

Evaluation of Some Date Palm Strains Grown in El-Baharia Oasis Region

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Abstract: This work was done on seven date palm seedlings in comparison with the commercial cultivar Sewi grown in El-Baharia Oasis - Giza Governorate through 2018 and 2019 seasons. Date of flowering, fruit set % and yield per palm as well as physical and chemical properties of fruit and general evaluation were studied for all tested date palm. Data of fruit set percentage showed differences between tested palms. Palm No. 3 produced the highest yield (168, 182 kg/palm) while the lowest yield (90 & 121 kg/palm) was recorded of palm No.1 in both seasons. Among the physical fruit characteristics are, fruit weight (16.9 & 16.7 gm), T.S.S. (75.5 & 74.5), total sugar% (68.2 & 69.1) were the highest in the palm No.3. The tested palms could be arranged descending based on total score (100) for yield and fruit quality as follows: palm No. 3 (98.53 units), Sewi cv. (87.38 units), palm No. 6 (83.28 units), palm No. 2(83.21 units), palm No.(81.36 units), palm No. (79.79 units), palm No. (68.59 units) and palm No. 5 (66.47 units). Finally, the palm No. 3 tree under this study can be considered as a beginning of new varieties of date palm in Egypt for its superiority in yield and fruit quality.

Key words: EL-Baharia Oasis • Seeded date palm trees • Evaluation • Date fruits characteristics

INTRODUCTION

In Egypt number of fruitful female palms trees about 14 million (280000 fed.) produced about 1, 600, 000 ton [1]. Most of date palm orchards were planted with seeded palms. The decrement of superior cultivars number is a big problem especially those of semi-dry group considered one of the most important factors leads to improve dates exportation [2]. A very large number of the date trees existing in Egypt, especially in the Oasis of Siwa, El-Wady El-Gidid, Faiyum, El-Baharia oasis and Upper Egypt, have been grown from seed which has been for the greater part sown by chance, these palms are known as Maghal, Baladi, Mantoor, etc., the trees grown under these names are extremely numerous and the most varied description [3]. To improve the date palm necessary to start studying and evaluation of these palms already grown in a big population. There was a significant variation on fruit quality behavior of most date palm cultivars.

The aim of this study is selection and evaluation of superior palms from these seedlings plantation for developing new date palm cultivars.

MATERIALS AND METHODS

The present study was conducted in a private farm at El-Baharia Oasis, Giza Governorate, Egypt, at (28° 19' 10" N: 28° 57' 35" E. 130 m a.s.l.). Field work of this study was conducted during 2018 and 2019 on seven seedling palms which chosen among many palm trees according to panel test survey and for their best fruits qualities in addition to the commercial cultivar "Sewi" (an individual Sewi satellite) as standard. All tested palms including "siwi" cv. belong to semi-dry date's group and were in production stage (fifteen years old), free from any infection and received the same horticultural practices and pollinated by using pollen grains from the same parent in both seasons. Average maximum temperatures as well as relative humidity percentage for El-Bahria oasis Giza Governorate during 2018 & 2019 years are shown in Table (1).

The Following Topics Were Studied and Recorded

Leaf Morphology: Three mature leaves (full grown leaves) of each tested palm for measuring leaf length (cm),

Table 1: Average temperature (°C), maximum temperature (°C), minimum temperature (°C), average humidity for El-Bharia oasis region during 2018& 2019 seasons

Months	2018				2019			
	T. max	T. min	T.A.	R.H.	T. max	T. min	T.A.	R.H.
Jan.	17.10	4.40	10.75	48.20	18.10	5.40	11.75	49.20
Feb.	19.40	6.20	12.8	46.60	20.50	7.20	13.85	47.60
Mar.	22.80	8.40	15.6	40.40	22.90	9.40	16.15	40.40
Apr.	27.90	12.70	20.3	32.70	28.90	13.70	21.3	33.70
May	35.60	18.70	27.15	22.00	36.60	19.70	28.15	22.00
Jun.	37.20	22.10	29.65	29.00	38.10	23.20	30.65	29.00
Jul.	38.10	22.90	30.5	30.30	39.20	23.90	31.55	31.30
Aug.	37.50	22.50	30	31.40	38.60	23.50	31.05	31.40
Sep.	34.30	20.00	27.15	40.80	35.30	21.00	28.15	41.80
Oct.	31.90	18.10	25	41.10	32.9	19.20	26.05	42.20
Nov.	26.80	13.30	20.05	45.60	27.8	14.40	21.1	64.60
Dec.	19.60	7.90	13.75	62.80	20.8	9.00	14.9	63.80

