EFFECTS OF LEGUME-BASED COMPOUNDED ORGANIC FERTILIZERS ON GROWTH, NUTRITIVE VALUE AND BIOMASS YIELD OF *AMARANTHUS HYBRIDUS* (LINN.) IN UMUDIKE, NIGERIA

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ABSTRACT

A field trial was conducted to evaluate potentials of locally manufactured organic fertilizers –compounded composts made from vegetal matter of six locally available legumes (*Centrosema pubescens*, *Mucuna bracteata*, *Calopogonium mucunoides*, *Mucuna pruriens*, *Lablab purpureus*, and *Stylosanthes capitata*) respectively composted with rice husk, poultry waste and swine waste in the ratio 5:4:4:4 dry weigh - on Amaranthus crop production at Umudike, Southeast Nigeria. The growth media (topsoil mixed respectively with each of the 6 organic fertilizers produced, top soil mixed with NPK 15:15:15 fertilizer, and Topsoil only as Control) were the 8 treatments. A sample size of four *Amaranthus* plants made up 32 plants per block, and a total 96 plants in a Randomized Complete Block Design in 3 replications. The experiment was monitored for 9weeks after planting (WAP) with the plant's growth parameters measured weekly. Data collected on plant height (cm), girth (cm), number of leaves, biomass production and proximate analysis were subjected to statistical analysis of variance (ANOVA) at $P<0.05$. The results show significant differences in the growth parameters and nutritive value of the *Amaranthus* raised in the compounded organic fertilizer treatments than the NPK and Control treatments. Highest values were recorded in *L. purpureus* manure treatment and *C. pubescence* manure treatment while the control treatment recorded the least values. The organic fertilizers enhanced *Amaranthus* growth, nutritive value and biomass production indicating that the use of legume-based compounded organic fertilizers have potentials for enhancing crop production, restoring soil and agroforest ecosystem of southeasthern Nigeria; and therefore should be recommended.

KEY WORDS: Organic fertilizers, legumes, plant growth, agricultural productivity.

INTRODUCTION

Amaranthus is one of the most important annual leaf vegetables in the tropics (Makinde *et al.*, 2010). The plant has been widely regarded as a stubborn weed or food for the poor in the past years especially in many parts of Africa, but for the past one decade there has been a sharp rise in the demand and consumption of Amaranth. This can be attributed to increased awareness on the importance as a valuable source of food, medicine and income for small-scale farmers (Maundu *et al.*, 1999). Compared to other leafy vegetables *Amaranthus* is reported to be remarkably rich in Vitamins A, C and other minerals which include iron, calcium, folate, and amino acids with high levels of sulphur (PROTA, 2004). However, high incidence of pest infestation and disease of *Amaranthus* in Nigeria, as well as poor soil fertility of especially southeastern Nigeria has adversely affected the cultivation of *Amaranthus* in the country (Odebunmi-Oshilanu, 1977; Kagali *et al.*, 2013**).**Viglasky *et al.* (2009) reported the potentials of *Amarathus* to playing an important role as a raw material source for industrial biofuel production as well as for environmental protection in this century. This is because Amaranth is a plant species with the C4 photosynthetic pathway. These plant species are distinguished by a significantly high DM yield potential and lower quality in comparison with plant species with the C3 photosynthetic pathway. Although numerous species are becoming an increasingly important resource for healthy food and fodder in many countries (Viglasky *et al.*, 2009), the main constrain is the limited research that has been put in to enhance the production (Maundu *et al.*, 1999). Makinde *et al.* (2010) noted that although the crop responds to organic manure, studies on effect of organic wastes, crop residues and integrated application of organic and inorganic fertilizers on performance of *Amaranthus* are scarce.

Legumes, members of the large family of plants known as *Leguminosae*, are known for their high crude protein content. Among other uses such as food for humans, animal feed including grazing livestock in animal husbandry, as ground cover for protection of soil from erosion and suppression of weeds, legumes are very useful in soil nutrient and fertility management (Nwosu *et al*., 2011). Not only do they fix highly needed nitrogen to the soil through the activities of microorganisms inhabiting their root nodules, their organic matter is rich in mineral elements such that leguminous cover crops add significant organic matter to the soil through leaf litter fall (Nwosu*et al*., 2011). Soils in which legumes are either grown or incorporated have been reported for enhanced chemical, physical and biological properties (Rao and Mathuva, 2000; Nwosu *et al.*, 2011; Ngome *et al.*, 2011). These legumes are found commonly growing in the wild, largely because much of their uses are unknown (Karachi, 1997) and this may be why some species are reported as under threat of extinction (Chadburn, 2012). In the light of the growing usefulness of *Amaranthus*, research efforts to enhancing its productionand quality are crucial. This research work is a field trial to evaluate the effects of locally manufactured legume-based compounded organic fertilizers on the growth, nutritive value and biomass yield of *Amaranthushybridus*.

