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Behaviour of some olive accessions resulting from an olive improvement program

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Abstract

The olive (*Olea europaea*) is one of the most important oleaginous crops of the Mediterranean basin. Increased demand for olive oil creates a need for new olive varieties to help meet the requirements of the global market. Rapid technological changes in olive growing have increased interest in breeding programs and new cultivars. A breeding program aimed at selecting new dual purpose (i.e. oil and table olive) cultivars, began in Egypt in 1994.

A three successive years evolution (2011, 2012 and 2013) was conducted on progenies resulted from crosses between (Koronaki x Hamed), (Manzanello x Hamed) (Picual x Hamed) and (Arbquine x Hamed). The progenies have been analyzed for some tree growth traits, growth, blooming, fruiting, fruit quality and rootability. The obtained data, concluded that some valuable selections have resulted from this study progenies No. **73, 91 and 100** for table olive, whereas progenies **No. 42, 47, 71, 89 and 98 for oil besides, progenies No. 57 and 59** for dual purpose.

Thereupon, it is preferable to propagate all the best selected progenies and planted in three locations, in order to evaluate their performance (i.e., tree growth, yield, fruit characteristics, oil content and oil compositions in fatty acids) in different geographical areas. It remains necessary to study quantities and qualitative traits of olive production in more detail, for the most interesting selections.

Key words: Olive, Progenies, Table olive, Oil olive, Cross breeding, Aggizi, Chemlali, Kalamata, Koroneiki.

Introduction

It is possible to enlarge the natural genetic variability of the olive through the cross breeding technique in which searching for interesting genotypes is aimed (**Bellini *et al.*, 2002**).

Bellini *et al*., (2008) found that the origin and phylogenesis of olive (*Olea europaea* L.) remain unclear. The olive's early domestication and the use of vegetative propagation have resulted in the development of a huge number of varieties. Olive breeding has been achieved both by clonal selection and by cross-breeding. Clonal selection has been widely adopted and has been utilized for morphological characterization. The olive industry is seeking new cultivars better suited to modern cultivation techniques.

In this concern, any genetic improvement program by cross breeding will need strong efforts and long time to obtain next generation besides its agronomical evaluation in the field. Juvenility period has been traditionally one of the main detects of fruit tree breeding including olive. However, in the last years, several methodologies aimed at shortening the length of the juvenile period have been approached, thus facilitating the progress of the breeding process. (**Lavee *et al.*, 1996 and Santos-Antunes *et al.*, 1999)**. This has promoted the developmental process of olive breeding programs in the main olive producing countries (**Leon *et al.*, 2006**).

Muzzalupo and Perri (2009) mentioned that Olive (*Olea europaea* L.) was one of the first plants to be cultivated for virgin olive oil and for olive table production. The genotyping of cultivated varieties using molecular markers is a crucial aim of modern plant breeding programmes and germplasm collection management.

Few breeding programs of olive by crossing and selection in the progenies have been initiated in the past decades (**Lavee, 1990; Bellini**, **1992; Arsel and Cirik, 1994; Panneli *et al*., 2006)**. Consequently, several new cultivars have been released such as Barnea **(Lavee *et al*., 1986)** Fs-17 **(Fontanazza *et al*., 1998)** Maalot **(Lavee *et al*., 1999**) "Arno, Tevere and Basento" (**Bellini *et al*., 2000**) and Askal **(Lavee *et al*., 2003)**.

Sampaio and Pinheiro, (2012) stated that the specific topics covered include: genetic diversity and genetic improvement; vegetative propagation; yield and quality of olive cultivars and disease management and cultivar resistance; and olive oil production and marketing.

Comparative field trials of advanced selections from breeding programs are currently carried out in several olive producing countries (**Bellini, *et al.*, 2000; Sonnoli *et al.*, 2003; Lavee *et al.*, 2004 and Alfei *et al.*, 2008).** A morphological scheme of primary descriptors which proved to be suitable for discriminating cultivars has been used to determine 262 cultivated olive varieties (**Rallo, 1995**). The secondary characterization of many cultivars is already underway as regards some criteria such as growth, productivity and fruit parameter **(Del Rio and Caballero, 1994)** and resistance to abiotic factors such as calcareous soils, drought and salinity **(Corderio, 1997 and Cresti *et al.*, 1997)**.

The main target of this breeding program was to select new olive cultivars with some preferable traits such as early bearing, high productivity and high oil content, resistance to pest and diseases, vigor suitability for mechanical harvesting and high quality of olive oil.

Material and Methods

An olive breeding program has been established in 1996 at Giza, Egypt using Koronaki; Manzanello; Picual and Arbquine olive cvs., (foreign cvs.) as mother plants for Hamed olive cv. (local cv.) as a pollinizer.

The resulting progenies were planted during 2000 season in the orchard of the Horticulture Research Institute at Giza, Egypt and evaluated during the 2011, 2012 & 2013 growing seasons.

The evaluated progenies in this study were derived from crosses between cvs. Koronaki x Hamed, Manzanello x Hamed; Picual x Hamed and Arbquine x Hamed planting at the orchard of Horticulture Research Institute during 1996 and 1997 (Table, 1).

Table 1. Number of progenies derived from crosses combination.

Selections	♀ X ♂
41	Koronaki x Hamed
42	Koronaki x Hamed
44	Koronaki x Hamed
45	Koronaki x Hamed
46	Koronaki x Hamed
47	Koronaki x Hamed
57	Manzanello x Hamed
59	Manzanello x Hamed
60	Manzanello x Hamed
61	Manzanello x Hamed
71	Picual x Hamed
72	Picual x Hamed
73	Picual x Hamed
89	Arbquine x Hamed
91	Arbquine x Hamed
94	Arbquine x Hamed
99	Arbquine x Hamed
100	Arbquine x Hamed

The seedlings were planted on Sept., 25th 2000 at the same orchard with planting distance 4 x 4 m apart where seedlings have a very long juvenile phase (15-20 years) under natural conditions begin to bearing fruit only. In order to shorten the length of the juvenility period, the plants must attain sufficient height and should be grown in the erect position. They should be maintained in a continuous growing phase and pruning should be avoided as far as possible with the exception of the lowest branches. Fertile substrates should be used with abundant fertilization when the seedlings reach the transition phase (i.e. from the juvenile to adult phase), which is characterized by the disappearance of the wild traits and the appearance of traits corresponding to the mature phase and the plants become potentially fertile. Standard cultural practices were followed including irrigation, fertilization and pest control.

The following characters were addressed by using the methodology for primary and secondary characterizations of olive cultivars proposed by the International Olive Council (**Barranco *et al.*, 2000**). Twenty shoots were labeled on each seedling in different directions to study shoot growth, flowering and fruiting. Thirty fruits from previously tagged flowers were randomly collected at the time of ripening index to avoid the influence of the ripening stage on fruit traits and rooting ability.

Evaluation of the studied progenies was performed through determining the following traits:-

1- Tree growth parameters. Shoot length (cm), shoot thickness (cm), number of nodes/shoot, internodes length (cm).

a- Leaves: (Average number of leaves/shoot, the leaf surface area (cm^2) and leaf shape).

b- Leaf Shape: This determined by the ratio between the length (L) and the width (W). Elliptic: L/W < 4, Elliptic-lanceolate: L/W 4-6, lanceolate: L/W > 6.

2- Blooming:

Flowering time, (start, end and duration) the length of inflorescence, number of total flowers/inflorescence, number of perfect flower/ inflorescence, number of staminate flowers/ inflorescence and sex ratio.

3- Fruiting:

a) Fruit set/m.

b) Yield (kg)/tree, fruit shape, fruit weight, stone weight.

4- Fruit quality: flesh weight and flesh/stone. Moisture and oil content (oil content in fresh weight and oil percent in dry weight). Fruit shape: This determined by the ratio between the length (L) and the width (W). Spherical: L/W < 1.25, Ovoid: L/W 1.25-1.45, Elongated: L/W > 1.45. Fruit weight: very low < 2 g, low 2-4 medium 4-6 g, high 6-8 g, very high > 8 g. Flesh/stone: low < 5, medium 5-7.5, high 7.5-10, very high > 10.

5- Rooting ability: Leafy stem cuttings to be taken from trees on "off" years (in the middle of spring or late summer) and treated with 3000 ppm indolebutyric acid (IBA).

The following categories have been established according to the international olive council (**Barranco *et al.*, 2000**).

Rooting (%): nil 0, very low 1- 20, low 20-40 medium 40-60 high 60-80, very high 80-100.

Results and Discussion

1- Tree growth parameters:

a- Shoot length (cm).

It is obvious from Fig., 1 that progenies No. 100, 99 and 94 derived from cvs. (Arbiquine x Hamed) produced the longest shoots than parental cultivars.

While progenies No 46 and 47 derived from cv. (Koronaki x Hamed) gave the shortest shoots than the parental cultivars.

b- Shoot thickness (cm).

Fig., 2 illustrates that the shoots of progenies No. 59 and 60 (Manzanillo x Hamed) were the thicker as well as, progeny No. 100 (Arbiquine x Hamed), more than the those of cvs. Koronaki, Hamed, Manzanillo, Picual and Arbiquine. On the other side, shoot of progeny No. 47 (Koronaki x Hamed) and No. 72 (Picual x Hamed) had the thinnest value. The standard error is ranging from 0.03 to 0.30.

c- Number of nodes/shoot.

It is quite evident from data in Fig., 3 that the progenies No. 98, 99, and 94 derived from (Arbiquine x Hamed), had the highest number of nodes and short than cv. Hamed compared to all other studied progenies. On the other side, progenies No. 46 and 47 derived from (Koronaki x Hamed) gave the lowest value of number of nodes/shoot.

d- Internodes length (cm.).

