

STUDIES ON GROWTH, FLOWERING AND FRUITING CHARACTERISTICS OF SIX TABLE OLIVE CVS. UNDER DESERT CONDITIONS

Hegazi, A.A. and A.E.A. Shaban

Department of Pomology, Faculty of Agriculture, Cairo University

ABSTRACT

Performance of six table olive cvs. was investigated during two seasons (2002 and 2003) under desert conditions. Average leaf area in (2002) at non bearing shoots was significantly higher (7.183 cm)² than leaf area at bearing shoots (6.84 cm²). Leaf area differed according to olive cvs. In Dulci cv., it was the highest (9.347 cm²), while it was the lowest (4.70 cm³) in Mission cv. compared to other cvs.

Increasing rate of Dulci shoot growth was significantly higher (1.616 cm), while it was lower (0.894 cm) in Eggizi Shami compared to other cvs. Increasing rate of growth from 1/5 to 1/6 was higher (2.973 cm). While, it was lower at the period from (1/9-1/11) with average (0.00 cm). GDD at FB in the first season (2002), was significantly higher (105.0) in Mission cv. than in other cvs. while, it was lower (70.22) in Eggizi balady.

Julian dates of bud break, beginning of flowering, FB and end of flowering was significantly higher in Kalamata than in other cvs. with average (74, 93.67, 104.70 and 114.0, respectively). While it was considerably lower in Eggizi balady than in other cvs. with average (61.33, 68.67, 81.33 and 87.33, respectively) for bud break, beginning of flowering, FB and end of flowering.

In 2002, flowering density was significantly higher (37.63, 37 and 35) for Kalamata, Eggizi balady and Dulci cvs. While, it was significantly lower in Eggizi Koprozi, Mission and Eggizi Shami cvs. with average (28.67, 30.33 and 31.67, respectively).

Average number of perfect flowers / inflorescence was higher in Kalamata (17.00) and Eggizi balady (16.00) than in other cvs. while, it was lower in Eggizi Shami (9.667), Eggizi Koprozi (10), Dulci (10.33) and Mission (11.67) compared to other cvs.

Average percentage of pollen germination of Dulci cv. was the highest (69%), while it was the lowest (53%) in Mission.

Initial fruit set of Dulci cv. was the highest (101.70 fruit / m) while, it was the lowest (53.94) in Mission.

Final fruit set of Dulci was higher (59.38), while it was the lowest in Mission cv. (29.03).

In (2002) increasing rate of fruit length and diameter was significantly higher at harvest (3.25 and 2.25 cm) than in other times. While it was lower in the first period of determination.

Increasing rate in fruit length in Eggizi Shami was the highest (2.78 cm), while it was the lowest in Mission (2.14 cm).

Increasing rate in 2002 in fruit diameter in Eggizi Shami was the highest (2.06 cm), while it was the lowest (1.29 cm) in Kalamata .

In (2002), fruit weight of Eggizi Shami was the highest (13.03 gm), while the lowest was observed in Eggizi Koprozi with average (4.80 gm).

Similar trend was observed in fruit length, diameter, size, flesh weight, seed weight and seed thickness.

Oil content of Kalamata cv. was the highest (38.11%), while it was the lowest in Eggizi Koprozi with average (31.85%).

Peroxide value of Eggizi Koprozi oil was the highest (19.18), while it was the lowest in Mission and Eggizi Shami oil with average (12.4 and 2.56).

Acid of Eggizi balady oil was higher (2.00) compared to other cvs., while it was the lowest in Mission oil with average (1.533).

Total phenols of Eggizi balady oil was significantly higher (141.50) compared to those in other cvs., while it was the lowest in Mission and Eggizi Shami oil with average (103.9 and 104.40).

Keywords: Olive, Cultivars, Floral biology, Oil quality

INTRODUCTION

Olive is one of the most important crops in the Mediterranean region. The performance of olive cultivars under different regions was unknown. This performance include floral characteristics, growing degree days for full bloom and during the growth season, pollen germination, fruit set and fruit characteristics.

(Hartmann *et al.*, 1980) and (Hegazi, 2001) reported that flowering date varied according to olive cvs., environmental conditions and studied region. Hegazi (2001) found that growing degree days varied according to cvs. and it was (250.89 , 280.59 and 261.69) in Picual, Manzanillo and Eggizi Shami at FB and it was (443.67, 473.37, and 454.45) at 21 day after full bloom and it was (831.21, 836.63 and 833.84) at 60 day after full bloom. (Ferrara *et al.*, 1999) and Hegazi, (2001) found that floral characteristics varied according to olive cv.

Ferrandez-Escobar *et al.*, (1983) and Hegazi, (2001) found that percentage of pollen germination varied according to cv.

(Hegazi, 2001) found that fruit set varied according to olive cv. which fruit set was significantly higher in Picual than Manzanillo and Eggizi Shami and high percentage of fruit drop occurred during 21 day after FB.

(Ferrara *et al.*, 1999 and Patumi *et al.*, 1999) found that fruit weight, percentage of flesh / seed and oil percentage varied according to olive cv.

(Fourati *et al.*, 2003) found that Physical and chemical characteristics of olive cvs. varied according to cvs.

This investigation was conducted to evaluate the performance of some table olive cvs. (Dulci, Kalamata, Eggizi Shami, Mission, Eggizi Koprozi and Eggizi balady) under Wady El-Faregh valley.

MATERIALS AND METHODS

This investigation was carried out through two successive seasons 2002 and 2003 on 8 years old of 6 table trees olive cvs. (Dulci, Kalamata, Eggizi Shami, Mission, Eggizi Koprozi and Egizi balady) in sandy soil in a private orchard at Wady El-Faregh valley region. Trees chosen for this investigation were of normal growth spaced at 5x5 meters and subjected to the same management practices.

1. Leaf area:

Three trees were chosen for each cv. (each tree as a replicate), and 20 leaves were chosen from one year old shoot from the middle portion of the shoot and leaf area was measured in July for on bearing shoots (bearing

shoots) and another trees as non bearing shoots , leaf area was measured by (leaf area meter- Germany) .

2. Shoot elongation:

Increasing rates during growth season for bearing and non bearing shoots (cm). Ten shoots of bearing and 10 shoots of non bearing on other trees on each replicate of studied cultivars were chosen and shoot length was measured at beginning of May and in each month elongation rate was measured till beginning of November.

3. Thermal accumulation

Thermal accumulation was estimated as growing degree days (G. D. D.) using (Thermograph- Italy). Measurements started at bud break and for each of the studied cultivars.

G. D. D. was estimated by accumulating the effective daily temperature from bud break throughout the growing season.

The effective temperature = Daily temperature – Base temperature.

Base temperature for olive was 15°C according to (Morettini 1950, Hegazi and Stino, 1982).

