

INFLUENCE OF PLANTING SYSTEM AND DIFFERENT LEVELS OF FERTILIZERS ON THE GROWTH AND YIELD OF BARNYARD MILLET

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The two year study on the influence of system of planting and different levels of fertilizers (DS) revealed that there is no significant difference on the plant height and yield of Millet. However, the application of recommended rate/ha (225 kgs of NPK/ha), gave the highest yield of 1192.0 kg/ha. under furrow methods of planting over broadcast method of planting with a yield of 1189.3 kg/ha. It was proven in this study that millet plants were not responsive to a greater amount of NPK fertilizer.

In terms of marginal rate of return (MRR), the application of 225 kg of NPK/ha gave the highest MRP with 329.10 and 480.6 when grown under broadcast and furrow system of planting, respectively.

INTRODUCTION

Barnyard Millet (*Echinochloa crus galli*) is a traditional crop in Western Visayas region particularly in the province of Aklan where they are simply broadcasted in upland areas. Not much care and cultivation is being given to this crop although Mill grains command a good price in the local market due to its varied uses as porridge, as the main ingredient in the preparation of native delicacies as puto, suman and native cakes. Millet grains contain 51.98% starch and 9.86% crude protein.

While there are no established statistics regarding production and availability of millet grains, its importance as a food crop just like any food crops such as rice and corn, etc., should not be overlooked. For one thing there is marked inadequacy on production management technology on millet. Thus, the search of appropriate cultural and management practices from a level associated with subsistence farming is still wanting. Hence this study.

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Ricafort: Influence of Planting System and Different Levels of Fertilizers on the Growth and Yield of Barnyard Millet

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REVIEW OF LITERATURE

Not much studies on the cultural and management have been done. E.E. Cruz (1966), stated that millet could be planted in furrows at a distance from 40-50 cm apart with seeding rate of 40-50 kgs/ha. Application of complete fertilizer (12-24-12) at the rate of 200-250 kgs/ha's beneficial to the crop.

Unpublished reports indicated that farmers particularly in Aklan province normally practice the broadcast method of planting without much care and management leaving the crops under self-supporting status.

OBJECTIVES

To determine and compare the economic yield and other agronomic characteristics of Barnyard Millet when grown under varied the system of planting at different levels of fertilizer.

METHODOLOGY

Millet seeds obtained from the province of Aklan were used in this study.

For the first trial dry season crop, planting was done on November 6, 1991 and December 14, 1994 for the second trial dry season. Field was thoroughly prepared laid out prior to planting following the split plot design with the rate of fertilizer as main plot and method of planting as subplot. Subplots measured 1.50 meters wide x 4.0 meters long or a total area of 6.0 square meters. For the furrow method, five rows were made at 25 cm apart. A total of 20 grams millet seeds were evenly drilled in the furrows. Likewise, 20 grams of seeds were also evenly broadcasted in plots under the broadcast method.

The different fertilizer treatment using complete fertilizer (14-14-14) were:

T1 - Control (no fertilizer)

T2 - 175 kg/ha

T3 - 225 kg/ha (recommended rate)

T4 - 275 kg/ha

Both methods of planting received the same fertilizer treatment which were applied in split, one half at planting time and other half during tillering stage. The whole experimental areas were treated uniformly. Thus appropriate care and management such as watering, weeding and control of pest were properly accorded to the test plants throughout the conduct of the study. Data on growth parameters and yield components (plant height, number of productive tiller and weight of grains) were recorded.

RESULTS AND DISCUSSIONS

The field performance and other agronomical characters of Barnyard Millet planted during the first and second trial dry season planting were observed :

Days to Emergence : Seeds were sown Nov. 6, 1991 for the first trial and December 14, 1992 for the second trial. It was observed that millet seeds had germinated uniformly five days after seeding on both system of planting.

Days to Flower : About 50% of the total plants started to bloom 40 days after seeding on both system of planting, irrespective of fertilizer treatments. It was noted that total flower emergence took place within 45 days after seeding on both trials.

Days of Maturity : Millet matures in 105 days after seeding, 90% of the total plant/population turned yellowish and grains were hard enough which is indication of maturity.

Plant Height : The growth performance of Barnyard Millet as affected by different levels of fertilizer using broadcast and furrow methods of planting are shown in Table I.

Table 1. Yield and other Agronomic Characteristics of Barnyard Millet as Affected by Different Levels of Fertilizer Under Broadcast and Furrow Methods

Treatment	PLANT HEIGHT (cm)		NUMBER OF PRODUCE		MEAN YIELD/ Plot in Grams (3 sq m sample plot)	COMPUTED Yield/ha (Kg)
	1st Trial	2nd Trial	1st Trial	2nd Trial		
Broadcast						
T1 Control	110.3	76.8	1.4	0.4	147.2	490.67
T2 - 175 kg/ha	99.1	83.8	1.1	0.7	271.2	904
T3 - 225 kg/ha	87.4	86.8	1.1	0.8	356.8	1189.3
T4 - 275 kg/ha	118.9	80.8	1.2	1.1	332.8	1109.3
Furrow						
T1 - Control	104.9	82.8	1.4	0.3 C	169.6	565.3
T2 - 175 kg/ha	104.9	86.3	1.1	0.8 B	334.4	1114.6
T3 - 225 kg/ha	90.8	89.8	1.2	0.8 B	357.6	1192
T4 - 275 kg/ha	120.9	93.2	1.2	1.0 A	342.4	1141.3
C.V	7.43	8.5	10.79	21.51		

