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EVALUATION OF GROWTH AND FRUITING OF SOME OLIVE CVS GROWN UNDER MINIA REGION CONDITIONS

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ABSTRACT

Seven olive cvs Aggezi Akse, Aggezi Shami, Picual, Frantoio, Coratina, Superinso and Koroneiki grown under Minia conditions were evaluated for their growth, flowering, yield and fruit quality during 2015 and 2016 seasons.

An obvious variation on all the investigated growth, leaf content of pigments and nutrients, flowering, yield and fruit characteristics were observed among the seven olive cvs. Olive cvs Aggezi Akse, Aggezi Shami and Picual exhibited the highest values of these parameters. Olive cv Koroneiki had the lowest values.

According to the values of yield and fruit characteristics during both seasons, it is suggested to plant olive cvs Aggezi Akse, Aggezi Shami and Picual, respectively under Minia region conditions.

***Conclusively,** based on relatively higher yield and good fruit quality, it is suggested to select olive cv. Aggezi Akse, Aggezi Shami, Picual, Frantoio, Coratina, Superinso and Koroneiki in descending order to plant under Siwa Oasis conditions.*

Keywords: Evaluation, olive cvs, growth, flowering, yield and fruit characteristics.

INTRODUCTION

In Egypt, olive is considered among the principle and strategic fruit crops. Due to the great variations in the performance of various olive cvs grown under various areas the suitability of these olive cv from the growers' point of view is investigated. These differences on behaviour of different olive cvs were governed by genetically, horticultural practices and environmental conditions. Great promotion on olive production is attributed to making more evaluation studies under all Egypt Locations (Martin and Sibbett *et al.,* 2005).

An obvious variation on growth flowering, fruit setting, yield and its components was observed among different olive cvs (El- Khawaga, 2001; Bronzini de Caroffa *et al.*, 2002; Hegazi and Shaban, 2005; El- Said *et al.*, 2006; Abd –Allatif, 2007; Therios, 2009; Abo- Shanab- Iram, *et al.*, 2010; El- Husseiny, 2012; Hegazi, 2012; IOC, 2013; Keceli, 2013, Mohamed, 2016 and Mousa, 2016).

Therefore, the target of this study was evaluating some olive cvs (Aggezi Akse, Aggezi Shami, Picual, Frantoio, Coratina, Superinso and Koroneiki) grown under Minia region conditions.

MATERIALS AND METHODS

This study was conducted during 2015 and 2016 seasons on 70 trees of seven olive cvs (Aggezi Akse, Aggezi Shami, Picual, Frantoio, Coratina, Superinso and Koroneiki). The trees of the seven olive cvs were about 5-years old, and growing in a private orchard located at West Matay, Matay district, Minia Governorate, Egypt. The uniform in vigour trees of the seven olive cvs were planted at 4x5 meter apart (210 tree/fed.) in sandy soil under drip irrigation system. The trees irrigated the same amount of water and subjected to the regular recommended horticultural practices. They are free from pathogens and physiological disorders. Salinity of irrigation water was 1500 ppm.

This study was carried out for evaluating of growth and fruiting of seven olive cvs (Aggezi Akse, Aggezi Shami, Picual, Frantoio, Coratina, Superinso and Koroneiki) grown, under Minia region environmental conditions.

Soil analysis was done according to Piper (1950), Black (1965) and Evenhuis and Dewaard (1980) as shown in Table 1 & 2.

This experiment included seven treatments from seven olive cvs namely (Aggezi Akse, Aggezi Shami, Picual, Frantoio, Coratina, Superinso and Koroneiki). Each treatment was replicated five times, two trees per each. This study was statistically analyzed using randomized complete block design (RCBD).

During both seasons the following parameters were recorded:

1- Vegetative growth characteristics:

Height (cm) and circumference (cm) ($2x\ \pi$) where x equals half diameter and π equals 13/4 of tree were recorded at the last of both seasons (Oct.). Also, number of new shoots per tree was counted. In late March, and

Table (1): Analysis of the tested soil

Content	**Value**
Sand %	75
Silt %	10.0
Clay %	15.0
Texture grade	Sandy
pH(1: 2.5 extract)	7.59
EC (1: 2.5 extract) dsm^{-1})	2.5
Calcium carbonate %	3.0
Total N%	0.005
Available P (Olsen, ppm)	1.9
Available K (ammonium acetate , ppm)	81.5
Available DTPA	-
DTPA Extractable micronutrients (ppm)	
Zn ppm	0.9
Fe ppm	0.8
Mn ppm	0.6
Cu ppm	0.2

Table (2): Monthly average temperature and relative humidity % for the two seasons of 2015 & 2016.

