# EFFECTS OF VARIETY AND SOWING METHOD ON WEED CONTROL AND CROP YIELD IN SESAME (*SESAMUM INDICUM* L.) IN A SOUTHERN GUINEA SAVANNA LOCATION OF NIGERIA

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## ABSTRACT

A field experiment was carried out in the rainy reasons of 2001 and 2002 at Minna, Nigeria, to evaluate the performance of nine sesame (*Sesamum indicum* L.) varieties (Cross 90, Yandev 55, Ex – Soliga, Ex – Adefar, Ex – Ijegun, Ex – Guma, Ex – Eke, Institute and Ex – Kachias) under dibble and broadcast sowing methods on weed control and crop yield. The seeds were sown at 4 kg $ha^{-1}$ by dibbling at 10 cm intra-row spacing on ridges 60 cm apart and by broadcasting on flat seed beds each measuring 2 x 6 m. The experimental design was split plot with three replications. The treatments assigned to the main plot were crop varieties, and sub-plot were sowing methods. The results indicated that crop varieties significantly differed in their ability to suppress weed density or dry matter in the two years of study. Also, crop varieties significantly affected number of branches/plant, number of capsules/plant, 1000 grain weight and grain yield. Broadcast sowing method significantly suppressed weeds in terms of density and dry matter more than dibbling, however, dibbling the seeds significantly produced more branches/plant, capsules/plant and higher grain yield than broadcasting the seeds.

## INTRODUCTION

Sesame (*Sesamum indicum* L.) is also known as beniseed in different parts of the world. It belongs to the family Pedaliaceae and is an erect branched annual plant, growing to a height of 1 m. It is a crop of the drier areas of the tropics that grows on poor soils and thrives well where rainfall is as low as 400 mm, being sensitive to excessive rainfall and waterlogged conditions (Adepoju, 1998). The crop is grown mainly for the oil which is extracted from the seed, but most important for consumption purposes, as confectioneries, cookies, cake and in bread making. The seed contains about 50% oil, 17-19% protein and 16-18% carbohydrate (Yermanos *et al.*, 1972). The oil is odourless and contains oleic, stearic and palmitic acid (Busari and Bature, 1993).

World production of sesame grains in 1993 was approximately two million tonnes (Hassanah, 1995). Nigeria is one of the sesame exporting countries in Africa (Weiss, 1983), and ranks second and seventh of the largest producers of the crop in Africa and the World, respectively (Nya, 2002).

The traditional planting method in Nigeria is by broadcasting seeds on wide ridges (known as Tiv system in Benue State). The crop is also sown on "hills" (known as Igbira system in Kogi State of Nigeria (Ndarubu and Adejonwo, 1998). The crop is mostly cultivated as a monocrop, even though occasionally interplanted with other crops (Kalu and Adeyemo, 1998).

Sesame exhibits a very high degree of genetic variability, hence most of its agronomic characteristics are reported to

be largely variety specific (Olowe and Busari, 1998). Seed yield is generally low, ranging from 90 to 250 Kg/ha in Nigeria (Ndarubu and Adejonwo, 1998). However, it is possible to obtain up to 456 Kg/ha under experimental conditions (Busari and Bature, 1993). Weed interference remains one major factor that contributes to poor yield in many crops (Akobundu, 1987). In the same vein, weeds have been identified as one of the major problems in sesame production in Nigeria (Busari and Bature, 1993). In line with this, works on row spacing in attempt to combat weeds, have been reported by Olowe and Busari (1994) and Ndarubu *et al.* (2003). However, little has been reported on the effect of sesame variety on weed growth. This study was therefore, conducted to evaluate the influence of sesame variety and sowing method on weed suppression and crop yield in a southern Guinea savanna location of Nigeria.

