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EFFECT OF NITROGEN FERTILIZER ON GROWTH AND YIELD OF SESAME (*SESAMUM INDICUM* L.) VARIETIES IN BAUCHI STATE, NIGERIA

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ABSTRACT
The experiment was conducted at the Abubakar Tafawa Balewa University teaching and research farm Bauchi, Bauchi State in 2012 and 2013 rainy seasons. The treatments consisted of nitrogen fertilizer rate of 0, 20, 40, 60 and 80kg ₦/ha and three different varieties of sesame (NCIR BEN 01M, NCIR BEN 02M and Ex–Sudan). The experiments were factorially combined and laid out in a Randomized Complete Block Design, replicated three times in both seasons. The results of the experiments showed that, nitrogen fertilizer had significant ($P<0.05$) effect on the growth and yield of sesame plant. The application of nitrogen fertilizer at 60 kg ₦/ha significantly ($P<0.05$) increased plant height, leaf area, number of branches, number of capsules per plant and yield/hectare of sesame plant in both 2012 and 2013 rainy seasons. It was also observed that, Ex–Sudan variety significantly ($P<0.05$) had higher plant height, leaf area, number of branches, number of capsules per plant and yield/hectare than the other two varieties. Based on the results obtained, it can be concluded that, the application of 60 kg ₦/ha to sesame varieties especially Ex – Sudan can be adopted by farmers in the study area for maximum yield.

Keywords: Bauchi, Nigeria, Nitrogen Fertilizer, Sesame, Varieties.

INTRODUCTION
Sesame (*Sesamum indicum* L.) belongs to the family Pedaliaceae, and is one of the most ancient crops and oilseeds known and used by mankind. It is also known as *benniseed*, *gingerly*, *simsim*, *ajonjali*, sesame and til. It was a major oilseed crop in the ancient world due to its easiness of extraction, great stability and resistance to drought. Sesame was cultivated and domesticated on the Indian subcontinent during Harrapan and Anatolian eras (Bedigian and Van der Maesen, 2003). This is evidenced by the presence of archaeological remnants of crop dating back to 5500 BC in the Harappa Valley in the Indian subcontinent (Weiss, 2000; and Ashri, 2007).
Sesame is considered to have both nutritional and medicinal values. The seeds are used either decorticated or whole in sweets such as sesame bars and halva, in baked products, or milled to get high-grade edible oil or tahini, an oil paste (Bedigian, 2004). Sesame seed contains two lignans, sesamin and *sesamolin*. After roasting sesame seeds, *seasmolin* is converted to *seasamol*. *Sesamol* has been found to have anti-oxidative effects to induce growth arrest and apoptosis in cancer cells. One of the veritable tools that could be used to boost the production of sesame by farmers in the tropics is to develop high yielding varieties that can produce very well in a wide range of agro-ecological zones.

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Therefore, the National Cereal Research Institute Badagry Nigeria (NCRI BEN) developed new varieties (NCRI BEN-01M and NCRI BEN-02M) which were released in 2002 and Ex-Sudan, an exotic variety from Sudan which was evaluated for its high yield performance. Nitrogen is a basic constituent of many other compounds of primary physiological importance to plant metabolism, such as chlorophyll, nucleotides, proteins, alkaloids, enzymes, hormones and vitamins (Marschner, 2005). Nitrogen is a nutrient required by plants in comparatively larger amounts than are other soil borne elements; endogenous application to crops often results in yield improvement. Nitrogen is obtained from the soil through mineralization of soil organic matter and from external sources, both organic and inorganic. For an optimal yield, the N supply must be available according to the needs of the plant, matching its pattern and total amount. This study was conducted therefore, in order to determine the effect of nitrogen fertilizer on growth and yield of sesame varieties.