4. Julian dates:

Julian dates was estimated as accumulation days from the year beginning to bud break, beginning of flowering, full bloom and end of flowering for each of the studied cultivars.

5. Floral characteristics:

Measurements were taken on floral characteristics for the studied olive cvs. including.

- 1- Dates of bud break.
- 2- Start of flowering : when 25% of flowers were opened.
- 3- Full bloom: when 50-70% of flowers were opened
- 4- End of flowering : when 25% of flowers developed to fruit
- 5- Floral biology:

Samples of 20 flowering shoots were taken randomly from each replicate (Tree as a replicate and 3 trees from each cultivar to study the following:

- 1- Flowering density: measured as number of inflorescences per meter.
- 2- Average length of inflorescence (cm).
- 3- Total number of flowers / inflorescence.
- 4- Total number of male flowers / inflorescence.
- 5- Percentage of perfect flowers was expressed as percentage of perfect flowers to total number of flowers according to (Hegazi and Stino, 1982, Hegazi, 2001) .

6. Pollen germination:

One year old flowering shoots of the six olive cvs. were collected randomly at ballon stage before pollen discharge. Shoots were kept on sheets of paper—at room temperature—over night to encourage anther dehiscence, pollen grains were collected from inflorescence.

Germination liquid media composed of 10% sucrose and hanging drop technique was used to estimate percentage of pollen germination (Fernandez–Escobar *et al.*, 1981).

7. Fruit set:

Fruit set was expressed as number of fruits / meter of shoot length. Fruit set was measured at two times (21 day after full bloom as initial fruit set and 60 day after bloom as final fruit set). (Fernandez- Escobar and Gomez-Valledor, 1985).

8. Fruit growth:

Thirty fruits from three replicates of each studied cvs. were selected randomly in similar dimensions and labeled at 10 DAFB, fruit length and diameter was measured by Warnier caliper (CCCP – W. Germany) in cm at (Mid of May, Seventh of July, Fifth of August and at harvest).

9. Fruit characteristics:

9.1. Physical characteristics:

Olive fruits set were harvested and 20 fruits for each replicates from each cultivar was used to study the following fruit characteristics.

- 1- Fruit weight (gm),
- 2- Fruit length (cm),
- 3- Fruit diameter (cm),
- 4- Fruit size (cm³),
- 5- Flesh weight (gm),
- 6- Seed length (cm),
- 7- Seed diameter (cm),
- 8- Seed weight (gm),
- 9- Fruit shape index as fruit L/D ratio,
- 10- Seed shape index as seed L/D ratio.,
- 11- Fruit moisture percentage,
- 12- Percentage of flesh / fruit.

9.2. Oil quality:

Fruit samples were taken from studied olive cvs. (3 kg from each cv.) at the suitable stage of harvest for oil, at purple colour (Hegazi, 1970) the seeds were removed and the flesh part of the fruit was dried at 70°C for three days to extract the oil in a Soxhlet apparatus with petroleum ether (40 / 60 °C) for several hours. The solvent was removed by evaporation under reduced pressure and the oil was taken to determine quality characteristics (Saponification value, Iodine value, Peroxide number, acid number and total phenols as mg/100 g oil) according to (A. O. A. C, 1984). The obtained data were subjected to analysis of variance (ANOVA) according to Snedcor and Cochran, (1980) using Mstat program. Least significant difference (L. S. D) were used to compare between means of treatments according to Waller and Duncan, (1969) at probability of 5%.

RESULTS AND DISCUSSION

1. Leaf area:

In the present study it was noticed that leaf area of non bearing shoots was significantly higher (7.183 cm²) than leaf area of bearing shoots (6.84 cm²) (Table,1).

Leaf area of Dulci cv. was significantly higher (9.347 cm²) than other cvs. and leaf area of Mission was significantly lower (4.70 cm²) compared to other cvs.

In the second season similar trend was observed that there was no significant difference between leaf area at off and bearing shoots and recorded (7.321 cm² and 7.147 cm²), respectively.

Leaf area of Dulci cv. was significantly higher (9.942 cm²) than in other cvs., while leaf area of Mission was significantly lower (4.917 cm²) compared to other cvs.

Table (1): Leaf area of six table olive cvs. bearing and non bearing shoots season 2002 and 2003

CV.	2002			2003		
	Bearing	Non bearing	Mean	Bearing	Non bearing	Mean
Dulci	10.82	7.87	9.347	11.08	8.80	9.942
Kalamata	8.237	9.46	8.848	8.733	9.710	9.222
Eggizi Shami	4.883	6.240	5.562	5.40	5.917	5.658
Mission	4.300	5.10	4.70	4.567	5.267	4.917
Eggizi Koprosi	5.323	6.22	5.772	5.533	6.00	5.767
Eggizi Balady	7.473	8.210	7.842	7.576	8.233	7.90
	6.84	7.183		7.147	7.321	

L.S.D cvs. 5% = 0.200

L.S.D bearing or non bearing 5% = 0.340

L.S.D interaction 5% = 0.570

L.S.D cvs. 5% = 0.700

L.S.D bearing or non bearing 5% = 0.340

L.S.D interaction 5% = 0.570

2. Increasing rates for bearing and non bearing shoots

In the first season, it was observed that increasing rate of one year old shoot at duration 1/5-1/6 in non bearing shoots was significantly higher (2.973cm) compared to other durations (Table, 2a). Increasing rate of Dulci shoots was significantly higher (1.616 cm) compared to other cvs.

In the second season, it was noticed that increasing rate was significantly higher(4.456cm) at dates 1/5 - 1/6 in non bearing compared to other dates (Table, 2 b). Increasing rate was significantly lower (0.00 cm) at (1/9 - 1/10) and (1/10-1/11) in bearing and non bearing and (1/7 - 1/8) and (1/8 – 1/9) in bearing shoots (Table, 2 b).

From the obtained results, it was observed that leaf area in non bearing shoots was significantly larger than that in bearing shoots and leaf area in Dulci cv. was significantly higher than in other cvs., while leaf area in Mission cv. was significantly lower compared to other cvs.

Increasing rates in bearing and non bearing shoots varied according to olive cvs. and duration of growth determination. These results are in line with previous findings of (Hussein, 1994) who found that there were significant varietal differences detected in the mean effective elongation period within 14 day period over all the 12 periods of shoot elongation measurements and Mission cv. recorded the longest increasing rate between seven studied olive cvs.

3. Growing degree days (G. D. D.)

In the first season, it was noticed that GDD from bud break to FB in Mission cv. was significantly higher (105.0) than in other cvs., while GDD of Eggizi balady was significantly lower (70.22) than in other cvs. (Table, 3a).

GDD from bud break to initial fruit set in Mission was significantly higher (190.80) than in other cvs. and GDD of Eggizi Koprozi (143.7) and Eggizi Shami (144.4) was significantly lower than in other cvs.