where: T. max, T. min= maximum and minimum temperature °C); R.H.= relative humidity (%); T.A.=temperature average [Data were obtained from the agrometeorological Unit at SWERI, ARC].

average length and width of leaflets(cm), number of leaflets per leaf and total leaf area(m²) according to Shabana and Rntoun [4].

Total leaf area = leaflet length × maximum leaflet width × 0.84

Date of Flowering and Fruit Set %: Date of flowering was recorded and number of set fruits per stalks was recorded 30 days after pollination; 50 attached stalks on 5 bunches per palm were used for purpose. The percentage of fruit set was calculated using the following equation:

$$\text{Fruit set \%} = \frac{\text{Av. number of set fruits per stalk}}{\text{Av. number of flowers per stalk}} \times 100$$

Yield

Bunch Weight (kg), Number of Bunches per Palm and Yield (kg): At harvesting time the number of bunches per palm was counted then bunches of each palm were cut and the weight in Kg of each bunch was recorded.

The average bunch weight and yield were calculated for each palm during the both studied seasons.

Fruit Quality: Thirty fruits sample were collected at harvesting date from each palm and divided into three replicates each of ten fruits. Physical and chemical fruit evaluation included fruit weight (g), length and dimensions (cm), as well as flesh percentage. Total soluble solids (T.S.S) contents were determined according to A.O.A.C. [5]. Moisture, total and reducing sugars content, were determined according to A.O.A.C. [5].

Also; tannins content was determined by using standard curve of tannic acid and expressed as mg tannins/g. f. wt. according to Winton and Winton [6].

General Evaluation: The final evaluation of all tested seedling date palms was calculated on the basis of 100 units which were shared between palm yield (40 units) and fruit quality (60 units) according to Mahdy [3], the latter units were divided on the basis of 10 units for the percent of each total sugars, T. S .S and tannins content, beside the fruit weight and flesh weight % and 5 units for each of fruit length and fruit diameter. Each palm that gave the best results in any property took the full mark specified for this property, while each of the other tested palms took lower units equal to their quality

Statistical Analysis: Data were analysis in complete randomized design with three replicates was followed according to Sendecor to Cochran [7]. The averages were compared by using the method of new least significant differences (New L. S. D.) described by Waller and Duncan [8].

RESULTS AND DISCUSSION

Leaf Morphology: The data in Table (2) showed the number of the yearly produced leaves per palm in 2018 and 2019. In general the tested palms produced from 15 to 23 leaves per palm. The most active in this respect was palm No 3, 4 and “Sewi” cultivar (about 22.5 leaves/ palm as av. of the two seasons). On the other hand, palm No. 5 and 6 was the lowest in their leaf producing capacity (15.5 leaves). Number of the yearly produced leaves of

date palm varies between 10 and 21 according to conditions under which the palms are growing and according to cultivar Mahdy [3]. The bearing capacity of a date palm is in proportion to the number of green leaves that it carries Nixon [9].

Concerning the length of full grown leaf, the average values for the two years show that leaf length was long in palm No.3 (about 441.5 cm) and short in palms No. 5 and 6 (about 370 cm.) but it was intermediated in the rest tested palms including "Sewi" cultivar (about 415 cm.). Several references assert that leaf length varies according to the cultivar [3, 10, 11]. Anyway, the date palm cultivars are classified according to this character as follows: i) Cultivars with short leaves (less than 3.20 m.). ii) Cultivars with medium length (3.30 – 4.20 m.). iii) Cultivars with long leaves (more than 4.20 m.). According to this classification, all tested palms including "Sewi" cultivar have long leaves [10].