MATERIALS AND METHODS

Experimental Design

The field trial was conducted during the 2012 and 2013 rainy seasons at the Abubakar Tafawa Balewa University, Teaching and Research Farm, Bauchi. The experiments were laid out in a Randomized Complete Block Design (RCBD) in three replications with net plot size of 3m x 4m with a border row of 0.5m between plots and 1m between replications. The treatments consisted of five levels of nitrogen; 0, 20, 40, 60, and 80kgN/hectare applied as urea (46%N) and three varieties of sesame; NCRI BEN 01M, NCRI BEN 02M and Ex–Sudan. The seeds were sown at a spacing of 60cm inter-row x 15cm intra-row and later thinned to two seedlings per stand three weeks after emergence; nitrogen fertilizer was applied as a single dose at five weeks after emergence. Growth and yield parameters such as plant height, leaf area, number of branches, number of capsules per plant, capsule length, and seed per capsule and yield per hectare were recorded. The data collected were subjected to analysis of variance (ANOVA) treatments means were compared by using Duncans Multiple Range Test (DMRT) of Fasino (2000).

RESULTS AND DISCUSSION

Plant Height

The result in Table 1 showed the effect of nitrogen fertilizer on plant height of sesame varieties during the 2012 and 2013 rainy seasons. The result showed that the application of nitrogen fertilizer significantly ($P \leq 0.05$) produced taller sesame plants per plot throughout the study period. The application of 60 kg N/ha produced similar plant height with 80 kg N/ha which were significantly ($P \leq 0.05$) taller than the other treatments in both seasons. The sesame varieties were observed to differ significantly ($P \leq 0.05$) on plant height at 6 and 12 WAS. Ex-Sudan variety produced significantly ($P \leq 0.05$) taller plants than the other varieties. However, 01M and 02M did not significantly ($P \leq 0.05$) differ in the two seasons.

Nitrogen had significant ($P \leq 0.05$) effect on sesame plant height during the period of the experiment. This indicated that nitrogen increase growth of sesame. Nitrogen is known to be an element essential for vigorous vegetative growth of plants. This result is in conformity with the findings of Malik *et al.* (1988) who also reported that plant height increased with increasing levels of nitrogen. The result also supports the finding of Umar *et al.* (2012) who reported that application of up to 60 kg N/ha resulted in significant increase in plant height of sesame. The present study also supported the earlier reports of Fagam *et al.* (2009) who reported that increasing nitrogen fertilizer increases plant growth of maize. The sesame varieties were

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observed to differ significantly (P≤0.05) on plant height. Ex-Sudan produced significantly (P≤0.05) taller plants than the other varieties. However, 01M and 02M did not significantly (P≤0.05) differ on plant height in both 2012 and 2013 rainy seasons respectively. The differences observed in the varieties could be as a result of variation among sesame genotypes in morphological character as earlier observed by Lazim (1973) who indicated the presence of considerable amount of variation among sesame genotypes in plant height, number of leaves, number of branches, number of nodes per plant and dry matter production. This might explain the consistent differences among the tested cultivars in some of the growth and yield parameters.

Table 1: Effect of Nitrogen Fertilizer on Plant Height of Sesame Varieties Branches in 2012 and 2013 Rainy Seasons

