Influence of Cow Manure and Variety on Growth and Yield of Sesame (*Sesanumindicum* L.) in Lafia, Nasarawa State

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ABSTRACT

A trial to investigate the effect of cow manure and variety on growth and yield of sesame (*Sesamumindicum* L.) was conducted at the Teaching and Research Farm of the Faculty of Agriculture, Shabu – Lafia Campus, Nasarawa State University Keffi, Nasarawa State, Nigeria, during the 2018 and 2019 cropping seasons. The trial was a 4 x 6 factorial experiment consisting of six varieties namely NCRIBEN 01M, NCRIBEN02M, NCRIBEN 03M, NCRIBEN 04E, NCRIBEN 05E and E-8 with four level of cow manure at (0,5,10 and 15 t/ha). The experiment was fitted into Randomized Complete Block Design (RCBD) with three replications. Data collected on growth parameters included plant height, number of branches and number of leaves. The results showed that varieties differed significantly across all parameters. The application of 15 $kgha^{-1}$ of cow manure significantly produced taller plants, higher number of leaves and number of branches, whereas the control significantly delay flowering. From this study it was observed that the use of variety E-8 in combination with application of 15$kgha^{-1}$ of cow manure was promising for maximum growth and yield and may be recommended for higher production of sesame in the Northern Guinea Savannah of Nigerian.

Keywords: cow manure, variety, *Sesamumindicum* L.

Introduction

Sesame (*Sesamumindicum*L.) is an oil crop belonging to the family Pedaliaceae. It is an important crop to Nigerian agriculture because it is quite extensively cultivated in the country. It is grown in tropical and subtropical regions of Africa, Asia, Latin America with India and Ethiopia. It is the most ancient oil seed known by man. Sesame oil is known as the king of all vegetable oil (Kashani *et al.,* 2015). Sesame seed popularly called "big treasure in small capsules" is currently ranked as the second best to cocoa in term of export volume and value (NEPC, 2010). The major producing areas in Nigeria are Nasarawa, Jigawa, Benue, Yobe,

Kano, Katsina, Gombe others are Taraba and Adamawa. World production in 2020 was 6.01600MT grown on 11,743,000 ha with an average yield of 512kg ha^{-1}. Asia and Africa produced nearly 97% of the world supply of sesame. Sudan devotes the greatest acreage but has one of the lower records for yield per hectare. Tanzania produces nearly 14.6% followed by Myanmar at 12.78% and India at 12.4% (FAOSTAT, 2020). Naturland (2002) identified some local varieties cultivated within the tropics and subtropics as the black, white, brown colour and KS-S6. The local sesame varieties are branched and drought resistant but have a low yielding capacity and are susceptible to most diseases. The black, white and brown colour varieties yield ranges from 0.5-0.9 t/ha while KS-S6 can give an average yield of 0.9-1.0 t/ha compare to the improve varieties which yield from 1.0-1.8 t/ha(USAID, 2009).

Organic materials are major source of organic matter and plant nutrients incorporating organic material (cow manure) into soil results in improved soil physical attributes such as soil structure, soil aggregate stability, water holding capacity, soil drainage, soil aeration and root penetration and soil chemical attributes namely; soil nutrients content and composition and soil pH. The application of organic manure would most likely improve growth, yields and seed quality (*Craswell* and *Lefroy,* 2001). Duhoon *et al.* (2015) buttressed that where chemical fertilizers are available, excessive usage increases pollution, decreases soil productivity and lead to nutrient imbalance.

The continuous cultivation, couple up with increased in population and industrial development, the land become so small that each pieces of land is put into production year in year out, which lead to loss in fertility. The cost of inorganic fertilizer which many household could not afford to increase yield and poor quality seed can result to low yield. Cow manure is commonly available and affordable. It has the capacity to increase soil fertility status, increase soil physical structure and improve water holding capacity of the soil. There is paucity of information on the combine use of sesame variety and cow manure. This study therefore seeks to assess the growth and yield of sesame varieties under varying cow manure.

Materials and Methods

Experimental Site

Field experiments were conducted during the rainy seasons of 2018 and 2019 at the Research field of Faculty of Agriculture Shabu-Lafia Campus Nasarawa State University, Keffi. Located in the Northern Guinea Savanna Ecological zone of Nigeria, at Longitude 0.8^{o}, 33^{l}North and Latitude 0.8^{0}, 32^{l}East.

