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RESEARCH ARTICLE

Evaluation of white seeded sesame (*Sesamum indicium* L.) genotypes on growth and yield performance in Menit Goldya Woreda of West Omo Zone, SWE

Tewoderos Legesse*, Bekelech Sharew

Abstract

Sesame is the second export crop next to coffee in annual export, indicating the highest 14% of the total world export of the crop. In Africa, Sudan is the major sesame producer, followed by Nigeria, Somalia, Uganda and Ethiopia. But lack of well-adapted varieties are one of the bottleneck production problems that account for low yield and small areas cropped to the nation. Thus it is essential to evaluate such genotypes, which have high yield potential and are suitable to local environmental conditions. Therefore, field experiments were conducted at west Omo zone during 2019/20 main cropping seasons at one location of West- the Omo zone, southwest Ethiopia. The location was Menit Goldiya districts of West Omo Zone, through evaluation and selection of high-yielding sesame varieties. The study comprised of five improved and one local sesame varieties laid out in RCBD with three replications at each location. The growth and yield data were collected and analyzed by using SAS Version 9.3 statistical software. The result of the study revealed that all of the parameters considered were significantly ($p < 0.01$) affected by varieties on both years. Accordingly, at Menit Goldiya for, all parameters in both years and the combined analysis over the years indicated that maximum plant height, number of primary branches per plant, number of capsules per plant, thousand seed weights in grams and seed yield were observed for the Humera-1 variety. Likewise, the shortest days to flowering, early maturing, the highest length of capsule bearing zone, the maximum number of capsules per plant, the highest number of seeds per capsule and the maximum seed yield (8.13 Qu/ha) were observed for the Humera-1 variety in 2019/2020 growing seasons. Based on the mean total seed yield of locations and different yield evaluation methods, a high-yielding variety was identified. Accordingly, the Humera-1 variety performed best on both years. Therefore, this variety can play a vital role in food self-sufficiency and food security of the south-western region and it should be widely distributed to farmers of the testing locations and similar areas of the region.

Keywords: Cropping seasons, Genotypes (varieties), Location, Sesame, Yield, Yield components.

Introduction

Sesame (*Sesamum indicum* L., 2n = 26), a member of the Pedaliaceae family, is most likely the oldest oil seed that humans have ever utilized (Kafiriti and Deckers, 2001; Reddy, 2006). It is referred to as the "Queen of oil seeds" because of its superior polyunsaturated stable fatty acid, which inhibits oxidative rancidity (Reddy, 2006; Gururajan *et al*., 2008; Balasubramanian and Palaniappal, 2011). It is also stable because sesamolinol and sesamol, which are naturally occurring antioxidants, slow down the rate of oxidation (Terefe *et al*., 2012). The crop is grouped in the Pedaliaceae family and adapted to hot areas (Reddy, 2006).

In Ethiopia, its demand for food and animal feed makes it very expensive when compared with other oil crops such as vegetable oils. Sesame oil cakes an important byproduct for animal feed; especially, for dairy production in rural areas where other sources of feed are limited (Abera, 2009).

In contrast, in Africa, average productivity ranges from 300 to 500 kg/ha in pure stands, but under good management, it can reach as high as 3000 kg/ha. Sesame is produced over an area of 8.8 mha, with an annual production of about 2.8 mt and an average productivity of 382 kg/ha (Kafiriti and Deckers, 2001).

Department of Plant Science, Mizan-Tepi University, College of Agriculture and Natural Resources, Mizan Teferi, Ethiopia.