MATERIALS AND METHODS

Study area: The experiment was carried out at the Nursery Unit of the Department of Forestry and Environmental Management (FOREM), Michael Okpara University of Agriculture Umudike (MOUAU), Abia State. Umudike is situated within 50 30'N and 70 31'E on the lowland rain forest of Nigeria, at an elevation of 122 meters above sea level (Nwosu *et al.*, 2011). Annual rainfall ranges from 1800mm to 2200mm with the intensity reaching up to 100mmhr-1. Temperature is high throughout the year with a range of 330C -350C as the maximum and 280C to 290C (Nwosu *et al.*, 2011), while relative humidity varies from 51% to 87%. The soil is acid sandy loam in the ultisol group (Omenihu *et al*., 2011).

Seeds: 50g of *Amaranthus* seeds were purchased from the grocery of the College of Crop and Soil Sciences, MOUAU.

Fertilizers: Fertilizers used for the study were NPK 15:15:15 and six different legumes-based organic fertilizers produced from composting vegetal matter of each of the six legumes (*Centrosema pubescens, Mucuna bracteata, Calopogonium mucunoides, Mucuna pruriens, Lablab purpureus, and Stylosanthe scapitata*) respectively with rice husk, poultry manure and swine dung in the ratio 5:4:4:4. Mineral element compositions of the organic fertilizers were determined *ab initio*at the laboratory of National Root Crop Research Institute (NRCRI), Umudike (Table 1).

Top soil and Germination: Top soils were collected from a uncultivated farm land besides the Nursery Unit of FOREM, bulked, properly mixed and sieved to remove large particles, roots and debris. The composite soil sample was analyzed for physico-chemical properties (Table 3) at the Soil Laboratory, NRCRI, Umudike, using standard methods of soil analysis described by Udo *et al.* 2001). *Amaranthus* seeds were broadcasted and germinated in germination boxes.

Experimental Layout: Ten grams (10g) of the soil was also collected into a total of ninety eight (98) poly pots measuring 35cm × 30cm and arranged in a Randomized Complete Block Design in three replications (Plate 1). The soils in the poly pots were then treated with appropriate fertilizer (10t/ha of the respective organic fertilizers, 800kg/ha NPK 15:15:15 and a Control No fertilizer treatment) (Table 1). Uniformly growing vigorous *Amaranthus* seedlings were carefully transplanted into poly pots containing appropriate growth media one plant per pot. Watering was once daily while weeding was done manually with hoe.

Plate 1: Experimental plot/layout

Table 1: Experimental treatments

Treatments	Description of treatment
1	20 t/ha *C. Pubescens* compost mixture
2	20 t/ha *M. bracteata* compost mixture
3	20 t/ha C. mucunoides " "
4	20 t/ha M. pruriens compost "
5	20 t/ha L. purpuriens " "
6	20 t/ha S. capitate " "
7	1,600kg/ha NPK 15:15 fertilizer.
8	Control

Table 2.Mineral composition of the legume-based compounded organic fertilizers (g/Kg).

Legumes compost	**N**	**P**	**K**	**Ca**	**Mg**	**Na**	**Org C**	**Org M**
C. pubescens	29.40	9.99	7.75	32.10	10.34	3.25	306.0	527.5
M. bracteata	32.20	11.70	4.25	40.20	17.60	1.75	306.0	528.0
C. mucunoides	30.80	10.30	8.00	38.20	10.94	3.50	347.7	590.9
M. pruriens	23.10	8.81	7.00	24.10	12.20	2.76	265.2	457.2
L. purpureus	33.60	11.20	4.50	30.10	12.20	4.00	289.7	499.4
S. capitata	28.70	10.50	4.00	28.10	11.60	3.25	240.7	415.0

Table 3: Physico-chemical properties of the soil used for the experiment

Parameters	Value
pH	5.40
Organic Carbon (OC) %	1.88
Total Nitrogen (TN) %	0.16
Organic Matter (OM) %	1.84
Calcium (Ca) cmolkg-1	2.60
Magnesium (Mg) cmolkg-1	1.00
Potassium (K) cmolkg-1	0.08
Sodium (Na) cmolkg-1	0.23
Phosphorus (P) mgkg-1	16.80
Sand %	46.40
Clay %	34.20
Silt %	19.40
Texture	Sand Clay

Proximate Analysis: The plant samples were also analyzed for moisture, protein, crude fibre, ash, fats, carbohydrates and energy content at NRCRI, Umudike.