It is clear from Fig., 4 that progenies No. 100 & 99 (Arbiquine x Hamed) and No. 59 (Manzanillo x Hamed) gave the longest internodes than cvs. Koronaki, Hamed, Manzanillo, Picual and Arbiquine cvs., while the shortest internodes were progenies No. 60 & 61 (Manzanillo x Hamed) and 46 & 47 (Koronaki x Hamed). The standard error is ranging from 0.02 to 0.12.

e- Number of leaves/shoot.

Fig., 5 shows that progenies No. 98, 99 and 94 (Arbiquine x Hamed) scored the highest values in this respect than the cvs. Parents, while the lowest value was obtained by progeny No. 46 (Koronaki x Hamed).

f- Leaf surface area.

Leaf surface area varied among the tested progenies as shown in Fig., 6. Progeny No. 72 derived from (Picual x Hamed) recorded the highest values in this concern than cv. Picual. Whereas the lowest value was produced by progeny No. 89 (Arbiquine x Hamed). The rest progenies gave an intermediate values.

g- Leaf shape.

Fig., 7 shows that the progeny No 73 derived from (Picual x Hamed) and No. 99 derived from (Arbiquine x Hamed), as well as, progeny No 46 derived from (Koronaki x Hamed) took Elliptic lance-date leaf shape like, Koronaki, Hamed, Manzanillo, Picual and Arbiquine cvs.

Differences in growth characteristics among olive selections are in close conformity with the findings previously reported by many researchers (**Bellini *et al.*, 1990 and 2000, Rallo, 1995, Trigui 1996, Damijela, *et al* 2008, Pritsa *et al*., 2003, Bartolini *et al*., 2006,** and **Bellini *et al.*, 2008**).

2- Blooming.

a- Flowering time (start, end and duration).

Table 2 demonstrates that progenies derived from cvs. (Koronaki x Hamed) began flowering during 12/3 to 23/3, meanwhile the progenies derived from cvs. (Manzanillo x Hamed) began flowering during 11/3 to 18/3; (Picual x Hamed) began flowering during 22/3 to 25/3 the fourth group of progenies, flowering began during 18-21/3.

b- Number of total flowers/inflorescence.

It is clear from Fig. (8) that the number of flowers/ inflorescence was 27.55. Progenies No. 100 (Arbiquine x Hamed), No 61 (Manzanillo x Hamed) and No. 47 (Kronaki x Hamed) scored the highest number of flowers/ inflorescence. On the other hand, the progeny No. 72 (Picual x Hamed) had the lowest values and the rest progenies gave intermediate values in this.

c- Number of perfect flowers/ inflorescence.

Fig., 9 indicates marked variations among tested progenies. The highest values of perfect flowers were in progenies No. 61 (Manzanillo x Hamed) and No 100 and 99 (Arbiquine x Hamed) than cvs. Koronaki, Hamed, Manzanillo, Picual and Arbiquine.

d- Number of male flowers/ inflorescence.

Fig., 10 illustrates that progenies No. 72 (Picual x Hamed) and No 61 (Manzanillo x Hamed) gave the lowest values than cvs. Koronaki, Hamed, Manzanillo, Picual. On the other hand, progenies No. 98 (Arbiquine x Hamed) and No. 57 (Manzanillo x Hamed) gave the highest values and the rest progenies gave intermediate numbers.

e- Inflorescence length.

Fig., 11 demonstrates that progenies No. 60 (Manzanillo x Hamed); and No. 45 (Koronaki x Hamed) and No. 100 (Arbiquine x Hamed) gave the highest value than cvs. Manzanillo, while progeny No. 57 (Manzanillo x Hamed) scored the lowest value, in this respect.

Differences in growth characteristics among olive progenies are in close conformity with the findings previously reported by **Bellini *et al.*, (2000), Ferri *et al.*, (2006), Bellini *et al.*, (2008**) and **Hechmi *et al*., (2012)**.

f- Sex ratio:

Data in Fig. (12) shows that progenies No. 61 (Manzanillo x Hamed), No 99 (Arbiquine x Hamed) and No. 46 (Koronaki x Hamed) gave the highest value than the cvs. Manzanillo; Hamed; Koronaki, whereas progenies No. 59 & 98 (Manzanillo x Hamed) and (Arbiquine x Hamed), scored the lowest values respectively. The rest progenies gave intermediate values in this concern.

3- Tree fruiting:

a- Fruit set/m.

Fig., 13 shows that the highest fruit set values were achieved by progenies No. 72 and 73 (Picual x Hamed) and No. 61 (Manzanillo x Hamed) than cvs. Koronaki; Manzanillo and Hamed. Conversely, the lowest values were produced by progeny No. 45 (Koronaki x Hamed).

b- Yield (kg)/tree.

Fig., 14 illustrates that progenies No. 72 and 71 (Picual x Hamed) were the most promising progenies in producing the highest yield, that scored between 32.13 to 32.00 kg /tree than the parents cvs. Picual and Hamed, followed by progenies No. 45, 41 and 47 (Koronaki x Hamed). Also rather than the parents cvs. Koronaki and Hamed. The least total yield was produced by progenies No. 73 and 99 (Picual x Hamed) and (Arbiquine x Hamed), respectively.

Progenies No. 72 and 71 (Picual x Hamed) scored constant yield during the three years. The standard error is ranging for those progenies are ranging from 2.59 to 2.46; also the progenies No. 45; 41 and 47 (Koronaki x Hamed) gave constant productivity the standard error is 2.46; 1.59 and 0.88.

Similar results in the Olive Germoplasm Bank of Cordoba showed mean accumulated fruit yield in the first three years of bearing from 2 to 52 kg per tree among cultivars (**Leon *et al.*, 2006**).

4- Fruit quality.

a- Fruit shape.

Data in Fig, 15 show that progenies No 89 resulted from (Arbiquine x Hamed) take elongated fruit shape like cv. Arbiquine, but progenies No 41, 42 and 44 resulted also from (Koronaki x Hamed) took the ovoid fruit shape like cv. Koronaki and progenies No 71 and 72 resulted from (Picual x Hamed) took avoid fruit shape like cv. Picual.

b- Fruit weight, seed weight, flesh weight and flesh/seed.

Figs., 16, 17, 18 and 19 illustrate showed that progenies derived from (Manzanillo x Hamed) produced the highest fruit weight. It was ranging between 2.03 to 5.91 gm, more than the fruits for cvs. Manzanillo and Hamed. Followed by (Arbiquine x Hamed) it was ranging between 2.63 to 5.75 gm. while progenies derived from (Picual x Hamed) gave the lightest fruit weight. It was ranging from 1.80 to 2.27 gm. On the other hand, the progenies derived from (Koronaki x Hamed) gave intermediate values which ranged between 2.31 to 2.83 gm.

Concerning seed weight and flesh weight they took an analogous trend to the fruit weight. As for determination of flesh to seed ratio, the resulting progenies showed a large variation in this parameter, ranging from 2.67 to 7.09, the highest value of F/S ratio was noticed with progeny No. 99 (Arbiquine x Hamed) more than cvs. Parents, followed by progenies No. 89 and 98 (Arbiquine x Hamed) also more than cvs. parents. The F/S ratio is extremely important because it is an indication for oil content.

c- Moisture content.

Moisture content is a major factor for olives as it generally contributes to more that 50 % of the fruit weight. Fig, 20 shows that the mean moisture content was generally high, around 67.58%. The progenies derived from (Koronaki x Hamed) showed that the moisture was ranging from 64.07 to 66.70 %, as well as the progenies derived from (Manzanillo x Hamed) showed that the moisture content was ranging between 65.67 to 67.46, also, the progenies derived from (Picual x Hamed) showed that the moisture content was ranging between 63.56 to 66.80 and the last group progenies derived from (Arbiquine x Hamed) showed that the moisture content was ranging between 64.72 to 66.53.

Moisture content of the fruit is important to oil quality for a number of reasons, if the fruit moisture level drops to a point where desiccation occurs, cell break down can follow leading to increase of free fatty acids and therefore lower oil quality (**Ayton, *et al.*, 2001**).

d- Oil content in fresh weight.

Olive fruit yield and oil content are the major contributors of profitability olive growers. The for average oil % extracted was determined and is illustrated in Fig, 21 oil content is expressed as a percentage of the fresh weight of olives. Progenies derived from (Koronaki x Hamed) showed that the oil content was which ranged from 17.99%, to 18.58 %. On the other side, oil progenies derived from (Manzanillo x Hamed) showed that the oil content was ranged from 17.43% to 17.92%, followed by progenies derived from (Picual x Hamed) showed that the oil content was ranging from 18.03 % to 19.15% and the last group progenies derived from (Arbiquine x Hamed) showed that oil content was ranged between 18.06% to 18.35%.

e- Oil percent in dry weight.

As fresh weight is influenced by several factors such as a tree crop and climatic conditions, oil content on a fresh weight cannot be taken into consideration in a comparative quality. This is a reason for using oil content per olive as a fixed criterion, disregarding weight.