***Corresponding Author:** Tewoderos Legesse, Department of Plant Science, Mizan-Tepi University, College of Agriculture and Natural Resources, Mizan Teferi, Ethiopia., E-Mail: ledutew@gmail.com

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Sudan is Africa's top producer of sesame, followed by Nigeria, Somalia, Uganda, and Ethiopia. Sesame is the second export crop next to coffee in annual export, indicating with the highest 14% of the total world export of the crop (Monitor Group, 2012). Due to the increase in price as a result of increasing demand for the crop, production of sesame is increasing in Ethiopia. According to Abera (2009) report, Ethiopia's export share 1.5% in volume and 1.9% in value to the World market in 1997, had grown to 8.9% and 8.3% in 2004, respectively. Sesame plays a significant role in the livelihood of sesame-growing farmers in Ethiopia. In the western part of Tigray (Humara, Welkayit and the Tahtay Adiabo), Amhara (Wollo and Metema), Benshangul and Gambella, farmers produce sesame as a major cash crop. According to CSA (2011) report, sesame occupied 0.62% (about 73,687.7 hectares) of the total area covered by grain crops and 1.61% (about 3,277,409.22 Qt) of total grains produced during 2010/11. The total area cultivated, production (which is 5.87% of the total World production) and productivity (which is 140.12% higher than the world record 5.176 Qt/ha) in Ethiopia during 2015 was 337,505 ha, 44783 tons and 7.253 Qt/ha, respectively (FAOSTAT, 2016). It has been utilized for thousands of years in Ethiopia through traditional expellers like camel-driven traditional expellers called 'Mogue'; and locally, sesame oil costs up to 30 Ethiopian Birr for 300 mL of oil. The domestic demand of the oil is due to its high-quality oil for consumption. The byproduct sesame cake is also an important livestock feed for dairy production, especially during the offseason when other green fodders are inadequate. Although many small-scale farmers, investors, dealers, exporters, and the Ethiopian economy rely on sesame as a source of revenue, the industrial processing and use of sesame in Ethiopia have not reached their full potential. Sesame is a highly marketable oil crop and a superior source of income in many Ethiopian regions where it is grown, but due to biotic (weeds, insects, and diseases) and abiotic (soil type, altitude, rail fall distribution and intensity, etc.) factors, its productivity is low and erratic across locations and years. The following factors contribute to seed breaking at maturity: Poor stand establishment, low harvest index, non-synchronous maturation, a lack of broader adaptable cultivars, and uneven capsule maturity (Fantaye *et al*., 2018; Ashri, 1994). Therefore, sesame production in the SNNPR is a recent wonder and its area coverage in 2014/15 was 6,365.70 hectares and its production and productivity are 31,650.97 quntal and 4.97 qu/ha, respectively (CSA, 2015). However, recently the Regional Government has given special attention due to the potential of sesame to be used as cash crop commodity and earn hard currency for Ethiopia. The importance of any variety testing program is to obtain the most accurate estimate of variety performance that is possible within the limitations imposed by the environmental growing conditions (Fantaye *et al.,* 2018). Farmers are basically interested in superior and specifically adapted varieties to their condition and with a high degree of stability over time. The well-performing ability of sesame over a wide range of environments is of major interest to plant breeders (Ashri, 1994; Fantaye *et al.,* 2018). Due to the higher productivity and drought tolerance of the crop, it can play a vital role in achieving better income of the region. The absence of better crop varieties that are tailored to the unique conditions of the region is often one of the biggest obstacles to raising yield per hectare, among other things. Under farmer conditions, soybean production is low for a number of reasons, one of which is the absence of better cultivars. According to Ashri (1994), low yields in farmers' fields are mostly caused by inadequate agronomic methods and a lack of better genotypes. This is also true in Benchi Sheko and West omo zone conditions. Thus, it is necessary to conduct this experiment to determine the productive and adaptive varieties for two seasons and two location conditions among the improved varieties released by the Humera Agricultural Research Center. The present study, is therefore, was designed with the following objective.

General Objective

To improve the production and productivity of sesame at West Omo Zone through evaluation and selection of high-yielding sesame verities.

Specific Objectives

- To evaluate the best-performing white-seeded sesame genotypes in Menit Goldiya district
- To identify and select superior white-seeded sesame genotypes in the tested area

Materials and Methods

Description of the Study Area

During the 2019 and 2020 agricultural seasons, the study was conducted in the Menit Goldiya area of the West Omo Zone in southwest Ethiopia. The distance from Addis Abeba to the southwest of the nation is approximately 592 km. The study site is located in the southwestern tropical area of Ethiopia, between 330N latitude and 350E longitude, at an elevation of 1750 m above sea level as shown in Figure 1. The rainy season lasts from March to November, with the seasonal pattern of rainfall being unimodal. The region receives 900 mm of rain each year, and the typical lowest and maximum temperatures a/re 22 and 35°C, respectively.

