equipment

The following materials and equipment were utilized in conduct of the study:

1. Seeds – the seeds used id PSBRc9 for transplanting and broadcasting method.
2. Meter stick – used to measure plant height and panicle length.
3. PVC pipes – used for trip irrigation.
4. Weighing scale – used to identify the grain yield per treatment and the weight of 1000 filled grains

3.1 Variety of Rice

The variety of rice used in the study was PSBRc9 (APO) having a maturity of 110 days. It is one of the varieties of aerobic rice technology that is considered drought resistant and strong against pest and weed.

Field Experiment

4.1 Site Selection

Field experiment was conducted at the experiment farm located at Nagbalayong, Morong, Bataan with total experimental area of 200 square meter. Plot size was 3.0 m x 3.0 m; the spacing between plots was 0.5 m and 0.5 m spacing between treatments. Type of soil in the experimental area is Sandy Clay Loam based on soil test of DA-RFU III.

4.2 Land Preparation and Establishment

Land preparation (Appendix Figure 1) was done by the cleaning, followed by plowing thrice to achieve the desired soil tilt and to ensure the fields were well harrowed and leveled. The area was plowed using plowing drawn implement. It was carefully prepared in such a way that no large clods would be visible. The furrows or bunds were conducted manually. The bund size were 0.5 m for each treatment and 0.5 m each replications.

Preparation of seedlings was soak the remaining seeds in water and floating seed are removed. Then, put the remaining seeds in wet towel and allow free water to drip off for a minute. Lay the wet towel on a clean surface. Put towel with a seeds in a sealable plastic bag. Germination time for most forage seeds is 20 days before transplant in the field.

4.3 Experimental Design and Layout

The experiment area (Appendix Figure 2) was composed of 18 plots measuring 3.0 m x 3.0 m. The experiment ware laid out in a Randomized Complete Block Design (RCBD), with two factorials. Factor A was the two (2) planting method and Factor B was the three (3) water application method. Treatments were replicated three (3) times. The following treatments were as follows:

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Planting Method (P)
- P1 – Transplanting
- P2 – Broadcasting

Water Application Method (W)
- W1 - Flooding
- W2 – Furrow
- W3 – Drip

4.4 Crop Establishment

Establishment of rice use (Appendix Figure 3-7) was transplanting method and broadcasting PSBRc9 (APO) variety was used and has a larger and full grain that performs well compared to other varieties that were stricken with disease. PSBRc9 is resistant to various pests and diseases. The seedling used in the experiment were weighed into 15o grams on each plot.

4.5 Irrigation Parameters

Irrigation interval was shown in Table 1. The product of the area was 9 square meter. The total days of irrigation was 42 days.

Table 1. Shows the Irrigation Interval of the Different Irrigation Method

Irrigation Method	Irrigation Interval (days)
Flooding	6
Furrow	4
Drip	3-4

4.6 Water Application Method

Applying water in the crops (Appendix Figure 8-9) were imposed three weeks (21 days) after seeds emergence and crop planting before applying the fertilizers to prevent damages on rice plants.

In furrow method, the water was placed in the canal furrows. The time-span of the water will depend until the water drained or absorbed by the soil.

Drip irrigation was done by placing the water through narrow tubes that deliver water directly to the base of the plant with 3.75 liters per drip.

Drip discharge= Liters/second
= 3.75 liters/60 seconds
= 0.0625 liters/ seconds

4.7 Cultural Practices

Fertilizers were laid down in the experimental field (Appendix Figure 10-11). The fertilizers were distributed manually in every plot after 21 days of planting and seeds emergence. Fertilizer were placed into the ground in bands with water. Equal amount of fertilizers (46-0-0 kg/ha of UREA) was applies for all treatments as basal, DAE (days after emergence), mid-littering and panicle initiation. Complete fertilizer (14-14-14) was applied
In the 15th days of seed emergence.

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4.8 Control of Pest, Weeds and Disease

Cymbush was applies within 15 days and infrequent manual weeding was done to keep the plots from weeds.