The experiment consisted of 4 x 6 factorial combination of four levels of cow manure, 0, 5, 10 and 15t/ha and six (6) varieties of sesame including NCRIBEN 01M, NCRIBEN 02M, NCRIBEN 03M, NCRIBEN 04E, NCRIBEN 05E and E – 8. The treatments were laid out in a Randomized Complete Block Design (RCBD) with three replications. The gross plot size was 3m x 3m ($9m^2$) and net plot size was 3m x 1.5m ($4.5m^2$). The field was cleared of all shrubs with pegs used for field layout. Ridges were constructed manually at 75cm between rows and then the field was marked into plots and replicated. A border of 1m gap was left between plots, while 1m was maintained between replications.

The four levels of cow manure were applied by opening the top ridge and covered according to treatment combination and allowed to decomposed two weeks before seed sowing.A pinch of sesame seed was sown at 10cm plant spacing on a 75cm ridge and covered thinly with soil and later thinned to three plants per stand at 3 weeks after sowing (WAS). Diseases and pest infestation was closely monitored, Hoe weeding was carried out at 3, 6 and 9 WAS to reduce

competition for nutrients. The crop was due for harvest when the leaves and stem shows yellowish that is change from green. The mature plant were cut at the base close to the ground level using sickle or knife manually and put in a sack and allowed to dry to reduce loss of seed when capsule shatter. The sack was gently beaten with stick to separate seeds from the capsule. Winnowing was done to separate good seeds from chaff or dirty.

Three randomly tagged plants in each plot were used for data collection such plant height, number of leaves per plant, number of capsule/plant, harvest index and seed yield. The harvest index was determined as described by Gadag *et al.* (1990).

$$HI = \frac{Grain\ yield}{Biological\ yield} x\ 100$$

The data collected was subjected to ANOVA using F-test to estimate the significance of treatment means as described by Snedecor and Cochran (1967). Means were separated using Fischer's Least Significant Difference (F-LSD) at 0.05 level of significance Duncan, (1955).

Results and Discussion

At 4 and 12 WAP in 2018, application of 10 to 15 kg ha $^{-1}$ did not but significantly higher than 5 kg ha $^{-1}$ and control while in 2019, at 4 WAS there is no significant difference in plant height among the treatments (Table 1). In both years, at 6, 8, 10 and 12 WAS in 2019, each increase in application rate of cow manure significantly increase plant height of sesame. Similarly, at 4 WAS, in both years NCRIBE04E variety produced significantly higher plant height as compared to other varieties. In both years, at 6 and 8 WAP, NCRIBEN 05E produced significantly higher plant than other varieties. At 10 and 12 WAS, in 2018 and 2019 cropping seasons, E-8 recorded significantly higher plant height than other varieties in this study. E-8 variety recorded significantly higher plant height than other varieties in this study. This result is in harmony with Kolo and Duniya (2006) had reported that E-8 variety significantly outperformed other varieties in term of growth and yield. This was corroborated by Haruna and Aliyu (2012), who found that sesame variety E-8, resulted in significantly higher plant height, number of branches and number of leaves. There were significant interactions between cow manure and variety on plant height at 12 WAS in both years (Table 2). The E-8 variety produced the tallest plant height at the application of 15 kg/ha of cow manure which did not differed with NCRIBEN05 and NCRIBEN04E but significantly differed with all other treatments across the periods of observation. The shorter plant heights were obtained at the control plots in both years.

The result showed that number of leaves among treatment was significant (Table 3). In 2018, at 4 WAP, application of cow manure rate does not significantly affect number of leaves. In both years, at 6 and 8 WAS, the application of 10 and 15 kg/cow manure produced significantly higher number of leaves. In 2018 and 2019, at 10 and 12 WAS, each increase in the rate of applied cow manure significantly increased number of leaves. Similarly, at 4 WAS in both years, NCRIBEN 04 E variety produced significantly higher number of leaves compared to other varieties. While at 6 WAS in both years variety NCRIBEN 03M produced significantly higher number of leaves compare to other varieties so also at 8 WAS in both cropping seasons NCRIBEN 04E, NCRIBEN 05 E and E8 recorded significantly higher number of leaves than other varieties. At 10 WAS in both years NCRIBEN 02M, NCRIBEN 05E and E-8 produced statistically similar number of leaves than other varieties. Lastly, at 12 WAS in both years

Table 1: Effect of Cow Manure and Variety on the Plant Height of Sesame at 4, 6, 8, 10 and 12 WAS in Lafia during the 2018 and 2019 Cropping Seasons.