Description of the Experimental Material

In the experiment, five distinct types of sesame varieties–Humera-1, Setit-2, Setit-3, Gonder-1, and Setit-1–were employed, as well as one indigenous variety that was taken from a farmer's field close to the testing location. The genotypes are fully described in Table 1. A three-replication randomized complete block design (RCBD) was used in the investigation.

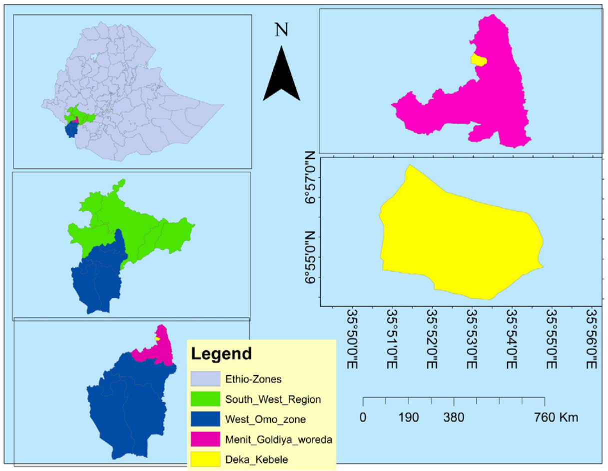

Figure 1: Map of the study area

Experimental Procedures

Using three replications across sites, the trial was conducted using a randomized complete block design (RCBD), with an experimental plot size of 2 x 5 m, 1 m across plots, and 1.5 m between blocks, maintaining 40 and 10 cm between inter- and intra-row spacing, respectively. Each plot was 10 m^2 in total, with five rows and a net plot area of 6 m^2 that included three harvestable rows. The experimental plots underwent two plowings, one prior to planting and the other during sowing, in order to preserve a fine seedbed that would facilitate crop establishment (Figure 2). After 25 days after seeding, the seed was manually drilled into the rows at a rate of 8 kg ha^{-1}. DAP (100 kg/ha) was applied at the identical rate to every experimental plot and According to the guidelines for the dry lowland regions, urea fertilizer (50 kg/ha) and all other field management techniques were applied equitably and correctly.

Data Collection

Soil sampling and analysis procedure

Prior to planting, a composite soil sample was created by taking representative soil samples from the experimental field at depths of 0 to 30 cm using an auger set up in a zigzag pattern from 18 spots. An analysis of the physicochemical properties of the soil was conducted by air-drying, grinding, and sieving the soil sample using a 2 mm-size sieve. To determine the total nitrogen and organic carbon contents,

(a) (b)

Figure 2: (a) Sesame site selection; (b) Sesame planting material preparation

the soil sample was crushed even more and put through a 0.5-mm screen. Using normal protocols, the following physicochemical analyses were performed at Jimma Soil Laboratory: Texture, pH, CEC, OC, total N, and available P; available sulphur and boron were analyzed at JIJE LaboGLass Soil Laboratory. In order to analyze the texture of the soil, the percentage of sand, silt, and clay by following the Bouyoucos hydrometer method (Bouyoucos, 1962).

Using a glass electrode connected to a digital pH meter, the soil's pH was measured at a weight/volume ratio of 1:2.5 to the water dilution (Sahlemedhin and Taye, 2000). Following the soil's saturation with ammonium acetate (NH 4OAC) and displacement with NaOAC, the cation exchange capacity (CEC) was ascertained (Chapman, 1965). The wet oxidation method (Walkley and Black, 1934) was used to quantify the amount of organic carbon, and a conversion factor of 1.724 was used to calculate the amount of soil organic matter. Black (1965) detailed the wet-digestion, distillation, and titration processes of the Kjeldahl technique, which were used to measure the total nitrogen content of the soil. The Olsen technique was used to calculate the amount of available phosphorus. Sulphur availability was assessed using the mono calcium(Olsen *et al*., 1954).