GDD from bud break to final fruit set was significantly higher (571.1) in Kalamata than in other cvs.

In the second season, GDD of Dulci (169.40) and Kalamata (168.30) was significantly higher from bud break to FB than in other cvs. (Table, 3b). While it was the lowest in Eggizi balady with average (113.30).

In (2003), GDD of Kalamata was significantly higher (361.10) from bud break to initial fruit set than in other cvs. (Table, 3 b).

GDD of Kalamata was significantly higher (821.30) from bud break to final fruit set than in other cvs. and GDD of Eggizi balady was significantly lower (587.80) than in other cvs. (Table, 3 b).

These results were confirmed by Hartmann *et al.*, (1980) and (Hegazi, 2001) that heat units for olive cvs. of full bloom, initial and final set differed according to olive cultivars.

Table (3,a): Growing degree days (GDD) of six table olive cvs. season (2002)

CV.	GDD (Bud Break-FB)	GDD (Bud Break – FB + 21)	GDD (Bud Break – FB + 60)
Dulci	86.67 b	166.8 c	460.90 c
Kalamata	85.73 b	180.60 b	571.1 a
Eggizi Shami	84.33 c	144.40 d	415.1 d
Mission	105.0 a	190.80 a	545.50 b
Eggizi Koprozi	81.80 d	143.70 d	404.10 e
Eggizi Balady	70.22 e	127.80 e	375.40 f
LSD 5%	1.161	1.354	1.762

Table (3,b): Growing degree days (GDD) of six table olive cvs. season (2003)

CV.	GDD Bud Break-FB	GDD Bud Break – FB + 21	GDD Bud Break – FB + 60
Dulci	169.40 a	336.0 b	718.6 b
Kalamata	168.30 a	361.10 a	821.30 a
Eggizi Shami	121.50 a	245.30 d	641.0 c
Mission	119.10 c	244.10 d	639.2 d

Eggizi Koprosi	117.0 c	218.50 e	615.30 e
Eggizi Balady	113.30 d	313.70 c	587.80 f
LSD 5%	2.275	12.04	1.540

4. Julian dates:

In the first season, it was recorded that Julian dates of bud break in Kalamata was significantly higher (74) than in other cvs. (Table , 4a) and the similar trend was observed after that, Julian dates of start flowering, FB and end of flowering was significantly higher in Kalamata cv. than in other cvs. and Julian dates of Eggizi balady was significantly lower than in other cvs.

In the second season, similar trend was observed that Julian dates of bud break of Kalamata was significantly higher (83.67) than in other cvs. (Table 4, b).

Also Julian dates of start of flowering, FB and end flowering was observed in Kalamata which was significantly higher (135.3) than in other cvs., while Julian dates of end flowering was the lowest with average (120.0) in Eggizi balady.

These results are in line with previous findings of Hartmann *et al.*, 1980 and Hegazi, 2001) that Julian dates and flowering date varied according to olive cvs., and environmental conditions.

Table (4,a): Julian dates of six table olive cvs. season (2002)

CV.	Bud Break	Beginning of flowering	FB	End of flowering
Dulci	60.33 c	72.67 c	89.33 c	99.33 c
Kalamata	74.00 a	93.67 a	104.70 a	114.0 a
Eggizi Shami	60.67 bc	71.33 d	85.33 d	96.00 d
Mission	61.67 b	76.33 b	98.33 b	104.70 b
Eggizi Koprosi	61.67 b	71.33 d	84.33 d	91.00 e
Eggizi Balady	61.33 bc	68.67 e	81.33 e	87.33 f
LSD 5%	1.135	0.9965	1.135	1.272

Table (4 b): Julian dates of six table olive cvs. season (2003)

CV.	Bud Break	Beginning of lowering	FB	End of flowering
Dulci	74.00 c	112.30 b	121.00 b	124.00 c
Kalamata	83.67 a	120.30 a	126.70 a	135.30 a
Eggizi Shami	73.67 c	107.30 c	113.30 d	125.30 b
Mission	76.33 b	106.30 d	115.70 c	121.70 d
Eggizi Koprosi	70.67 d	105.70 e	112.30 d	121.70 d
Eggizi Balady	76.33 b	100.30 f	110.00 e	120.00 e
LSD 5%	0.920	0.430	1.660	0.878

5. Floral characteristics:

In 2002, flowering density of Kalamata, Eggizi balady and Dulci was significantly higher (37.63, 3.7 and 35%) than in other cvs. Table (5, a), while flowering density of Eggizi Koprosi, Mission and Eggizi Shami was significantly lower than in other cvs. and recorded (28.67, 30.33 and 31.67).

In the second season, the same trend was observed, that flowering density of Kalamata and Eggizi balady cvs. was significantly higher (38.09

and 35.54%) (Table 5,b), while flowering density of Eggizi Shami was significantly lower (20.33%) compared to other cultivars.

This is in agreement with previous findings of Fouad *et al.*, (1992) that flowering density ranged from (11.7 to 80.9 flowers / m) according to cultivar and season and it averaged (71.4 , 61.4 and 49.6 flowers / m) in Koroneiki, Manzanillo and Picual, respectively.

In the first season, it was noticed that inflorescence length of Kalamata (3.5 cm) and Eggizi Shami (3.10 cm) was significantly higher than in other cvs. while, inflorescence length of Mission (2.40) and Eggizi Koprosi (2.26 cm) was significantly lower than in other cvs. (Table, 5a).

In the second season, it was observed that inflorescence length of Kalamata was significantly higher (3.673 cm) than in other cvs. and inflorescence length of Eggizi Koprosi (2.167 cm) and Mission (2.320 cm) was significantly lower than in other cvs. (Table, 5b).

This trend is in line with findings of (Ferrara *et al.*, 1999) who found that inflorescence length ranged from (2.5 to 4.5 cm) according to cv.

In the first season, it was recorded that total number of flowers in Kalamata (25.67) was significantly higher than in other cvs. and total number of flowers in Eggizi Shami (12.33) and Eggizi Koprosi (13.33) was significantly lower compared to other cvs. (Table , 5a).

In the second season, total number of flowers in Kalamata (25.33) was significantly higher than in other cvs and total number of flowers in Mission (8.703) was significantly lower than in other cvs. (Table , 5b).

This is in line with previous findings of Ferrara *et al.*, (1999) and Hegazi, (2001) that number of flowers differed according to olive cvs.

In the first season, it was noticed that number of male flowers of Kalamata (8.667) was significantly higher than in other cvs. and number of male flowers in Eggizi Shami (2.667), Eggizi Koprosi (3.333) Dulci (3.667) was significantly lower than in other cvs. (Table, 5 a).

In the second season, number of male flowers in Eggizi balady (17.17) was significantly higher than in other cvs. while, number of male flowers in Dulci (0.70) was significantly lower than in other cvs. (Table, 5b).

