

ORGANIC FERTILIZER AND ITS EFFECT ON VEGETABLE PRODUCTION: A CASE STUDY OF VEGETABLE FARMERS IN KWARA STATE, NIGERIA

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ABSTRACT

Organic fertilizer use over the years has been encouraged for the production of almost all crops due to the health benefits derived from its utilization. This study was carried out in Kwara State Nigeria in order to determine the effect of using organic fertilizer for vegetable production. Data was collected through the use of questionnaires augmented with an interview schedule. Data obtained were analysed using both descriptive and inferential statistics. The result revealed that quality vegetables produced was the highest effect of the use of organic fertilizer with the mean score of (3.265). The efficient waste management of animal waste had a mean rating of 2.35 and environmental friendliness of the perceived effect of the use of organic fertilizer on vegetable production had the least ranking with a mean score of 1.95. The hypothesis tested revealed that there was a positive relationship between farm size (0.548), years of experience (0.381), household size (0.279) and the perceived effect of the use of organic fertilizer on vegetable production in Kwara state which was significant at Pvalue of 5%. Thus, it was recommended that vegetable farmers should be encouraged to use more organic fertilizers given its positive effect on the quality of the vegetables produced.

Keywords: Organic Fertilizer, Production, Quality, Yield

INTRODUCTION

One of the main driving forces for development in most developing countries remains agriculture. However, agricultural production has not been able to meet up with the growing population and the increased demand for agricultural products. Agriculture as a whole has faced numerous challenges, including low productivity due to declining soil fertility and continuous

occurrences of prolonged drought. Low productivity, declining soil fertility coupled with low use of improved inputs such as fertilizers among other factors are some of the key challenges facing the agricultural sector (Ministry of Agriculture Animal Industry and Fisheries, 2010). Thus, one way that has helped to deal with the problem of low productivity in agriculture is through the use of fertilizer (Smaling *et.al* 2006). Increased agricultural productivity in Sub-Saharan Africa has required crop protection innovations and improved farm practices which encompasses the appropriate use of fertilizers and improved seeds (Vanlauwe *et al.*, 2014; Agbahey *et al.*, 2015). Optimal increase in the use of fertilizer has great potential to increase crop yields and improve land productivity (Barbier, 2000). Thus, the use of organic fertilizers from animal or plant residues provide some nutrients that play a crucial roles in improving soil moisture conservation, especially when combined with some conservation tillage practices that protect soil structure, reduce erosion, run offs and promote soil biological functions which are important for soil productivity (Agwe *et.al* 2007). The indirect use of fertilizers has led to higher economic growth and poverty reduction through increased agricultural productivity and output (Dethier and Effenberger, 2011).

Similarity, the effect of the use of organic fertilizers on vegetable quality and its impact on food security cannot be over emphasised. Organic products are lower in water content, reserving higher density weight. Organic fertilizers are richer in iron, magnesium, vitamin C and other important body building products (IFOAM, 2005). However, vegetables are staple foods and very important component of healthy human diet. According to Squire (1982), vegetables are sometimes categorized as leaves, seeds, tubers, seed and pods, stem, root, and mushrooms depending on part of the plant consumed. They are good sources of vitamins and minerals, proteins, protective micronutrients and dietary fibres which help to prevent constipation (Balasubramanian, 2012; Layade and Adeoye, 2014). They are foods with few calories and they are generally refers to as low energy foods which favors maintenance of healthy body weight (USDA, 2009). Eating vegetables appears to help keep the brain young and may subsequently slow down the declining process of mental activities which are sometimes associated aging (Morris *et al*, 2006). In spite of these enormous benefits, vegetables consumption in Africa is said to be low compared to the recommended daily intake (Hall *et al*, 2009). In the report of Ruel *et al*, (2004), fruits and vegetables in sub-Saharan Africa ranges from 70 to 312g/person/day, which is far below the WHO minimum recommendation of 400g/person/day or 146kg/person/year. Given this shortage, there has been a need to boost the production of vegetables to meet the recommended daily intake and to enhance food security. One of the ways to increase the production is through the use of organic fertilizer which is a better option when compared to size effects of and high cost of inorganic fertilizers.

According to Morris *et al.*, (2007), factors that influence the intensity of the use of fertilizers depend majorly on farmers' perception of the potential profitability of fertilizer use. This in-turn depends on the characteristics of the inputs including the productivity of crops as they response to different types of fertilizers. (Sarci, 2012) stated that chemical fertilizers are agricultural pollutants and they can pose health issues such as cancer. Even though there has been past studies on the effect and adoption of fertilizers on farmers output, little is been known about the perceived effect of the use of organic fertilizers on vegetable production especially in Kwara State along with the fact that there is a low usage rate of inorganic fertilizer in Nigeria. In light of the aforementioned, this study sort to achieve the following objectives; assess the socioeconomic characteristics of the vegetable farmers; determine the level of awareness on the use of organic fertilizers among the farmers, identify the factors that encourage the use of organic fertilizers and determine the perceived effect of the use of organic fertilizers in Kwara State, Nigeria.