Data Collection

Phonological and growth parameters

Three net-harvestable rows of ten randomly chosen plants from each plot were used to collect data for each variable.

- *Days to 50% flowering (DF)*

The period of time measured from population emergence to 50% of each plot's population reaching flowering.

Table 1: Description of genotypes used in the study

Variety	*Year of release*	*Altitude*	*Maturity day*	*Seed color*	*Yield(Qu/Ha)*	*Center of release*
Setit-1	2011	600-800	80-90	White	8.5	Humera
Humera-1	2011	600-1100	90-100	White	9	Humera
Setit-2	2016	600-1100	80-87	White	9	Humera
Setit-3	2017	600-1500	75-80	White	10.5	Humera
Gonder-1	2016	760-1022	101	White	7	Gonder

EARO(Ethiopian Agricultural Research Organization),2004

- *Days to 75% maturity (DM)*

The average number of days from plant emergence to the point at which 75% of each plot's plants reached full maturity.

- *Height (PH) of the plant (cm)*

Using meter tape, the height of ten randomly chosen and tagged plants from each plot's harvestable rows was measured from the ground to the top of the plant.

- *Length of capsule bearing zone (LCBZ) (cm)*

Using meter tape, the height of the plant from the first capsule to the tip was measured.

- *Number of main branches per plant (NBPP)*

Ten randomly chosen plants were counted to see how many branches produced fruitful capsules.

- *Number of capsules per plant (NCPP)*

At maturity, the overall number of capsules from 10 randomly chosen plants was counted.

- *Seed yield (Qu/ha)*

A sensitive balance was used to weigh the entire amount of seed gathered from the net plot area.

- *Weight in thousand seeds (TSW)*

This was measured in games per thousand seeds.

- *Number of seeds per capsule (NSPC)*

A hand count was performed on the number of seeds per capsule.

Data Analysis

The average days to flowering, days to maturity, length of capsule bearing zone, and number of seeds per capsule response variable results were reported based on individual year analysis (2019 and 2020) due to significant error variances across years; however, the remaining response variable results were reported based on combined analyses over the years due to non-significant error variances across years. These results indicate that the significant difference between treatments was tested using analysis of variance (ANOVA). SAS 9.3 software was used to do the statistical analysis. A significance threshold of 0.05 was set, and the mean of the treatments that were determined to be significant was compared using the LSD technique (SAS, 2008).

Table 2: Physicochemical characteristics of soil

Properties	*Value*
Texture	Clay
pH (HO)	5.89
Organic matter (%)	6.77
Total nitrogen (%)	0.38
Available phosphorus (ppm)	9.5
CEC (meq/100 g)	39.21 (meq/100 g)
Exchangeable Ca (meq/100 g)	11.71
Exchangeable K (meq/100 g)	0.81
Exchangeable Mg (meq/100 g)	2.5
Exchangeable Na (meq/100 g)	0.04
Exchangeable acidity (mg kg^{-1})	0.25

Where: CEC = Cation Exchange Capacity, OC = Organic Carbon, OM = Organic Matter, TN = Total nitrogen and Av. = Available.

Results and Discussion

Soil Physicochemical Properties of the Experimental Site

Tables 2 to 4 present the findings of the individual-year study conducted for the growth seasons of 2019 and 2020, respectively. Because of the uniform error variance of all the variables, a two-year combined analysis was also performed (Table 5).

Phonological and Growth Parameters

Days to 50% flowering (DF)

Regarding days to 50% blooming, there was a highly significant ($p < 0.01$) variance between the sesame types planted at one location in both years. Accordingly, data from the Menit Goldiya growth seasons of 2019 and 2020 showed that the local variety had the greatest and lowest values for days to 50% blooming, respectively (88.55 and 80.68), and setit-1 had the lowest values (45.67 and 49.77) (Tables 3 and 4). According to Yasin *Etal, 2017,* variations in the number of days until 50% of a plant's flowers may result from genetic variations in the variety's responses to various environmental factors.