This is in line with results of Fouad *et al.*, (1992) and (Hegazi, 2001) that number of male flowers differed according to some factors such as olive cvs.

In the first season, average number of perfect flowers in Kalamata (17.00) and Eggizi balady (16.00) was significantly higher than in other cvs, while average number of perfect flowers of Eggizi Shami (9.667), Eggizi Koprosi (10), Dulci (10.33), and Mission (11.67) was significantly lower compared to other cvs. (Table , 5a) .

In the second season, average number of perfect flowers in Kalamata was significantly higher (23.73) than in other cvs. (Table, 5b) . While, average number of perfect flowers in Eggizi balady was significantly lower(4.133) than in other cvs. This is in agreement with recent finding of (Hegazi, 2001) that percentage of perfect flowers differed according to olive cvs.

In the first season, percentage of perfect flowers in Eggizi Shami (78.18%), Eggizi Koprosi (75.08%), Dulci (74.05%) and Eggizi balady (73.0%) was significantly higher than in other cvs. (Table, 5a).

Percentage of perfect flowers in Mission (65.09%) and Kalamata (65.33%) was significantly lower than in other cvs. (Table, 5a).

In the second season, it was noticed that percentage of perfect flowers in Dulci (95.18) and Kalamata (93.67%) was significantly higher than in other cvs. (Table, 5b). While percentage of perfect of flowers of Eggizi balady (19.39) was the lowest compared to other cvs.

Table (5 a) Floral characteristics of six table olive cvs. a- season (2002)

CV.	Flowering - density	Inflo. length	Total number of flowers	N. male flowers	N. perfect flowers	Perfect flowers %
Dulci	35.00 a b	2.833 b	14.00 d	3.667 c	10.33 b	74.05 a
Kalamata	37.63 a	3.50 a	25.67 a	8.667 a	17.00 a	65.33 b
Eggizi Shami	31.67 bc	3.10 ab	12.33 d	2.667 c	9.667 b	78.18 a
Mission	30.33 c	2.40 c	18.00 c	6.333 b	11.67 b	65.09 b
Eggizi Koprosi	28.67 c	2.267 c	13.33 d	3.333 c	10.00 b	75.08 a
Eggizi Balady	37.00 a	3.067 b	22.00 b	6.00 b	16.00 a	73.00 ab
LSD 5%	3.906	0.402	2.609	1.870	2.039	8.502

Table (5 b) Floral characteristics of six table olive cvs. b- season (2003)

CV.	Flowering - density	Inflo. length	Total number of flowers	N. male flowers	N. perfect flowers	Perfect flowers %
Dulci	34.11 b	2.70 c	15.93 c	0.70 f	13.90 b	95.18 a
Kalamata	38.09 a	3.673 a	25.33 a	1.433 e	23.73 a	93.67 a
Eggizi Shami	20.33 d	2.960 b	13.05 d	3.410 c	9.643 c	73.87 b
Mission	33.32 b	2.320 d	8.703 e	2.917 d	5.787 e	66.48 c
Eggizi Koprosi	25.05 c	2.167 d	13.59 d	5.187 b	8.420 d	61.93 d
Eggizi Balady	35.54 ab	2.540 c	21.30 b	17.17 a	4.133 f	19.39 e
LSD 5%	3.752	0.199	2.065	0.275	0.922	1.689

6. Pollen germination:

In the first season, it was noticed that percentage of pollen germination of Dulci cv. was significantly higher (69%) compared to other cvs. while percentage of pollen germination of Mission was significantly lower compared to other cvs. and it averaged (53%) (Table,6).

In the second season, similar trend was observed. The percentage of pollen germination of Dulci was significantly higher (70.53%) compared to other cvs. while, it was significantly lower in Mission cv. (50.44%) than in other cvs.

This trend is in parallel with conclusions that pollen germination were closely related to cultivars and environment, percentage of pollen germination ranged from (31.1) in Manazanillo to (69.9%) in Mission (Fernandez – Escobar *et al.*, 1983) and (52.64, 63.61 and 74.17) for Manzanillo, Koroneiki and Picual olive cvs., respectively (Hegazi, 2001).

7. Fruit set:

In the first season, it was noticed that initial fruit set of Dulci cv. was significantly higher (101.70) fruit / m than in other cvs., while initial fruit set of Mission cv. was significantly lower (53.94) compared to other cvs. (Table, 7). In the second season, similar trend was observed that initial fruit set of Dulci and Eggizi balady was significantly higher (55.18 and 53.67) than in other

cvs. (Table, 7). While, initial fruit set of Eggizi Koprosi and Eggizi Shami was significantly lower compared to other cvs. recording (14.5 and 20.28).

Table (6): Percentage of pollen germination of six table olive cvs. (2002 and 2003) seasons.

CV.	Pollen germination	
	2002	2003
Dulci	69.00 a	70.53 a
Kalamata	65.83 b	68.83 b
Eggizi Shami	64.00 bc	66.67 c
Mission	53.00 d	50.44 f
Eggizi Koprosi	62.33 c	64.67 d
Eggizi balady	62.50 c	63.18 e
LSD 5%	2.025	1.464

In (2002), final fruit set of Dulci was significantly higher than in other cvs. recording (59.38) (Table, 7).

In the second season, the same was observed that final fruit set of Dulci and Eggizi balady cv. was significantly higher compared to other cvs. and averaged (43.63 and 42.00) (Table, 7), while final fruit set of Eggizi Koprosi cv. was significantly lower compared to other cvs. and it averaged (7.50).

The obtained results are confirmed with Fouad *et al.*, (1992) and (Hegazi, 2001) that fruit set differed according to olive cvs., season and environmental conditions.

Table (7): Initial and final fruit set of studied olive cvs. (2002 and 2003) seasons.

CV.	2002		2003	
	FB + 21	FB + 60	FB + 21	FB + 60
Dulci	101.70 a	59.38 a	55.18 a	43.63 a
Kalamata	80.97 b	33.62 bc	29.43 b	21.09 b
Eggizi Shami	53.94 c	38.33 b	20.28 cd	15.33 c
Mission	36.44 d	29.03 c	25.87 bc	20.67 bc
Eggizi Koprosi	46.50 cd	33.69 bc	14.50 d	7.50 d
Eggizi Balady	47.67 cd	32.67 bc	53.67 a	42.00 a
LSD 5%	15.53	5.759	6.875	5.350

8. Increasing rate in fruit length

In (2002), it was noticed that increasing rate in fruit length at harvest was significantly higher (3.25 cm) than in other times (Table, 8a).

Increasing rate in fruit length of Eggizi Shami was significantly higher (2.78 cm) than in other cvs. and it was significantly lower in Mission cv. compared to other cvs. as it averaged (2.14 cm).