Data Collection: Data on growth parameters such as height, collar diameter, and leaf area were collected weekly. Plants heights (cm) were measured using measuring tape from soil level in the poly pot to the apex of the plant. Collar diameter (cm) were determined using veneer caliper at the collar region. Leaf areas (cm^2) were determined by tracing leaf outline on graph sheet and counting the number of squares. Plants biomass production was determined at 7 weeks after planting (WAP**).** Two randomly selected seedlings were uprooted from each treatment. Soils were washed of the roots and the samples oven-dried at 70^0C weighing and reweighing until a constant weight was achieved. Proximate

Data Analysis: Data collected were analysed using Analyses of Variance (ANOVA) at P<0.05. Significant differences were separated using Duncan Multiple Range Test (DMRT) at P<0.05.

RESULTS AND DISCUSSION

Effect of Fertilizers on Height Growth of *Amaranthus* (Cm)

The plant height varied significantly between treatments in the various weeks (Table 4). At 4WAP, *Amaranthus* treated with *L. purpureus* fertilizer recorded highest height (14.95±0.26) while the control (10.16±0.52) had the least plant height. Height of *Amaranthus* treated with *C. pubescence*, *M. bracteata*, *C. mucunoides*, *M. pruriens* and *L. purpureus* fertilizers were not significantly different, but were significantly higher than heights of *Amaranthus* treated with NPK 15:15:15 and the control from 4 WAP. The findings indicated that the organic fertilizers enhanced the plant's growth better than the NPK 15:15:15 and control. This is likely due to better nutrient supply to the plants from the applied compounded organic fertilizers. The result support reports that application of manure enhanced the performance of *Amaranthus* (Okokoh and Bisong, 2011; Mshelia and Degri, 2014), and that organic fertilizers supply the essential plant nutrients that enhances growth, development and optimum productivity of crops (Basso and Ritchie, 2005; Akanbi *et al.*, 2010; Quattara *et al*., 2008; Chukwuka *et al.*, 2014). The findings also support report of a rich nutrient composition of legume composts (Adamu *et al***.,** 2014).

Table 4. Effect of Fertilizers on Height of *Amaranthus* (Cm).

TREATMENTS	4WAP	5WAP	6WAP	7WAP	8WAP	9WAP
T1 (*C. pubescens)*	13.55±0.54bc	30.28±2.24b	47.38±1.29c	60.67±2.40c	62.67±2.40bc	69.21±3.45c
T2 (*M. bracteata)*	13.37±0.87bc	27.32±2.98b	44.55±1.79c	53.33±4.64c	58.67±5.96bc	60.38±5.23bc
T3 (*C. mucunoides)*	13.75±1.52bc	28.00±2.18b	46.82±i.93c	57.00±1.04c	57.83±0.33bc	63.88±2.10bc
T4 (*M. pruriens)*	12.86±1.11abc	31.72±2.87b	43.47±3.81bc	53.17±6.80bc	52.17±6.07bc	63.67±8.02bc
T5 (*L. purpureus)*	14.95±0.26c	28.28±3.37b	50.52±1.54bc	62.33±2.60c	66.63±225c	72.03±8.7c
T6 (*S. capitata)*	12.37±1.20abc	25.33±2.81ab	43.43±0.42bc	51.17±6.30bc	51.95±1.02bc	58.52±2.03bc
T7 (NPK 15:15:15)	11.35±0.35ab	24.87±1.45ab	35.33±1.45b	43.33±2.42ab	48.13±1.35b	49.33±1.74ab
T8 (Control)	.10.16±0.52a	18.72±1.14a	23.70±5.42a	32.33±2.38a	34.90±0.bca	38.78.±1.59a

abcdeMeans ± SE with similar superscripts in the same column are not significantly different (P >0.05)