Days to 75% maturity (DM)

At all sites during both growing seasons, the effect of sesame cultivars on days to 75% maturity was similarly extremely significant (p 0.01). The variety Setit-2 (82.07 and 74.5) at the Menit Goldiya site had the lowest values in both the 2019 and 2020 growing seasons, respectively, whereas Humera-1 (120.36) had the most days to 75% maturity during the 2019 growing season (Tables 3 and 4).

Figure 3: (a) Humera-1 genotype; (b) Setit-1 genotype; (c) gonder-1 genotype

Table 3: Average values of sesame varieties' growth and yield variables in Menit Goldiya Woreda in the West Omo Zone during the 2019 growing season

Variety	*DF*	*DM*	*PH (m)*	*LCBZ (cm)*	*NBPP*	*NCPP*	*TSW (gm)*	*NSPC*	*SY (Qu/Ha)*
Setit 2	54.34^{E}	82.07^{E}	1.98^{B}	44.41^{E}	3.40^{C}	25.02^{C}	3.37^{D}	61.36^{D}	5.42^{D}
Gonder-1	81.55^{B}	94.47^{D}	1.22^{D}	51.64^{D}	2.82^{E}	20.74^{E}	3.11^{E}	56.09^{E}	5.12^{E}
Setit 3	71.69^{C}	72.08^{F}	1.82^{C}	61.90^{C}	3.22^{D}	23.31^{D}	3.56^{C}	64.63^{C}	6.33^{C}
Humera 1	64.41^{D}	120.36^{A}	2.50^{A}	83.03^{A}	5.88^{A}	30.85^{A}	4.33^{A}	75.96^{A}	8.32^{A}
Setit 1	45.62^{F}	103.92^{B}	2.40^{A}	71.52^{B}	4.25^{B}	28.39^{B}	3.66^{B}	67.27^{B}	7.02^{B}
Local	88.55^{A}	94.95^{C}	1.86^{C}	34.50^{F}	2.53^{F}	17.34^{F}	2.80^{F}	45.88^{F}	4.54^{F}
LSD0.05	7.01	3.33	2.76	12.03	2.33	2.25	1.80	8.02	1.22
CV (%)	3.11	1.12	12.7	3.53	17.4	9.14	14.4	7.8	7.8

Means followed by the same letter (s) for a variable are not significantly different at P > 0.05. DF= Days to 50% flowering DM= Days to 75% maturity PH= Plant height(m) LCBZ= Length of capsule bearing zone(cm) NBPP= Number of primary branches per plant NCPP= Number of capsules per plant TSW= Thousand seed weight(gm) NSPC= Number of seeds per capsule SY= Seed yield (qu/ha)

Table 4: Average values of sesame varieties' growth and yield variables in Menit Goldiya Woreda in the West Omo Zone for the 2020 growing season

Variety	*DF*	*DM*	*PH (m)*	*LCBZ (cm)*	*NBPP*	*NCPP*	*TSW (gm)*	*NSPC*	*SY (Qu/Ha)*
Setit 2	58.37^{E}	74.5^{F}	1.78^{BAC}	46.95^{D}	3.73^{BA}	26.10^{BA}	2.22^{E}	29.14^{B}	4.49^{E}
Gonder-1	76.26^{B}	83.6^{E}	1.36^{BC}	57.44^{C}	2.95^{B}	27.74^{BA}	2.32^{D}	35.21^{A}	5.43^{D}
Setit 3	71.51^{C}	120.4^{B}	1.68^{BAC}	60.66^{C}	3.43^{BA}	28.96^{A}	2.96^{C}	27.17^{CB}	6.25^{C}
Humera 1	60.18^{D}	97.1^{D}	1.96^{BA}	82.66^{A}	5.05^{A}	32.36^{A}	3.98^{A}	33.66^{A}	7.94^{A}
Setit 1	49.77^{F}	104.5^{C}	2.21^{A}	68.85^{B}	3.40^{BA}	25.37^{BA}	3.10^{B}	26.62^{CB}	7.44^{B}
Local	80.68^{A}	132.9^{A}	1.14^{C}	40.72^{E}	4.38^{BA}	17.94^{B}	2.14^{F}	25.94^{C}	3.77^{F}
LSD0.05	2.7	2.26	0.72	3.83	1.97	10.28	1.44	3.10	2.76
CV (%)	13.34	11.76	1.7	14.00	7.4	4.21	6.4	5.8	3.8