Treatment	Plant Height in 2012					Plant Height in 2013				
	4WAS	6WAS	8WAS	10WAS	12WAS	4WAS	6WAS	8WAS	10WAS	12WAS
N fertilizer (kg/ha)										
0	31.11^{c}	43.12^{d}	73.12^{c}	98.82^{c}	100.50^{c}	32.80^{b}	43.23^{c}	73.34^{c}	99.30^{c}	101.54^{b}
20	30.00^{c}	53.60^{c}	81.12^{b}	104.03^{b}	109.04^{b}	32.70^{b}	54.80^{b}	8280^{b}	109.02^{b}	111.30^{a}
40	35.11^{b}	55.60^{b}	87.15^{a}	104.45^{b}	106.20^{b}	34.33^{b}	56.17^{b}	89.41^{a}	110.12^{b}	112.60^{a}
60	40.80^{a}	59.80^{a}	87.92^{a}	113.62^{a}	113.50^{a}	41.90^{a}	60.50^{a}	86.40^{b}	113.25^{a}	113.96^{a}
80	40.80^{a}	50.50^{c}	89.24^{a}	114.40^{a}	112.50^{a}	40.90^{a}	51.97^{b}	85.00^{ab}	114.31^{a}	112.92^{a}
LS	**	**	**	**	**	**	**	**	**	**
SE±	0.90	1.32	1.54	1.80	0.99	0.90	1.50	1.90	1.10	1.22
Variety (V)										
01M	35.27^{b}	50.90^{b}	83.61	107.50	108.43^{b}	36.40	51.40^{b}	83.08	108.65	110.53^{b}
02M	36.20^{a}	51.16^{b}	82.70	108.40	109.04^{b}	36,60	51.70^{b}	83.08	108.65	110.53^{b}
Ex-Sudan	34.94^{b}	55.50^{a}	84.82	107.71	112.31^{a}	36.54	56.91^{a}	84.01	109.42	112.84^{a}
LS	**	**	**	**NS**	**NS**	**NS**	**	**NS**	**NS**	**
SE±	0.70	1.03	1.20	2.40	0.80	0.70	1.15	1.50	0.83	0.94
Interaction N x V	**	**	**NS**	**NS**	**NS**	**	**NS**	**NS**	**NS**	**NS**

WAS = Weeks after sowing: NS = Not significant: LS = Level of significance: **Significant at 1% level of probability: means followed by the same latter(s) within a treatment group are not significant using DMRT

Leaf area

The effect of nitrogen fertilizer on leaf area of sesame varieties during the 2012 and 2013 rainy seasons is shown in Table 2. The result revealed that, the application of nitrogen fertilizer at 4, 6, 8 and 10 WAS in both 2012 and 2013 rainy seasons significantly (P≤0.05) produced wider leaf area of sesame plant. The application of 60 kg N/ha produced similar leaf area with 80 kg N/ha which were significantly (P≤0.05) larger than the other treatments.

The sesame varieties did not differ significantly (P≤0.05) on leaf area in 2012 rainy season. It also followed the same trend in 2013 rainy season except at 10 WAS where the

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application of nitrogen fertilizer produced significantly (P≤0.05) wider leaf area of sesame plant. Ex-Sudan produced significantly (P≤0.05) wider leaf area per plant than the other varieties.

Table 2: Effect of Nitrogen Fertilizer on Leaf Area of Sesame Varieties in 2012 And 2013 Rainy Seasons

Treatment	Leaf Area in 2012					Leaf Area in 2013				
	4WAS	6WAS	8WAS	10WAS	12WAS	4WAS	6WAS	8WAS	10WAS	12WAS
N fertilizer (kg/ha)										
0	26.60^{c}	31.64^{c}	41.28^{b}	50.03^{b}	68.74	26.62^{d}	31.91^{c}	40.10^{b}	50.81^{c}	65.68
20	38.10^{b}	41.50^{b}	55.13^{a}	62.91^{a}	68.90	32.21^{c}	39.90^{c}	53.82^{a}	61.27^{b}	66.64
40	39.15^{b}	43.90^{a}	60.10^{a}	63.62^{a}	69.01	39.70^{b}	44.40^{b}	60.22^{a}	65.50^{ab}	67.73
60	40.37^{b}	53.90^{a}	65.40^{a}	68.56^{a}	69.80	40.50^{b}	53.00^{a}	64.00^{a}	66.24^{ab}	69.19
80	57.10^{a}	54.91^{a}	65.50^{a}	69.61^{a}	72.96	53.10^{a}	54.91^{a}	65.02^{a}	69.25^{a}	69.97
LS	**	**	**	**	NS	**	**	**	**	NS
SE±	3.12	3.12	4.28	2.40	4.33	1.71	3.50	4.18	2.23	5.82
Variety (V)										
01M	43.00	45.74	57.33	64.57	69.57	37.40	44.71	55.71	61.54^{c}	71.40
02M	42.23	46.95	56.75	63.87	71.90	38.67	45.33	56.62	59.32^{b}	69.16
Ex-Sudan	44.40	47.80	58.38	65.10	72.13	37.18	46.44	58.15	66.96^{a}	70.20
LS	**NS**	**NS**	**NS**	**NS**	**NS**	**NS**	**NS**	**NS**	**	**NS**
SE±	2.41	2.42	3.32	1.90	3.35	1.32	2.70	3.23	1.73	3.00
Interaction N x V	**	**	**NS**	**NS**	**NS**	**	**NS**	**NS**	**NS**	**NS**