Months	**2015**				**2016**			
	Temperature ^{o}C		**RH %**		**Temperature ^{o}C**		**R.H. %**	
	Min.	**Max.**	**Min.**	**Max.**	**Min.**	**Max.**	Min.	Max.
Jan.	5.0	25.0	31.9	86.0	4.9	24.2	28.0	90.0
Feb.	8.9	27.0	22.8	68.0	6.7	25.0	24.0	85.0
March.	8.9	32.0	16.8	62.0	8.0	30.0	15.0	70.0
April	13.0	35.0	15.0	47.0	14.0	32.0	12.0	44.0
May	19.0	35.0	18.0	46.0	18.0	33.0	13.0	39.0
June	17.0	35.0	18.9	60.0	18.1	34.0	15.0	54.0
July	17.0	35.0	18.9	80.0	19.8	34.0	16.0	63.0
August	18.0	36.0	21.0	81.0	18.9	34.0	21.0	73.0
Sept.	18.1	34.0	21.0	73.0	17.0	34.0	20.0	72.0
Oct.	17.0	33.0	26.0	73.0	12.0	34.0	22.0	90.0
Nov.	9.0	32.0	30.0	93.0	9.0	30.0	27.0	92.0
Dec.	6.0	27.3	30.0	94.0	5.0	26.0	27.0	93.0

RH % = Relative humidity % , Source: Minia Airport. Centre Meteorological Station, Minia.

for each tree, five similarly branches distributed around the tree canopy were labeled in each season.

A sample of thirty uniform shoots of the current season was chosen at random and labeled on each tree to measure growth measurements such as shoot length (cm.), number of leaves per shoot, shoot thickness (cm.).

In mid- October (after 7 months), twenty mature leaves from the middle of every new shoot growth of the current season were taken at random from each tree. Length and width of leaf (cm.) were recorded. The leaf area was measured by using the following equation reported by Ahmed and Morsy (1999). Leaf area $(cm)^2 = 0.53$ (length x width) + 1.66.

2-Leaf pigment contents

Chlorophyll a, b, total chlorophylls and total carotenoids (mg/100 g F.W) according to Von-Wettstein (1957) and Hiscox and Isralstam (1979).

3- Leaf nutrient contents

During mid-October of both seasons, 30 mature leaves were taken from the third leaf of labeled fruit shoot base from current season, leaf samples were cleaned with tap water, and then rinsed three times with deionized water, thereafter, leaves were prepared and dried in an electric oven at 70°C until constant weight then ground for determination of different nutrients (N, P, K and Mg as % as well as Zn, Fe, Mn and Cu as ppm on dry weight basis (Piper, 1950; Chapman and Pratt, 1965; Peach and Traccy 1968; Cottonie *et al.,* 1982; Summer, 1985 and Wilde *et al.,* 1985).

4- Flowering aspects:

Twenty one- year old shoots on each tree were labeled for counting the number of panicles per shoot as well as number of flowers per panicle. Dates of blooming were recorded.

5- Dates of fruit setting and percentages of fruit retention:

Dates of fruit setting were recorded. Twenty one- year old shoots on each tree were labeled for counting the initial number of flowers at full bloom. Number of fruitlets and fruits were recorded at monthly intervals up to harvest. Number of fruits were recorded before harvest on each of the selected shoots according to Ferguson *et al.,* (1994). Fruit retention % was calculated by dividing number of fruits just before harvesting date by total number of setted fruits and multiplying the product x 100.

6- Harvesting dates and yield per tree (Kg):

Fruits of each experiment tree were harvested at ripe stage (olive with superficial pigmentation on more that 50% of the exo-carp) then harvesting date was recorded according to each olive cvs (kg) and the average yield was calculating terms of number of fruits/tree and weight (kg).

7- Oil yield

The olive oil was extracted by pressing olive fruits using the pressure system to estimate oil yield per tree (kg.) and per fed. (tons)

8- Fruits and oils quality

8-1. Physical properties

8-1-1. Fruit weight (g)

8-1-2. Fruit dimensions

8-1-3. Flesh weight, %

8-1-4. Stone weight, %

8-1-5. Flesh/stone

8-2. Chemical properties

8-2-1- Oil content, % (**A.O.A.C, 2000).**

8-2-2 Acid values, % (A.O.A.C., 2000).