The tested palms varied significantly according to the number of leaflets per leaf. Leaves of palm No.2 contained the greatest number of leaflets (207 leaflets per leaf as average of the two years), while leaves of palm No. 5, 7 bore the least number (190). Similar findings were obtained by Mousa [11]; Abdalla [12] and Metwally *et al.* [13] who reported that the number of leaflets per leaf ranged between 132 and 250 leaflets according to the cultivar.

It is clear from the results presented in Table (2) that palm No. 2, 3 have the longest leaflet (44.3 cm.) followed by Sewi cultivar (40.9 cm.). The values of the rest tested ranged between 39.7 cm. in palm No. 7 and 34.1 cm in palms No. 5. In order to leaflet width data show that the palms No. 2 and 3 have the broadest leaflets (3.25 & 3.55cm) compared with palm No. 1, which recorded the narrowest leaflets (2.15 cm). In this respect, differences among the tested palms were statistically significant. The obtained data show also significant differences in length and width of the leaflets between the tested palms. These results are similar with El-Bakr [10]; Mousa [11] and Metwally *et al.* [13] who reported that the length and width of leaflet varies according to cultivar.

Regarding the total leaf area Table (2) shows that the studied palms varied significantly in total leaf area. The average values of the two years show that palms No. 2 and 3 have the largest total leaf areas (121 and 132 cm², respectively) in comparison with the other tested palms including Siwi cultivar ranged between 107 cm², palm No. 7 (103 cm², while palms No. 1 and 5 have the

smallest total leaf area (73.3 and 78.8 cm², respectively). These results accorded with Mahdy [3]; Mousa [11] and Metwally *et al.* [13] who reported that total leaf area varies according to cultivar.

Fruit Set and Yield

Fruit Set %: The tested trees varied, significantly according to fruit set % (Table 3). Average values for the two seasons show that palm No 3 attained the highest percentage of fruit set (92.5%) among the tested palms. Meanwhile, Palm No. 6 recorded the lowest fruit set (73.8 %), while the other tested palms as well as "Sewi" cultivar exhibited intermediate figures. Similar findings were obtained by Metwally [2] and Abo Rekab [14].

Harvesting Date: Data in Table (3) showed that under conditions of the El-Baharia Oasis, El-Giza Governorate, date of harvesting of all tested palms including "Sewi" cultivar was ranged from 1st October to 20th October in the first season, while in the second one harvesting was done early between 1st - 17th October. Fruits of palm No.3 were the earliest to harvest (from 1st Oct to 5th Oct.) in both seasons. However, harvesting of palm No.5 was done later (from 15th Oct. to 17th Oct.). Fruit ripening continues over a period of 4-8 weeks depending upon the cultivars and weather conditions according to Metwally [2] and Abo Rekab [14].

Number of Bunches per Palm: According to data presented in Table (3) it is showed that palm No. 6 surpassed other palms in average number of bunches / palm (14.5), followed by palm No. 3, 7 and Sewi cultivar (14.00), while, palm No. 1 recorded the lowest average number of bunches / palm (10.5). Significant differences were remarked in the average number of bunches / palm.

Our results about number of bunches / palm and bunch weight are in the same line with the findings of Mousa [11]; Metwally [2] and El-Safy *et al.* [16].

Bunch weight: According to Table (3) it clear that palm No. 3 produced the highest bunch weight (12.50 kg/palm as average of two years), followed by Sewi cultivar and palm No. 2 (11 kg). However, palm No. 1 which produced the lightest bunch weight (10 kg), the average weight of bunch in the other studied palms ranged from 10 to 10.5 kg. Similar results were obtained by Metwally [2]; Abo-Rekab [14]; Hamed [17]; Ibrahim *et al.* [18] and Osman [19] who stated that there was a great variation on fruiting behavior of most date palm cultivars.