1/ - taken at 105 DAS

* Treatment having or common letter are not significantly different with a mean separation

2/ - Average yield of 2 cropping season by DMRT at 5% level
DAS - Days After Seeding

Plant height was taken at harvest time (105 days after seeding). Results showed that there were no significant differences on plant height of millet at different levels of fertilizer using broadcast and furrow methods of planting during the first and second dry season cropping.

In broadcast method however, it was observed that T4 (275 kg/ha) exhibited the tallest plants with a mean height of 118.9 cms. followed by T1 (Control) with a mean height of 110.3 cm, T2 (175 kg/ha) with a mean height of 99.1 cm and T3 (225 kg/ha) exhibited the tallest plants with a mean height of 86.8 cm., T4 (275 kg/ha) with a mean height of 80.8 cm and T1 (Control) exhibited the shortest plant with a mean height of 76.8 cm.

In like manner, using furrow method, T4 (275 kg/ha) attained the tallest plant with a mean height of 120.9 cm. followed by T1 (Control) with a mean height of 104.9 cm, T2 (175 kg/ha) with a mean height of 104.9 cm, followed by T1 (Control) with a mean height of 104.4 cms. and T3 (225 kg/ha) attained the shortest plants with a mean height of 90.8 cm. during the first trial planting. During the second trial planting, T4 (275 kg/ha) with a mean height of 89.8 cm, T2 (175 kg/ha) with a mean height of 86.3 cm and T1 (Control) attained the shortest plant with a mean, height of 82.8 cms.

Number of Productive Tiller : Results revealed that there was no significant influence using broadcast system of planting and effect of fertilizer on the production of tillers during the first and second trial planting. However, it was observed that using furrow system of planting, indicated significant effect as influenced by the level of fertilizer. T4 (275 kg/ha) produced more tillers at an average of 1.0 tiller/plant followed by T3 (225 kg/ha) at an average of 0.8 tiller/plant. T1 (Control) had the least number of productive tillers at an average of 0.3 tiller/plant during the second trial planting.

Grain Yield (kg. Unmilled): The grain yield of Millet as affected by the system of planting and the level of fertilizers is shown in Table 1. Results showed that the yield performance of Millet under the two

system of planting at varying levels of fertilizer failed to reach significant difference. However, the highest computed yield of 1192.00 kg/ha was obtained when planted using furrow system and with the application of 225 kg of N-P-K per hectare. Likewise, higher computed yield at 1189.3 kg/ha was obtained when planted employing the broadcast system and with the application of 225 kg of N-P-K per hectare. Furthermore, results revealed that Millet can be grown successfully using either furrow or broadcast system of planting with the application of 225 kg of N-P-K per hectare.

Economic Benefit Analysis : The cost and return analysis of the study is shown in Table 2. Economic analysis showed that T3 application of recommended rate of fertilizer at 225 kg/N-P-K/ha under furrow method of planting gave the highest gross and net income of P23,244.00 and P14,329/ha respectively with an MRR of 482.6%. Likewise the same fertilizer treatment under broadcast system of planting also gave the highest gross income and net income of P23,190.00/ha and P14,595.00/ha, respectively with an MRR of 329.1%.

Table 2 : Cost and Return Analysis of the Study :

Treatment	: Grain Yield kg/ha :		: Treatment : Net :			
	: Milled 1/ : Unmilled :		: Gross Benefit 2/ : Cost/ha 3/ : Benefit :			: MRR (%)
Broadcast						
T1 - Control	318.9	490.67	9567	5420	4147	
T2 - 175 kg/ha	587.6	904	17628	8245	9383	185.3
T3 - 225 kg/ha (recommended rate)	773	1189.3	23190	8595	14595	329.1
T4 - 275 kg/ha	721	1109.3	21630	8945	12685	
Furrow						
T1 - Control	367.4	565.3	11022	5740	5282	
T2 - 175 kg/ha	724.5	1114.67	21735	8656	13079	267.4
T3 - 225 kg/ha (recommended rate)	774.8	1192	23244	8915	14329	482.6
T4 - 275 kg/ha	741.8	1141.3	22254	9265	12989	

1/ - Computed at 65% recovery

2/ - Computed at P30.00/kg (Farm - Price - Milled)

3/ - Included labor, fertilizer and other farm inputs

CONCLUSIONS AND RECOMMENDATIONS

Strong evidence was obtained that Millet can be grown successfully using either furrow or broadcast system of planting with the application of the recommended rate of fertilizer at 225 kg N-P-K per hectare. Thus, either of the two planting systems (furrow or broadcast) can be recommended for farmers adoption depending on thier choice for farm, operational comfortability or convenient

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