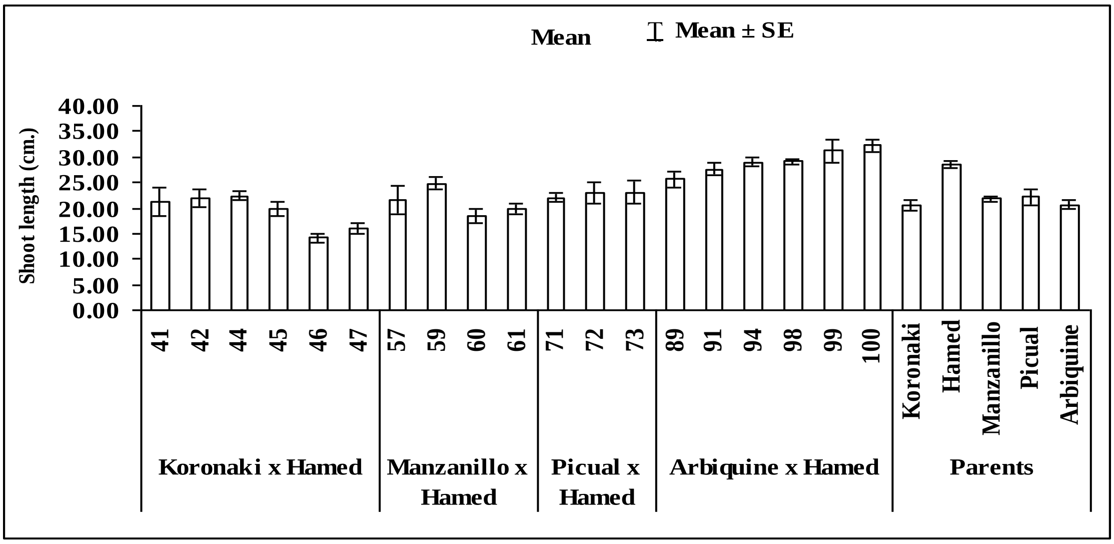


Fig., 1. Mean and standard error during three seasons for shoot length (cm.) of the olive progenies.

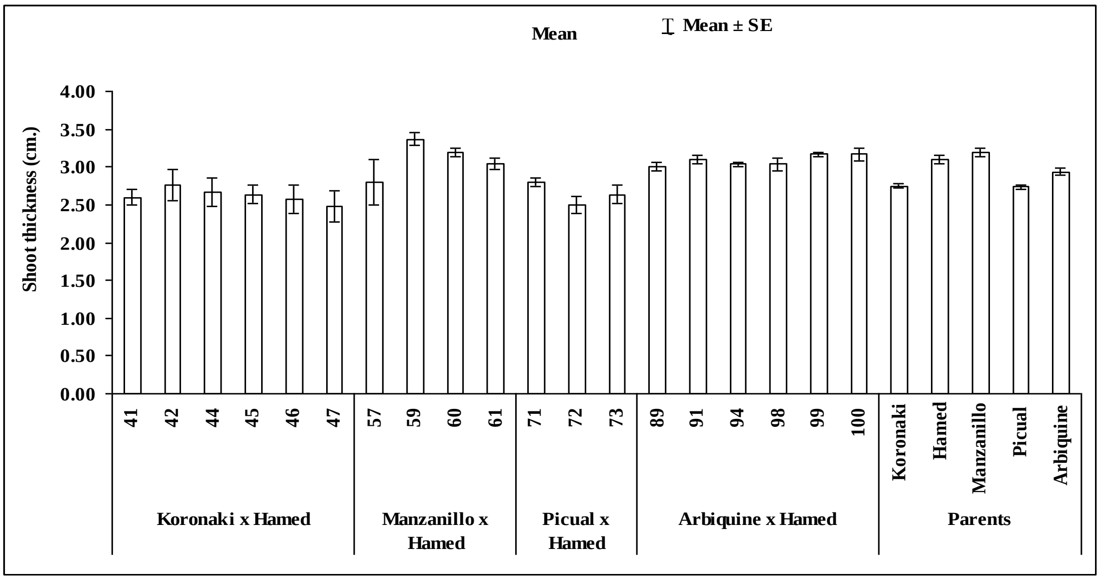


Fig., 2. Mean and standard error during three seasons for shoot thickness (cm.) of the olive progenies.

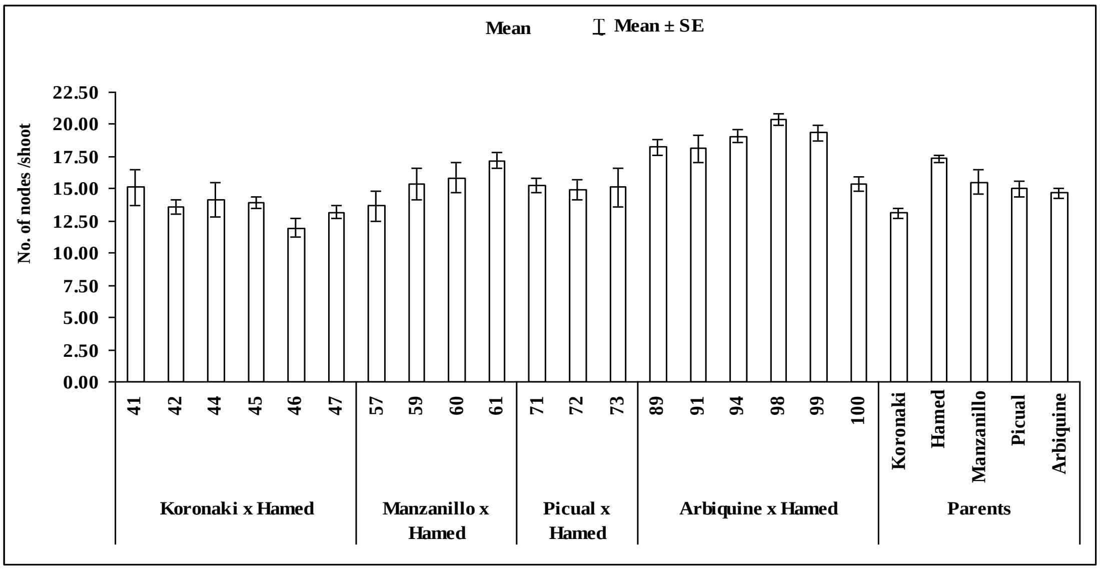


Fig., 3. Mean and standard error during three seasons for no. of nodes /shoot of the olive progenies.

Data presented in Fig, 22 clearly indicate that oil content in dry weight was ranging from 51.73 to 54.08. % in progenies derived from (Koronaki x Hamed), but less than cv. Koronaki. On the other side, progenies derived from (Manzanillo x Hamed) showed that the oil content scored from 51.65 to 55.08 %. Also, progenies derived from (Picual x Hamed) showed that the oil content was ranged from 52.55 to 54.39 %. The last group progenies derived from (Arbiquine x Hamed) showed that the oil content ranged between 51.91% to 53.98 % and gave the highest oil percent in dry weight and more than cv. Arbiquine.

Differences in growth characteristics among olive selections are in close conformity with the findings previously reported by many researchers (**Saad El-Din *et al*. 2009, Esmaeili, *et al*., 2012, Hechmi *et al*., 2012 and Medina *et al*., 2012**).

5- % Rooting ability.

Rooting ability of the semi hardwood cutting is reported in Fig, 23 it is varied from 17.40 to 22.73. All the progenies were classified as with moderate rootability.

Table 2. Time of flowering (start, end and duration).

Progeny No	Start of blooming	End of blooming	Blooming duration
41	19-3	11-4	23
42	23-3	14-4.	22
44	20-3	11-4	22
45	15-3	5-4.	21
46	17-3.	10-4.	24
47	12-3	4-4.	23
57	11-3	2-4.	23
59	14-3.	7-4.	24
60	16-3.	5-4.	20
61	18-3	7-4.	20
71	23-3.	14-4.	22
72	25-3.	16-4.	22
73	22-3	16-4.	25
89	20-3	10-4.	21
91	19-3	11-4.	23
94	21-3	10-4.	20
94	18-3	9-4.	22
99	23-3.	12-4.	20
100	20-3	10-4	21
Koronaki	15-3	7-4	23
Hamd	22-3	14-4	23
Picual	30-3	21-4	**22**
Arbquine	20-3	10-4	21
Manzanello	10-3	1-4	22

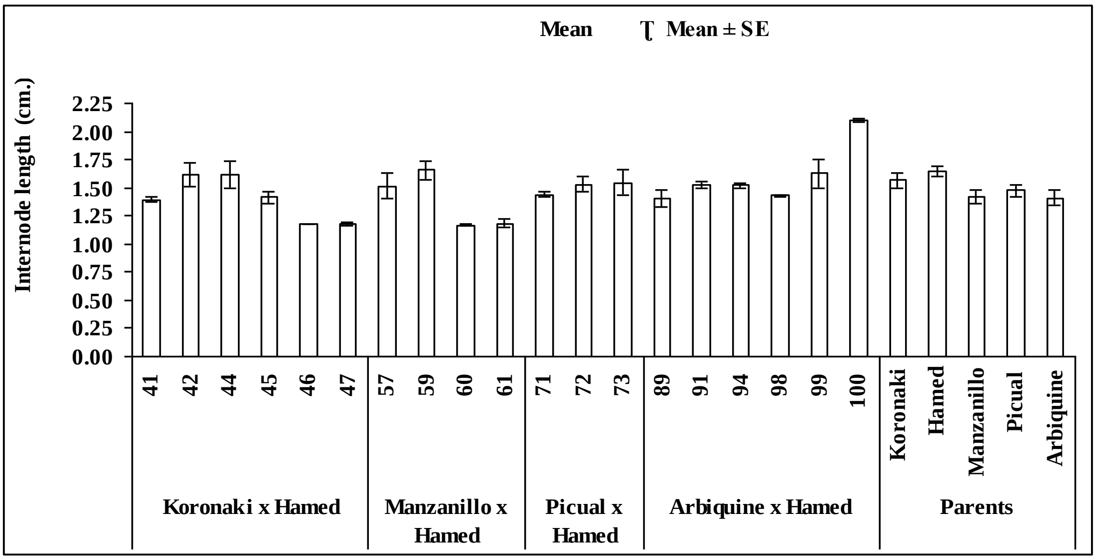


Fig., 4. Mean and standard error during three seasons for internodes length (cm.) of the olive progenies.