## MATERIALS AND METHODS

This study was conducted at Minna ($9^0$ 37'N, $6^0$ 30'E) in the southern Guinea savanna zone of Nigeria in 2001 and 2002 rainy seasons. The site for 2001 experiment was previously cropped to sole sorghum while that for 2002 was at fallow the previous year. A composite soil sample were taken at 0-15 cm depth with a 15 cm diameter soil auger for textural class determination before land preparation. The land was cleared and ridged manually 60 cm apart with hand hoe for sowing of seeds by dibbling or 2 x 6 m seed beds for sowing by broadcast. Nine sesame varieties (Cross 90, Yandev 55, Ex-Ankpa, Ex- Adefar, Ex-Ijegun, Ex-Guma, Ex-Eke, Institute and Ex-Kachias) constituted the main treatments.

Two sowing methods (dibbling and broadcasting ) were assigned to the sub-plots, each measuring 2 m x 3 m. The experimental design was split plot with three replications in each year of study. Paths of 1 m and 0.5 m were maintained between the main plots and sub-plots respectively. The seeds were sown by dibbling at 4 Kg/ha as recommended by Enwezor *et al.* (1989) at 10 cm intra-row spacing on the ridges and by broadcast on seed beds (Olowe and Busari, 1994). For uniformity of spread, the seeds were mixed with 142 g of soil before broadcasting each treatment and raked into the soil to avoid loss of seed to insect pests and rodent attack. The seeds were sown manually on $12^{th}$ September, 2001 and $4^{th}$ September, 2002.

No fertilizer was applied in order to maintain peasant farming practice (Busari *et al.*, 1998) which relies on the native soil nutrients. Manual weeding with hand hoe was carried out at 3 and 7 weeks after sowing (WAS). The incidence of sesame leaf webber (*Antigastra cataulanalis*) attack at 5 WAS in both years of study were kept down with the application of lambda-cyhalothrin (Karate 2.5 EC) at 25 g a.i./ ha. Harvesting was done manually at 14 WAS by cutting the plants with knife at the base close to ground level at physiological maturity (when the leaves had turned brown at the base). The harvested plants were tied into bundles and sun dried in an upright position against a wooden rack on a platform for four weeks. The seeds were threshed by beating the head with a stick.

The weeds in the experimental sites were identified; weed density and dry matter were determined by harvesting random samples using 1 m quadrant in each treatment at 3 and 7 WAS just before weeding. Other parameters measured were number of branches and capsules per plant, 1000 grain weight and grain yield. The data collected for each year and their mean were subjected to analysis of variance and the treatment means were separated using the New Duncan Multiple Range Test (NDMRT) at 5% level of probability.

## RESULTS

### Experimental soil

The analytical results of the soils of the experimental sites were characterized as sandy loam (78.1% sand, 9.6% silt and 12.3% clay in 2001 and 75% sand, 13.5% silt and 10.8% clay in 2002 cropping season) and slightly acidic with a pH of 5.8 and 5.7 (1:2 soil and water suspension) in 2001 and 2002 respectively.

### Weed flora

The predominant weed types found in the experimental sites were mainly broadleaves, such as *Spigelia anthelmia*, *Stachytarpheta jamaicensis*, *Ludwigia abyssinica* in 2001 and *Tridax procumbens*, *Leucas martinicensis* and *Mitracarpus villosus* in 2002 (Table 1) Some grasses such as *Chloris pilosa* and *Rottboelia cochenchinensis* were common in 2001 while grass species were of low occurrence in 2002. The sedges were mainly *Kyllinga bulbosa* and *Fimbristylis* spp. in 2001 and *Cyperus* spp. in 2002 which were of low dominance.