This experiment was included seven treatments from seven olive cvs. Each treatment had five replicates with two trees per a replicate. The results in this study were exposed to proper statistical analysis of variance for a randomized complete block design (RCBD) and different treatment means were compared using new L.S.D. at 5% (Snedecor and Cochran, 1980 and Mead *et al.*, 1993).

RESULTS

1- Growth characteristics:

Tables (3 & 4) shows that significant differences on the eight growth aspects namely tree height, Tree circumference, number of new shoot/tree, main shoot length, number of leaves/shoot, leaf length, leaf width and leaf area were observed among the seven olive cvs. The highest values of these growth characteristics were observed on olive cvs. Aggezi Akse, Aggezi Shami, Picual, Frantoio, Coratina, Superinso and Koroneiki. Olive cv Aggezi Akse had the highest values and the lowest values of these growth aspects olive cv were recorded on olive cv Koroneiki. These results were true during both seasons.

Table (3): Some vegetative growth characteristics in the seven olive cvs grown under Minia region conditions during 2015 and 2016 seasons

Olive cvs	Tree height (m)		Tree circumference (cm)		No. of new shoot/tree		Main shoot length (cm)	
	2015	2016	2015	2016	2015	2016	2015	2016
Aggezi Akse	2.50	2.61	503.0	507.9	210.0	218.0	13.0	14.8
Aggezi Shami	2.50	2.60	503.0	508.0	210.0	219.0	14.0	15.7
Picual	2.50	2.60	534.0	540.0	190.0	200.0	13.0	14.8
Coratina	2.75	2.86	502.0	507.7	250.0	261.0	17.0	18.7
Frantoio	3.00	3.09	565.0	569.9	210.0	220.0	19.0	20.6
Superinso	3.00	3.10	377.0	382.0	210.0	221.0	18.0	19.7
Koroneiki	2.75	2.84	562.0	567.0	210.0	220.0	15.0	16.8
New L.S.D at 5%	**0.20**	**0.19**	**11.7**	**11.3**	**20.0**	**21.0**	**2.0**	**2.1**

Table (4): Some vegetative growth characteristics in the seven olive cvs grown under Minia region conditions during 2015 and 2016 seasons

Olive cvs	No. of leaves/shoot		Leaf length (cm)		Leaf width (cm)		Leaf area $(cm)^2$	
	2015	2016	2015	2016	2015	2016	2015	2016
Aggezi Akse	25.0	27.0	4.50	4.50	1.00	1.08	4.05	4.24
Aggezi Shami	25.0	27.0	4.50	4.51	1.00	1.11	4.05	4.31
Picual	190.0	193.0	5.01	5.12	1.50	1.52	5.64	5.78
Coratina	19.0	20.0	7.01	6.92	1.64	1.66	7.23	7.23
Frantoio	35.0	38.0	5.52	5.61	1.56	1.52	6.05	6.18
Superinso	58.0	60.0	5.01	5.12	1.50	1.52	5.64	5.78
Koroneiki	58.0	59.0	5.01	5.12	1.51	1.52	5.67	5.78
New L.S.D at 5%	**2.0**	**3.0**	**0.39**	**0.32**	**0.20**	**0.18**	**0.22**	**0.24**

2- Leaf pigments:

It is clear from the obtained data in Tables (5, 6 and 7) that varying olive cvs significantly altered leaf pigments namely chlorophylls a & b , total chlorophylls and total carotenoids as well as leaf content of N, P, K, Mg, Zn, Fe, Mn and Cu and the maximum values were detected on olive cv. Aggezi Akse and the lowest values were recorded on olive cv. Koroneiki. Similar results were announced during 2015 and 2016 seasons.

3- ***Number of panicles/shoot and flowers per panicle and dates of blooming and fruit setting and fruit retention(%) :***

Data in Tables (8 & 9) clearly show that number of panicles/shoot, number flowers per panicle and fruit retention % significantly were affected by varying olive cvs. Olive cv Aggezi Akse was the highest values. Aggezi Akse and Koroneiki were bloomed early on 20 and 18 March during both seasons, respectively. It is worth to mention that all investigated olive cvs bloomed nearly on the same time. These results were true during both seasons.