Proper pest management was performed to keep the crops free form pest and diseases. Application of insecticides was done as the need take place

5.1 Data Collection

All data were collected and evaluated to determine the effective use of different water application method in both transplanting and broadcasting. Crop parameters were as follows:

1. Plant height at maturity (cm), were taken from the base of the plant to the tip of the tallest panicle in the hill measures at harvest (Appendix Figure 12).
2. Number of tillers, were taken in 30 and 60 days after crop planting and seed emergence (Appendix Figure 13).
3. Number of productive and unproductive tillers, were taken from the tillers maturity (Appendix Figure 14-15).
4. Panicle length (cm), was measured from the panicle base or neck node to the tip of panicle. It will be taken as the average of longest and shortest panicles form each plot.
5. Number of grains per panicle, was the total number of grains in a panicle consisting of both filled and unfilled grains.
6. Number of filled and unfilled grains per panicle, was the number of fully develop and mature grains per panicle.
7. Number of loss grains per panicle, was the grains that fall from the panicle.
8. Weight of 1000 filled grains (grams), was taken in all plot per treatment (Appendix Figure 16).
9. Grain yield per treatment (kg), was taken to compare the results in each plot per treatment (Appendix Figure 17-19).

6.1 Statistical Analysis

The following data were collected and analyzed statically.

1. Plant height (cm) of PSBRc9 were randomly selected. Plant height were collected every two weeks (14 days) 21 days after planting using the soil surface as the lower reference and the last leaf of the main stem as the upper reference. It was measures from ground level to the tip of the most fully opened leaf and expressed in centimeter (cm). Measuring of plant was carefully done by using a meter stick.
2. Number of tillers was determined by direct counting on the number of tillers per hill of plants.
3. Number of productive and unproductive tiller were determined by counting the tillers and evaluate whether productive or unproductive tillers based on the panicle of each tillers.
4. Panicle length (cm) was measured from panicle base to the tip of panicle.
5. Number of grains per panicle was taken and was randomly selected. This was the total number of grains in a panicle consisting of both filled and unfilled grains.

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6. Number of filled and unfilled grains per panicle were determined the count of fully develop and mature grains per panicle.
7. Number of loss grains per panicle was determined the count of grains that fall fron the panicle.
8. Weight of 100 filled grains (grams) was determined by counting 1000 filled grains per treatment.
9. Grain yield per treatment (kg) was taken to measure the results in each plot per treatment. This were taken by weighing the grain yield per plot.

Data were collected, tabulated and analyzed using the analysis of variance for a two way factor experiment in Randomized Complete Block Design (RCBD). The means were be compares using Duncan Multiple Range Test (DMRT).

RESULTS AND DISCUSSIONS

Crop Parameters

Crop parameters in this study were plant height (cm), number of tillers, panicle length (cm), number of grains per panicle, productive and unproductive tillers, number of filled and unfilled grains per panicle, weight of 1000 grains in grams and grain yield per treatment in kilograms.

Average plant height (cm) at maturity. Table 2 showed at the highest average height was achieved by broadcasting in flooding method with a mean of 116.2 cm, followed by broadcasting in drip irrigation method with a mean of 112.8 cm and the lowest plant height was measured from transplanting in furrow and drip irrigation method with a mean of 108.9 cm. analysis of variance indicates highly significant differences among treatment means. All treatments were comparable with each other in terms height at maturity.

Table 2. Average Plant Height (cm) at Maturity of PSBRc9 Rice Variety

PLANTING METHOD	WATER APPLICATION	*REPLICATIONS*			TOTAL	MEAN
		I	II	III		
BROADCASTING	Flooding	115.9	117.0	115.6	348.5	116.2
	Furrow	110.0	113.6	111.4	335.0	111.7
	Drip	112.8	110.5	115.0	338.3	112.8
TRANSPLANTING	Flooding	111.4	114.4	109.6	335.4	111.8
	Furrow	108.4	108.0	110.2	326.6	108.9
	Drip	110.6	108.2	107.8	326.6	108.9
Grand Total					2,010.4	
Grand Mean						111.7

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Comparison among means of the average plant height (cm) at different water application method show that plant height was highly affected by the application of transplanting in flooding irrigation with an average mean of 113.76.
According to De Atta (2011) plant height is generally increasing water depth or moisture of the soil.