In the second season, similar trend was observed .The increasing rate in fruit length at harvest was significantly higher (3.15 cm) compared to other times (Table, 8 b). Increasing rate in fruit length of Eggizi balady was significantly higher (2.75 cm) compared to other cvs.

Table (8,a): Increasing rate in fruit length in six table olive cvs. a-season (2002)

CV.	15 / 5	7 / 7	5 / 8	Harvest	Mean
Dulci	1.86 m	2.35 g	2.40 g	3.35 b	2.49 c
Kalamata	1.53 n	2.16 ij	2.30 gh	3.04 d	2.26 d
Eggizi Shami	2.08 jk	2.70 e	2.80 e	3.56 a	2.78 a
Mission	1.40 o	2.00 kl	2.21 hi	2.98 d	2.14 e
Eggizi Koprosi	1.90 lm	2.35 g	2.53 f	3.35 b	2.53 c
Eggizi balady	2.03 k	2.51 f	2.75 e	3.24 c	2.63 b
LSD 5%	1.80 d	2.34 c	2.50 b	3.25 a	

Table (8,b): Increasing rate in fruit length in six table olive cvs. b-season (2003)

CV.	15 / 5	7 / 7	5 / 8	Harvest	Mean
Dulci	1.07 kl	1.83 j	1.96 hij	2.73 cd	1.90 c
Kalamata	1.12 kl	2.00 g-j	2.20 f-i	3.18 ab	2.12 b
Eggizi Shami	0.78 l	1.16 k	2.41 def	3.40 a	1.94 c
Mission	1.01 kl	1.86 ij	2.26 fgh	2.98 bc	2.03 b c
Eggizi Koprosi	0.78 l	2.06 fij	2.35 efg	3.29 ab	2.12 b
Eggizi Balady	2.08 fij	2.66 cde	2.93 bc	3.35 a	2.75 a
LSD 5%	1.14 d	1.93 c	2.35 b	3.15 a	

9. Increasing rate in fruit diameter

In (2002), it was noticed that increasing rate in fruit diameter at harvest was significantly higher (2.25 cm) than in other times (Table, 9a).

Increasing rate in fruit diameter of Eggizi Shami was significantly higher (2.06 cm) than in other cvs. and it was significantly lower in Kalamata cv. compared to other cvs. as it averaged (1.29 cm).

In the second season, increasing rate of fruit diameter at harvest was significantly higher (2.29 cm) compared to other times (Table, 9 b). Increasing rate in fruit diameter in Eggizi balady was significantly higher (1.98 cm) compared to other cvs. and it was significantly lower in Dulci cv. compared to other cvs. and it averaged (0.96 cm) (Table, 9 b).

Table (9,a): Increasing rate in fruit diameter in six table olive cvs. a-season (2002)

CV.	15 / 5	7 / 7	5 / 8	Harvest	Mean
Dulci	0.73 k	1.00 ij	1.01 ij	1.75 e	1.12 e
Kalamata	0.81 jk	1.25 h	1.30 gh	1.80 e	1.29 d
Eggizi Shami	1.31 gh	2.15 cd	2.05 d	2.75 a	2.06 a
Mission	0.96 j	1.60 ef	1.76 e	2.45 b	1.69 c
Eggizi Koprosi	0.98 j	1.50 fg	1.76 e	2.44 b	1.67 c
Eggizi Balady	1.81 hj	1.80 e	2.13 cd	2.33 bc	1.86 b
LSD 5%	1.00 d	1.55 c	1.67 b	2.25 a	

Table (9,b): Increasing rate in fruit diameter in six table olive cvs. b-season (2003)

CV.	15 / 5	7 / 7	5 / 8	Harvest	Mean
Dulci	0.51 j	0.88 hi	1.00 gh	1.45 f	0.96 e
Kalamata	0.65 j	1.13 g	1.43 f	1.98 e	1.30 d
Eggizi Shami	0.67 ij	1.10 g	2.01 de	2.80 a	1.64 b
Mission	0.67 ij	1.46 f	1.45 f	2.56 b	1.54 c
Eggizi Koprosi	0.58 j	1.43 f	1.51 f	2.55 b	1.52 c
Eggizi Balady	1.35 f	1.96 e	2.23 cd	2.39 bc	1.98 a
LSD 5%	0.74 d	1.33 c	1.60 b	2.29 a	

10. Fruit characteristics

In the first season, it was noticed that fruit weight of Eggizi Shami was significantly higher compared to other cvs. and it averaged (13.03 gm) (Table, 10 a).

Fruit length of Eggizi balady, Kalamata, Eggizi Shami and Mission cv. was significantly higher compared to other cvs. and it averaged (3.2, 3.35, 3.4 and 3.41 gm).

Fruit diameter of Eggizi Shami was significantly higher (2.7 cm) compared to other cvs.

Fruit size of Eggizi Shami was significantly higher (12.67 cm³) than in other cvs. and fruit size of Eggizi Koprosi (4.90 cm³) and Mission (5 cm³) was significantly lower compared to other cvs.

Flesh weight of Eggizi Shami was significantly higher (11.66 gm) compared to other cvs.

Seed thickness was significantly higher in Kalamata, Eggizi Shami and Dulci cv. than in other cvs. and it averaged (0.98, 0.99 and 1.02 cm).

Seed weight of Mission fruit was significantly higher (2.63 gm) than in other cvs. (Table, 10 b), while seed weight of Eggizi balady was significantly lower (1.68 gm) compared to other cvs.

In (2002), it was observed that seed length of Dulci, Eggizi Shami and Kalamata cvs. was significantly higher (1.28, 1.37 and 1.44 cm) compared to other cvs.

Fruit L/D ratio of Mission cv. was significantly higher (1.98) compared to other cvs.

Seed L/D ratio was significantly higher (3.76) in Mission cv. compared to other cvs.

Moisture content was significantly higher in Mission cv. (76.67 %) compared to other cvs., while moisture content of Eggizi Shami was significantly lower (70.51 %) compared to other cvs.

Flesh percentage / fruit of Dulci, Kalamata, Eggizi balady and Eggizi Shami cvs. was significantly higher (87.1, 87.32, 89.34 and 89.46%) compared to Eggizi Koprosi and Mission cvs. which recorded (81.74 and 82.45, respectively).

T10a.b

In the second season, it was noticed that fruit weight of Eggizi Shami and Kalamata was significantly higher compared to other cvs. and it was averaged (12.36 and 11.95gm). While fruit weight of Mission cv. was significantly lower than in other cvs. and it averaged (3.19 gm) (Table 10, b).

Similar trend was observed in the second season. Fruit length of Eggizi balady, Kalamata and Eggizi Shami was significantly higher compared to other cvs. and it averaged (3.22, 3.29 and 3.4 cm). While fruit length of Mission was the lowest as it averaged (2.73 cm).