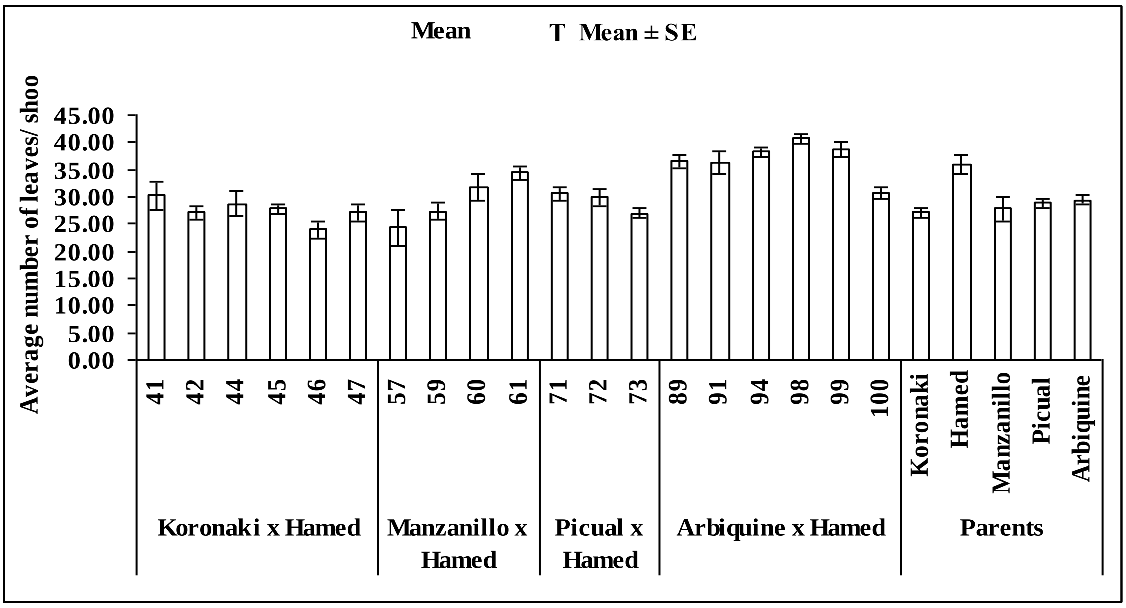


Fig., 5. Mean and standard error during three seasons for average number of leaves/ shoot of the olive progenies.

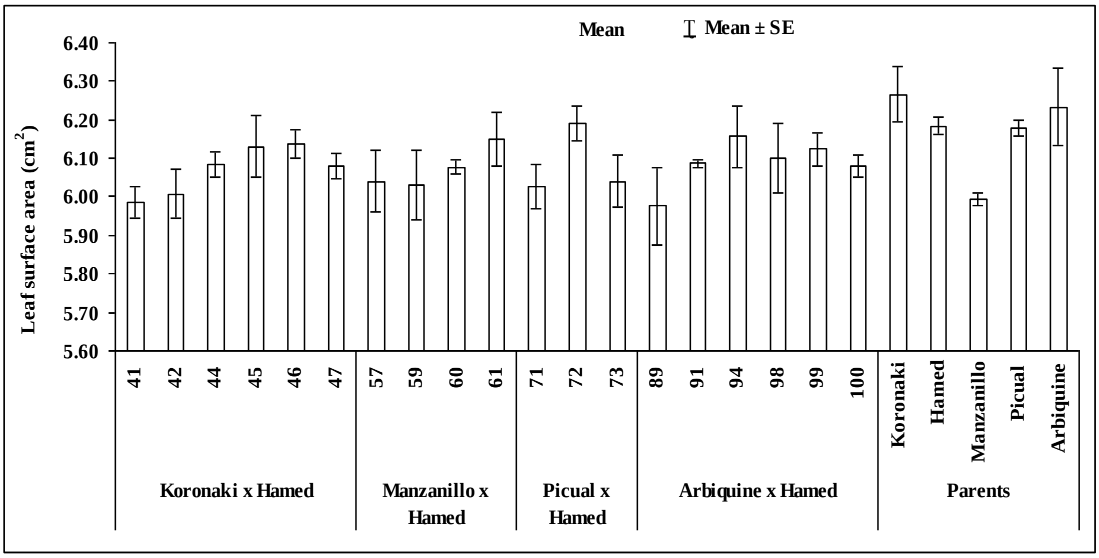


Fig., 6. Mean and standard error during three seasons for leaf surface area (cm^2) of the olive progenies.

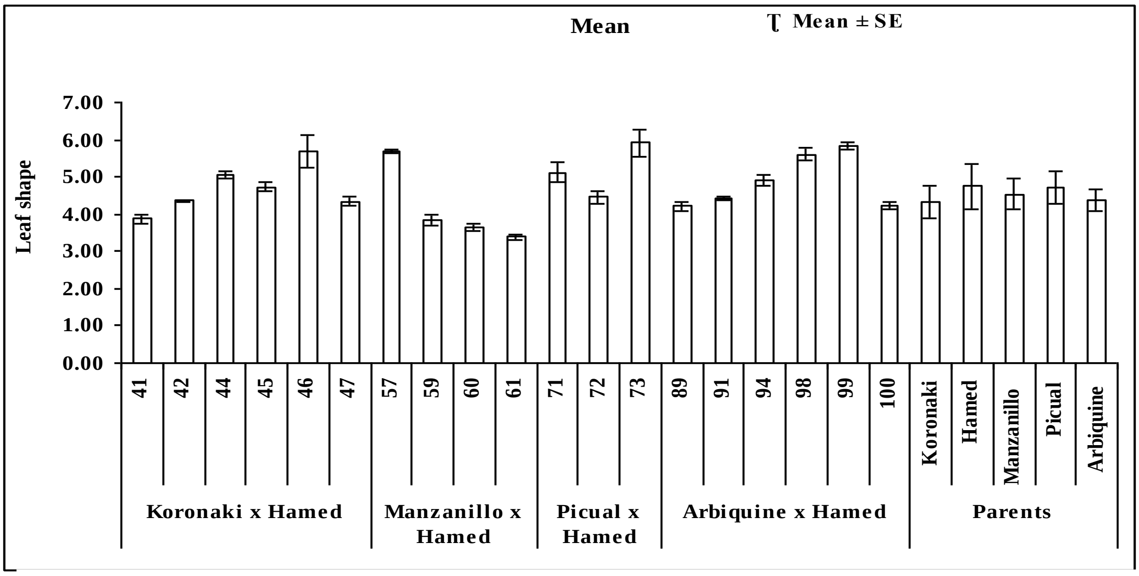


Fig., 7. Mean and standard error during three seasons for leaf shape of the olive progenies.

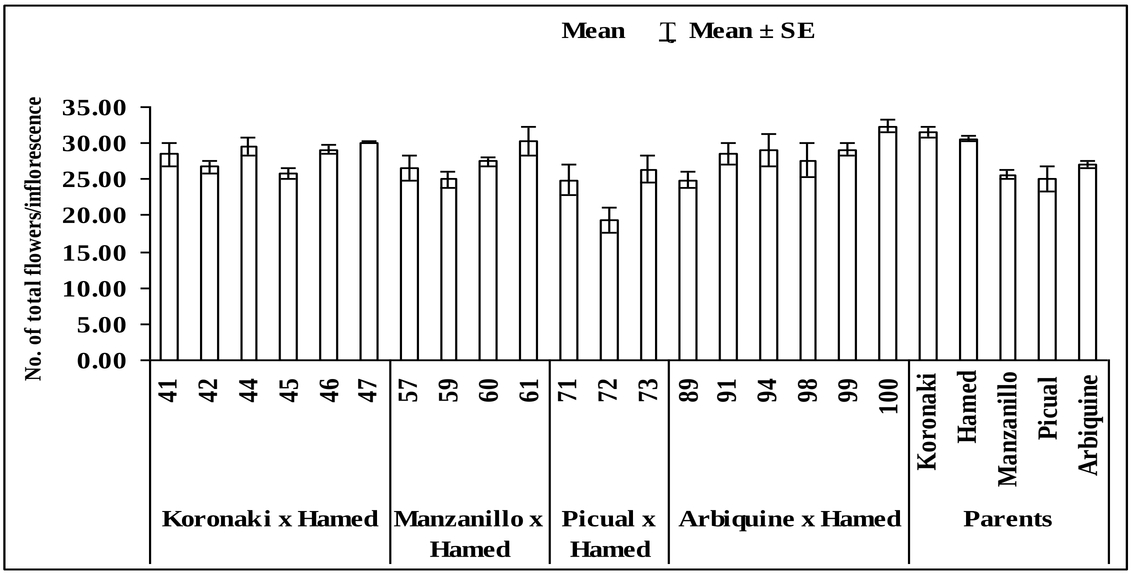


Fig., 8. Mean and standard error during three seasons for no. of total flowers/inflorescence of the olive progenies.