Effect of the Fertilizers on Number of Leaves of *Amaranthus*

There was significant difference in the number of leaves of *Amaranthus* with treatments (Table 5). At 4 WAP *L. purpureus and C. Pubescens* organic fertilizer treatments had the highest number of leaves with a mean value of 13.67. The Control had significantly least number of leaves (7.17±1.17) than all the compounded organic fertilizers and the NPK treatments. At 9 WAP *L. Purpureus organic* fertilizer treatment had the highest number of leaves (32.17±2.02), followed by *C. Pubescens* (29.33±2.33) and *C. mucunoides* (28.83±0.17) fertilizer treatments; and they all were significantly different from *S. Capitata* (23.33±0.88), NPK (21.83±0.60) and the Control (18.50±1.15) treatments. Higher nutrient supply to the plants by the organic fertilizers may have provided a balance of the uptake of essential nutrients, facilitating plant metabolisms, growth and leaf production in the organic fertilizers treatments. The findings support that manures enhance performance of *Amaranthus* (Okokoh and Bisong, 2011; Mshelia and Degri, 2014). Mshelia and Degri (2014) reported significant increase in leaf width, leaf length and mean number of leaves per plant by application of poultry manure on *Amaranthus*. It also supported report that the nutrient composition of legume composts is rich (Adamu *et al***.,** 2014).

Table 5. Effect of the Fertilizers on Number of Leaves of *Amaranthus*

abcdMeans±SE with similar superscripts in the same column are not significantly different (P > 0.05)

TREATMENTS	4WAP	5WAP	6WAP	7WAP	8WAP	9WAP
T1 (*C. pubescens)*	13.67±0.17b	17.66±1.42b	21.83±1.01b	24.50±0.58bc	25.00±0.76c	29.33±2.33d
T2 (*M. bracteata)*	13.00±0.50b	17.00±0.76b	21.33±1.69b	23.50±0.76bc	23.50±0.76bc	28.00±1.00cd
T3 (*C. mucunoides)*	13.00±1.15b	17.33±0.73b	21.83±0.83b	24.00±0.76bc	24.00±0.76bc	28.83±0.17d
T4 (*M. pruriens)*	12.50±1.00b	16.33±1.45b	21.17±1.59b	23.00±3.00bc	25.67±0.33c	27.83±0.16cd
T5 (*L. purpureus)*	13.67±1.09b	18.67±0.88	22.23±0.63b	26.50±1.26c	26.50±1.26c	32.17±2.02d
T6 (*S. capitata)*	12.17±0.44b	16.50±0.50b	20.67±1.04b	20.67±2.72ab	21.33±2.33bc	23.33±0.88bc
T7 (NPK 15:15:15)	10.83±1.09b	15.67±0.93	18.33±0.45ab	18.50±0.28ab	43.17±3.49ab	21.83±0.60ab
T8 (Control)	7.17±1.17a	11.00±0.59a	14.83±2.09a	16.83±0.67a	40.33±5.36a	18.50±1.15a

Effect of Fertilizers on Girth of *Amaranthus* (cm)

Table 6 shows that *Amaranthus* girth also varied significantly with the various fertilizer treatments. At 4WAP, the plant girth was highest (1.60±0.26) in the *C. Pubescens* organic fertilizer treatment, followed by the *L. purpureus* fertilizer treatment (1.58±0.23), while least girth value was recorded in the Control (0.48±0.06). At 9WAP, *Amaranthus* treated with *L. purpureus* organic fertilizer had the highest girth (5.60±0.19), followed by *C. Pubescens* organic fertilizer treatment (5.00±0.43). The least girth was recorded in the Control (3.48±0.20) though it was not significantly different from girth value of the NPK fertilizer treatment. The higher girth values in the organic manure treatments could be due to higher nutrient supply to the plants by the organic fertilizers. The findings supported reports that manures enhance the growth performance of plants by facilitating the plant metabolisms (Okokoh and Bisong; 2011; Mshelia and Degri, 2014; Akanbi *et al*,.2010; Quattara*et al*., 2008). It also supports Adamu *et al.* **(**2014) who reported a rich nutrient composition of legume composts.

Table 6. Effect of Fertilizers on Girth of *Amaranthus* (cm).