WAS = Weeks after sowing: NS = Not significant: LS = Level of significance: **Significant at 1% level of probability: means followed by the same latter(s) within a treatment group are not significant using DMRT

Nitrogen fertilizer application had a significant (P≤0.05) effect on leaf area of sesame plant grown in the rainy seasons of 2012 and 2013. Nitrogen played a key role in carbohydrates and protein metabolism; hence it is essential in plant growth and development. This report is in line with the findings of Loomis *et al.* (1971) and Shehu *et al.* (2010) who reported that nitrogen fertilization enhanced vegetative growth through increased number and size of leaves that resulted in increased leaf area. Wide leaf area enhanced the capacity of the sesame plant to intercept adequate sunlight, which might have resulted in the production of more assimilate thereby enhancing growth and development of the crop. It is also in support of the earlier report by (Anonnymous, 2008; and Malik 2003) who reported that there is great growth and yield improvement with fertilized sesame than unfertilized ones.

The significant (P≤0.05) difference observed on variety in which Ex-Sudan produced significantly wider leaf area in 2013 than 2012 rainy seasons could be due to differences in soil fertility, temperature and amount and spread of rainfall received during the study period. This confirms the report of Bationo *et al.* (2000) who reported that although nitrogen contributes to the increase in growth and yield of sesame, the response in most cases depends on the location where the crop is grown.

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Number of Braches

The result in Table 3 showed the effect of nitrogen fertilizer on number of branches of sesame varieties during the 2012 and 2013 rainy seasons. It was observed in 2012 rainy season that, the application of nitrogen fertilizer at 6, 8, 10 and 12 WAS significantly (P≤0.05) gave higher number of branches of sesame plant. The application of 40 kg N/ha produced similar number of branches with 60 kg and 80 kg N/ha which were significantly (P≤0.05) higher than 0 kg and 20 kg N/ha. Similarly, in 2013 rainy season the result revealed that, the application of nitrogen fertilizer at 6 and 12 WAS significantly (P≤0.05) produced higher number of branches of sesame plant. The application of 40 kg N/ha produced similar number of branches with 60 kg and 80 kg N/ha which were significantly (P ≤ 0.05) higher than 0 kg and 20 kg N/ha. The sesame varieties were observed to differ significantly (P≤0.05) on number of branches at 10 WAS. Ex-Sudan produced significantly (P≤0.05) higher number of branches per plant than the other varieties. However, 01M and 02M did not significantly (P≤0.05) differ in both 2012 and 2013 rainy seasons, respectively.

Nitrogen had significant (P≤0.05) effect on number of branches of sesame during the period of the experiment. This could be due to the fact that nitrogen is one of the limiting nutrients in savannah soils and plays an important role in rapid vegetative growth. Nitrogen is also important in photosynthesis, formation of chlorophyll, nucleic acid and amino acid. This report is in line with the findings of (Anonymous, 2006; and Malik, 2003) who reported that there is great growth and yield improvement with fertilized sesame than unfertilized ones. It is also in support of the earlier report by Umar *et al.* (2012) who reported that application of nitrogen fertilizer up to 60 kg N/ha resulted in significant increase in number of branches of sesame. In the same view, (Saharia and Bayan, 1996) discovered that highest number of branches per plant of sesame were obtained with increase in nitrogen fertilizer.