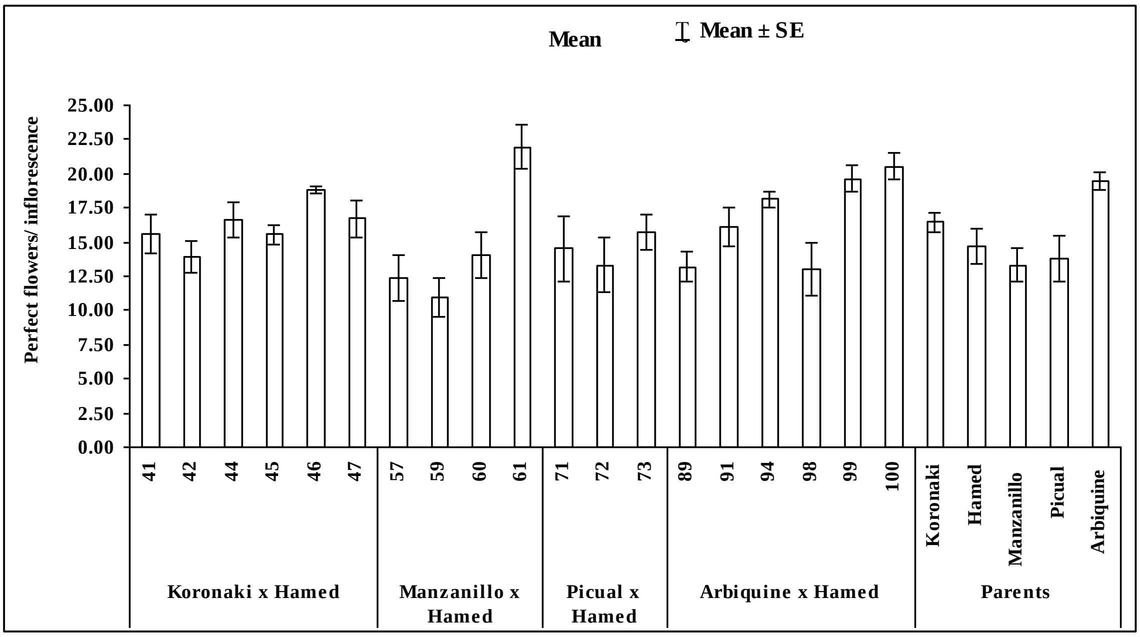
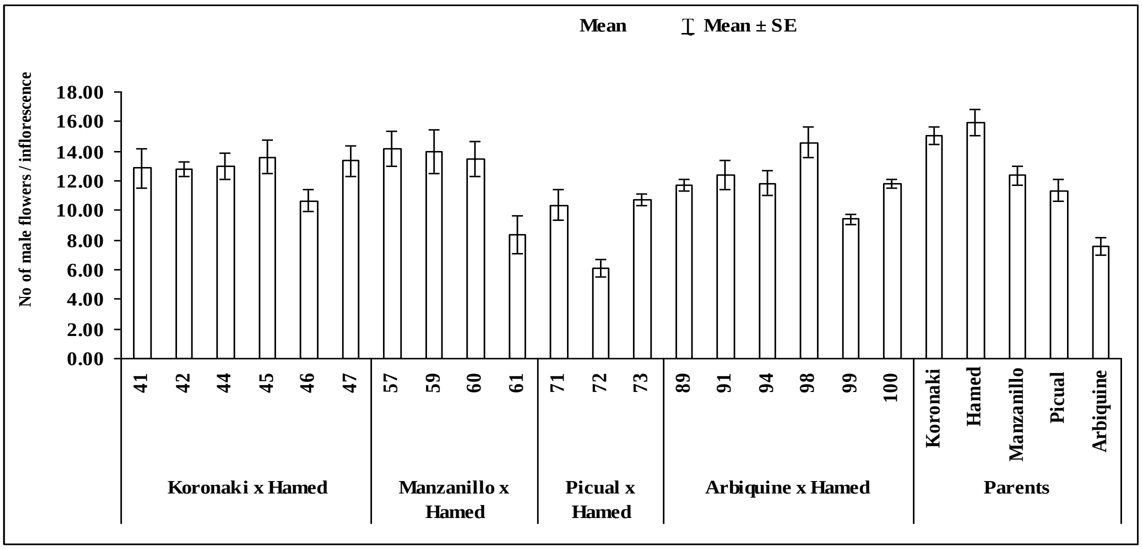
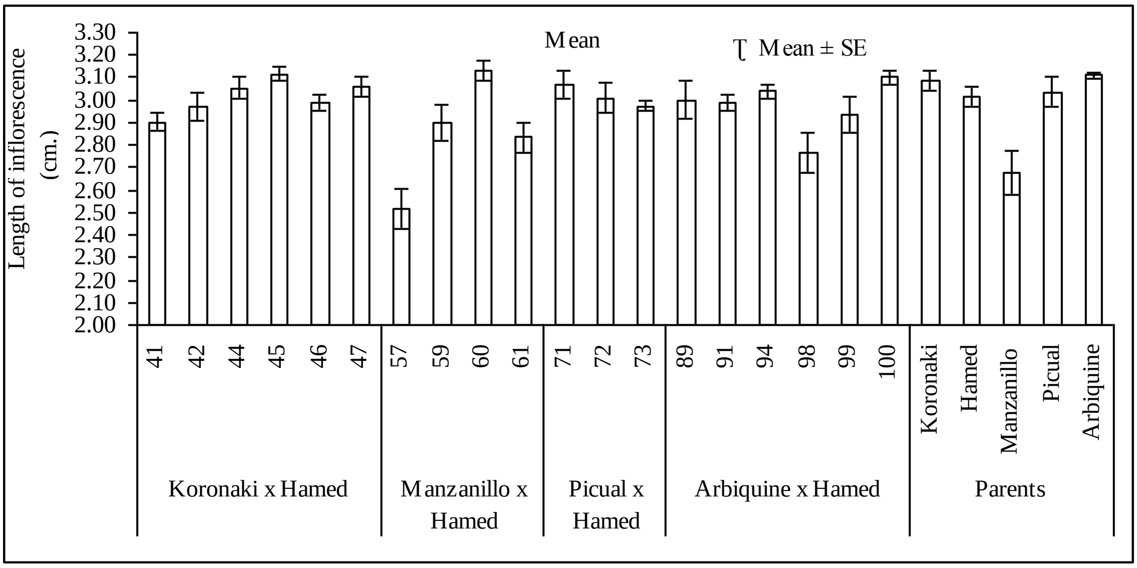


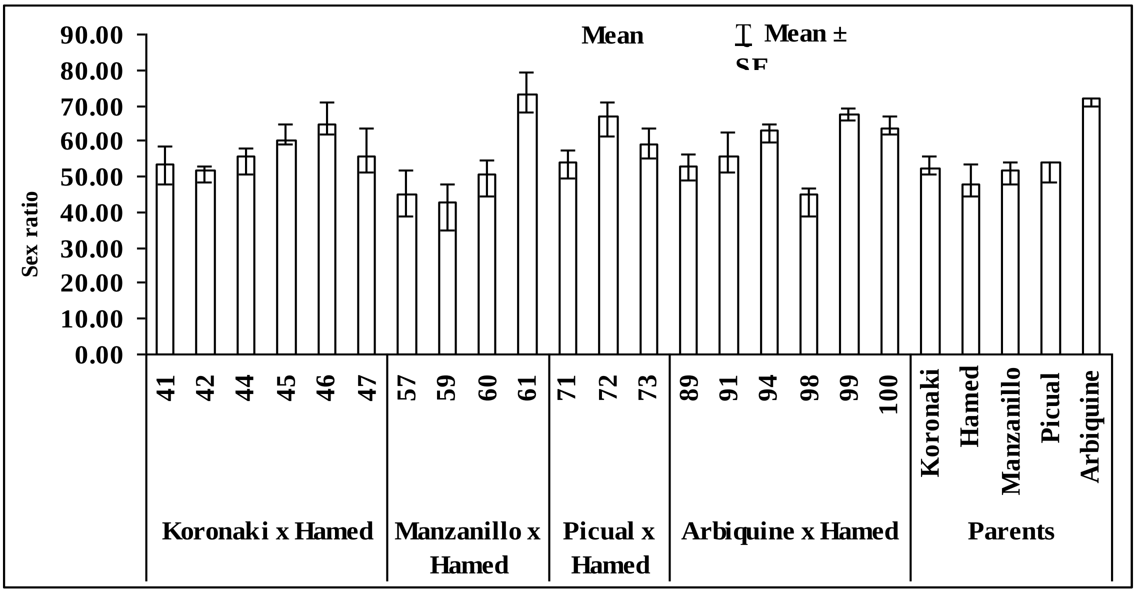
Fig., 9. Mean and standard error during three seasons for perfect flowers/ inflorescence of the olive progenies.