TREATMENTS	4WAP	5WAP	6WAP	7WAP	8WAP	9WAP
T1 (*C. pubescens)*	1.60±0.26b	3.05±0.15b	4.13±0.26de	4.45±0.20cd	4.90±0.17cd	5.00±0.43bc
T2 (*M. bracteata)*	1.41±.0.09b	3.18±0.18b	4.02±0.22cde	4.23±0.20bc	4.45±0.20bc	4.80±0.51bc
T3 (*C. mucunoides)*	1.57±0.06b	3.08±0.23b	3.82±0.13cd	4.13±0.17bc	4.13±0.17b	4.63±0.13b
T4 (*M. pruriens)*	1.53±0.16b	2.97±0.26b	3.63±0.07cd	4.00±0.17bc	4.47±0.23bc	4.78±0.17bc
T5 (*L. purpureus)*	1.58±0.23b	3.23±0.08b	4.56±0.19e	4.86±0.03d	5.05±0.18d	5.60±0.19c
T6 (*S. capitata)*	1.40±.0.20b	2.93±0.50b	3.50±0.15bc	3.97±0.09b	4.03±0.03b	4.56±0.21b
T7 (NPK 15:15:15)	1.10±0.09b	2.67±0.25b	3.02±0.10ab	3.88±0.05b	4.14±0.13b	4.14±0.79ab
T8 (Control)	0.48±0.06a	1.73±0.13a	2.53±0.29a	3.22±0.11a	2.98±0.25a	3.48±0.20a

[abcde]Means ± SE with similar superscripts in the same column are not significantly different (P > 0.05)

Effect of Fertilizers on Dry Matter Production of *Amaranthus* (g/plant)

The dry matter production of *Amaranthus* treated with *L. Purpureus* compounded organic fertilizer treated plants yielded the highest dry matter (18.91±0.19), followed by *C. pubescens* organic fertilizer treatment (17.86 cd±0.76)(Table 7). The least dry matter yield was by the Control (9.84a±0.61) which was significantly less than the dry matter yield of the NPK treatment (13.61b±1.08). The higher dry matter yield in the organic fertilizer treatments could be due to higher nutrient supply to the plant by the compounded organic fertilizers. The findings support FAO (1974) and Ibrahim and Fadni (2013) that organic matter sustains the fertility of soil for good production of vegetables. It also supported Adamu *et al.* **(**2014) that the nutrient composition of legume composts is rich.

Table 7. Effect of Fertilizers on Dry Matter Production of *Amaranthus* (g/plant)

Treatments	Dry Weight
T1 (*C. pubescens)*	17.86 cd±0.76
T2 (*M. bracteata)*	16.93 cd±0.19
T3 (*C. mucunoides)*	17.61 cd±0.69
T4 (*M. pruriens)*	17.59 cd±0.59
T5 (*L. purpureus)*	18.21±d0.19
T6 (*S. capitata)*	16.95c±2.29
T7 (NPK 15:15:15)	14.61b±1.08
T8 (Control)	12.84a±0.61

[abcd]Means ± SE with similar superscripts in the same column are not significantly different (P > 0.05)

Proximate Composition of *Amaranthus* Grown with the Fertilizers (mg/100g dry matter)

There is significant treatment effect in nutrient composition of *Amaranthus* (Table 8). The moisture content of NPK treatment was highest (6.44±1.21), while *S. capitata* organic manure treatment recorded the least moisture content (5.10±0.64). *Amaranthus* grown with *S. capitata* organic fertilizer could be more preferable for commercial production purposes since higher moisture content in food material is said to be related to higher chances of microbial attack (Ihemeje *et al.*, 2013).The ash content of *L. purpureus* organic fertilizer treatment (14.70±0.58) is highest of all the treatments, while the least value was recorded in the Control (12.30±1.33). It indicated potential for higher nutrient supply by the *L. purpureus* organic fertilizer since higher ash content is reflective of greater mineral content (Ihemeje *et al*, 2013). The protein content of the *Amaranthus* plants were generally high, supporting reports that protein content in the plant is higher than that of most vegetables (PROTA, 2004, Idris, 2011). The least protein content was recorded in the control (13.13±0.2) while the highest was recorded in the *L. Purpureus* organic fertilizer treatment (18.81±0.61). The carbohydrate content of Amaranthus in the Control (39.45±0.22) was the least of all the treatments, followed by the NPK treatment (46.30±1.17). The *S. capitata* organic fertilizer treatment recorded the highest carbohydrate content value of 53.67±1.35, followed by *C. mucunoides* organic fertilizer treatment (52.99±1.65). However, the carbohydrate content of the *Amaranthus* plants in all the treatments was higher compared to those reported for *Telfairia occidentalis* (Ihemeje *et al*., 2011; Idris, 2011). Carbohydrates provide the body with a source of energy required to carry out daily activities and exercise. The high carbohydrate value indicated a high energy value which may be why *Amaranthus* plant is being considered as a raw material source for industrial biofuel production as well as environmental protection in this century (Viglasky *et al.*, 2009).*M. bracteata* organic fertilizer treated *Amaranthus* plant has the highest energy value (338.14±1.82), followed by *L. purpureus* organic fertilizer treatment (333.34±2.12). The Control treatment had the least value (311.60±1.83) which is significantly less than the NPK fertilizer treatment (321.10±0.47). Generally, the findings show a high nutritive value of *Amaranthus* plant supporting the claim that it is one of the most important annual leaf vegetables in the tropics (Makinde *et al.*, 2010). It justifies the increasing awareness on the importance of the plant as a valuable source of food, medicine and income for small-scale farmers (Maundu *et al*., 1999). However, the nutritional value of the compounded organic fertilizer treated *Amaranthus* were higher than that of the Control and the NPK fertilizer treatments thereby supporting Makinde *et al.* (2010) that the crop responds to organic manure.