Fruit diameter of Eggizi Shami was significantly higher (2.8 cm) compared to other cvs., while fruit diameter of Mission cv. was the lowest (1.45 cm) compared to other cvs.

In (2003), it was noticed that fruit size of Eggizi Shami and Kalamata cvs. was significantly higher compared to other cvs. and it averaged (12.67 and 12 cm³).

Flesh weight of Eggizi Shami and Kalamata cvs. was significantly higher than in other cvs. as it averaged (11.21 and 10.50 gm) .

Similar trend was observed in seed thickness of Kalamata, Dulci and Eggizi Shami cvs. was higher than in other cvs. as it averaged (1.05, 1.00 and 1.00 cm), while it was lower in Mission than in other cvs. as it averaged (0.75).

Seed weight of Mission cv. was higher (2.33 gm) than in other cvs., while it was lower in Eggizi balady and Dulci as it averaged (1.72 and 1.81gm).

Seed length of Dulci, Eggizi Shami and Kalamata cvs. was significantly higher (1.3, 1.44 and 1.45 cm) compared to other cvs. While seed weight of Mission fruit was significantly lower compared to other cvs. and averaged (0.80 cm).

Fruit L/D ratio of Mission was significantly higher (1.88) compared to other cvs., while fruit L/D ratio of Dulci, Eggizi Shami and Kalamata was significantly lower compared to other cvs. and it averaged (1.18, 1.21 and 1.28, respectively).

Similar trend was observed that seed L/D ratio of Mission was significantly higher (3.11) compared to other cvs. (Table, 10a), while seed L/D ratio of Dulci, Eggizi Shami and Kalamata cvs. was lower (1.18, 1.21 and 1.28) compared to other cvs.

Moisture content of Eggizi Shami was significantly higher (76.18%) compared to other cvs., while it was lower in Mission and Eggizi Koproisi as it averaged (75.10 and 65.10%).

In (2003), flesh percentage / fruit of Eggizi balady and Eggizi Shami cvs. was significantly higher (88.97 and 90.70%) compared to other cvs. While, flesh percentage / fruit of Mission cv. was significantly lower (74.71%) compared to other cvs.

These results are inline with (Fouad *et al.*, 1992, Ferrara *et al.*, 1999 and Patumi *et al.*, 1999) that physical characteristics of fruit olive cvs. differed according to olive cvs.

11. Oil characteristics

In the first season (2002), oil content of Kalamata was significantly higher (38.18) compared to other cvs. (Table, 11a). While, oil content of

Eggizi Koprosi and Eggizi Shami cvs. was significantly lower compared to other cvs. and recorded (31.85 and 32.79%).

Saponification value was significantly higher in Mission cv. (197.9) compared to other cvs., while saponification value of Eggizi Shami oil was significantly lower compared to other cvs. and recorded (175.10).

Iodine value of Eggizi balady oil was significantly higher (88.50) compared to other cvs. while, it was the lowest in Dulci, Kalamata and Eggizi Shami and recorded (80.33, 80.67 and 80.67, respectively).

Peroxide value of Eggizi Koprosi oil was significantly higher (19.18) compared to other cvs. while peroxide value of Mission and Eggizi Shami oil was significantly lower compared to other cvs. and it averaged (12.40 and 12.56).

Acid value of Eggizi balady oil was significantly higher (2.00) compared to other cvs., while acid value of Mission and Kalamata oil was significantly lower compared to other cvs. and averaged (1.533 and 1.60), respectively.

Total phenols of Eggizi balady oil was significantly higher (141.50) compared to other cvs., while it was the lowest in Mission and Eggizi Shami oil as it averaged (103.9 and 104.04).

In the second season (2003), oil content of Kalamata was significantly higher (39.83%) than in other cvs. while, it was the lowest in Eggizi Shami and Eggizi Koprosi cvs. as it averaged (32.33 and 32.39) (Table, 11 b) .

Table (11, a) oil characteristics of six table olive cvs. A- season (2002)

CV.	Oil %	S. V	I. V	P. V	A. V	Total Phenols mg/100 g oil
Dulci	34.67 b	192.40 c	80.33 d	17.02 c	1.767 b	138.40 b
Kalamata	38.11 a	180.60 d	80.67 d	16.57 c	1.60 cd	115.0 d
Eggizi Shami	32.79 cd	175.1 e	80.67 d	12.56 d	1.633 c	104.4 e
Mission	34.90 b	197.90 a	83.33 c	12.40 d	1.533 d	103.9 e
Eggizi Koprosi	31.85 d	195.10 b	85.00 b	19.18 a	1.793 b	118.60 c
Eggizi Balady	34.00 bc	180.80 d	88.50 a	18.00 b	2.00 a	141.50 a
LSD 5%	1.39 b	1.218	1.064	0.453	0.099	2.855

S. V: Saponification value
P.V: Peroxide value

I.V: Iodine value.
A.V: Acid value

Table (11, b) : Oil characteristics of six table olive cvs. b- season (2003)

CV.	Oil %	S. V	I. V	P. V	A. V	Total phenols mg/100 g oil
Dulci	37.67 b	186.0 c	91.10 b	20.32 d	2.710 a	221.1 e
Kalamata	39.83 a	191.20 b	80.57 d	25.75 c	2.817 a	246.80 d
Eggizi Shami	32.33 d	191.10 b	90.70 b	27.30 b	1.757 c	251.10 c
Mission	39.50 a	195.1 a	81.80 c	17.46 e	2.087 bc	288.2 a
Eggizi Koprosi	32.39 d	182.50 d	92.86 a	30.37 a	2.200 b	270.40 b
Eggizi Balady	36.17 c	183.20 d	91.27 b	18.37 e	2.887 a	218.10 f
LSD 5%	1.281	1.371	1.039	0.994	0.434	2.280

S. V: Saponification value
P.V: Peroxide value

I.V: Iodine value.
A.V: Acid value

Saponification value, of Mission oil was significantly higher (195.1) than in other cvs., while saponification value of Eggizi Koprosi and Eggizi balady oil was significantly lower compared to other cvs. and recorded (182.5 and 183.2), respectively.

Iodine value of Eggizi Koprosi oil was significantly higher compared to other cvs. and it averaged (92.86), while it was the lowest in Kalamata with average (80.57).

Peroxide value of Eggizi Koprosi oil was the highest (30.37), while it was the lowest (17.46) and (18.37) in Mission and Eggizi balady oil.

Acid value of Dulci, Kalamata and Eggizi balady oil was significantly higher compared to other cvs. and it was averaged (2.71, 2.817 and 2.887), respectively, while it was the lowest in Eggizi Shami and Mission oil with average (1.757 and 2.087).

Total phenols of Mission oil was significantly higher (288.2) compared to other cvs. while, total phenols of Eggizi balady oil was significantly lower (218.10) compared to other cvs.