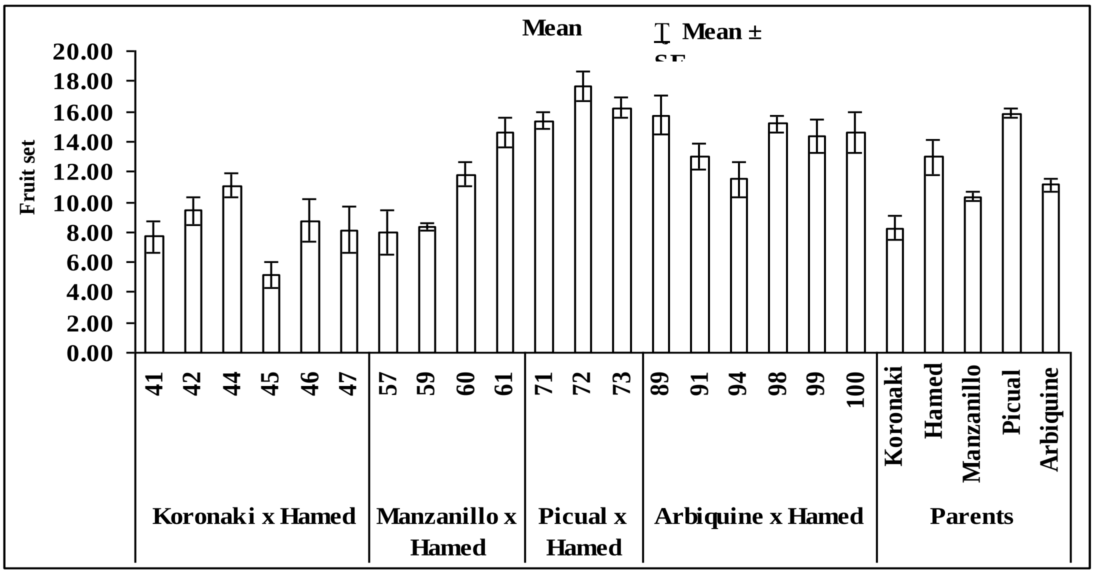
Fig, 10. Mean and standard error during three seasons for no of male flowers/inflorescence of the olive progenies.



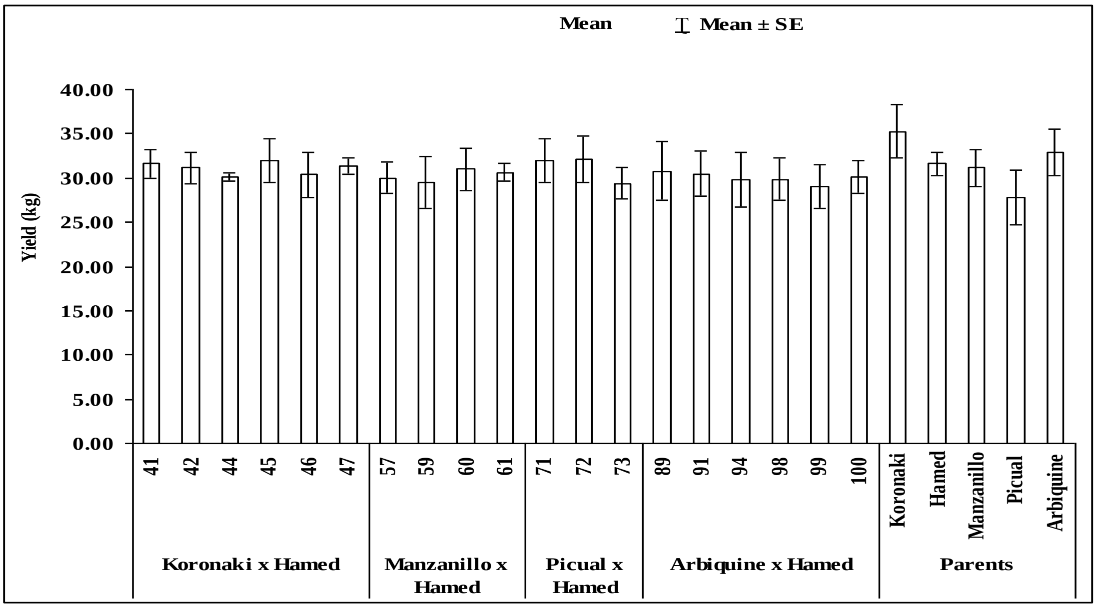
Fig, 11. Mean and standard error during three seasons for length of inflorescence (cm.) of the olive progenies.



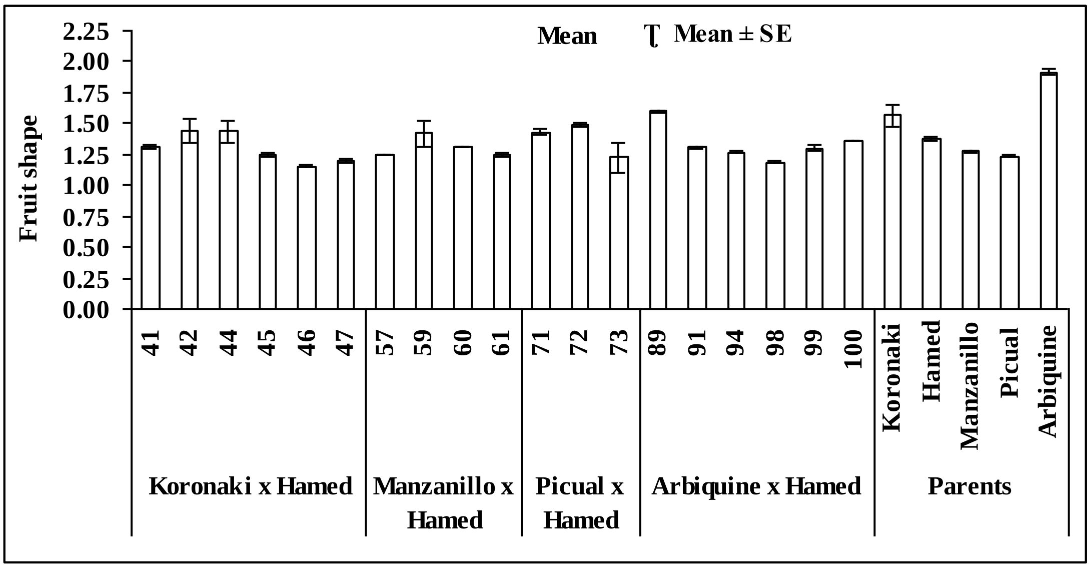
Fig, 12. Mean and standard error during three seasons for sex ratio of the olive progenies.



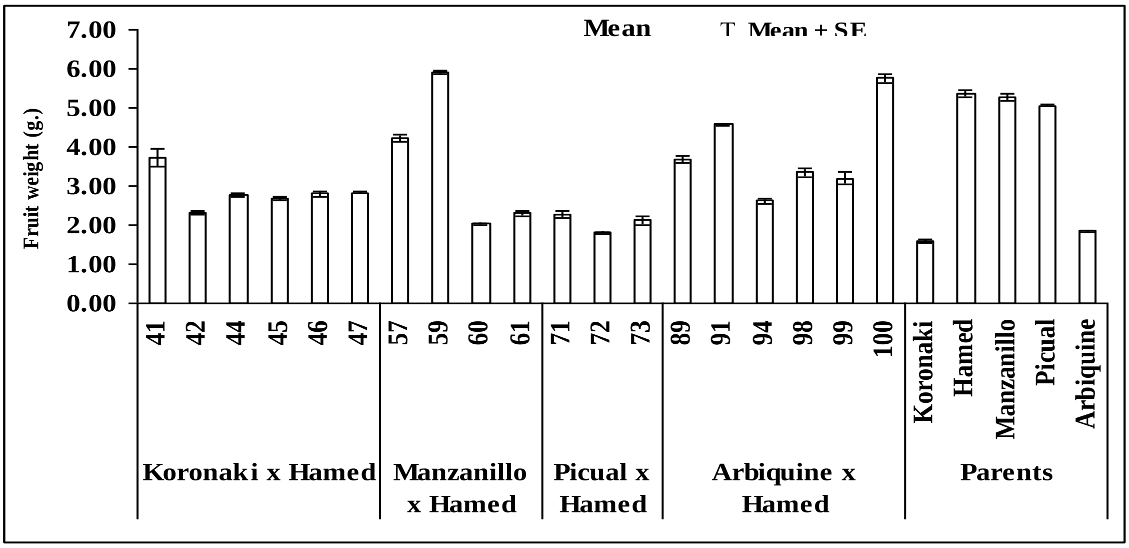
Fig, 13. Mean and standard error during three seasons for fruit set of the olive progenies.



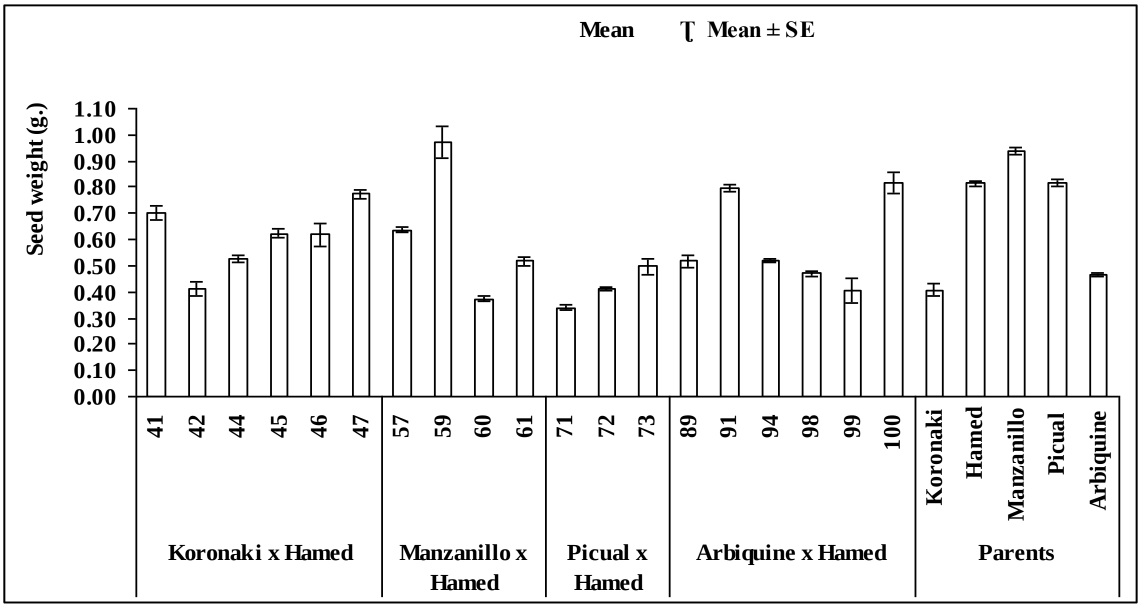
Fig, 14. Mean and standard error during three seasons for yield (kg) of the olive progenies.