Table 2: Leaf morphology of some date palm strains and Sewi date palm cultivar grown in El-Baharia Oasis during 2018 & 2019 seasons

Date palm	Number of new leaves/palm			Leaf length (cm.)			Number of leaflets/leaf			Leaflet length (cm)			Leaflet width (cm)			Total leaf area (sq.cm)		
	2018	2019	Av.	2018	2019	Av.	2018	2019	Av.	2018	2019	Av.	2018	2019	Av.	2018	2019	Av.
Palm No. 1	16	17	16.5	380	410	395	193	192	192.5	40.0	41.2	40.6	2.10	2.20	2.15	70.6	76.1	73.3
Palm No. 2	18	19	18.5	414	450	432	205	209	207	44.0	44.5	44.3	3.20	3.30	3.25	118	123	121
Palm No. 3	23	22	22.5	423	460	441.5	204	200	201	44.5	44.0	44.3	3.50	3.60	3.55	131	133	132
Palm No. 4	23	22	22.5	422	455	438.5	200	201	200.5	35.8	36.2	36.0	2.80	2.90	2.85	84.2	88.2	86.2
Palm No. 5	15	16	15.5	330	410	370	190	191	190.5	33.6	34.6	34.1	2.70	2.80	2.75	76.2	81.4	78.8
Palm No. 6	15	16	15.5	330	410	370	190	192	191	38.6	39.2	38.9	2.90	3.0	2.95	94.0	98.8	96.4
Palm No. 7	17	18	17.5	380	450	415	190	191	190.5	39.1	40.0	39.6	2.95	3.10	3.1	96.9	104	103
Siwi cultivar	22	23	22.5	380	450	415	200	201	200.5	40.5	41.2	40.9	3.00	3.20	3.1	102	111	107
New LSD at 0.05	2.01	2.01	2.01	15.9	22.2	19.05	5.9	6.1	6.0	2.20	2.9	2.55	0.30	0.23	0.3	1.51	1.72	1.62

Table 3: Date of harvesting, fruit set % and yield parameters of some date palm strains and Sewi date palm cultivar grown in El- Baharia Oasis during 2018 & 2019 seasons

Date palm	Date of harvesting		Fruit set %			Number of bunches/palm			Bunch weight (kg)			Yield / palm (kg)		
	2018	2019	2018	2019	Av.	2018	2019	Av.	2018	2019	Av.	2018	2019	Av.
Palm No. 1	1 st Oct	5 th Oct	66.00	84.67	75.3	10	11	10.5	9	11	10	90	121	105
Palm No. 2	10 th Oct	12 th Oct	82.33	91.67	87.0	12	13	12.5	10	12	11	120	156	137.5
Palm No. 3	1 st Oct.	5 th Oct	91.00	94.00	92.5	14	14	14	12	13	12.5	168	182	175
Palm No. 4	15 th Oct	13 th Oct	75.67	80.33	78.0	10	13	11.5	10	11	10.5	100	143	120.75
Palm No. 5	15 th Oct	17 th Oct	72.33	88.00	80.2	11	14	12.5	10	9	10.5	110	126	131.25
Palm No. 6	20 th Oct	10 th Oct	63.00	84.67	73.8	14	15	14.5	9	11	10	126	165	145
Palm No. 7	13 th Oct	15 th Oct	75.67	81.67	78.7	13	15	14	9	10	10.5	117	150	147
Siwi cultivar	10 th Oct	15 th Oct	85.33	91.67	88.5	14	14	14	11	11	11	154	154	154
New LSD at 0.05	---	---	3.50	2.21	2.85	1.41	1.35	1.38	1.9	1.8	1.79	5.37	15.81	4.59

Table 4: Fruit physical characteristics of some date palm strains and Sewi date palm cultivar grown in El- Baharia Oasis during 2018 & 2019 seasons