These results are confirmed with previous findings of Ferrara *et al.*, (1999) and patumi *etal.*, (1999) that oil percentage and oil quality varied according to olive cvs.

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دراسة النمو الخضري و التزهير والإثمار لستة أصناف من زيتون المائدة تحت الظروف الصحراوية

أيمن عبد المؤمن حجازي، أيمن السيد شعبان
جامعة القاهرة ، كلية الزراعة ، قسم الفاكهة

أجرى هذا البحث خلال موسمي (٢٠٠٢، ٢٠٠٣) لتقييم ستة أصناف من زيتون المائدة تحت الظروف الصحراوية.

كانت مساحة الورقة في موسم (٢٠٠٢) أعلى بدرجة ملحوظة (٧,١٨٣ سم^٢) في أوراق الأفرع التي لا تحمل ثمار مقارنة بالتي تحمل ثمار وكانت (٦,٨٤ سم^٢). لوحظ كذلك أن مساحة الورقة تختلف باختلاف الصنف حيث لوحظ أن مساحة الورقة في صنف الدولسي أعلى معنويًا بدرجة ملحوظة وسجلت (٩,٣٤٧ سم^٢) بينما كانت مساحة الورقة أقل بدرجة ملحوظة (٤,٧٠ سم^٢) وذلك في صنف الميشن مقارنة بباقي الأصناف. لوحظ أن معدل الزيادة في طول الأفرع المثمرة أعلمعنويًا في صنف الدولسي (١,٦١٦ سم^٢) مقارنة بباقي الأصناف بينما كان معدل الزيادة في طول الأفرع أقل معنويًا (٠,٨٩٤ سم^٢) في صنف العجيزي الشامي مقارنة بباقي الأصناف. كان معدل الزيادة في طول الأفرع الغير مثمرة في فترة (٥/١ - ٦/١) أعلى معنويًا (٢,٩٧٣ سم^٢) مقارنة بباقي الأصناف بينما كانت أقل في الفترة من (٩/١ - ١٠/١) وكانت صفر. وقد لوحظ أن درجات الحرارة اللازمة لإكمال التزهير في موسم ٢٠٠٢ كانت أعلى (١٠٥) في صنف الميشن مقارنة بباقي الأصناف. كما لوحظ أنها كانت أقل معنويًا في صنف العجيزي البلدي (٧٠).

ولوحظ أن عدد الأيام من بداية العام لكسر سكون البرعم، بداية التزهير إكمال التزهير وإنهاء التزهير كانت أعلى في صنف الكالاماتا مقارنة بباقي الأصناف وبلغت (٧٤، ٦٧، ٩٣، ٧، ١٠٤، ١١٤) على الترتيب. بينما كانت أقل بدرجة ملحوظة في صنف العجيزي البلدي مقارنة بباقي الأصناف وكانت (٦١، ٦٧، ٦٨، ٣٣، ٨١، ٣٣، ٨٧، ٣٣) على الترتيب وذلك لكسر سكون البرعم، بداية التزهير، إكمال التزهير وإنهاء التزهير.

في موسم (٢٠٠٢) لوحظ أن كثافة التزهير أعلى معنويًا (٣٧، ٦٣، ٣٧، ٣٥) في أصناف الكالاماتا، العجيزي البلدي، الدولسي، بينما كانت أقل معنويًا (٢٨، ٦٧، ٣٠، ٣٣، ٣١، ٦٧) في أصناف العجيزي القبرصي، الميشن، العجيزي الشامي على الترتيب. كان متوسط عدد الأزهار الكاملة / النورة أعلى معنويًا (١٧) في صنف الكالاماتا و (١٦) في صنف العجيزي البلدي مقارنة بباقي الأصناف. بينما كانت أقل معنويًا في العجيزي الشامي

(٩,٦٦٧)، العجيزى القبرصى (١٠) والدولسى (١٠,٣٣) والميشن (١١,٦٧) مقارنة بباقي الأصناف.

كان متوسط إنبات حبوب اللقاح في صنف الدولسى أعلى بدرجة ملحوظة (٦٩%) بينما كان أقل في صنف الميشن (٥٣%). لوحظ كذلك أن العقد الثمرى الابتدائى أعلى في صنف الدولسى (١٠١,٧ ثمرة / المتر) بينما كان أقل (٥٣,٩٤ ثمرة / المتر) فى الميشن. كذلك كان العقد الثمرى النهائى فى صنف الدولسى أعلى معنويا (٥٩,٣٨) بينما كان أقل معنويا فى صنف الميشن وبلغ (٢٩,٠٣).

معدل الزيادة فى طول وقطر الثمرة عند الحصاد أعلى معنويا (٣,٢٥، ٢,٢٥ سم) مقارنة بباقي التواريخ. بينما كان أقل معنويا فى أول تاريخ ٥/١٥ وكان (١,١٨، ١,٠٠ سم) وذلك لطول وقطر الثمرة على الترتيب.

كان معدل الزيادة فى طول الثمرة فى صنف العجيزى الشامى أعلى (٢,٧٨ سم) بينما كان أقل فى صنف الميشن وبلغ (٢,١٤ سم).

كان معدل الزيادة فى قطر الثمرة فى موسم (٢٠٠٢) أعلى فى صنف العجيزى الشامى (٢,٠٦ سم) بينما كان أقل فى صنف الكالاماتا (١,٢٩ سم). فى موسم ٢٠٠٢ وزن الثمار لصنف العجيزى الشامى كان أعلى (١٣,٠٣ جم) بدرجة ملحوظة بينما كان أقل فى صنف العجيزى القبرصى (٤,٨٠ جم).

هذا الاتجاه كان مشابها بالنسبة لصفات طول، قطر، حجم الثمار ووزن اللحم ووزن البذرة وكذلك سمك البذرة حيث كان صنف العجيزى الشامى أعلى بدرجة ملحوظة وصنف العجيزى القبرصى أقل بدرجة ملحوظة مقارنة بباقي الأصناف.

كان محتوى الزيت لثمار صنف الكالاماتا أعلى (٣٨,١١) بينما كان أقل لزيت ثمار الصنف العجيزى القبرصى (٣١,٨٥).

كان رقم البيروكسيد فى زيت الصنف العجيزى القبرصى أعلى (١٩,١٨) بينما كان أقل بدرجة ملحوظة لزيت الصنف ميشن، عجيزى شامى، وبلغ (١٢,٤، ١٢,٥٦) على الترتيب.

كان رقم الحموضة لزيت الصنف العجيزى البلدى أعلى بدرجة ملحوظة (٢) مقارنة بزيت باقى الأصناف بينما كان أقل بدرجة ملحوظة لزيت الصنف ميشن وبلغ (١,٥٣٣).

