GROWTH AND YIELD RESPONSE OF *Telfairia Occidentalis* (HOOK F.) AS AFFECTED BY DIFFERENT RATES OF POULTRY MANURE

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ABSTRACT
The study was designed to investigate the effect of different rates of poultry manure on the growth and yield of fluted pumpkin (*Telfairia occidentalis* Hook F.) the treatment rates were; 0t/ha, 5t/ha, 10t/ha and 15t/ha poultry manure. The experimental design was a randomized complete block design replicated four times. The parameters measured were number of leaves, total leaf area (cm^2), number of pod per plant, weight of pod per plant (kg) and number of seeds per pod. The result showed that 10t/ha poultry manure performed better than the others in both growth and yield parameters, followed by 15t/ha while the plants in control plots gave the least performance. It is therefore recommended that 10t/ha rate of poultry manure should be applied to fluted pumpkin for optimum growth and yield in the study area.

Keywords: Poultry manure, Telfairia, Growth and Yield

INTRODUCTION
Telfaira occidentalis (Hook .F.) known as fluted pumpkin or Telfairia is a member of the family curcubitaceae (Schippers, 2002). It is a popular vegetable crop in Nigeria, Cameroun, Benin Republic Sierra Leone and Angola (Akoroda, 1990). The crop is commonly called "Ugu" by the Ibos of South Eastern Nigeria. It is often planted solely from seeds often close to fences and walls to provide support for the shoots (Lathan, 2002). *Telfaira occidentalis* leaves are palatable and nutritions (Olomola *et al.,* 2006). The leaves of fluted pumpkin are used in soups and porridges as the vegetative parts of the crop make an excellent vegetable rich in vitamin and has 37.3% protein content on a dry weight basis (Schippers, 2002). The leaves have medicinal values and are used for the treatment of anaemis and diabetes (Akanbi *et al.,* 2007). The tender vine and foliage are eaten as potherb, while the seed is consumed as a nut (Akoroda, 1990).

The seeds which can be boiled, roasted and eaten or ground into paste could be used for thickening soup (Fashina *et al.,* 2002). The seed contains 20% protein, 45% fat, 23% carbohydrate, 2.2% fibres and 1.8% total ash. The oil in the seeds is non-drying and contains lactating properties which are of high demand by nursing mothers (Akanbi *et al.,* 2007). The oleic and linoleic acid constitute over 63% of the fatty acids and that makes the oil useful in soup making and cooking, suitable for use in the manufacturing of pomade, margarine and as well as being carrier for certain drugs (Asiegbu, 1987; Akanbi *et al.,* 2007).

The production of Telfaira has been impeded by some constraints which include: the poor storability of the recalcitrant seed (Akoroda, 1990); dioeciously character of the crop and the demand pressure from the farmers, consumers and industrialists for the few available potential seeds of the crop (Akoroda, *ibid*; Fashina *et al.,* 2002). In Nigeria, especially southern eastern

part, there is widespread problem of soil degradation due to continuous cultivation of the soils (Schippers, 2002). The use of organic manure in maintaining soil fertility and productivity is a well known agricultural practice in many parts of the world. In many tropical soils, organic manure has been reported to be the major sources of nitrogen, phosphorus, potassium, calcium as well as magnesium (Awodin, 2007). Organic manure when properly applied have the potentials of improving soil infiltration capacity as well as raising the organic manure have been known to stabilize soil aggregates and impact beneficent effects on the structure of the soil (Ojeniyi, 2006). The objective of this study was to determine the effect of different rates of poultry manure on the growth and yield of Telfairia in Nsugbe area of Anambra State.

MATERIALS AND METHODS

Field experiment was carried out at the Teaching and Research Farm of Department of Agricultural Education, Nwafor Orizu College of Education, Nsugbe, Anambra State ($6^0$25'N, $6^0$82E) during the 2012 cropping season to determine the effect of different rates of poultry manure on the growth and yield of *Telfairia occidentalis*. Nsugbe is located in the tropical rainforest zone with an annual rainfall ranging from 1,500mm to 2,000mm and are characterized by a bimodal rainfall pattern that peaks in July and September with a short dry spell in August (NIMET, 2011). The site was cleared manually using local implement. The experiment was laid out in a randomized complete block design, replicated four times. Seed beds measuring 3m x 3m and 0.5m apart were prepared to a fine tilt. The treatment comprised of four levels of poultry manure (0, 5, 10 and 15 t/ha) on dry weight basis. The cured poultry manure was obtained from the college poultry farm and was incorporated manually with hoe after broadcasting at two weeks before planting. The seeds were planted at the rate of 2 seeds per hole at a spacing of 75cm x 75cm (35,556 plants/ha). Data were collected at three week intervals on number of leaves, total leaf area (cm^2), weight of pod per plant (kg), number of pod per plant, number of seeds per pod. Data collected were subjected to Analysis of variance using SAS (2010) and treatment means were separated using Duncan multiple range test at 5% level of probability.