Date palm	Fruit weight (g)			Fruit length (cm)			Fruit diameter (cm)			Flesh weight (g)			Flesh /fruit %		
	2018	2019	Av.	2018	2019	Av.	2018	2019	Av.	2018	2019	Av.	2018	2019	Av.
Palm No. 1	6.6	6.8	6.7	2.7	2.9	2.8	1.3	1.2	1.25	5.1	5.3	5.2	77.27	77.94	77.61
Palm No. 2	11.5	11.7	11.6	3.12	3.2	3.16	1.5	1.7	1.6	10.2	10.4	10.3	88.70	88.89	88.79
Palm No. 3	16.9	16.7	16.8	4.7	4.9	4.8	2.1	2.3	2.2	14.7	15.1	14.9	86.98	90.42	88.69
Palm No. 4	12.2	12	12.1	3.21	3.29	3.25	1.6	1.62	1.61	11.2	11.2	11.2	91.80	93.33	92.56
Palm No. 5	11	11.9	11.5	3.12	3.3	3.21	1.5	1.44	1.47	10.7	10.9	10.8	97.27	91.60	93.91
Palm No. 6	10.8	11	10.9	2.9	2.9	2.9	1.5	1.7	1.6	10.3	10.5	10.4	95.37	95.45	95.41
Palm No. 7	8.4	9.1	8.75	3.2	3.1	3.15	1.4	1.5	1.45	7.1	7.3	7.2	84.52	80.22	82.29
Siwi cultivar	13.7	13.9	13.8	3.4	3.3	3.35	2.2	2.1	2.15	10.1	10.2	10.15	73.72	73.38	73.55
New LSD at 0.05	1.21	1.3	1.26	0.44	0.45	0.45	0.44	0.29	0.37	1.22	1.41	1.315	2.25	2.21	2.22

Table 5: Fruit chemical characteristics of some date palm strains and Sewi date palm cultivar grown in El- Baharia Oasis during 2018 & 2019 seasons

Date palm	Moisture content			T S S %			Total sugars content %			Non-Reducing sugars content%			Reducing sugars content%			Tannins content %		
	2018	2019	Av.	2018	2019	Av.	2018	2019	Av.	2018	2019	Av.	2018	2019	Av.	2018	2019	Av.
Palm No. 1	21.5	21.9	21.7	69.6	68.6	69.1	60.1	62.1	61.1	19.6	20.9	20.3	40.5	41.2	40.9	0.15	0.12	0.14
Palm No. 2	28.5	30.2	29.4	72.7	72.4	72.6	67.5	66.5	67	24.4	24.4	24.4	43.1	42.1	42.6	0.12	0.13	0.13
Palm No. 3	32.5	33.5	33	75.5	74.5	75.0	68.2	69.1	68.7	25	25	25	43.2	44.1	43.7	0.12	0.13	0.13
Palm No. 4	26.6	26.7	26.7	66.5	68.0	67.3	64.1	63.2	63.7	23.9	23.1	23.5	40.2	40.1	40.2	0.11	0.12	0.12
Palm No. 5	24.2	24.8	24.5	61.0	55.8	58.4	63.2	63.5	63.5	23.7	24.9	24.3	39.5	38.6	39.1	0.13	0.13	0.13
Palm No. 6	25.2	23.4	24.3	67.3	67.1	67.2	60.2	61.1	60.7	21	21.6	21.3	39.2	39.5	39.4	0.13	0.13	0.13
Palm No. 7	27.5	26.9	27.2	67.1	68.1	67.6	61.9	62.3	62.1	21.7	21	21.4	40.2	41.3	40.8	0.13	.12	0.13
Siwi cultivar	24.9	26.5	25.7	73.3	73.5	73.4	66.5	64.1	65.3	24.9	22	23.5	41.6	42.1	41.9	0.14	0.13	0.14
New LSD at 0.05	2.69	2.01	2.40	1.76	1.76	1.76	2.12	2.17	2.12	1.95	1.41	1.68	2.45	2.55	2.52	N.S.	N.S.	N.S.