METHODOLOGY

This study was carried out in Kwara State, located in the North Central geopolitical zone of Nigeria. The state was created on May 27, 1967. It comprises 16 local Government Areas and lies between longitudes 4'-6' East of Greenwich meridian and between latitudes 8'-10' North of the Equator. It covers a land area of about 32500km². Kwara State has about 260,528 farm families (KWADP, 2006) and about 36,820 hectares of farmland (FOS, 1995).

The study population comprised of all the vegetable farmers in Kwara State. A multi stage sampling techniques was used for the sample selection. The first stage involved the random selection of four (4) Local Government Areas from a total of sixteen Local Government Areas in the state. The second stage involved the purposive selection of five (5) communities known for vegetable production in each of the Local Government Areas previously selected while the third stage involved the random selection of four (4) vegetable farmers in each of the communities. Thus, a total of eighty (80) respondents were sampled for this study. Data was collected using closed ended questionnaires. Data for this study was analysed using both descriptive and inferential statistics. The descriptive statistics includes the mean, frequencies and percentages. The hypothesis of this study was tested using Pearson moment correlation analysis at a P.value of 5% confidence.

RESULTS AND DISCUSSION

Socioeconomic characteristics of the respondents

Table 1: Socio Economic Characteristics of the Vegetable Farmers in Kwara State

Socio-Economic Characteristics	Frequency	Percentage (%)
Age:		
>20	4	5.00
20-29	23	28.75
30-39	30	37.50
40-49	12	15.00
50-59	8	10.00
>59	3	3.75 (37)
Sex		
Male	58	72.50
Female	22	27.50
Education		
No formal Education	39	48.75
Primary	13	16.25
Secondary	18	22.50
Tertiary	10	12.50
Household size		
<5	25	31.25
5-10	43	53.75
>10	12	15.00
Year of Experience		
1-5	9	11.25
6-10	17	21.25
11-15	11	13.25

16-20	13	16.25
21-25	21	26.25
26-30	5	6.25
>30	4	5.00
Farm years of establishment		
1-5	17	21.25
6-10	26	32.50
11-15	21	26.25
16-20	11	13.75
21-25	4	5.00
26-30	1	1.25

Source: Field survey 2016. N = 80

Table 1 revealed that the categories of respondents between the ages of 30-39 years had the highest percentage of about 37.50%. This indicates that a large number of youths participated in vegetable farming. Also, the results revealed that majority of the respondent were male 72.50% while 27.50% were the female. About 48.75% of the respondents had no formal education while 12.50% of the respondents had tertiary education. This implies that majority of the respondents had the technical knowhow of the use of organic fertilizers. Only about 16.25% of the respondents belonged to a cooperative society while the majority did not belong to any cooperative society and this might be as a result of the inadequate information on the importance of being a member of a cooperative society.

Reasons that encouraged the use of organic fertilizer by the vegetable farmers

The result in table 2 shows the various reasons that encouraged the vegetable farmers to use organic fertilizers on their vegetable farms. It was found that the easy availability and the cheapness of the organic fertilizers were the main reasons why vegetable farmers used organic fertilizer on their vegetable farms. One of the least reasons why vegetable farmers preferred to use organic fertilizer was because of its easy accessibility. The result was supported by the work of Odhiambo and Magandini, (2008) where they both identified availability and affordability as major reasons why farmers preferred one type of fertilizer over another and not because of easy accessibility.

Table 2: Reasons that encouraged the use of organic fertilizer by the vegetable farmers

Reason	Yes	No
Make more profit	57 (71.25)	23 (28.75)
Easy availability	66 (82.50)	14 (17.50)
Increase output	48 (60.00)	32 (40.00)
It is cheaper	71 (88.75)	9 (11.25)
Relatively safe	43 (53.75)	37 (36.25)
To manage waste	28 (35.00)	52 (65.00)
Easy Accessibility	33 (41.25)	47 (58.75)

Note: The values in parenthesis represent the percentage while the value outside represent the frequency

Source: Field survey data, 2016

Level of awareness on the use of organic fertilizer by the vegetable farmers

Table 3 revealed that all the respondents are aware of the use of organic fertilizer. However, majority (51.25%) of the respondents who did not belong to a farmer’s association got to know about the use of organic fertilizers from family and friends. Also, 31.25% of the respondents got their information from the extension agent, while 17.50% were aware through mass media. Benabise and Banciles (2012) had a different view as the stated that extension workers were channels through which farmers got awareness and information about the benefits of using organic fertilizers. Also the table revealed that majority of the respondents (67.50%) consistently used organic fertilizer while, 17.50% of the respondents never used it probably due to their personal preference.