Average number of tillers. Table 3 presented that the average number of tillers in 60 days from transplanting in flooding irrigation achieved the highest average number of tillers per treatment with a mean of 27.1 tillers per hill followed by the broadcasting in flooding method with a mean of 26.2 tillers and the least tillers produced was attained by broadcasting in drip method with a mean of 20.5 tillers per hill.

Table 3. Average Number of Tillers of Rice in 60 Days as affected by Different Water Application Method

PLANTING METHOD	WATER APPLICATION	*REPLICATIONS*			TOTAL	MEAN
		I	II	III		
BROADCASTING	Flooding	23.4	30.0	25.2	78.6	26.2
	Furrow	17.2	24.4	22.6	64.2	21.4
	Drip	23.9	21.0	16.7	61.6	20.5
TRANSPLANTING	Flooding	24.6	29.1	27.7	81.4	27.1
	Furrow	27.0	23.7	25.0	75.7	25.2
	Drip	25.8	24.4	18.2	68.4	22.8
Grand Total					429.9	
Grand Mean						23.9

Analysis of variance showed no significant effect on variety of rice using different water application method on the average number of tillers per hill at tillering stage.
Vergara (2012) cited that rice generally produced more tiller if there is enough water, right amount of fertilizer, proper spacing and good weed control.

Average number of produced tillers. Table 4 showed that the highest average number of productive tillers was gathered in by transplanting under flooding irrigation with a mean of 22.9, followed by transplanting in drip irrigation method with a mean of 22.6 and the lowest average number of tillers was drip irrigation in broadcasting method with a mean of 17.0 average number of productive tillers per hill.
Analysis of variance specifies no significant effect on variety of rice using different irrigation method on the average number of productive tillers.

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Table 4. Average Number of Productive Tillers per Hill in Every Treatment

PLANTING METHOD	WATER APPLICATION	*REPLICATIONS*			TOTAL	MEAN
		I	II	III		
BROADCASTING	Flooding	19.4	18.8	21.6	59.8	19.9
	Furrow	14.6	25.6	15.8	56.0	18.7
	Drip	13.0	20.2	17.8	51.0	17.0
TRANSPLANTING	Flooding	25.8	29.2	13.6	68.6	22.9
	Furrow	15.0	21.8	23.6	60.4	20.1
	Drip	24.0	16.8	27.0	67.8	22.6
Grand Total					363.3	
Grand Mean						20.2

Not all tiller produce heads since some tiller may die and other remain in their vegetative stage, due to competition for water nutrient and sunlight (Vergara, 2012)

Average number of unproductive tillers. Table 5 indicated that average number of unproductive tillers per hill from broadcasting method in drip irrigation exposed the highest average number of unproductive tillers per hill of each sample plot with a mean of 6.3 unproductive tillers per hill and followed by furrow irrigation in broadcasting method with a mean of 5.1 unproductive tillers. The least average number of unproductive tillers was transplanting method in flooding n irrigation with a mean of 2.3 unproductive tillers.

Analysis of variance displayed no significant effect on the rice variety by using different water application method.

According to Vergara (2012), tillers formed during late growth stage are usually non-productive tiller. Either the tiller die or the panicles produce are to small and ripen late. Mutual shading competition among tiller or lack of nutrient (especially nitrogen) may cause tiller loss.

Table 5. Average Number of Unproductive Tillers as Affected by Different Irrigation Method

PLANTING METHOD	WATER APPLICATION	*REPLICATIONS*			TOTAL	MEAN
		I	II	III		
BROADCASTING	Flooding	4.0	2.6	6.4	13.0	4.3
	Furrow	2.6	10.4	2.4	15.4	5.1
	Drip	4.8	6.8	7.4	19.0	6.3
TRANSPLANTING	Flooding	2.4	2.8	1.8	7.0	2.3
	Furrow	2.0	5.2	4.2	11.4	3.8
	Drip	3.2	3.4	3.0	9.4	3.2
Grand Total					75.4	
Grand Mean						4.2

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Average panicle length (cm). Table6 showed that the average panicle length from transplanting in flooding irrigation reached the highest average pf panicle length sample treatment with a mean of 23.4 cm followed by transplanting in furrow irrigation and broadcasting in flooding method with mean of 23.3 cm and the least panicle length produced was transplanting in drip with mean of 21.3 length.