Yield per Palm: The average of the two years showed in Table (3) that palm No. 3, produced the highest yield (175 kg/palm) as compared with “Sewi” cultivar which came in the second order (154 kg/palm). Yield of the other tested palms descending arranged according to their average yield per palm as follows: palm No. 7 (147 kg), palm No. 6 (145 kg), palm No. 2 (137.5), palm No. 5 (13.23kg), palm No. 4 (120.75kg) and palm No. 1 (105kg / palm) (Table 3). These results are in the same line with the findings of Metwally *et al.* [20]; El-Kosry [21]; Ao-Rekab *et al.* [22]; Bashir *et al.* [23] and Bakr *et al.* [24].

Fruit Characteristics

Physical Characteristics

Fruit Weight: From the obtained results, Table (4) showed that palm No. 3 had the highest significant average value of fruit weight (16.80 g), followed by Sewi cultivar (13.8 g), palm No.4 (12.1 g), 2 (11.6 g), 5 (11.5 g), 6 (10.9 g) and 7 (8.75 g). On the other hand, palm No. 1 recorded the least significant value of fruit weight (6.7 gm.) compared to the other tested palms.

Fruit Dimension: According to fruit dimension data in Table (4) reevaluated that, fruit of palm No.3 were the tallest ones (4.8 cm) against those of palm No. 1 which behaved diversely (2.8 cm). Fruits of other tested palms were in between in this respect. Also, results showed that palm No. 3 had the biggest value of fruit diameter (2.2 cm) compared to palm No.1 which recorded the lightest value (1.25 cm).

Flesh Weight: According to Table (4), flesh weight of palm No. 3 were the heaviest (14.9 g), however, fruits of palms No. 2 and 7 recorded low values of flesh weight (5.2 and 7.3 g, respectively). The results concerning fruit weight, fruit dimension and flesh weight are coincided with the findings on various date cultivar [13, 25-27]. The obtained results are in agreement with those reported by Mahdy [3] that the ratio between weights of edible portion to total fruit weight varied from 79.5 to 92.9% for fifteen date cultivars grown in Sewa Oasis, Egypt.

Flesh /Fruit Weight %: As for flesh/ fruit weight% data of the Table (4) reveal that there are significant differences in flesh/ weight % between different palms including “Sewi” cultivar. Data recorded that palms No. 6, 5 and 4 were highest in flesh % (more than 90%), while it was less than 82% in fruits of palm No. 1, 7 and “Sewi” cultivar. Meanwhile flesh% was in between for other studied palms (ranged from 90 to 82%). These results agree with Metwally *et al.* [13] and Mahawar *et al.* [25].

Chemical Characteristics

Moisture Content: It is clear in Table (5) that there are significant differences in moisture content between the tested palms. The average values of the two seasons show that moisture content of flesh was high in palm No.3 fruits (33%) followed in a descending order by palm No.2 (29.4%), palm No. 7 (27.2%), palm No. 4 (26.7%), “Sewi” (24.7%), palm No.5 (24.5%) and palm No.6 (24.3 %) then by fruits of palm No.1 which attained the lowest moisture content (1.7%). These results are in line with those obtained by Metwally [2]; Metwally *et al.* [13] and Ibrahim *et al.* [18] on some seedling and local date cultivars, who found that the moisture content of fruits was ranged from 21.45 to 32.90% according to cultivar, as well as moisture content in fruits of semi dry dates was ranged between 20 and 30%.

Total Soluble Solids (T.S.S. %): As shown in Table (5), fruits of palm No. 3 recorded the highest T.S.S value (75.5 %), followed by :Sewi” cultivar (73.5 %), while the fruits of palms No. 6 and 5 recorded the lowest T.S.S values (67.2 and 58.4%, respectively). These results are similar to that reported by Metwally *et al.* [13]; ElMerghany and Zin El-dean [28]; Farag *et al.* [29] and Omar [30].

Total Sugars (%): It is evident from Table (5) that, the fruits of palms No. 3 and 2 recorded the highest value of total sugars percentage (68.7 and 67.00 %, respectively) without significant differences), followed by Sewi cultivar (65.3), palm No. 4 (63.7 %), palm No. 5 (63.5 %), palm No. 7 (62.1 %), On the other hand, palms No. 1 and 6 were the lowest (61.1 and 60.7%, respectively) without significant differences).