Table 8. Proximate Composition of *Amaranthus* Grown with the Fertilizers (mg/100g dry matter)

	Parameter and Concentration							
Treatments	**MC (%)**	**DM (%)**	**Ash (%)**	**CF (%)**	**CP (%)**	**EE (%)**	**CHO (%)**	**Energy.v KJ/Kg**
C. pubescens	5.60±1.4ab	94.62±1.0c	14.25±2.4c	12.80±0.7a	14.44±0,4	8.50±0.8	46.71±0,2bc	331.60±1.4c
M. bracteata	6.20±0.7b	94.40±0.7c	13.90±0.4bc	16.10±0.7d	12.69±0.6a	8.90±0.2c	51.71±1.1c	338.14±1.8c
C. mucunoides	5.34±0.9ab	92.62±1.0b	13.76±1.0a	14.60±1.3bc	12.25±1.4a	7.20±0,2ab	52.99±1.7c	325.76±2.4b
M. pruriens	6.35±2.3b	93.80±0.3bc	14.15±0.6c	16.04±2,1d	12.81±0.6a	9.10±0.3cd	50.75±0.8c	332.14±1.6c
L. purpureus	5.40±0.9ab	94.66±1.2c	14.70±0.6c	14.14±1,0c	16.81±0.6c	8.10±0.7c	50.82±1.7c	333.34±2.1c
S. capitata	5.10±0.6a	93.56±0.7bc	13.45±0.7a	13.88±0.8bc	14.00±1.1b	6.00±0.5a	53.67±1.4c	324.68±2.4b
NPK 15:15:15	6.44±1.2b	92.55±2.0b	13.65±0.9bc	13.90±1.5bc	14.75±0.4b	9.20±0.9cd	46.30±1.2bc	321.10±0.5
Control	5.34±0.2a	91.90±3.2a	12.30±1.3a	15.70±0.5cd	12.13±0.3a	6.20±1.7a	39.45±0.2a	311.60±1.8a

[abcd] Means ± SE with similar superscripts in the same column are not signifi±cantly different (P > 0.05).

MC (Moisture content), DM (Dry Matter), CF (Crude Fibre), CP (Crude Protein), Ether estract (fats), CHO (Carbohydrate),

CONCLUSION AND RECOMMENDATIONS

Leguminous species are increasingly appreciated for their roles in nutrition and in soil fertility amendment. Nigeria is endowed with numerous underutilized leguminous species, many of which are growing in the wild and as weeds. The vegetal matters of the legumes are rich in minerals and plant nutrient in varying levels. The use of these relatively abundant organic materials for organic fertilizer production has enormous potential usefulness in soil management, biodiversity conservation and agro-ecosystem stabilization in Nigeria. The compounded organic fertilizers which were manufactured using legumes matter, rice husk, poultry manure and swine dung enhanced the growth, nutritive value, and biomass production of *Amaranthus. Lablab purpureus*, *Mucuna bracteata* and *Mucuna pruriens* based compounded organic fertilizers have higher adaptability based on the growth attributes of the test plant assessed and are highly recommended for crop and soil productivity enhancement initiatives in southeastern Nigeria.

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