4-Dates of harvesting:

It was significantly varied among the seven olive cvs (Aggezi Akse, Aggezi Shami, Picual, Frantoio, Coratina, Superinso and Koroneiki). Dates of harvesting in all the seven olive cvs ranged from the first week of August (Aggezi Akse, Aggezi Shami and Frantoio) to the first week of October (Picual, Coratina, Superinso and Koroneiki). These results were true during both seasons. (Table 9).

5- Yield/tree:

Table (9) that yield expressed in number of fruits/ tree and yield (kg) was significantly different among the seven olive cvs. Significant differences were observed on the yield among the seven olive cvs. The highest values were recorded on olive cvs Aggezi Akse, Aggezi Shami, Picual, Frantoio, Coratina, Superinso and Koroneiki. Aggezi Akse (50.5 & 51.5), Aggezi Shami (41.9 &42.8), Picual (20.9 &21.5), Frantoio (18.8 &19.4), Coratina (18.0 & 18.6), Superinso (11.5 & 11.9) and Koroneiki (6.2 & 6.6). during both seasons respectively. These results were true during both seasons.

Table (5): Leaf pigments content in the seven olive cvs grown under Minia region conditions during 2015 and 2016 seasons

Olive cvs	Chlorophyll a (mg/100 g F.W)		Chlorophyll b (mg/100 g F.W)		Total chlorophylls (mg/100 g F.W)		Total carotenoids (mg/100 g F.W)	
	2015	2016	2015	2016	2015	2016	2015	2016
Aggezi Akse	6.1	6.3	2.7	2.9	8.8	9.3	2.8	3.0
Aggezi Shami	5.7	6.0	2.5	2.6	8.2	8.6	2.6	2.7
Picual	5.3	5.6	2.3	2.3	7.6	7.9	2.3	2.4
Coratina	5.0	5.2	2.1	2.0	7.1	7.2	2.1	2.1
Frantoio	4.6	4.8	1.8	1.7	6.4	6.5	1.9	1.8
Superinso	4.1	4.4	1.5	1.4	5.6	5.8	1.7	1.5
Koroneiki	3.6	4.1	1.3	1.1	4.9	5.2	1.4	1.2
New L.S.D at 5%	**0.3**	**0.2**	**0.2**	**0.3**	**0.3**	**0.4**	**0.2**	**0.3**

Table (6): Percentage of N, P, K and Mg in the leaves in the seven olive cvs grown under Minia region conditions during 2015 and 2016 seasons

Olive cvs	Leaf N %		Leaf P %		Leaf K %		Leaf Mg %	
	2015	2016	2015	2016	2015	2016	2015	2016
Aggezi Akse	1.93	1.94	0.34	0.31	1.55	1.59	0.69	0.71
Aggezi Shami	1.86	1.87	0.29	0.28	1.50	1.55	0.66	0.67
Picual	1.79	1.80	0.24	0.24	1.46	1.50	0.63	0.63
Coratina	1.64	1.71	0.19	0.21	1.42	1.44	0.59	0.59
Frantoio	1.52	1.61	0.15	0.18	1.38	1.39	0.55	0.54
Superinso	1.46	1.53	0.14	0.15	1.34	1.35	0.53	0.50
Koroneiki	1.40	1.48	0.10	0.12	1.29	1.32	0.50	0.47
New L.S.D at 5%	**0.06**	**0.05**	**0.04**	**0.03**	**0.04**	**0.03**	**0.02**	**0.03**

Table (7): Leaf content of Mn, Zn, Fe and Cu (as ppm) in the seven olive cvs grown under Minia region conditions during 2015 and 2016 seasons

Olive cvs	Leaf Mn		Leaf Zn		Leaf Fe		Leaf Cu	
	2015	2016	2015	2016	2015	2016	2015	2016
Aggezi Akse	61.0	61.9	71.0	70.9	81.0	80.3	1.9	2.0
Aggezi Shami	58.0	59.0	68.9	68.4	79.0	78.3	1.8	1.9
Picual	55.0	56.0	66.6	66.1	76.3	75.7	1.8	1.9
Coratina	51.0	52.5	64.0	63.4	74.1	73.4	1.8	1..9
Frantoio	49.0	50.5	61.9	61.5	72.0	71.3	1.8	1.9
Superinso	47.0	48.0	58.3	58.0	69.9	69.2	1.8	1.9
Koroneiki	45.0	46.3	56.1	56.0	66.3	65.6	1.6	1.5
New L.S.D at 5%	**1.8**	**1.5**	**1.7**	**1.9**	**1.4**	**1.6**	**NS**	**NS**