	2018 plant height WAS					2019 WAS				
Treatment	**4**	**6**	**8**	**10**	**12**	**4**	**6**	**8**	**10**	**12**
Cow manure (C) (kg ha^{-1})										
0	8.0^{b}	25.6^{d}	53.1^{d}	75.6^{d}	91.5^{b}	9.1^{a}	26.8^{d}	54.5^{d}	76.9^{d}	91.3^{d}
5	8.2^{b}	29.9^{c}	57.0^{c}	79.3^{c}	997.4^{b}	9.0^{a}	32.3^{c}	59.4^{c}	80.3^{c}	98.5^{c}
10	9.2^{a}	35.5^{b}	66.4^{b}	55.0^{b}	106.7^{a}	9.7^{a}	37.3^{b}	67.9^{b}	85.0^{b}	106.3^{c}
15	8.7^{ab}	40.5^{a}	67.7^{a}	88.3^{a}	107.4^{a}	8.8^{a}	42.8^{a}	71.1^{a}	90.6^{a}	115.3^{a}
SE ±	0.26	0.44	0.44	0.23	2.55	0.36	0.69	0.32	0.35	0.19
Variety (V)										
NCRIBEN 01M	87.7^{bc}	28.2^{d}	59.9^{c}	75.6^{e}	98.4^{bc}	9.3^{ab}	30.5^{d}	61.1^{c}	76.7^{e}	98.8^{e}
NCRIBEN 02M	7.4^{d}	28.2^{d}	62.7^{d}	80.5^{c}	103.7^{ab}	8.3b	29.5^{d}	63.8^{c}	81.5^{c}	104.2^{b}
NCRIBEN 03M	8.6^{bc}	34.7^{b}	58.5^{c}	77.2^{d}	92.0^{c}	8.7c	36.1^{bc}	60.4^{c}	78.2^{d}	100.9^{d}
NCRIBEN 04E	9.7^{a}	32.7^{c}	56.2^{d}	81.2^{c}	100.6^{bc}	10.3 a	34.9c	58.8^{d}	82.1^{c}	101.1^{d}
NCRIBEN 05E	9.9^{ab}	37.5^{a}	67.5^{a}	87.5^{b}	101.3^{abc}	9.2^{ab}	39.5^{a}	70.5^{a}	88.4^{b}	102.1^{c}
E-8	7.9^{cd}	36.1^{a} b	62.8^{b}	90.3^{a}	108.9^{a}	9.1^{ab}	38.4^{ab}	64.7^{b}	92.1^{a}	110.0^{a}
SE ±	0.31	0.53	0.47	0.28	3.13	0.44	0.85	0.39	6.44	0.23
Interaction										
C X V	NS	NS	NS	NS	**	NS	NS	NS	NS	**

Means of different letter(s) in each column of treatment group are significant at 5 % level of significance.
NS = Not significant
** = Significant at 5% level of significance

NCRIBEN 02M, NCRIBEN 03M and E-8 produced significantly higher number of leaves compared to other varieties. This could be attributed to low nutrient status of the soil and ability of manure to supply nutrient content gradually to support crop which letter translated to high yield (Aliyu, 2003; Annon, 2007). The application of 15 kg ha^{-1} of cow manure significantly produced higher plant high, number of branches, and number of leaves of sesame than the control. This was supported by the reports of El-Naim *et al*. (2010); Teshome (2016) and Ashri (2007) that increasing level of cow manure leads to increase in yield.

Table 2: Interaction between Cow Manure and Variety on Plant height at 12 WAS of Sesame in Lafia during the 2018 and 2019 Cropping Seasons