Means followed by the same letter (s) for a variable are not significantly different at P > 0.05. DF= Days to 50% flowering DM= Days to 75% maturity PH= Plant height(m) LCBZ= Length of capsule bearing zone(cm) NBPP= Number of primary branches per plant NCPP= Number of capsules per plant TSW= Thousand seed weight(gm) NSPC= Number of seeds per capsule SY= Seed yield (qu/ha)

Table 5: Mean values for growth and yield characteristics of sesame cultivars at Menit Goldiya woreda in the West Omo zone during the growing seasons of 2019 and 2020

Variety	*PH (m)*	*NBPP*	*NCPP*	*TSW (gm)*	*SY (Qu/Ha)*
Setit 2	1.88^{B}	3.56^{C}	25.56^{B}	2.79^{D}	4.95^{D}
Gonder-1	1.29^{E}	2.88^{E}	24.24^{C}	2.72^{D}	5.28^{D}
Setit 3	1.75^{C}	3.33^{D}	26.14^{B}	3.26^{C}	6.29^{C}
Humera 1	2.23^{A}	5.47^{A}	31.61^{A}	4.12^{A}	8.14^{A}
Setit 1	2.30^{A}	3.83^{B}	26.86^{B}	3.38^{B}	7.23^{B}
Local	1.5^{D}	3.46^{C}	17.64^{D}	2.47^{E}	4.17^{F}
LSD0.05	1.49	2.15	6.25	1.62	1.99
CV (%)	7.2	12.4	6.8	10.4	5.8

Means followed by the same letter (s) for a variable are not significantly different at P > 0.05. DF= Days to 50% flowering DM= Days to 75% maturity PH= Plant height(m) LCBZ= Length of capsule bearing zone(cm) NBPP= Number of primary branches per plant NCPP= Number of capsules per plant TSW= Thousand seed weight(gm) NSPC= Number of seeds per capsule SY= Seed yield (qu/ha)

Plant height (PH)

Sesame variety effects on plant height were likewise extremely significant ($p < 0.01$) during both growing seasons at all sites. In the 2019 growing season, the variety Gonder-1 (1.22) at the Menit Goldiya site had the lowest values, while the maximum plant height was reported for Humera-1 (2.50), which was statistically equivalent to Setit-1 (2.40) (Table 3). The variety Setit-1 (2.21) had the highest plant height reported in the same area during the 2020 growing season, while variety local (1.14) had the lowest plant height (Table 4 and Figure 3). The cumulative study throughout the years at the Menita Goldiya site showed that the Humera-1 variety had the largest result (2.23), which was statistically identical to the Setit-1 (2.3) variety, while the Gonder-1 (1.29) variety had the lowest value (Table 5). This variation was due to the differences in the growing environment, climatic conditions and genetic make-up of the varieties. This outcome is consistent with Fiseha *et al.*, 2019, finding that there is a considerable variation in plant height amongst sesame genotypes. Similar findings were published by Tamer *et al.* in 2017, who found a substantial variation in plant height amongst sesame cultivars.

Length of capsule bearing zone (LCBZ)

In both growth seasons, the impact of different types of sesame on the length of the capsule-bearing zone was also extremely significant ($p < 0.01$) at every site. In both the 2019 and 2020 growing seasons, Humera-1 had the longest capsule bearing zone (83.03 and 82.66), whereas variety local (34.05 and 40.72) at the Menit Goldiya site had the shortest values (Tables 3 and 4).