The sesame varieties were observed to differ significantly (P≤0.05) on number of branches Ex-Sudan produced significantly (P≤0.05) higher number of branches per plant than the other varieties. However, 01M and 02M did not significantly (P≤0.05) differ in both 2012 and 2013 rainy seasons respectively. This could be as a result of variation among sesame genotypes in morphological character as earlier observed by Lazim (1973) who indicated the presence of considerable amount of variation among sesame genotypes in plant height, number of leaves, number of branches, number of nodes per plant and dry matter production. This might explain the consistent differences among the tested cultivars in some of the growth and yield parameters.

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Table 3: Effect of Nitrogen Fertilizer on Number of Branches of Sesame Varieties in 2012 and 2013 Rainy Seasons

Treatment	Number of Branches in 2012				Number of Branches in 2013			
	6WAS	8WAS	10WAS	12WAS	6WAS	8WAS	10WAS	12WAS
N fertilizer (kg/ha)								
0	3.00^{b}	5.40^{b}	7.20^{b}	7.50^{b}	3.60^{b}	5.70	7.90	8.00^{b}
20	3.20^{b}	5.90^{b}	7.60^{b}	8.00^{b}	3.80^{b}	6.90	8.20	8.50^{b}
40	4.40^{a}	6.90^{a}	8.70^{a}	9.50^{a}	4.50^{ab}	7.20	8.50	9.90^{a}
60	4.60^{a}	7.30^{a}	9.00^{a}	9.80^{a}	5.20^{a}	7.60	8.60	9.90^{a}
80	4.80^{a}	7.60^{a}	9.00^{a}	10.10^{a}	5.30^{a}	7.80	9.40	10.00^{a}
LS	**	**	**	**	**	NS	NS	**
SE±	0.29	0.40	0.24	0.44	0.34	2.51	4.60	0.40
Variety (V)								
01M	4.20	6.30	8.70^{c}	10.90	4.40	7.20	7.70^{c}	9.60
02M	4.10	6.50	10.10^{b}	11.20	4.60	7.30	9.00^{b}	9.30
Ex-Sudan	4.30	6.50	11.50^{a}	11.50	4.40	7.40	9.90^{a}	9.50
LS	**NS**	**NS**	**	**NS**	**NS**	**NS**	**	**NS**
SE±	0.22	0.28	0.30	0.64	0.27	0.40	0.28	0.36
Interaction N x V	**NS**	**NS**	**NS**	**NS**	**NS**	**NS**	**NS**	**NS**

WAS = Weeks after sowing: NS = Not significant: LS = Level of significance:**Significant at 1% level of probability: *significant at 5% level of probability: means followed by the same latter(s) within a treatment group are not significant using DMRT

Number of capsules

The result in Table 4 showed the effect of nitrogen fertilizer on number of capsules of sesame varieties during the 2012 and 2013 rainy seasons. The result indicated that the application of nitrogen fertilizer at 6, 8 and 10 WAS significantly (P≤0.05) produced higher number of capsules per plant in both the two rainy seasons. The application of 40 kg N/ha produced similar number of capsules per plant with 60 kg N/ha and 80 kg N/ha which were significantly (P≤0.05) higher than the other treatments in both 2012 and 2013 rainy seasons, respectively. The sesame varieties were observed to differ significantly (P≤0.05) on number of capsules per plant at 6 WAS in 2012 rainy season. Whereas in 2013 rainy season the varieties were also observed to differ significantly (P≤0.05) at 10 WAS. Ex-Sudan significantly (P≤0.05) produced higher number of capsules per plant than the other two varieties in both 2012 and 2013 rainy seasons respectively. The result indicated that the application of nitrogen fertilizer significantly (P≤0.05) produced higher number of capsules per plant in both the two rainy seasons. The increase in number of capsules per plant of sesame could be as a result of response of the sesame plant to application of nitrogen. Nitrogen fertilizer has been found to improve growth and yield of crop plants. This report is in line with the findings of (Subramaniam, 1979; and Malik, 2003) who reported that nitrogen fertilization has also been found to have profound effect on oilseed crops. The application of 45 kg to 80 kg N/ha increased the number of

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branches and number of capsules per plant in sesame. This result is also in conformity with the findings of Umar *et al.* (2012) who reported that application of 60 kg to 80 kg N/ha produced higher number of leaves, number of branches and number of capsules per plant of sesame.