	2018				2019			
	Cow manure kg ha^{-1}				Cow manure kg ha^{-1}			
Variety	**0**	**5**	**10**	**15**	**0**	**5**	**10**	**15**
NCRIBEN 01M	92.4^{d}	94.9^{d}	99.4^{c}	107.0^{b}	90.3^{f}	95.8^{e}	100.8^{d}	108.5^{c}
NCRIBEN 02M	94.8^{d}	99.0^{c}	106.1^{b}	109.7^{b}	94.1^{e}	100.3^{d}	106.6^{c}	115.8^{b}
NCRIBEN 03M	89.5^{e}	94.9^{d}	112.0^{b}	71.6^{f}	90.1^{f}	96.2^{d}	104.5^{c}	112.7^{b}
NCRIBEN 04E	87.4^{e}	94.4^{d}	103.3^{c}	115.4^{a}	87.9^{f}	95.5^{e}	104.5^{c}	116.3^{a}
NCRIBEN 05E	88.2^{e}	96.3^{d}	104.4^{c}	116.4^{a}	88.5^{f}	97.3^{d}	105.1^{c}	117.4^{a}
E-8	96.4^{d}	105.0^{b}	115.0^{a}	119.3^{a}	96.9^{d}	106.0^{c}	116.4^{a}	120.9^{a}
SE ±	6.25				4.53			

Means of the same letter(s) within the same treatment group are statistically the same at 5% level of significance.

Table 3: Effect of cow manure and variety on the number of leaves of sesame at 4, 6, 8, 10 and 12 WAS in Lafia during the 2018 and 2019 cropping seasons

	2018 Number of leaves WAS					2019 WAS				
Treatment	**4**	**6**	**8**	**10**	**12**	**4**	**6**	**8**	**10**	**12**
Cow manure (kg ha^{-1})										
0	6.9^{a}	9.9^{c}	18.5^{c}	27.9^{d}	35.5^{d}	7.1^{bc}	10.5^{c}	19.2^{c}	29.0^{d}	36.8^{d}
5	6.6^{a}	11.3^{b}	21.0^{b}	31.8^{c}	39.5^{c}	7.2^{bc}	12.1^{bc}	22.1^{b}	33.1^{c}	40.5^{c}
10	6.8^{a}	12.9^{a}	28.4^{a}	37.5^{b}	46.2^{b}	8.0^{a}	13.6^{a}	29.2^{a}	38.6^{b}	47.6^{b}
15	7.0^{a}	12.0^{a}	27.1^{a}	42.5^{a}	55.2^{a}	8.2^{a}	13.2^{a}	28.6^{ab}	43.7^{a}	56.3^{a}
SE ±	0.15	0.32	0.53	0.29	0.31	0.14	0.26	0.43	0.27	0.29
Variety										
NCRIBEN 01M	6.5^{bc}	10.4^{c}	20.9^{c}	30.3^{d}	43.0^{b}	7.0^{bc}	11.1^{c}	21.2^{cd}	31.4^{d}	44.1^{c}
NCRIBEN 02M	7.0^{ab}	11.9^{b}	21.9^{abc}	38.0^{a}	45.5^{a}	8.2^{ab}	12.4^{b}	22.3^{c}	39.2^{a}	46.5^{a}
NCRIBEN 03M	6.9^{ab}	13.2^{a}	23.2^{ab}	31.5^{c}	44.7^{a}	7.6^{b}	14.3^{a}	24.1^{b}	32.6^{c}	46.6^{a}
NCRIBEN 04E	7.3^{a}	11.5^{bc}	24.2^{a}	33.6^{b}	44.6^{b}	8.8^{a}	12.2^{bc}	25.2^{a}	34.5^{b}	45.6^{b}
NCRIBEN 05E	6.3^{c}	11.3^{bc}	24.9^{a}	38.5^{a}	41.5^{c}	7.1^{bc}	12.1^{bc}	25.8^{a}	39.4^{a}	11.7^{c}
E-8	6.9^{abc}	11.0^{bc}	24.4^{a}	37.5^{a}	45.4^{a}	7.6^{b}	12.0^{bc}	25.7^{a}	39.0^{a}	46.5^{a}
SE ±	0.19	0.39	0.65	0.36	0.38	0.17	0.40	0.58	0.34	0.36
Interaction										
CXV	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS

Means of different letter(s) in each column of treatment group are significant at 5% level of significance.
NS = Not significant
** = Significant at 5% level of significance