Number of primary branches per plant (NBPP)

The number of main branches per plant was found to be significantly impacted by the types of sesame ($p < 0.01$) in both growth seasons at all sites. In both the 2019 and 2020 growth seasons, Humera-1 had the greatest number of primary branches per plant (5.883 and 5.05), while the varieties Gonder-1 (2.95) and local (2.53), both at the Menit Goldiya site, had the lowest numbers (Tables 3 and 4). The results of the combined analysis across several years showed that the variety Humera-1 had the highest result (5.47), and the variety Gonder-1 had the lowest value (2.88) (Table 5). The variations' varying genetic compositions might be the fundamental cause of the variation in the number of principal branches among them; as a result, characteristics may differ in their genetic responses for the formation of branches. These results are in concordance with (Ahadu, 2010), who stated that the numbers of branches did change according to the varieties.

Number of capsules per plant (NCPP)

The number of capsules per plant was likewise significantly affected ($p < 0.01$) by the types of sesame at all sites throughout both growth seasons. In both the 2019 and 2020 growing seasons, Humera-1 had the greatest number of capsules per plant (30.85 and 32.36), while Gonder-1 (20.74) and local (17.94) had the lowest numbers at the Menit Goldiya site (Tables 3 and 4). The variety Humera-1 showed the highest result (31.61) over the course of several years, whereas the local variety (17.64) showed the lowest value (Table 5). This outcome is consistent with the findings of Begum *et al.*, 2001, who indicated that the presence of favorable climatic conditions for the varieties caused a variance in the number of capsules per plant assessed for several sesame varieties in the region under test. Similar to (Weres, 2020), who noted notable variations in the amount of capsules produced per plant across sesame types as a result of the kinds' genetic variances.

Thousand seed weight in gram (TSW)

In both growth seasons, the impact of sesame types on the weight of thousand seeds in grams was likewise extremely significant ($p < 0.01$) at all sites. At the Menit Goldiya site in the growth seasons of 2019 and 2020, Humera-1 had the greatest seed weight in grams (4.33 and 3.88) and the lowest values (2.80 and 2.14) (Tables 3 and 4). The variety Humera-1 showed the highest result (4.12) over the course of several years, whereas the local variety (2.47) showed the lowest value (Table 5). Olowe *et al.,* 2010 investigated notable variations in 1000-seed weight among different kinds of sesame.

Number of seeds per capsule (NSPC)

The number of seeds per capsule was likewise significantly affected ($p < 0.01$) by the types of sesame at all sites throughout both growth seasons. In both the 2019 and 2020 growing seasons, Humera-1 (75.96) and Gonder-1 (35.21) had the maximum recorded numbers of seeds per capsule, whereas variety local (45.88 and 25.94) in the Menit Goldiya site had the lowest values (Tables 3 and 4). This outcome is consistent with the research of finding of Morris, 2009, who noted that the variety effect causes variation in the number of seeds per capsule in sesame.

Seed yield (Qu/ha)

At all sites throughout both growing seasons, the effect of sesame types on seed output in qu/ha was similarly very significant (p 0.01). In both the 2019 and 2020 growing seasons, Humera-1 had the highest seed production in qu/ha (8.32 and 7.94), while variety local (4.54 and 3.77) had the lowest values (Tables 3 and 4). This study's findings are consistent with those of Tadesse and Misgana, 2017, who found that there were notable differences between the different types of sesame. Similar findings were made by Fiseha *et al.* 2019, who examined the genotypes of sesame and discovered a notable variation in grain production between kinds.

Conclusion and Recommendation

Significant differences were found in this study between the evaluated sesame cultivars when yield and yield-related factors were taken into account. As a result, it was discovered that the Humera-1 variety produced more and outperformed the local variety in terms of yield and productivity components. Given the results of this study, farmers and small-scale farming communities can be advised to plant the Humera-1 variety since it is suited for the study region and related agroecologies. Additionally, using this type will aid customers by easing the supply shortage of sesame.

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