Analysis of variance showed no significant effect on panicle length of rice using different water application method.

Average number of grains per panicle. Table 7 displayed that the average number of grains from transplanting in flooding irrigation reached the highest average number of grains per panicle of sample treatment with a mean178.7 followed by transplanting in furrow irrigation with a mean of 171.2 and the least average number of grains produced was transplanting in drip with a mean of 152.9 grains.

Table 6. Average Panicle Length (cm) of Rice per Treatment

PLANTING METHOD	WATER APPLICATION	*REPLICATIONS*			TOTAL	MEAN
		I	II	III		
BROADCASTING	Flooding	24.6	22.8	22.3	69.7	23.2
	Furrow	20.6	22.6	23.4	66.6	22.2
	Drip	23.0	21.1	22.4	66.5	22.2
TRANSPLANTING	Flooding	22.5	23.7	23.9	70.1	23.4
	Furrow	23.9	22.1	24.0	70.0	23.3
	Drip	21.7	20.9	21.4	64.0	21.3
Grand Total					406.9	
Grand Mean						23.1

Table 7. Average Number of Grains per panicle as Affected by Irrigation Method

PLANTING METHOD	WATER APPLICATION	*REPLICATIONS*			TOTAL	MEAN
		I	II	III		
BROADCASTING	Flooding	158.4	175.6	160.6	494.0	164.7
	Furrow	178.9	157.2	134.6	470.7	156.9
	Drip	167.2	183.4	127.0	477.6	159.2
TRANSPLANTING	Flooding	195.0	173.4	167.8	536.2	178.7
	Furrow	173.0	152.2	188.4	513.6	171.2
	Drip	157.6	162.8	138.4	458.8	152.9
Grand Total					2,950.9	
Grand Mean						163.9

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Analysis of variance achieved no significant effect on the number of grains per panicle of rice using different water application method.
Vergara (2012) stated that difference could be attributed to a yielding ability of the variety. Yield is normally a function of genetic make-up and environment conditions.

Average number of filled grains per panicle. Table 8 indicated that the average number of filled grains from transplanting in flooding irrigation reached the highest average number of filled grains per panicle of sample treatment with a mean of 152.2 followed by transplanting in furrow irrigation with a mean of 135.3 and the least average number of filled grains produced was broadcasting in drip irrigation with a mean 124.1 grains.
Analysis of variance showed no significant effect on number of filled grains per panicle of rice using different water application method.

Table 8. Average of Filled Grains per Panicle by Means of Water Application Method

PLANTING METHOD	WATER APPLICATION	*REPLICATIONS*			TOTAL	MEAN
		I	II	III		
BROADCASTING	Flooding	131.2	147.2	148.2	426.6	142.2
	Furrow	149.4	151.0	96.6	397.0	132.2
	Drip	151.0	125.0	96.0	327.4	124.1
TRANSPLANTING	Flooding	141.6	153.8	161.2	456.6	152.2
	Furrow	107.6	133.6	164.8	406.0	135.3
	Drip	127.8	131.8	130.6	390.2	130.1
Grand Total					406.9	
Grand Mean						136.0

PhilRice (2011) cited that while rice id still growing, water stress must be avoided to prevent retardation of growth and reduction of tillers. Large amount of unfilled grains is due to lack of water. Insufficient water results in wilting and also reducing the capacity of the plant and transport its foods. Thus the high number of unfilled grains is due to insufficient water available for the plant.

Average number of unfilled grains per panicle. Table9 identified that the average number unfilled grains from broadcasting in drip irrigation reached the highest average number of unfilled grains per panicle of sample treatment with a mean of 30.1 followed by transplanting in drip irrigation with a mean of 29.9 and the least average no. of unfilled grains produced was transplanting with a mean of 20.5 grains.
Analysis of variance showed no significant effect on number of unfilled grains per panicle of rice using different irrigation method.