**TABLE 1** Composition and abundance of weed flora in the experimental sites.

| Weed flora | Level of occurrence 2001 | 2002 |
|---|---|---|
| **Broad leaves** | | |
| *Ludwigia abyssinica* A. Rich. | **** | - |
| *Ludwigia decurrens* Walt. | - | * |
| *Ageratum conyzoides* Linn | ** | ** |
| *Spigelia anthelmia* Linn | ***** | ***** |
| *Hyptis spicigera* Lam | ** | - |
| *Mimosa pudica* Linn. | - | ** |
| *Tridax procumbens* Linn | *** | *** |
| *Commelina diffusa* Burim. F | * | - |
| *Commelina erecta* L. | - | * |
| *Stachytarpheta jamaicensis* (Linn) Vahl. | ***** | ***** |
| *Leucas martinicensis* (Jacq.) Ait. F. | * | * |
| *Melochia corchorifolia* Linn. | * | * |
| *Euphorbia hirta* Linn. | * | * |
| *Euphorbia heterophylla* Linn | * | - |
| *Mitracarpus villosus* (SW.) DC. | - | **** |
| *Ipomoea aquatica* Forsk. | * | - |
| *Physalis angulata* Linn. | - | * |
| *Desmodium scorpiurus* (SW.) Desv. | * | * |
| *Cleome viscosa* L. | * | * |
| *Tephrosia pedicellata* Bak. | - | * |
| *Synedrella nodiflora* L. | * | * |
| *Sida acuta* Burm. F. | * | * |
| *Acanthospermum hispidum* DC. | - | * |
| **Grasses** | | |
| *Digitaria horizontalis* Willd. | ** | * |
| *Cynodon dactylon* (Linn.) Pers. | * | * |
| *Chloris pilosa* Schumach | **** | ** |
| *Cynodon plectostychus* | - | * |
| *Rottboellia cochinchinensis* (Lour.) Clayton | **** | ** |
| *Imperata cylindrica* (L.) Raeuschel | - | * |
| *Dactyloctenium aegyptium* (Linn.) P. Beauv. | * | * |
| *Pennisetum polystachion* (Linn.) Schult. | - | * |
| *Andropogon gayanus* Kunth. | - | * |
| *Brachiaria spp.* (Schumach) C.E. Hubbard | - | * |
| *Setaria pumila* (Poir) Roem & Schult. | - | * |
| **Sedges** | | |
| *Kyllinga bulbosa* Beauv. | * | - |
| *Fimbristylis spp.* Gaudet | * | - |
| *Cyperus spp.* Linn. | - | * |

*=Very Low ** =Low *** = Medium **** = High *****= Very high - = Not present

**Weed growth**

The effect of sesame variety and sowing method on weed density is shown in Table 2. The results indicate that variety Ex-Ijegun at 3 WAS in 2001 suppressed weeds over Yandev 55 and Ex-Eke. At 7 WAS however, Ex-Kachias suppressed weeds over Cross 90 and Institute. Weed densities were generally lower in 2002 than in 2001 (Table 2). The variety Ex-Kachias suppressed weeds over Institute at 3 WAS in 2002. At 7 WAS, weed density was least in Ex-Adefar, and was significantly lower than that obtained from variety Institute only in 2002.

**TABLE 2** Influence of crop variety and method of sowing on weed density ( $m^{-2}$) in sesame at 3 and 7 weeks after sowing (WAS) in 2001 and 2002 cropping seasons.

| | WAS (2001) | | WAS (2002) | |
|---|---|---|---|---|
| **Treatments** | **3** | **7** | **3** | **7** |
| **Variety** | | | | |
| Cross 90 | 22.0abc | 70.3a | 9.5ab | 13.3ab |
| Yandev 55 | 26.3ab | 54.7ab | 8.3ab | 13.3ab |
| Ex-Ankpa | 22.2abc | 58.0ab | 9.7ab | 12.0ab |
| Ex-Adefar | 18.0bc | 52.2ab | 8.2ab | 8.7b |
| Ex-Ijegun | 12.5c | 36.3ab | 12.2ab | 21.5ab |
| Ex-Guma | 22.5abc | 44.0ab | 7.5ab | 13.5ab |
| Ex-Eke | 31.2a | 45.3ab | 9.0ab | 18.2ab |
| Institute | 18.5bc | 72.0a | 13.8a | 24.5a |
| Ex-Kachias | 23.5abc | 29.2b | 6.5b | 14.8ab |
| SE ± | 3.6 | 8.2 | 1.9 | 4.2 |
| **Sowing method** | | | | |
| Dibbling | 30.1a | 61.0a | 9.9a | 24.9a |
| Broadcasting | 13.6b | 41.7b | 8.9b | 6.2a |
| SE ± | 1.7 | 5.4 | 0.9 | 4.2 |
| Variety x sowing method | NS | NS | NS | NS |