Table 4: Effect of Nitrogen Fertilizer on Number of Capsules of Sesame Varieties in 2012 and 2013 Rainy Seasons

Treatment	Number of Capsules in 2012				Number of Capsules 2013			
	6WAS	8WAS	10WAS	12WAS	6WAS	8WAS	10WAS	12WAS
N fertilizer (kg/ha)								
0	6.30^{c}	11.60^{b}	19.30^{c}	28.50	6.80^{b}	11.70^{c}	18.40^{c}	27.80
20	8.90^{b}	15.70^{ab}	24.70^{b}	29.20	7.70^{ab}	16.10^{b}	23.40^{b}	30.10
40	9.20^{ab}	17.80^{a}	27.20^{ab}	29.50	9.40^{a}	17.80^{ab}	27.10^{a}	30.10
60	9.40^{ab}	17.80^{a}	27.80^{ab}	30.60	9.80^{a}	18.30^{ab}	28.60^{a}	30.80
80	10.10^{a}	19.10^{a}	30.90^{a}	32.00	10.40^{a}	19.80^{a}	30.10^{a}	32.50
LS	**	**	**	NS	**	**	**	NS
SE±	0.40	0.73	1.10	3.40	0.62	1.11	1.10	4.25
Variety (V)								
01M	7.70^{c}	17.10	25.90	30.30	8.70	17.50	24.30^{b}	29.50
02M	8.80^{b}	17.60	26.90	29.70	9.10	17.50	25.70^{b}	31.20
Ex-Sudan	9.90^{a}	16.70	27.20	31.30	9.80	16.20	28.40^{a}	30.30
LS	**	**NS**	**NS**	**NS**	**NS**	**NS**	**	**NS**
SE±	0.28	1.60	1.90	1.01	1.50	1.90	0.84	1.90
Interaction N x V	**	*	**NS**	**NS**	**NS**	**NS**	**NS**	**NS**

WAS = Weeks after sowing: NS = Not significant: LS = Level of significance: **Significant at 1% level of probability: *significant at 5% level of probability: means followed by the same latter(s) within a treatment group are not significant using DMRT

The sesame varieties were observed to differ significantly (P≤0.05) on number of capsules per plant at 6 WAS in 2012 rainy season. Whereas in 2013 rainy season the varieties were also observed to differ significantly (P≤0.05) at 10 WAS. Ex-Sudan significantly (P≤0.05) produced higher number of capsules per plant than the other two varieties in both 2012 and 2013 rainy seasons respectively. This clearly revealed the effect of nitrogen in providing a favourable environment for better nutrient up take of the sesame variety. This is in agreement with the findings of Roy *et al.* (1995) who reported that application of nitrogen fertilizer increased seed yield and oil content of sesame cultivars. It is also in conformity with the findings of Lazim (1973) who indicated the presence of considerable amount of variation among sesame genotypes in plant height, number of leaves, number of branches, number of

nodes per plant and dry matter production. This might explain the consistent differences among the tested cultivars in some of the growth and yield parameters.

Capsule Length, Seeds/Capsule and Yield/Hectare

The result in Table 5 showed the effect of nitrogen fertilizer on capsule length, seeds/capsule and yield/hectare of sesame varieties during the 2012 and 2013 rainy seasons. The result showed that, the application of nitrogen fertilizer significantly ($P \leq 0.05$) produced higher yield/hectare of sesame plant. The application of 40 kg N/ha produced similar yield/hectare of sesame plant with 60 kg and 80 kg N/ha which were significantly higher than the other treatments in both 2012 and 2013 rainy seasons, respectively. Similarly, the application of 20 and 40 kg N/ha produced similar but significantly ($P \leq 0.05$) higher yield than the control in both 2012 and 2013 rainy seasons, respectively. The result also revealed that, the application of nitrogen fertilizer did not differ significantly ($P \leq 0.05$) on capsule length and seeds/capsule in both 2012 and 2013 rainy seasons, respectively. The sesame varieties did not differ significantly ($P \leq 0.05$) on capsule length, seeds/capsule and yield/hectare of sesame in both 2012 and 2013 rainy seasons, respectively. The result showed that, the application of nitrogen fertilizer significantly ($P \leq 0.05$) produced higher yield/hectare of sesame plant.