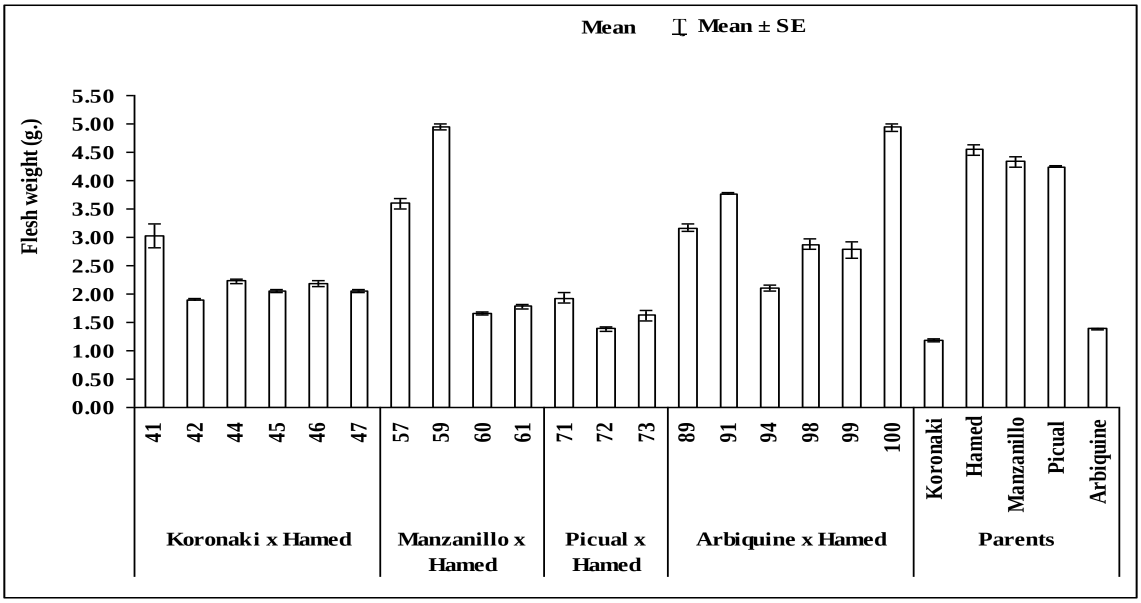
Fig, 15. Mean and standard error during three seasons for fruit shape of the olive progenies.



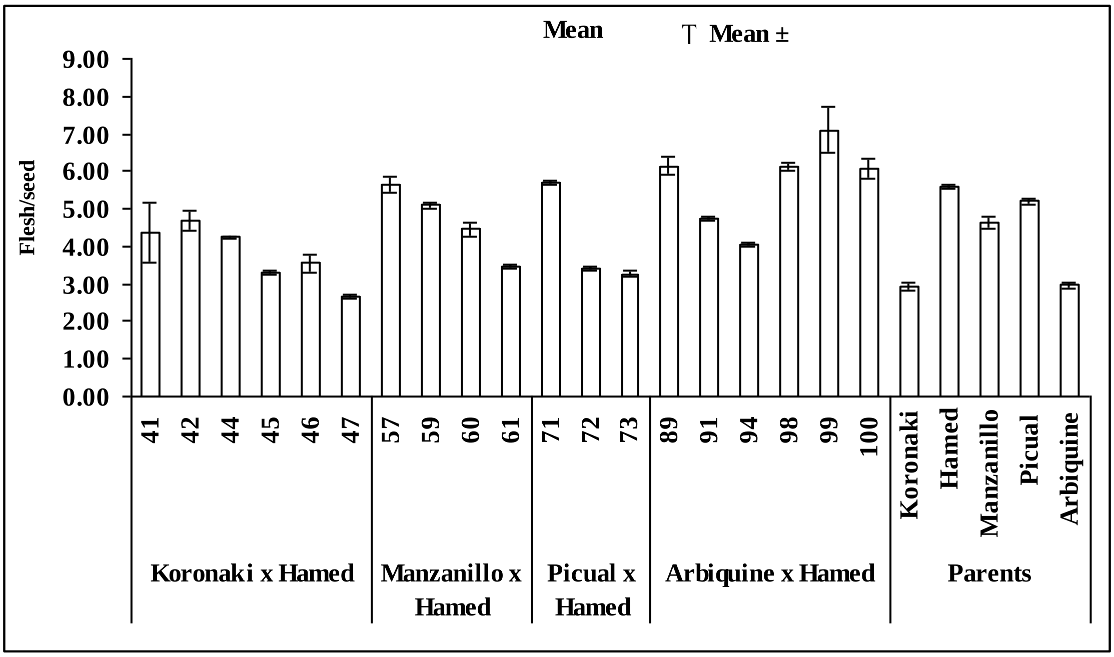
Fig, 16. Mean and standard error during three seasons for fruit weight (g.) of the olive progenies.



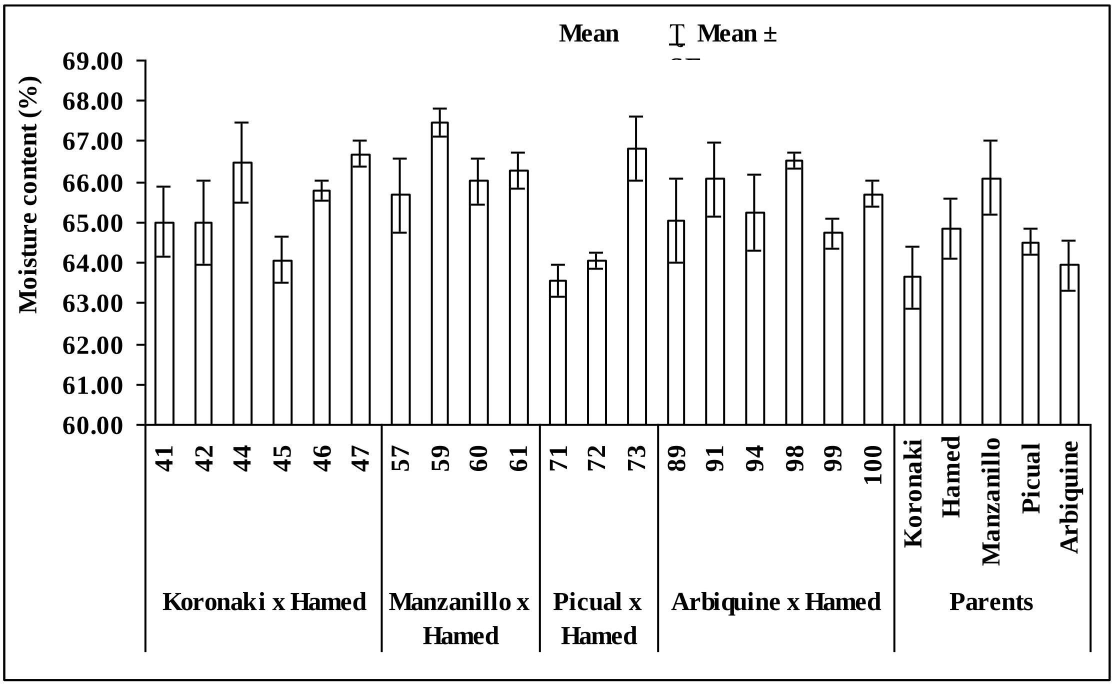
Fig, 17. Mean and standard error during three seasons for seed weight (g.) of the olive progenies.



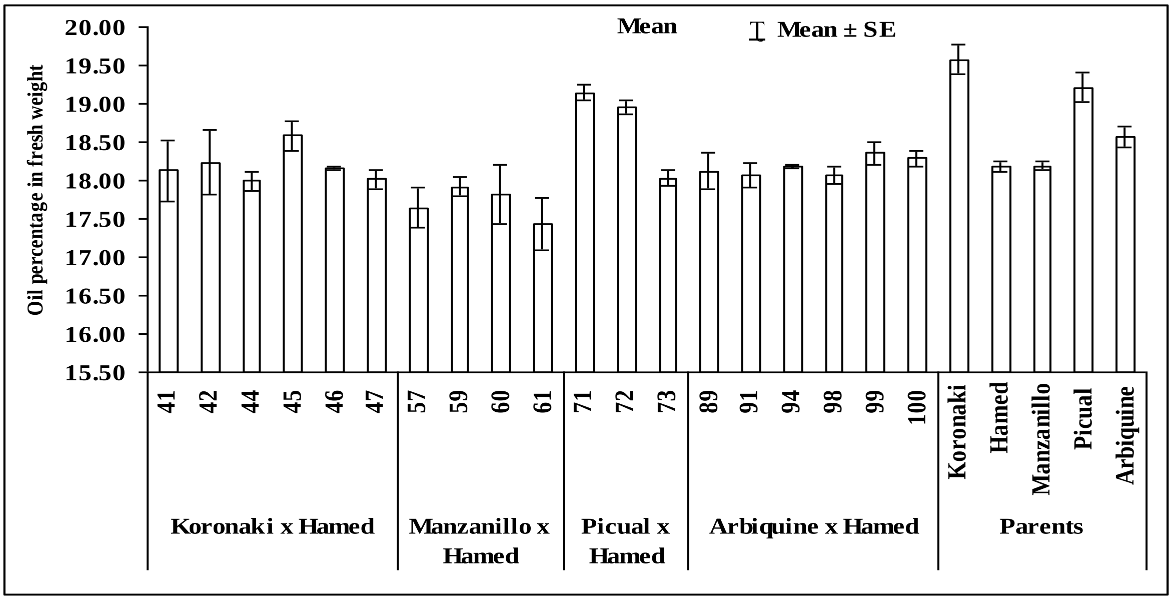
Fig, 18. Mean and standard error during three seasons for flesh weight (g.) of the olive progenies.