Column means followed by unlike letter(s) are significantly different at 5% level of probability by NDMRT.
NS = Not significant.

Table 2 shows that sesame sown by broadcasting suppressed weeds more throughout the sampling periods in 2001 and 2002. The interaction of sesame variety and sowing method on weed density growth were non-significant.

Sesame variety Yandev 55 suppressed weed dry matter compared to Ex – Guma at 3 WAS in 2001 (Table 3). At 7 WAS however, Ex-Kachias suppressed weeds over Ex-Adefar and Institute. Weed suppressive ability of other varieties were similar. In 2002 cropping season weed dry matter accumulation in all the sesame varieties were generally lower than those in 2001 (Table 3) and were non-significant during the two sampling periods.

**TABLE 3** Influence of crop variety and method of sowing on weed dry matter (g $m^{-2}$) in sesame at 3 and 7 weeks after sowing (WAS) in 2001 and 2002 cropping seasons.

| Treatments | WAS (2001) | | WAS (2002) | |
|---|---|---|---|---|
| | 3 | 7 | 3 | 7 |
| **Variety** | | | | |
| Cross 90 | 22.0ab | 17.1ab | 3.0a | 4.0a |
| Yandev 55 | 18.1b | 15.1ab | 3.9a | 3.0a |
| Ex-Ankpa | 27.2ab | 18.1ab | 2.6a | 4.7a |
| Ex-Adefar | 36.2ab | 21.4a | 2.4a | 3.0a |
| Ex-Ijegun | 26.3ab | 18.5ab | 2.2a | 5.9a |
| Ex-Guma | 38.3a | 15.8ab | 2.4a | 2.3a |
| Ex-Eke | 33.3ab | 12.2b | 1.6a | 4.0a |
| Institute | 27.6ab | 22.0a | 2.8a | 5.1a |
| Ex-Kachias | 28.8ab | 10.8b | 3.3a | 4.8a |
| SE ± | 5.4 | 0.1 | 0.7 | 1.3 |
| **Sowing method** | | | | |
| Dibbling | 42.7a | 22.9a | 2.6a | 6.4a |
| Broadcasting | 14.7b | 10.6b | 2.7a | 1.8b |
| SE ± | 2.6 | 1.1 | 0.3 | 0.6 |
| Variety x sowing method | NS | NS | NS | NS |

Column means followed by unlike letter(s) are significantly different at 5% level of probability by NDMRT.
NS = Not significant.

Broadcasting sesame seeds significantly reduced weed dry matter at the two sampling periods compared to dibbling in both years, except at 3 WAS in 2002 when the two methods gave similar results.

**Crop growth**

Number of branches per plant of sesame was highest in variety Ex-Adefar and Ex-Eke in 2001 cropping season (Table 4). These were greatly higher than those produced by Ex-Ankpa and Institute. Ex-Eke produced the highest number of branches per plant, which was significantly higher than that of Yandev 55 variety in 2002. The combined data show that variety Ex-Eke produced the highest number of branches per plant, which was significantly greater than those of varieties Institute, Yandev 55, Ex-Ankpa and Ex-Kachias.

Dibbling sesame seeds produced plants with significantly more number of branches than those broadcast in both the cropping seasons and combined data.