The results of the effects of cow manure and variety on the harvest index of sesame is shown in Table 4. In both seasons with increase in rate of cow manure applied significantly produced

higher harvest index of sesame plant. Similarly, variety E-8 yielded high harvest index in both years, significantly higher than other varieties. In 2018 and 2019 cropping seasons, the application of 15 kg/ha^{-1} cow manure significantly increase number of seed per capsule compared to other rate of applied cow manure and control. However, variety E-8 significantly produced higher number of seed per capsule compared to other varieties (Table 4). At 2018 and 2019 cropping seasons, the effect of cow manure and variety on the seed yield per plot showed that the applied rate of 15 kg/ha^{-1} cow manure significantly yielded high seed yield per plot but significantly higher than other rates and control (Table 4). Seed yield (kg ha^{-1}) of sesame in 2018 and 2019 differed significantly as affected by the treatments. Application of 15 kg/ ha^{-1}cow manure produced significantly higher grain yield compared with other levels of applied cow manure.Similarly, variety E-8 produced significantly higher seed per hectare compared to all other varieties in both years. From the result obtained, it was seen that growth and yield of sesame were significantly increased by the application of 15 kg/ha^{-1} of cow manure This could be attributed to low nutrient status of the soil and ability of manure to supply nutrient content gradually to support crop which letter translated to high yield (Aliyu, 2003; Anon, 2007).

There were significant interactions between cow manure and variety on harvest index and seed yield per hectare in both years. Variety NCRIBEN 01M produce more harvest index at the application of 15kg/ha of cow manure which not differed with NCRIBEN 04E, NCRIBEN 05E and E-8 but significantly differed with all other treatment across the period of observations (Table 5). In respect to the seed yield per hectare (Table 6), the lower seed yield per hectare was obtained at the control plot in both years. E-8 variety in both season recorded total yield of (1232.7 kg/ha^{-1} and 1239.0 kg ha^{-1}) of cow manure, respectively which was in agreement with Morris (2009). who reported that among The tested varieties,E-8 gave the highest seed yield of 1468.68kg/ha^{-1} over other varieties. On the other hand NCRIBEN 02M gave the lowest seed yield of 690.9 kg ha^{-1} in 2018 and 694.7kg/ha^{-1} in 2019, respectively. Adnan *et al.* (2015) reported that the highest seed yield obtained with variety E-8 in combination of 15kg ha^{-1} as well as the interaction clearly shows the important of cow manure. Moreover, Noorka *et al*. (2011) reported that increase in seed yield is as a result of increase in cow manure rate. Furthermore, Daniya *et al*. (2013) reported that the high yielding variety E-8 compared to other varieties is attributed to genotypic differences among varieties. The smallest numbers of capsule were obtained at the control plots in both years. Number of capsules and seed yield where all enhanced by the application of 15 kg/ha.$^{-1}$of cow manure. The result is in agreement with the one reported by Imayaramban *et al*. (2002) who found that the application of cow manureincreases number of capsules, capsule length, and number of seeds per capsule. This was also supported by (Olowe, 2014). Similar results were reportedby Ashri (2007) who noted that the effect of cow manure on growth and yield of sesame plant at various levels of application exerted a stimulating effect on the growth and yield of sesame Plant.

Table 4: Effect of cow manure and variety on yield parameters of sesame in Lafia during the 2018 and 2019 cropping season.

Treatment	2018				2019			
	Harvest Index	No. of seed capsule^{-1}	Seed yield plot^{-1}	Seed yield ha^{-1}	Harvest Index	No. of seed capsule^{-1}	Seed Yield plot^{-1}	Seed Yield ha^{-1}
Cow manure (kg ha^{-1})								
0	11.7^{d}	50.0^{d}	149.9^{d}	481.3^{d}	12.5^{d}	51.1^{d}	151.5^{d}	485.2^{d}
5	12.8^{c}	53.7^{e}	183.9^{c}	757.0^{c}	13.6^{c}	54.3^{c}	185.0^{c}	761.6^{c}
10	15.3^{b}	62.2^{b}	261.7^{b}	1179.2^{b}	16.6^{b}	63.1^{b}	262.6^{b}	1193.4^{b}
15	18.6^{a}	71.7^{a}	329.2^{a}	1338.9^{a}	19.9^{a}	71.5^{a}	335.8^{a}	1342.7^{a}
SE ±	0.14	0.26	2.80	1.42	0.19	0.45	0.33	0.94
Variety								
NCRIBEN 01M	12.7^{e}	62.3^{b}	181.5^{f}	794.2^{e}	16.1^{bc}	62.4^{bc}	208.7^{d}	797.8^{e}
NCRIBEN 02M	13.3^{d}	53.2^{d}	207.9^{d}	690.9^{f}	14.6^{d}	54.3^{d}	182.5^{f}	694.7^{f}
NCRIBEN 03M	14.7^{c}	53.7^{d}	256.8^{b}	1000.8^{c}	13.9^{e}	54.4^{d}	258.4^{b}	1006.0^{c}
NCRIBEN 04E	15.4^{b}	62.3^{b}	204.0^{e}	1019.2^{b}	15.8^{c}	63.3^{ab}	205.0^{e}	1035.8^{b}
NCRIBEN 05E	15.5^{b}	60.1^{c}	236.8^{c}	897.0^{d}	16.6^{ab}	60.9^{c}	238.1^{c}	901.3^{d}
E-8	16.1^{a}	64.8^{a}	300.0^{a}	1232.7^{a}	17.0^{a}	64.7^{a}	309.6^{a}	1239.0^{a}
SE ±	0.18	0.32	3.44	1.15	0.23	0.55	0.40	0.80
Interaction								
CXV	**	NS	NS	**	**	NS	NS	**