Reducing Sugars (%): As shown in Table (5) that, the fruits of palms No.3 and 2 recorded the highest value of reducing sugars percentage (43.7 and 42.6 %, respectively) without significant differences. On the other hand, palm No. 5 was the lowest (39.1 %).

Non- Reducing Sugars (%): It is clear in Table (5) that, the fruits of palms No. 3 and 2 recorded the highest value of non reducing sugars percentage (25.0 and 24.4 %, respectively) without significant differences), while, palms No. 1 had the lowest value (20.3 %). These results concerning total, reducing and non-reducing sugars content (%) are in harmony with those reported by Abd El-Hamid *et al.* [27]; Farag *et al.* [29]; Omar [30] and Qadri *et al.* [31].

Table 6: General score evaluation of some date palm strains and Sewi date palm cultivar grown in El- Baharia Oasis during 2018 & 2019 seasons

Date palm	Yield Per palm Units (40)	Fruit quality (60 units)							Total score of fruit quality (60)	General evaluation of palms (100)
		Fruit Weight (gm)	Flesh/fruit wt. %	Fruit length (cm)	Fruit diameter (cm)	TSS %	Total sugars	Tannins		
Palm No. 1	24	3.99	8.13	2.92	2.8	9.2	8.98	8.57	44.59	68.59
Palm No. 2	31.4	6.9	9.31	3.3	3.64	9.68	9.75	9.23	51.81	83.21
Palm No. 3	40	10	9.3	5	5	10	10	9.23	58.53	98.53
Palm No. 4	27.6	7.2	9.7	3.39	3.66	8.97	9.27	10	52.19	79.79
Palm No. 5	16.9	6.8	9.84	3.3	3.34	7.79	9.27	9.23	49.57	66.47
Palm No. 6	33.14	6.50	10	3.02	3.64	8.95	8.80	9.23	50.14	83.28
Palm No. 7	33.6	5.21	8.62	3.28	3.3	9.08	9.04	9.23	47.76	81.36
Siwi cultivar	35.2	8.21	7.71	3.49	4.89	9.8	9.51	8.57	52.18	87.38

General Evaluation (Total Score for Yield and Fruit Quality (100 Units):

The numerical evaluation of some seedling date palm and Sewi cultivar (Table 6) showed that palm No.3 seemed to be the superiors cultivar in yield and fruit quality, as it recorded the uppermost score units (98.53 units of 100) as compared with Sewi cultivar (local semi-dry date palm) (87.38 units of 100) due to receiving all the units specified for yield and ranked the first position for five of the concerned 7 fruit properties i.e. fruit weight, fruit length, fruit diameter, T.S.S. and total sugars. In other words, palm No. 3 ranked first in total score units of yield (40/40) and fruit quality (58.53/60). Local cultivar "Sewi" occupied the second situation (87.38units/100) as it ranked the second in total score of yield (35.2/40 units) and ranked the second position for four properties i.e. fruit weight , fruit length, fruit diameter and T.S.S. it also ranked third position for total sugars content. In other words, Sewi cultivar ranked the second in total score units of yield (35.22/40) and fruit quality (52.18/60).

The tested palms could be arranged descending based on total score (100) for yield and fruit quality as follows: palm No. 3 (98.53 units), Sewi cultivar (87.38 units), palm No. 6 (83.28 units), palm No. 2(83.21 units), palm No.(81.36 units), palm No. (79.79 units), palm No. (68.59 units) and palm No. 5 (66.47 units).

CONCLUSION

Generally, we can conclude that, palms No. 3 recorded high values in terms of average bunch weight and yield per palm. Also, they gave high records of average fruit physical characteristics followed by Sewi cultivar which recorded the second value in numerical evaluation. Finally, the palm No. 3 tree under this study can be considered as a beginning of new varieties of date palm in Egypt for its superiority in yield and fruit quality.

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