Table (8): Number of panicles/shoot and flowers per panicle, dates of blooming and fruit setting in the seven olive cvs grown under Minia region conditions during 2015 and 2016 seasons

Olive cvs	No. of panicles /shoot		No. of flowers/ panicle		Date of blooming		Date of fruit setting	
	2015	2016	2015	2016	2015	2016	2015	2016
Aggezi Akse	30.0	31.0	3.0	3.0	20-Mar.	18-Mar.	10-Apr.	11-Apr.
Aggezi Shami	30.0	31.0	3.0	3.0	20-Mar.	18-Mar.	10-Apr.	11-Apr.
Picual	30.0	31.0	3.0	3.0	21-Mar.	18-Mar.	15-Apr.	11-Apr.
Coratina	29.0	30.0	3.0	3.0	20-Mar.	18-Mar.	15-Apr.	11-Apr.
Frantoio	30.0	30.0	3.0	3.0	20-Mar.	18-Mar.	10-Apr.	11-Apr.
Superinso	30.0	30.0	3.0	2.0	20-Mar.	18-Mar.	10-Apr.	11-Apr.
Koroneiki	28.0	30.0	3.0	2.0	20-Mar.	18-Mar.	15-Apr.	11-Apr.
New L.S.D at 5%	**NS**	**NS**	**NS**	**NS**	--------	--------	--------	--------

Table (9): Number of fruits/ tree, fruit retention, date of harvesting and yield in the seven olive cvs grown under Minia region conditions during 2015 and 2016 seasons

Olive cvs	Fruit retention (%)		No. of fruits /tree		Date of harvesting		Yield/tree (kg.)	
	2015	2016	2015	2016	2015	2016	2015	2016
Aggezi Akse	9.0	9.7	4830.0	4900.0	1- Aug.	3-Aug.	50.5	51.5
Aggezi Shami	8.0	8.8	4410.0	4481.0	1- Aug.	3-Aug.	41.9	42.8
Picual	6.9	7.6	3230.0	3301.0	3- Oct.	4-Oct.	20.9	21.5
Coratina	5.8	6.5	6000.0	6074.0	3- Oct.	4-Oct.	18.8	19.4
Frantoio	4.7	5.4	5000.0	5071.0	1- Aug.	3-Aug.	18.0	18.6
Superinso	3.7	4.4	4410.0	4484.0	3- Oct.	4-Oct.	11.5	11.9
Koroneiki	2.7	3.4	5460.0	5530.0	3- Oct.	4-Oct.	6.2	6.6
New L.S.D at 5%	**1.0**	**1.1**	**100**	**97.0**	-----	----	**1.9**	**1.8**

Physical and chemical characteristics of the fruits:

It is clear from the data in Tables (10 & 11) that all physical and chemical characteristics of the fruits fruit weight, height and diameter, flesh %, stone %, Flesh/stone, Fruit oil %, Oil yield/tree, Oil yield/fed. (crops) and Acid value % were significantly varied among the seven olive cvs Aggezi Akse, Aggezi Shami, Picual, Frantoio, Coratina, Superinso and Koroneiki. Olive cv Aggezi Akse had the highest values of fruit weight, height and diameter and flesh / stone. The maximum stone % was observed on olive cv Coratina and the lowest values were recorded on olive cvs Aggezi Akse and Aggezi Shami. The maximum values of fruit oil% was recorded on olive cv Coratina (22.0 & 22.3 %) during both seasons, respectively. The maximum values of oil yield per fed. was appeared on olive cv Aggezi Akse (1.52 & 1.52 tons) during both seasons, respectively. Acid value was significantly varied among the seven olive cvs. The highest values of acid values were recorded on olive cv Picual (0.53 & 0.56 %) during both seasons, respectively. Olive cv Aggezi Shami (0.48 & 0.46 %) during both seasons, respectively. These results were true during both seasons.