RESULTS AND DISCUSSION

The results in Table 1 show the physico-chemical properties of the soil of the experimental area and poultry manure used. The result showed that the soil is slightly acidic and very low in essential element, hence the need for additional nutrient amendment to the soil. The poultry manure was rich in plant nutrients and the acidity was near neutral. The result revealed that there were significant increases in number of leaves of fluted pumpkin with plant age. Significant difference ($P<0.05$) were observed among the different rates of poultry manure all through the sampling period except at 3^{rd} week after sowing (Table 2). Plants sown on plot treated with 10t/ha rate of poultry manure had the highest values of 7, 11, 18 and 20 as number of leaves respectively across the sampling periods while plants in the control plot had the least values as number of leaves throughout the sampling periods.

The result obtained on total leaf area indicated that there were significant differences ($P<0.05$) among the different rates of poultry manure throughout the sampling period. Plants sown on plots treated with 10t/ha poultry manure had the highest total leaf area at 3^{rd}, 6^{th}, 9^{th} and 12^{th} WAS with the values of 80.60cm^2, 191.0cm^2, 477.20cm^2 and 698.0cm^2 respectively (Table 2). This may be attributed to the sufficient release of nutrients particularly N.P.K contain in the poultry manure applied, as these nutrients tend to fasten the growth of all crops. This result is

consistent with the findings of Agbede (2008) who found out that the number of leaves of crop significantly increased with increase in the concentration of poultry droppings. Supporting the above Sanwal *et al.* (2007) reported that farmyard manure application significantly increased number of branches and growth of crops.

The result on yield parameters indicated that significant differences ($P<0.05$) were observed among the different rates of poultry manure used in the study. The application of 10t/ha rate of poultry manure resulted in highest number of pod per plant (4.5), weight of pod per plant (6.8kg) and number of seeds per pod (35) respectively. This superior performance was followed by plants that received 15t/ha rate of poultry manure (Table 3). This is in line with the findings of Ghorbain *et al.* (2008) who reported that tomato fruit weight increased with increasing manure source. These findings are also in agreement with the findings of Sanwal *et al.* (2007), as well as Premsekhar and Rajashree (2009) who reported that higher yield responses of crops due to organic manure application could be ascribed to improved physical and biological properties of the soil result in better supply of nutrients to the plant. Agbede (2008) reported that fruit and fruit quality is improved as a result of application of poultry manures.

CONCLUSION

Telfairia is one of the most important leafy vegetables among Nigerians. The application of 10t/ha rate of poultry manure resulted to optimum yields of Telfairia. It can therefore be recommended for Telfairia production in the tropical rainforest.

Table 1: Physico-Chemical Properties of Soil Sample of the Experimental Site and Poultry Manure Used

Properties	Soil sample	Poultry manure
Sand	82.2	-
Silt	10.9	-
Clay	6.9	-
PH(H_2o)	5.9	7.2
Organic carbon gkg^{-1}	0.58	8.30
Total nitrogen	0.46	1.26
Available P ($Mgkg^{-1}$)	6.75	6.90
Exchangeable bases ($Cmolkg^{-1}$)		
N_+9^+	0.16	0.12
K	0.17	8.03
Ca^{2+}	0.92	3.08
Mg^{2+}	1.50	0.45
CEC	3.75	-

2: Effect of Different Rates of Poultry Manure on Number of Leaves and Total Leaf Area (cm^2) Of Telfairia

Treatments t/ha	No of Lvs	TLA(cm^2)3	No of Lvs	TLA(cm^2)6	No of Lvs	TLA(cm^2)9	No of Lvs	TLA(cm^2)12
0	4^a	15.34^d	6^b	64.20^d	7^d	94.6^d	9.0^c	139.0^d
5	5^a	23.3^c	8^b	89.0^c	11^c	126.1^c	14.0^b	243.4^c
10	7^a	80.3^a	11^a	191.0^a	18^a	477.2^a	20.0^a	698.0^a
15	6^a	71.3^b	10^a	140.0^b	15^b	301.9^b	19.0^a	508.5^b

Means with the same letter(s) on the same column are not significantly different at $P>0.05$ level of probability using DMRT (Lvs = leaves, TLA = Total leaf area).

Table 3: Effects of Different Rates of Poultry Manure on Number of Pod/Plant, Weight of Pod/Plant (kg/ha) and Number of Seeds per Pod

Treatments t/ha	Number of pod per plant	Weight of pod (kg/ha)	Number of seeds per pod
0	2.0^{c}	2.5^{c}	20
5	3.3^{b}	2.8^{c}	25
10	4.5^{a}	6.8^{a}	35
15	4.0^{a}	5.0^{b}	32
Se ±	0.57	3.71	21.27

Means with the same letter(s) on the same column are not significantly different at P>0.05 level of probability using DMRT.

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