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PROFITABILITY OF BEST BET PLANTING METHODS TOWARDS IMPROVED RICE PRODUCTIVITY IN NORTHERN GUINEA SAVANNAH ZONE OF NIGERIA

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ABSTRACT

Rice is a staple food for about 2.6 billion people in the world. In developing countries rice accounts for 29 percent of the total calorie intake of this populations.To improve rice productivity and income of small-scale farmers; on-farm demonstrations involving planting methods were carried out in Dandume Local Government Area of Katsina State, Nigeria in 2008 and 2009 cropping seasons. The objectives of the demonstrations were to create awareness and promote the adoption of Best Bet Planting Methods in rice production. This paper determines the cost and returns of the Best Bet Planting Options demonstrated for increased rice productivity and income of the farmers. Data collected was analyzed using descriptive statistics and budgeting technique. The results indicate that intensification and expansion of production of rice using drilling and dibbling planting methods will increase yield and more income to the farmers. Therefore, farmers should be encouraged to invest their resources in rice production using drilling and dibbling planting methods for increased rice productivity which in turn will increase the farmers' income and improve their standard of living.

KEYWORDS: Promotion, Best, Bet, Planting, Methods, Rice, Costs, Returns

INTRODUCTION

Rice is a staple food for about 2.6 billion people in the world. The global output shows that the Asian continent account for about 92 percent, while American and Caribbean account for 5 percent and 3 percent for Africa (Spore, 2005). The Nigeria food sub-sector parades a range of crops, but of all these, rice gained prominence (Akande, 2001). Singh et al (1997) and FAO (2007) reported that Nigeria is the largest producer of rice in West Africa producing over 46% of the regions total production. According to the report of FAO (2007) in the last 30 years, production has increased 6 folds with Nigeria producing 3.6 million tons of paddy rice in 2000 and 2005 respectively. Nigeria is equally the largest importer of rice and its importation figure stood at 1 million tons costing over $300 million by 1998, which is one third of sub-region total (Fashola, 2007).

The crop has witnessed a steady increase in demand and this gave rise to its importance place in the strategic food security planning of many countries (Akande, *op cit, 2001*). According to FAOSTAT (2010), the Nigeria rice sub sector has witnessed a remarkable increase in output of 2.5 million metric tonnes in 1990 to about 4.2 million metric tonnes in 2008. This increase in output of rice over the years was as a result of increase in hectarage cultivation. However, there has been falling yield of rice in Nigeria from 2069.54kg per hectare in 1990 to 1754.40kg per hectare in 2008 (FAOSTAT op cit, 2010). This falling yield of kg per hectare of rice led to supply deficit situation in the country.

In response to the prevailing rice supply deficit situation in the country, successive Nigeria government have intervened in the rice sub-sector by increasing tariff on rice importation so that local production could be encouraged. This was expected to widen the home market for the nation local rice (Bamidele, Abayomi and Esther, 2010).

Despite the numerous government policies and programmes on rice and rise in domestic production, the demand/consumption exceeds the local production resulting in rice importation. During the last five years, Nigeria has become one of the largest importers of rice, second to Indonesia. Its importer bill of rice has increased from 1million United State dollar in 1970s to as high as 800million United State Dollar in 2005 (FAO, 2007). The short fall in supply of rice in Nigeria has been attributed to continuous rise in per capita consumption brought about by increased population and rapid urbanization (Akande *op cit*, 2001, Fabusoro and Agbonlahor). The inability of Nigeria rice sub-sector to meet the domestic demand could be attributed to low productivity, inefficiency in the use of resources, disincentives from macro-economic environment and production in the hand of small scale farmers who use traditional technologies (Federal Ministry of Agriculture, 1995). The objectives of the demonstrations were to create awareness and promote the adoption of Best Bet Planting Methods in rice production. This paper determines the cost and returns of the Best Bet

Planting Options demonstrated for increased rice productivity and income of the farmers.

MATERIALS AND METHODS

The study was conducted in an upland rice production area, Dandume Local Government Area (11°27.520'N and 7°07.838'E, 2303 feet above sea level), Katsina State of Nigeria, in the framework of Kano-Katsina-Maradi (KKM) project in NGS. The agro-ecological zone is symbolized by a landscape with gentle and sinuous slope, an average rainfall of about 900 – 1300 mm per annum with an average daily temperature of 30°C in summer (warm and rainy from May ending to November) and 20°C in winter (cold with lots of dust from December to April). Rice, maize, soybeans, sorghum, cotton and pepper are the main cash crops while the food crops are maize, rice, sorghum, cocoyam and millet. To improve rice productivity and income of small-scale farmers, on-farm demonstrations involving best planting options were carried out in Dandume Local Government Area of Katsina State, Nigeria in 2008 and 2009 cropping seasons. The demonstrations were conducted in two villages, namely; Mahuta and Dansoda of Dandume Local Government Area. In each village 10 farmers were randomly selected to participate in the project, making a total 20 participating farmers.

The objectives of the demonstrations were to create awareness and promote the adoption of Best Bet Planting Methods in rice production. Data collected was analyzed using descriptive statistics and budgeting technique. The gross margin analysis was employed as the budgeting tool in analyzing the benefit–cost of adopting the best bet planting options in rice production.