كانت الفينولات الكلية لزيت الصنف العجيزى البلدى أعلى بدرجة ملحوظة وبلغت (١٤١,٩) مقارنة بزيت باقى الأصناف بينما كانت الفينولات الكلية أقل (١٠٣,٩، ١٠٤,٤) لزيت الأصناف الميشن، العجيزى الشامى.

Table (2, a) Increasing rates for bearing and non bearing shoots a-season (2002)

CV.	Bearing							Non bearing						
	1/5-1/6	1/6-1/7	1/7-1/8	1/8-19	1/9-1/10	1/10-1/11	Mean	1/5-1/6	1/6-1/7	1/7-1/8	1/8-19	1/9-1/10	1/10-1/11	Mean
Dulci	3.00	0.00	0.34	0.0	0.0	0.00	0.563	3.66	1.33	1.33	1.67	1.67	0.00	1.616
Kalamata	1.00	1.33	0.34	0.34	0.00	0.00	0.506	1.34	2.00	0.0	1.33	1.33	1.00	1.172
Eggizi Shami	4.00	2.33	0.34	0.67	0.00	0.00	1.228	3.00	1.00	1.00	0.00	0.34	0.00	0.894
Mission	1.33	1.00	0.0	0.0	0.00	0.00	0.395	4.16	1.00	1.66	1.16	0.00	0.00	1.337
Eggizi Koprosi	0.67	1.83	0.50	0.34	0.00	0.00	0.561	2.50	1.33	0.34	0.0	0.00	0.00	0.701
Eggizi balady	0.98	0.63	0.17	0.0	0.00	0.10	0.318	3.16	2.66	1.00	0.53	0.00	0.00	1.231
Mean	1.831	1.191	0.285	0.230	0.00	0.02		2.973	1.558	0.89	0.788	0.563	0.176	

L.S.D cvs. = 0.95

L.S.D dates = 0.95

L.S.D interaction = 1.46

Table (2, b) Increasing rates for bearing and non bearing shoots b-season (2003)

CV.	Bearing							Non bearing						
	1/5-1/6	1/6-1/7	1/7-1/8	1/8-19	1/9-1/10	1/10-1/11	Mean	1/5-1/6	1/6-1/7	1/7-1/8	1/8-19	1/9-1/10	1/10-1/11	Mean
Dulci	0.696	0.50	0.00	0.00	0.00	0.00	0.206	2.80	1.00	0.00	0.00	0.00	0.00	0.64
Kalamata	1.867	0.866	0.00	0.00	0.00	0.00	0.462	3.933	3.833	1.00	0.366	0.00	0.00	1.52
Eggizi Shami	2.833	1.00	0.00	0.00	0.00	0.00	0.645	4.333	1.00	0.00	0.00	0.00	0.00	0.895
Mission	1.00	1.00	0.00	0.00	0.00	0.00	0.340	4.333	2.00	0.00	0.00	0.00	0.00	1.06
Eggizi Koprosi	1.00	0.80	0.00	0.00	0.00	0.00	0.306	6.667	3.667	0.00	0.00	0.00	0.00	1.72
Eggizi balady	1.00	0.70	0.00	0.00	0.00	0.00	0.29	4.667	2.667	1.00	0.50	0.00	0.00	1.476
Mean	1.399	0.811	0.00	0.00	0.00	0.00		4.456	2.361	0.34	0.151	0.00	0.00	

L.S.D cvs. = 0.125

L.S.D dates = 0.125

L.S.D interaction = 0.306

Table (10, a): Fruit characteristics of six table olive cvs. a – season (2002)

CV.	Fr. weight gm	Fr. Length cm	Fr. Diameter cm	Fr Size cm ³	Flesh weight gm	Seed diameter cm	Seed weight gm	Seed length cm	L/D Ratio Fruit	L/D Ratio Seed	Moisture %	% Flesh/ Fruit
Dulci	9.98 c	2.98 b	2.45 bc	10.00 c	8.69 c	1.02 a	2.05 c	1.28 a	1.21 d	2.00 d	76.82 a	87.1 a
Kalamata	11.43 b	3.35 a	2.49 b	11.67 b	9.98 b	0.98 a	2.26 b	1.44 a	1.34 c	2.30 c	76.32 b	87.32 a
Eggizi Shami	13.03 a	3.40 a	2.70 a	12.67 a	11.66 a	0.99 a	1.99 c	1.37 a	1.26 cd	2.01 d	70.51 e	89.46 a
Mission	4.98 d	3.41 a	1.71 d	5.00 e	4.11 d	0.70 d	2.63 a	0.87 b	1.98 a	3.76 a	76.67 a	82.45 b
Eggizi Koprosi	4.80 d	3.02 b	1.73 d	4.90 e	3.92 d	0.81 c	2.29 b	0.87 b	1.74 b	2.80 b	71.97 c	81.74 b
Eggizi Balady	9.70 c	3.20 ab	2.36 c	9.33 d	8.66 c	0.88 b	1.68 d	1.03 b	1.34 c	1.89 d	70.90 d	89.34 a
LSD 5%	1.114	0.230	0.115	0.648	0.983	0.057	0.099	0.207	0.115	0.181	0.250	2.441

Table (10, b): Fruit characteristics of six table olive cvs. b – season (2003)

CV.	Fr. weight gm	Fr. length cm	Fr. diameter cm	Fr. Size cm ³	Flesh weight gm	Seed diameter cm	Seed weight gm	Seed length cm	L/D Ratio fruit	L/D ratio seed	Moisture %	% Flesh/ Fruit
Dulci	10.81 b	3.05 b	2.56 b	11.00 bc	9.50 bc	1.00 ab	1.81 cd	1.30 a	1.18 d	1.81 d	69.50 c	87.91 b
Kalamata	11.95 a	3.29 ab	2.55 b	12.00 ab	10.50 ab	1.05 a	2.18 ab	1.45 a	1.28 cd	2.09 c	71.44 b	87.71 b
Eggizi Shami	12.36 a	3.40 a	2.80 a	12.67 a	11.21 a	1.00 ab	1.94 c	1.44 a	1.21 d	1.94 cd	76.18 a	90.70 a
Mission	3.19 e	2.73 c	1.45 e	6.00 d	2.39 e	0.75 c	2.33 a	0.80 c	1.88 a	3.11 a	75.10 d	74.71 d
Eggizi Koprosi	6.06 d	3.06 b	1.93 d	6.33 d	4.99 d	0.90 b	2.13 b	1.07 b	1.58 b	2.36 b	65.10 d	82.37 c
Eggizi Balady	9.62 c	3.22 ab	2.39 c	9.66 c	8.56 c	0.90 b	1.72 d	1.06 b	1.34 c	1.91 cd	72.02 b	88.97 ab
LSD 5%	0.984	0.275	0.099	1.39	1.01	0.11	0.181	0.162	0.115	0.263	0.936	2.208