Table 3: Means and level of awareness on the use of organic fertilizer by the vegetable farmers

Variables	Frequency	Percentage (%)
Means of information		
Farmers association	0	0.00
Mass media	14	17.50

Extension agent	25	31.25
Family member/Friends	41	51.25
Awareness		
Yes	80	100.00
No	0	0.00
Year of experience in using organic fertilizer		
0	14	15.50
1-5	11	16.67
6-10	19	23.75
11-15	23	28.75
16-20	9	11.25
>20	4	5.00
Frequency of use		
Always	54	67.50
Rarely	12	15.00
Never	14	17.00

Source: Field survey data, 2016

Effect of the Use of Organic Fertilizer on Vegetable Farmers Production

Table 4 showed the perceived effect of the use of organic fertilizer on vegetable farmers' production. The effects were ranked using the mean scores computed from the 4-point likert scale type. Better quality of the vegetable had the highest ranking of a mean score of 3.25. It was perceived as the highest effect for the use organic fertilizers on vegetable production, while high yield had the second rating of mean score of about 3.00. Table 4 also revealed that efficient waste management had a mean rating of 2.35 which ranked 5th, and environmental friendliness of the perceived effect of the use of organic fertilizer on vegetable production had the least ranking with mean score of about 1.95. This result complements the work of Okubena and Dipeolu (2015), on effects of organic, organominral and NPK fertilizer treatments on the sensory evaluation of *Amaranthus Cruentus*.

Table 4: Perceived Effect of the Use of Organic Fertilizer on Vegetable Farmers Production

Perceived effect	SA	A	D	SD	Mean	Rank
Better quality of the vegetable	37	31	7	5	3.25	1 st
High yield	42	13	8	17	3.00	2 nd
Environmental friendly	9	14	23	34	1.95	6 th
Low Purchasing price	39	9	12	10	2.71	4 th
Increase Income	29	26	7	18	2.83	3 rd
Efficient waste management	18	24	6	32	2.35	5 th

Source: Field survey data, 2016

Relationship between some selected socio-economic characteristics and the effects of the use of organic fertilizer on vegetable production

The relationship between some selected socio-economic characteristics and the perception on effect of the usage of organic fertilizer on vegetable production is presented in Table 5. Table 5 revealed that there was a positive relationship (0.548) between farm size and the perceived effect of the use of organic fertilizer on vegetable production in Kwara State and it was significant at Pvalue of 1%. Furthermore, the years of experience (0.381) and household size (0.279) were significant at Pvalue of 5%. This implies that farm size, household size and years of experience were factors of production. There was a negative relationship between the gender of the respondents and the perceived effect of the use of organic fertilizer on vegetable production which was significant at P.value of 5%. There was however no significant relationship between age, education status, farm years of establishment and the perceived effect of the use of organic fertilizer for vegetable production.

Table 5: Pearson correlation coefficient showing the relationship between some selected socio-economic characteristics and the effects of the use of organic fertilizer on vegetable production

Variable	Coefficient	P. value	RMK
Age	.179	.110	NS
Gender	-.267*	.016	Sig
Education status	.094	.403	NS
Year of experience	.381*	.010	Sig
Farm Years of establishment	-.146	.193	NS
Farm size	.548**	.002	Sig
Household size	.279*	.012	Sig

Source: Field survey data, 2016

*. Correlation is significant at the 0.05 level

**. Correlation is significant at the 0.01 level.

CONCLUSION AND RECOMMENDATIONS

The study examined the effect of organic fertilizer on vegetable production in Kwara state, Nigeria. The cheapness and availability of organic fertilizer in the study area were some of the factors that encouraged the use of organic fertilizer by the vegetable farmers. The main effects of the use of organic fertilizer were the improvement in the quality and yield of the vegetable produced. However, the environmental friendliness was the least perceived effect of the use of organic fertilizer on vegetable production. Finally, there was a significant relationship between some socio-economic variables (Farm size, gender, household size and farming experience) and the perceived effect of the use of organic fertilizer. In this regard, extension workers should educate the farmers on the environmental impact of the use of organic fertilizer. Also, Government should encourage famers, most especially vegetable farmers to use organic fertilizers due to its impact on the quality of their farm produce.

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