The significant ($P \leq 0.05$) difference observed in this study in which the application of 60 and 80 kg N/ha gave higher yield than other rates revealed that, there is increase in yield with increase in nitrogen fertilizer application which clearly indicates the importance of nitrogen fertilizer in the performance of sesame. This indicated the effect of nitrogen as a basic component of many physiological processes in plants. The present finding is in support of the report of Marschner (2005) who reported that, nitrogen is a basic constituent of many compounds of physiological importance to plant metabolism such as chlorophyll, nucleotides, alkaloids, proteins, enzymes, hormones and vitamins. The result is also in conformity with the findings of Parihar *et al.* (1999) and Tiwari *et al.* (2000) who reported that there increased in yield and yield components of sesame with increased application of nitrogen. Also, Olowe *et al.* (2003) observed that application of nitrogen fertilizer significantly ($P \leq 0.05$) increased grain yield per plant of sesame.

The result obtained indicated that nitrogen had no significant ($P \leq 0.05$) influence on capsule length and seed/capsule of sesame. This result is in agreement with the findings of Malik *et al.* (2003) who reported that fertilizer application has no significant ($P \leq 0.05$) influence on capsules length of sesame. The result is also in line with the findings of Umar *et al.* (2012) who reported that varying cultivars as well as interaction between different nitrogen levels and intra row spacing could not reach a level of significance with respect to capsule length. The result also corroborates with the findings of Olowe and Busari (2000) who reported that fertilizer application has no significant influence on seeds/capsule of sesame.

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Table 5: Effect of Nitrogen Fertilizer on Capsule Length, Seed/Capsule and Yield/Hectare of Sesame Varieties in 2012 And 2013 Rainy Seasons

Treatment	Yield parameters 2012			Yield parameters 2013		
	Capsule length (CM)	Seed/capsule	Yield/ha (kg/ha)	Capsule length (CM)	Seed/capsule	Yield/ha (kg/ha
N fertilizer (kg/ha)						
0	2.30	76.50	59.54^{c}	2.53	75.50	69.40^{c}
20	2.50	76.65	121.80^{b}	2.60	75.70	141.44^{b}
40	2.50	77.04	167.58^{ab}	2.70	75.90	165.10^{ab}
60	2.70	78.23	177.92-a	2.73	77.20	195.10^{a}
80	2.83	79.09	219.90^{a}	2.80	77.71	222.30^{a}
LS	NS	NS	**	NS	NS	**
SE±	0.60	3.60	23.90	0.30	3.80	22.70
Variety (V)						
01M	2.51	77.80	158.16	2.44	74.15	154.23
02M	2.64	75.04	146.99	2.90	75.10	146.70
Ex-Sudan	2.52	76.53	139.90	2.70	73.98	138.31
LS	NS	NS	NS	NS	NS	NS
SE±	0.14	2.84	18.50	1.12	1.40	17.60
Interaction N x V	NS	NS	NS	NS	NS	NS

WAS = Weeks after sowing: NS = Not significant: LS = Level of significance: ** Significant at 1% level of probability: *significant at 5% level of probability: means followed by the same latter(s) within a treatment group are not significant using DMRT.

CONCLUSION AND RECOMMENDATIONS

The study concluded that, application of nitrogen fertilizer had a significant effect on growth and yield of sesame varieties. Application of 60kg N/ha can be recommended for the study area. Ex-Sudan variety can be recommended for the study area. Further study can be carried out to include additional varieties of sesame to determine the best variety for the study area.

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