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Low air and water temperature could cause injuries such as failure of grain to germinate, delayed flowering high spikelet sterility which result to higher unfilled grain per panicle and irregular maturity. High number of unfilled grain can reduce yield (Yoshida, 2011).

Average number of loss grains per panicle. Table 10 stated that the average number of loss grains form broadcasting in furrow irrigation reached the highest average number of loss grains from broadcasting in furrow irrigation reached the highest average number of loss grains per panicle of sample treatment with mean of 4.3 and the least average number of loss grains produced was transplanting in flooding irrigation with a mean of 2.7 grains.

Table 9. Average number of unfilled grains per panicle

PLANTING METHOD	WATER APPLICATION	*REPLICATIONS*			TOTAL	MEAN
		I	II	III		
BROADCASTING	Flooding	15.0	29.0	28.2	72.2	24.1
	Furrow	28.0	35.6	19.4	82.4	27.5
	Drip	26.0	25.6	38.6	90.2	30.1
TRANSPLANTING	Flooding	14.8	15.8	32.0	62.6	20.9
	Furrow	25.8	22.0	13.6	61.4	20.5
	Drip	24.6	29.2	35.8	89.6	29.9
Grand Total					458.4	
Grand Mean						20.5

Analysis of variance obtained no significant effect on number of loss grains per panicle of rice using different irrigation method.

Table 10. Average Number of Loss Grains per Panicle by Using Water Application Method

PLANTING METHOD	WATER APPLICATION	*REPLICATIONS*			TOTAL	MEAN
		I	II	III		
BROADCASTING	Flooding	2.8	3.6	4.2	10.6	3.5
	Furrow	3.0	4.2	6.0	13.2	4.4
	Drip	3.6	5.4	3.8	12.8	4.3
TRANSPLANTING	Flooding	2.8	2.6	2.8	8.2	2.7
	Furrow	2.8	3.4	2.2	8.4	2.8
	Drip	2.2	6.0	1.8	10.0	3.3
Grand Total					63.2	
Grand Mean						3.5

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Average weight of 1000 filled grains. Table 11 specified that the average weight of 1000 filled grains in grams from flooding irrigation in transplanting method the highest average weight of 1000 filled grains of sample treatment with a mean of 25.7 gams followed by broadcasting in flooding with a mean of 25.5 grams and the least average weight of 1000 filled grains produced was broadcasting in drip irrigation with a mean of 23.4 grams.

Analysis of variance reached no significant effect on the weight grains per panicle of rice using different irrigation method.

Difference could be due to grain characteristics in terms of size and shape if grain.

Table 11. Average Weight of 1000 Filled Grains per Treatment (grams)

PLANTING METHOD	WATER APPLICATION	*REPLICATIONS*			TOTAL	MEAN
		I	II	III		
BROADCASTING	Flooding	26.1	24.6	25.9	76.6	25.5
	Furrow	26.4	23.0	25.8	75.2	25.1
	Drip	22.7	23.5	24.0	70.2	23.4
TRANSPLANTING	Flooding	29.0	23.3	24.8	77.1	25.7
	Furrow	24.1	23.5	26.7	74.3	24.8
	Drip	25.0	24.7	25.7	75.4	25.1
Grand Total					448.8	
Grand Mean						24.9

Average grain yield per treatment. Table 12 showed that the flooding irrigation in transplanting method revealed the highest average grain yield per sample treatment with a mean of 6.98 kg followed by broadcasting in flooding irrigation with a mean of 6.57 kg and the least average produced was transplanting in drip irrigation with a mean of 5.67 kg per treatment.

Analysis of variance showed no significant effect on the grain yield (kg) per treatment using irrigation method.

According to PCAARRD (2009), rice has the highest three critical stages wherein moisture deficit reduce grain yield substantially. These are: (1) transplanting period (or seedling establishment) (2) tillering stage and (3) the period from about 14 days before to a week after panicle initiation. Yield reduction due to moisture stress during heading or flowering is largely caused by unfertilized flower.