The effects of sesame variety and sowing method on number of capsules per plant are shown in Table 5. Ex-Guma variety produced the highest number of capsules per plant in 2001 though similar to Cross 90, Ex-Adefar, Ex-Ijegun and Ex-Eke. The least number of branches per plant was produced by variety Institute followed by Yandev 55. The number of sesame capsules per plant were generally fewer in 2002 than in 2001 cropping season (Table 5). The highest number of capsules per plant in 2002 was produced by Ex-Eke variety which was significantly higher than those of Yandev 55 and Institute, being the least. The results of the combined data on number of capsules per plant of sesame indicate that Ex-Guma and Ex-Eke had the highest. However, these were similar to those produced by Cross 90, Ex-Ijegun, and Ex-Adefar.

**TABLE 4** Influence of crop variety and method of sowing on average number of branches/plant in sesame in 2001 and 2002 cropping seasons.

| Treatments | 2001 | 2002 | Combined |
|---|---|---|---|
| **Variety** | | | |
| Cross 90 | 4.7abc | 3.7ab | 4.2abc |
| Yandev 55 | 3.8abc | 2.8b | 3.3bc |
| Ex-Ankpa | 3.0bc | 3.8ab | 3.4bc |
| Ex-Adefar | 5.5a | 3.3ab | 4.4ab |
| Ex-Ijegun | 4.8ab | 3.3ab | 4.1abc |
| Ex-Guma | 4.5abc | 3.5ab | 4.0abc |
| Ex-Eke | 5.5a | 4.5a | 5.0a |
| Institute | 2.8c | 3.5ab | 3.2c |
| Ex-Kachias | 3.7abc | 3.7ab | 3.7bc |
| SE ± | 0.3 | 0.5 | 0.2 |
| **Sowing method** | | | |
| Dibble | 5.0a | 5.2a | 5.1a |
| Broadcast | 3.6b | 1.0b | 2.8b |
| SE ± | 0.3 | 0.2 | 0.4 |
| Variety x sowing method | NS | NS | NS |

Column means followed by unlike letter(s) are significantly different at 5% level of probability by NDMRT.
NS = Not significant.

**TABLE 5** Influence of crop variety and method of sowing on average number of capsules/plant in sesame in 2001 and 2002 cropping seasons.

| Treatments | 2001 | 2002 | Combined |
|---|---|---|---|
| **Variety** | | | |
| Cross 90 | 47.3abcd | 35.8abc | 41.6abc |
| Yandev 55 | 28.7de | 29.3bc | 29.0cd |
| Ex-Ankpa | 33.2cde | 41.8abc | 37.5bcd |
| Ex-Adefar | 53.0ab | 38.8abc | 45.9ab |
| Ex-Ijegun | 46.5abcd | 40.3abc | 43.4ab |
| Ex-Guma | 58.2a | 47.3ab | 52.8a |
| Ex-Eke | 52.2abc | 51.3a | 51.8a |
| Institute | 25.3e | 25.5c | 25.4d |
| Ex-Kachias | 36.8bcde | 36.3abc | 36.6bcd |
| SE ± | 5.9 | 6.2 | 5.6 |
| **Sowing method** | | | |
| Dibbling | 53.6a | 61.6a | 57.6a |
| Broadcasting | 31.1b | 15.5b | 23.3b |
| SE ± | 2.8 | 2.9 | 4.3 |
| Variety x sowing method | NS | NS | NS |

Column means followed by unlike letter(s) are significantly different at 5% level of probability by NDMRT.
NS = Not significant.

Sowing of sesame seeds by dibbling produced more capsules than broadcasting in both seasons and their combined data (Table 5). No significant interaction effect was found between variety and sowing method.