Table (10): Some physical characteristics in the seven olive cvs grown under Minia region conditions during 2015 and 2016 seasons

Olive cvs	Fruit weight (g.)		Fruit height (cm)		Fruit diameter (cm)		Flesh %		Stone %	
	2015	2016	2015	2016	2015	2016	2015	2016	2015	2016
Aggezi Akse	10.45	10.51	3.00	3.05	2.30	2.33	88.0	88.5	12.0	11.5
Aggezi Shami	9.50	9.55	2.60	2.64	2.25	2.29	88.0	88.5	12.0	11.5
Picual	6.46	6.52	2.61	2.65	2.21	2.24	83.0	83.7	17.0	16.3
Coratina	3.14	3.20	2.31	2.35	1.50	1.55	75.0	75.0	25.0	25.0
Frantoio	3.60	3.66	2.21	2.25	1.40	1.45	76.0	76.5	24.0	23.5
Superinso	2.61	2.65	2.00	2.05	1.30	1.34	77.0	77.0	23.0	23.0
Koroneiki	1.14	1.20	1.71	1.75	1.15	1.20	72.0	72.5	28.0	27.5
New L.S.D at 5%	**0.46**	**0.49**	**0.18**	**0.17**	**0.04**	**0.05**	**0.9**	**0.9**	**0.9**	**0.8**

Table (11): Some physical and chemical characteristics of the fruits in the seven olive cvs grown under Minia region conditions during 2015 and 2016 seasons

Olive cvs	Flesh /stone		Fruit oil %		Oil yield /tree (kg)		Oil yield/fed. (tons)		Acid value %	
	2015	2016	2015	2016	2015	2016	2015	2016	2015	2016
Aggezi Akse	7.33	7.70	15.0	14.8	7.6	7.6	1.52	1.52	0.49	0.44
Aggezi Shami	7.33	7.62	16.0	16.1	6.7	6.9	1.34	1.38	0.48	0.46
Picual	4.88	5.13	18.0	17.9	3.8	3.8	0.76	0.76	0.53	0.56
Coratina	3.00	3.00	22.0	22.3	4.1	4.3	0.82	0.86	0.52	0.55
Frantoio	3.17	3.26	17.0	17.5	3.1	3.4	0.62	0.68	0.52	0.55
Superinso	3.35	3.35	16.0	16.3	1.8	1.9	0.36	0.38	0.52	0.55
Koroneiki	2.57	2.64	19.0	19.2	1.2	1.3	0.24	0.26	0.52	0.55
New L.S.D at 5%	**0.36**	**0.37**	**0.9**	**0.7**	**0.3**	**0.2**	**0.11**	**0.10**	**0.02**	**0.03**

DISCUSSION

The great variation on all growth, flowering, fruit setting harvesting, yield and fruit setting of the fruits among the five olive cvs Hamed, Picual , Wateken, Kalamata and chemlali might be attributed to eth great differences on responses of each cv. to changes in climatic and different environmental conditions as well as horticultural practices. In addition, the variation on genetical behaviour and tolerance to biotic and abiotic stresses could add another explanation.

These results are in agreement with those obtained by El- Khawaga (2001); Hegazi and Shaban (2005); El- Said *et al.,* (2006); Abd Allatif (2007); Abo- Shanab *et al.,* (2010); El-Husseiny (2012); Hegazi (2012); Mohamed (2016) and Mousa (2016).

Conclusively, based on relatively higher yield and good fruit quality, it is suggested to select olive cv. Aggezi Akse, Aggezi Shami, Picual, Frantoio, Coratina, Superinso and Koroneiki in descending order to plant, under Siwa Oasis conditions.

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تقييم نمو وإثمار بعض أصناف الزيتون النامية تحت ظروف منطقة المنيا

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تم تقييم سبعة اصناف من الزيتون نامية تحت ظروف منطقة المنيا وهى العجيزى العقصى والعجيزى الشامى والبيكوال والكوراتينا والفورانتيو والسوبرسينو والكروناكى من ناحية نموها ومحتوى الورقة من الصبغات والعناصر الغذائية وكمية محصولها وخصائص الجودة لثمارها وذلك خلال موسمى ٢٠١٥/ ٢٠١٦

لوحظ أن هناك اختلافات واضحة فى صفات النمو تحت الدراسة وصفات الازهار وكمية المحصول وخصائص الجودة للثمار بين أصناف الزيتون السبعة ولقد سجل العجيزى العقصى والعجيزى الشامى والبيكوال اعلى هذه القياسات علي التوالى اما صنف الزيتون الكروناكى فقد سجل اقل هذه القياسات.

التوصية: طبقا لتقييم المحصول والازهار وخصائص الجودة للثمار فى خلال موسمى الدراسة فانه يقترح زراعة أصناف الزيتون العجيزى العقصى والعجيزى الشامى والبيكوال مرتبة تنازليا وذلك تحت ظروف منطقة المنيا.