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Table 12. Average Grain Yield per Treatment in Kilogram

PLANTING METHOD	WATER APPLICATION	*REPLICATIONS*			TOTAL	MEAN
		I	II	III		
BROADCASTING	Flooding	6.70	7.25	5.75	19.70	6.57
	Furrow	6.50	6.60	4.50	17.60	5.87
	Drip	6.00	5.25	7.00	18.25	6.08
TRANSPLANTING	Flooding	6.70	8.00	6.25	20.95	6.98
	Furrow	5.40	6.00	6.25	17.65	5.88
	Drip	5.25	4.75	7.00	17.00	5.67
Grand Total					111.15	
Grand Mean						6.18

SUMMARY, CONCLUSION AND RECOMMENDATIONS

Summary

The study was conducted to determine the different water application method and planting method. The study findings are as follows:

1. Average plant height in centimeters was attained from broadcasting in flooding method 348.5 cm followed by the broadcasting in furrow irrigation method 335.0 cm and the lowest average plant height was obtained by the transplanting in drip and furrow irrigation with a mean of 108.9 high.
2. The number of tillers per hill at 60 days was affected by different water application method. On the other hand, transplanting in flooding irrigation produced most number at tillering stage with a mean of 27.1 tillers.
3. Most number of unproductive tillers was found in broadcasting in drip irrigation. The average number of productive tillers was transplanting in flooding irrigation that produced 22.9 tillers.
4. Statically, average panicle length in centimeters was obtained by transplanting in flooding method with a mean of 23.4 cm followed by the transplanting in furrow method and broadcasting in flooding method with a mean of 23.3 cm and the lowest average panicle length was drip irrigation in transplanting method with a mean of 21.3 length.
5. Average number of grains per panicle in centimeters was reached by transplanting in flooding method with a mean of 178.7 and the lowest was transplanting in drip irrigation with a mean of 22.9 grains.
6. Highest average number of filled grains was obtained by the flooding waster application method in transplanting area with a mean of 152.2 grains and the lowest average number of filled grains was revealed by broadcasting in drip irrigation

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method with a mean of 124.1 grains. On the other hand, the highest average number of unfilled grains was attained drip irrigation in broadcasting method with a mean of 30.1 grains and the lowest was reached by furrow irrigation of transplanting method with a mean of 20.5 grains. When it comes from loss of grains per panicle was the furrow irrigation method in broadcasting attained the highest average number of loss per panicle with a mean of 4.4 grains and lowest average number of loss of grains per panicle was transplanting method in flooding irrigation with a mean of 2.7 grains.

7. Flooding irrigation in transplanting method achieved the highest average weight of 1000 filled grains of sample treatment in grams with a mean of 25.7 grams followed by transplanting in drip irrigation with a mean of 25.2 grams and the least average weight of 1000 filled grains produced was broadcasting in drip irrigation with a mean of 23.4 grams.
8. Flooding irrigation in transplanting method with a mean of 6.98 kg obtained the highest average grain yield per treatment in kilogram and the lowest average grain yield per treatment was attained by transplanting method in drip irrigation with a mean of 5.67 kilogram.

Conclusion

Every drop needs water because it is one of the basic need of plants for them grow especially when it comes to rice production since rice is the main food of every Filipino.

Irrigating the field using flooding irrigation in transplanting method could increase number of tillers, number productive tillers, panicle length (cm), number of grains per treatment, number of filled grains, weight of 1000 grains in grams and grain yield (kg) per treatment in comparison to furrow and drip irrigation. Based on the average plant height (cm) of the PSBRc9 nice variety, the highest plant height (cm) was attained by broadcasting in flooding method. Planting using broadcasting method affects the plant height. This proved that broadcasting method affects the growth the plant.

Recommendation

Based on the result of the study using different water application method the following suggestions are recommended.

1. Testing of other rice varieties are recommended using different water application method.
2. Soil moisture meter is recommended to indicate the soil surface whether it’s dry or wet.
3. Oven soil drying is recommended to indicate the determination and percentage of soil moisture content.

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