**Crop yield**

The weight of 1000 grains of sesame in 2001 was heaviest in Yandev 55 which was significantly heavier than the grains produced by all other varieties (Table 6). This was followed by Institute and Cross 90 in decreasing order. Grains by Ex-Guma were the lightest though similar to those produced by Ex-Ankpa and Ex-Eke. In 2002 cropping season, variety Institute and Yandev 55 produced the heaviest 1000 grains, and these were significantly heavier than those produced by all other varieties. The combined data indicate that Institute and Yandev 55 produced the heaviest grains.

The method of sowing sesame had no significant effect on 1000 grain weight in the two years of study (Table 6) and no interaction effect of the varieties and sowing method was observed.

**TABLE 6** Influence of crop variety and method of sowing on average weight (g) of 1000 grains of sesame in 2001 and 2002 cropping seasons

| Treatments | 2001 | 2002 | Combined |
|---|---|---|---|
| **Variety** | | | |
| Cross 90 | 2.18c | 2.20b | 2.19b |
| Yandev 55 | 2.62a | 2.53a | 2.58a |
| Ex-Ankpa | 2.00ef | 1.98b | 1.99cd |
| Ex-Adefar | 2.03de | 2.05b | 2.04bcd |
| Ex-Ijegun | 2.02de | 1.90b | 1.96cd |
| Ex-Guma | 1.92f | 1.88b | 1.90d |
| Ex-Eke | 2.00ef | 2.12b | 2.06bcd |
| Institute | 2.52b | 2.83a | 2.68a |
| Ex-Kachias | 2.10cd | 2.15b | 2.13bc |
| SE ± | 0.30 | 0.11 | 0.21 |
| **Sowing method** | | | |
| Dibbling | 2.2a | 2.1a | 2.19a |
| Broadcasting | 2.1a | 2.2a | 2.15a |
| SE ± | 0.01 | 0.05 | 0.05 |
| Variety x sowing method | NS | NS | NS |

Column means followed by unlike letter(s) are significantly different at 5% level of probability by NDMRT.
NS = Not significant.

The grain yield of sesame was greatest with variety Ex-Eke in 2001 cropping season (Table 7). The yield was however, similar to those produced by Ex-Ijegun, Ex-Guma , Cross 90 and Ex-Adefar. Institute produced the lowest yield in 2001 which was similar to that produced by Ex-Ankpa (Table 7). In 2002, the greatest grain yield was produced by variety Cross 90 (Table 7). This was however, similar to those of Ex-Eke, Ex-Ankpa , Ex-Guma, Yandev 55 and Ex-Kachias. Institute, Ex – Adefar and Ex – Ijegun produced the lowest grain yield in 2002. The highest yield was produced by Cross 90 in the combined data. This was

however, not significantly different from yields obtained from Ex-Eke and Ex-Guma.

Data presented in Table 7 show that dibbling sesame produced the greater grain yield than the broadcast crop in the two seasons. Mean effect of the two seasons showed that there was a 37.7% yield increase in dibbled over the crop broadcast. There was no significant interaction between the crop varieties and sowing methods.

**TABLE 7** Influence of crop variety and method of sowing on average grain yield (kg/ha) of sesame in 2001 and 2002 cropping seasons.

| Treatments | 2001 | 2002 | Combined |
|---|---|---|---|
| **Variety** | | | |
| Cross 90 | 204.2ab | 388.5a | 296.4a |
| Yandev 55 | 178.0bc | 219.0ab | 198.5bc |
| Ex-Ankpa | 148.2cd | 268.3ab | 208.2bc |
| Ex-Adefar | 184.2abc | 181.8b | 183.0c |
| Ex-Ijegun | 215.9ab | 204.3b | 210.1bc |
| Ex-Guma | 213.4ab | 233.2ab | 223.3abc |
| Ex-Eke | 232.7a | 320.1ab | 276.4ab |
| Institute | 120.6d | 163.2b | 141.9c |
| Ex-Kachias | 181.3bc | 216.5ab | 198.9bc |
| SE ± | 15.1 | 18.5 | 16.8 |
| **Sowing method** | | | |
| Dibbling | 203.1a | 360.5a | 265.2a |
| Broadcasting | 169.9b | 127.2b | 165.2b |
| SE ± | 7.1 | 54.8 | 27.5 |
| Variety x sowing method | NS | NS | NS |

Column means followed by unlike letter(s) are significantly different at 5% level of probability by DMRT.
NS =Not significant.