Means of different letter(s) in each column of treatment group are significant at 5% level of significance, NS = Not significant, ** = Significant at 5% level of significance.

Table 5: Interaction between cow manure and variety on harvest index of sesame in Lafia during the 2018 and 2019 cropping season.

	2018				2019			
	Cow manure kg ha^{-1}				**Cow manure kg ha^{-1}**			
Variety	**0**	**5**	**10**	**15**	**0**	**5**	**10**	**15**
NCRIBEN 01M	12.2^{h}	13.4^{f}	15.9^{d}	20.4^{a}	12.8^{g}	13.9^{f}	16.4^{d}	21.1^{a}
NCRIBEN 02M	10.5^{j}	11.8^{h}	14.1^{e}	16.9^{c}	11.3^{h}	12.5^{g}	15.8^{de}	18.8^{b}
NCRIBEN 03M	10.7^{g}	11.7^{i}	14.4^{e}	13.8^{f}	11.6^{h}	13.1^{fg}	16.1^{d}	14.9^{e}
NCRIBEN 04E	12.1^{h}	13.2^{fg}	15.7^{d}	20.4^{a}	12.6^{g}	13.3^{fg}	15.8^{de}	21.5^{a}
NCRIBEN 05E	11.8^{h}	12.8^{g}	15.1^{de}	19.1^{b}	12.7^{g}	13.9^{f}	18.2^{bc}	21.3^{a}
E-8	12.9^{g}	14.0^{e}	16.8^{c}	20.8^{a}	13.9^{f}	14.8^{e}	17.6^{c}	21.5^{a}
SE ±	0.349				0.454			

Means of the same letter(s) within the same treatment group are statistically the same at 5% level of significance.

Table 6: Interaction between cow manure and variety on seed yield per hectare of sesame in Lafia during the 2018 and 2019 cropping season

	2018				2019			
	Cow manure kg ha^{-1}				Cow manure kg ha^{-1}			
Variety	0	5	10	15	0	5	10	15
NCRIBEN 01M	502.9^{t}	737.8^{n}	849.0^{l}	1087.1^{b}	504.7^{t}	741.2^{n}	853.2^{l}	1092.1^{h}
NCRIBEN 02M	365.5^{w}	565.3^{r}	860.9^{k}	971.8^{j}	369.2^{w}	569.9^{r}	864.5^{k}	975.6^{j}
NCRIBEN 03M	497.5^{u}	748.1^{m}	1377.1^{e}	1380.5^{d}	500.3^{j}	753.1^{m}	1386.8^{d}	1383.6^{e}
NCRIBEN 04E	377.2^{v}	675.1^{p}	1364.5^{f}	1659.9^{b}	381.9^{v}	675.8^{p}	1365.3^{f}	1664.1^{b}
NCRIBEN 05E	523.3^{s}	735.8^{o}	1084.9^{h}	1244.8^{g}	527.3^{b}	740.9^{o}	1089.7^{i}	1247.2^{g}
E-8	621.6^{q}	1080.9^{j}	1538.9^{c}	1689.4^{a}	627.9^{q}	1088.6^{a}	1544.9^{c}	1694.3^{a}
SE ±	2.290				1.921			

Means of the same letter(s) within the same treatment group are statistically the same at 5% level of significance.

Conclusion

From the results of this study, it can be concluded that both growth and of sesame were better following the application of 15 kg ha^{-1}of cow manure with variety E-8 out-perform better over other varieties.This study is therefore recommended for farmers in Lafia, Northern Guinea Savana of Nigeria that they should adopt the practices of using cow manure at 15 kg ha^{-1} with E-8 variety of sesame for maximum productivity.

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