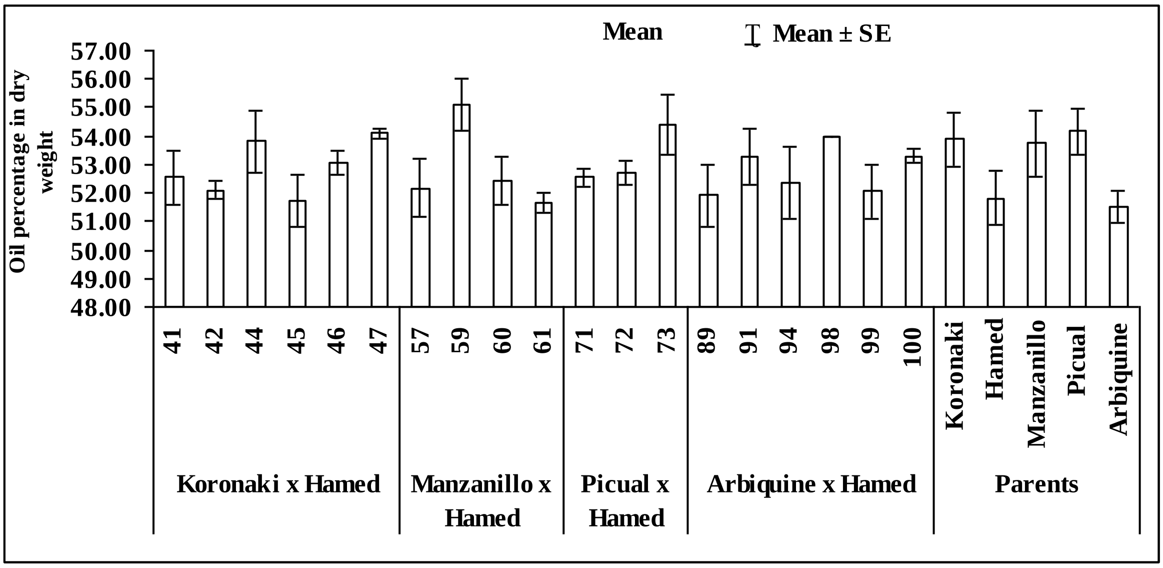
Fig, 19. Mean and standard error during three seasons for flesh/seed of the olive progenies.

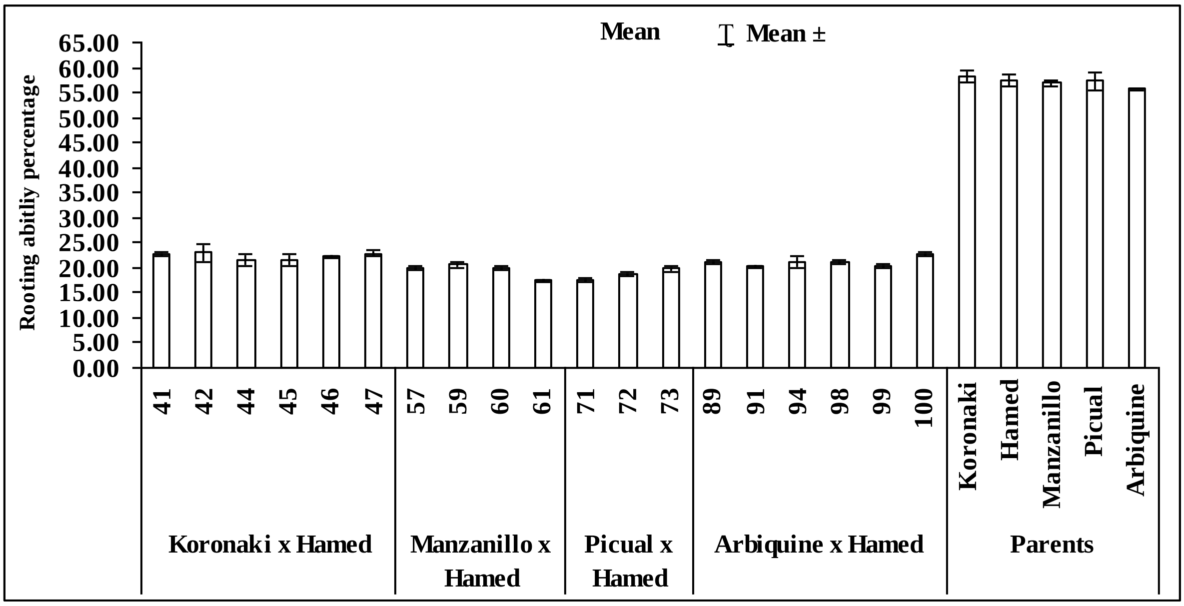


Fig, 20. Mean and standard error during three seasons for moisture content (%) of the olive progenies.



Fig, 21: Mean and standard error during three seasons for oil percentage in fresh weight of the olive progenies.





Fig, 23: Mean and standard error during three seasons for rooting ability percentage of the olive progenies.

- Summary of best characteristics

Progenies No	Characteristics				
	Productivity	Constant productivity	Fruit weight	Flesh/ stone	Oil content in dry weigh
41	31.63	Constant	Medium	Low	High
42	31.13	Constant	Medium	Low	High
44	30.13	Constant	Medium	Low	High
45	32.00	Alternate	Medium	Low	High
46	30.38	Alternate	Medium	Low	High
47	31.38	Constant	Medium	Low	High
57	30.00	Constant	High	Medium	High
59	29.50	Alternate	High	Medium	High
60	31.00	Alternate	Medium	Low	High
61	30.63	Constant	Medium	Low	High
71	32.00	Alternate	Medium	Medium	High
72	32.13	Alternate	Low	Low	High
73	29.38	Constant	Medium	Low	High
89	30.75	Alternate	Medium	Medium	High
91	30.50	Constant	High	Low	High
94	29.88	Constant	Medium	Low	High
98	29.88	Constant	Medium	Medium	High
99	29.00	Alternate	Medium	Medium	High
100	30.13	Constant	High	Medium	High
Koronaki	35.25	Alternate	Low	Low	High
Hamd	31.63	Constant	High	Medium	High
Picual	31.13	Alternate	High	Low	High
Arbquine	27.88	Alternate	High	Medium	High
Manzanello	32.88	Alternate	Low	Low	High

Thereon, the preferable, progenies are No. 73, 91 and 100 for table olive; progenies No. 42, 47, 71, 89 and 98 for oil and progenies No. 57 and 59 for dual purpose.

All the best selected progenies should be propagated and planted in three locations in order to evaluate their performance (i.e., tree growth, yield, fruit characteristics, oil content, oil compositions in fatty acids fruit compounds) in different geographical areas. It is a top priority to study qualitative and qualitative traits of olive production in more detail for the most interesting selections.

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سلوك بعض هجن الزيتون الناتجة من برنامج التحسين الوراثى

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قسم بحوث الزيتون وفاكهة المناطق شبه الجافة – معهد بحوث البساتين – مركز البحوث الزراعية

الزيتون من أهم المحاصيل الزيتية فى حوض البحر الأبيض المتوسط لزيادة الطلب على الزيت والأصناف الجديدة من الزيتون بالأسواق العالمية، حيث أن التغيرات التكنولوجية سريعة ونظراً للاهتمام الشديد ببرامج التربية لانتقاء أصناف مائدة وثنائية الغرض وذلك طبقاً لبرنامج التحسين الوراثى فى مصر سنة 1994.

أجريت دراسة لتقييم بعض هجن الزيتون الناتجة من التهجين من (كروناكى × حامض)، (منزانيللوا × حامض)، (بيكوال × حامض) و (أربكوين × حامض)، خلال الفترة من 2011 – 2013م وتم دراسة هذه السلالات وتقييم صفاتها (طول الفرع – سمك الفرع وعدد العقد على الأفرع) الأوراق (متوسط عدد الأوراق على الفرع – شكل الورقة)– التزهير (ميعاد التزهير، عدد الأزهار الكلية فى النورة، عدد الأزهار الكاملة فى النورة وعدد الأزهار الخنثى فى النورة – طول النورة الزهرية، النسبة الجنسية) الإثمار (يشمل الإنتاج – شكل الثمرة وزن الثمرة – وزن البذرة – وزن اللحم – وزن اللحم/البذرة) – والقدرة على التجذير.

وتشير النتائج المتحصل عليها أنه أمكن التوصل إلى أحسن الهجن لإنتاج زيتون مائدة هى رقم 73؛ 91، 100 ولإنتاج الزيت رقم 42، 47، 71، 89 و 98 ولإنتاج ثنائي الغرض 57 و59.

وعليه فأنه يجب إجراء تكاثر لهذه الهجن لتقييم صفاتها فى ثلاث مناطق مختلفة جغرافياً حيث تزرع شتلات هذه الهجن وذلك لتقييم (صفات الشجرة، نمو الشجرة، صفات الثمار، نسبة الزيت، تركيب الاحماض الدهنية فى الزيت) ومن الأهمية دراسة الصفات الكمية والنوعية للإنتاج اكثر تفصيلا للهجن الاكثر تميزا .