## DISCUSSION

### Weed Growth

The effect of crop variety on weed density and dry weight varied from one stage of growth to the other and between the seasons. This phenomenon could be due to the vegetative growth pattern of the various varieties. Busari *et al.* (2005) citing Uzo (1998) observed that the time for each of the major phenological stages during the growth of sesame depends on certain environmental conditions. These conditions for example, moisture would have affected varieties differently and at different growth stages hence, the inconsistency in the ability of the varieties to suppress weeds. The ability of broadcast sesame plants to suppress weeds more than those dibbled could be attributed to greater plant density per unit area in the former than the latter. This could have discouraged weed germination and retarded the growth of emerged seedlings. Our finding, which is in consonance with the observations of Ndarubu *et al.* (2003), is however, in contrast with the results reported by Imoloame *et al.* (2004) who obtained greater weed growth in the dibbled sesame than those broadcast.

### Crop Growth

The variation in the ability of sesame varieties to produce branches (Table 4) and

capsules per plant (Table 5) could be due to their genetic made. The number of capsules produced per plant is a function of the number of branches per plant. Those varieties with more branches produced greater number of capsules per plant (Tables 4 and 5).

The capacity of the dibbled sesame plants to produce greater number of branches and capsules per plant than the broadcast crop could be due to greater availability of resources utilization in the former than in the latter method of sowing. There might have been less intra -plant competition for both below-and above-ground growth resources in dibbled plants than those broadcast. This result is however, contrary to the findings of Imoloame *et al.* (2004) who worked in the Sahel ecological zone of Nigeria.

**Grain Yield**

The 1000 – grain weight obtained in this study generally fell below those quoted (2.5-3.2 g/1000 seeds) by Delgado and Yermanos (1975) and Ndarubu *et al.* (2003). Sesame grain weight, like the other parameters varied so much with variety. It is observed from Tables 4 and 5 that the fewer the number of branches per plant and hence number of capsules per plant, the heavier the weight of 1000 grains. For example, while varieties Yandev 55 and Institute had lower number of branches and capsules/plant than Ex-Eke and Ex-Adefar (Tables 4 and 5), the former produced heavier grains (Table 6) than the latter two varieties. The explanation for this is that the photosynthate is utilized by relatively smaller sink in plants with fewer branches and capsules than those with more. Weight of 1000 grains were similar among the sowing methods (Table 6) and this may not play a significant role in determining 1000 - grain weight.

Sesame grain yield was not directly related to high number of branches or capsules per plant (Tables 4-7). Yield potential may therefore, be genetic. Dibbling sesame resulted in greater yield by 37.7% over those broadcast. This was probably due to better plant growth due to resources availability to plants from dibbled seeds than those broadcast due to higher intra-plant competition in the latter.

## CONCLUSION

It is hereby concluded that the growth and yield components of sesame varieties evaluated in this study varied greatly. This wide variability might be due to their genetic characteristics and influenced by environmental conditions at different stages of growth (Busari *et al.*, 2005). Sesame varieties Cross 90, Ex-Eke and Ex-Guma are recommended for this ecological zone for their good yield performance.

In choosing between dibbling and broadcasting method of sowing a farmer has to decide what his objective is. Broadcasting sowing was found to be better than dibbling in reducing weed density and dry matter. However, dibbling is recommended, rather than broadcast, for optimum grain yield. In addition, a farmer is better disposed to easy manual hoe weeding in field sown by dibbling than that sown by broadcasting.

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