The Gross Margin is expressed as follows:

GM = GR - TVC
Where,
GM = Gross Margin (₦/ha)
GR = Gross revenue (₦/ha)
TVC = Total Variable Cost (₦/ha)

RESULTS AND DISCUSSION

The costs and returns analysis as shown in Table- 1 and 2 revealed that labour and fertilizer costs are the most important components of the variable costs incurred in rice production. In Mahuta, the total cost of production for broadcast, dibbling and drilling methods were ₦186,800.00, ₦187,951.00, ₦188,871.00/ha and gross revenue of ₦228,800.00, ₦279,600.00 and ₦352,000.00/ha, thus making a gross margin of ₦42,000.00, ₦109,649.00 and ₦163,129.00/ha respectively. This results Drilling methods of planting rice generate more income to farmers followed by dibbling and broadcasting method. Thus intensification of rice production using drilling and dibbling methods would increase productivity in the study area and more income to the rice farmers. The returns per naira invested in the different planting methods support the results of the gross margin analysis. The returns per naira invested indicates that for every one naira invested in planting methods in rice production, a net gain of 86, 58 and 22kobo was obtained as the net gain using drilling, dibbling and broadcasting planting methods in rice production.

In Dansoda, the cost and analysis revealed that from one hectare of rice cultivated using three different planting methods, total cost of production for broadcast, dibbling and drilling methods were ₦187,830.00, ₦188,281.00, ₦189,356.00/ha and gross revenue of ₦294,400.00, ₦311,200.00 and ₦392,000.00/ha, thus making a gross margin of ₦106,550.00, ₦122,919.00 and ₦202,644.00/ha respectively. In this location, drilling method of planting rice generate more income to farmers followed by dibbling and broadcasting methods similarly as in Mahuta location. In terms of the returns per naira in the different planting methods, drilling method generate more returns per naira invested (₦1.07) than dibbling and broadcasting methods (65 and 57 kobo respectively). The combined analysis from the two location shows that intensification of rice production using drilling and dibbling methods would increase productivity in the study area and generate more income to the rice farmers.

CONCLUSION

The results indicate that intensification and expansion of production of rice using drilling and dibbling planting methods will increase yield and more income to the farmers. Therefore, farmers should be encouraged to invest their resources in rice production using drilling and dibbling planting methods for increased rice productivity which in turn will increase the farmers' income and improve their standard of living.

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Table 1: COSTS AND RETURNS ANALYSIS PLANTING METHODS IN RICE PRODUCTION
LOCATION: Mahuta

	TREATMENT					
Costs/Returns Items	BROADCAST	%	DIBBLING	%	DRILLING	%
(1) COSTS/Ha						
Seed	8,000.00	4.28	8,000.00	4.26	8,000.00	4.24
Fertilizer	40,800.00	21.84	40,800.00	21.71	40,800.00	21.60
Fungicide	1,250.00	0.67	1,250.00	0.67	1,250.00	0.66
Bag (Sacks)	2,320.00	1.24	3,040.00	1.62	3,520.00	1.86
Labor						
Land Preparation	29,166.67	15.61	29,166.67	15.52	29,166.67	15.44
Planting	16,666.67	8.92	16,667.67	8.87	16,667.67	8.82
Fertilizer Application	7,166.66	3.84	7,166.66	3.81	7,166.66	3.79
Weeding	40,000.00	21.41	40,000.00	21.28	40,000.00	21.18
Harvesting	20,000.00	10.71	20,000.00	10.64	20,000.00	10.59
Threshing	20,000.00	10.71	20,000.00	10.64	20,000.00	10.59
Transportation	1,430.00	0.77	1,860.00	0.99	2,200.00	1.16
Total Variable Cost (TVC)(₦)	186,800.00	100.00	187,951.00	100.00	188,871.00	100.00
(2) RETURNS						
Average yield (kg/ha)	2860		3720		4400	
Average Price (kg/ha)	80		80		80	
Gross Revenue (₦ /ha)	228,800.00		279,600.00		352,000.00	
Gross Margin (GR –TVC)(₦) /ha	42,000.00		109,649.00		163,129.00	
Return/Naira Invested	0.22		0.59		0.86	

Table 2: COSTS AND RETURNS ANALYSIS PLANTING METHODS IN RICE PRODUCTION
LOCATION: Dansoda

	TREATMENT					
Costs/Returns Items	BROADCAST	%	DIBBLING	%	DRILLING	%
(1) COSTS/Ha						
Seed	8,000.00	4.26	8,000.00	4.25	8,000.00	4.22
Fertilizer	40,800.00	21.72	40,800.00	21.67	40,800.00	21.55
Fungicide	1,250.00	0.67	1,250.00	0.66	1,250.00	0.66
Bag (Sacks)	2,960.00	1.58	3,120.00	1.66	3,920.00	2.07
Labor						
Land Preparation	29,166.67	15.53	29,166.67	15.49	29,166.67	15.40
Planting	16,666.67	8.87	16,667.67	8.85	16,667.67	8.80
Fertilizer Application	7,166.66	3.82	7,166.66	3.81	7,166.66	3.78
Weeding	40,000.00	21.29	40,000.00	21.24	40,000.00	21.12
Harvesting	20,000.00	10.65	20,000.00	10.62	20,000.00	10.56
Threshing	20,000.00	10.65	20,000.00	10.62	20,000.00	10.56
Transportation	1,840.00	0.98	1,945.00	1.03	2,450.00	1.29
Total Variable Cost (TVC)(₦)	187,850.00	100.00	188,281.00	100.00	189,356.00	100.00
(2) RETURNS						
Average yield (kg/ha)	3680		3890		4900	
Average Price (kg/ha)	80		80		80	
Gross Revenue (₦ /ha)	294,400.00		311,200.00		392,000.00	
Gross Margin (GR –TVC)(₦) /ha	106,550.00		122,919.00		202,644.00	
Return/Naira Invested	0.57		0.65		1.07	