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EVALUATION OF THIRTEEN SEEDLING DATE PALMS GROWN IN ASWAN GOVERNORATE, EGYPT

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ABSTRACT

This study was carried out during 2006 and 2007 seasons in order to evaluate 13 selected palms grown in Aswan governorate, Egypt, in comparison with the commercial cv. “Sakoty”. The average of the two years of yield per palm, as well as physical and chemical properties of fruit were recorded. Yield per palm was highest with palm no. 12 and 13 in comparison with other tested palms. as well as “Sakoty” cv. while the lowest yield was obtained from palm no. 2. Regarding, physical properties of fruit, fruits of palm no. 12 were the heaviest weight and highest pulp weight%. Concerning chemical properties, data proved the superiority of palm no. 13 in T.S.S% and total sugars content. Fruits of palm no. 6 had lower tannins and acidity% while the highest tannins% was recorded for “Sakoty”.

General evaluation revealed that palm no.12 and 13 seemed to be the superior types in yield and fruit quality among all the tested palms, as they attained the uppermost score units as compared with the standard cv.” Sakoty”. On the contrary, palm no. 2 and 10 showed less palm yield and inferior fruit quality.

Thus one can conclude that all 13 selected palms except palm no. 2 and 10 are of good fruit quality for consumer but only palm 12 and 13 showed the highest yield.
Keywords: evaluation, date palm, yield, fruit weight, dimention and acidity

INTRODUCTION

The date palm (Phoenix dactylifera L.) is regarded as valuable genetic resources for new variety breeding (because its propagation may occur by seeds that produce a genetic variation). Egypt native Aswan governorate collected from its habitats showed genetic variation such as larger crops and better quality. Date palm is the national crop in Aswan, Egypt, has been widely planted in the country for a long time, and so there are many valuable genetic resources. A native 100 year old tree among them many types of fruits characters and productivity.

The prevailing climatic conditions of Aswan Governorate are considered ideal for growing and fruiting of date palm specially dry varieties. Since they need 4834 thermal units/year (Hussein et., al. 1979).

As a result of the sexual reproduction some of the seedling date palms are highly desirable for fruit quality and propagation of their off shoots as well as seedling palms for the many investigation style. The evaluation of seedy date palms (Salim et al 1968, Moustafa et al 1986 and Abdullah 2002).

MATERIALS AND METHODS

This study was carried out in Aswan governorate in the two successive seasons (2006-2007) to evaluate thirteen seedling (unknown) palms in addition to the commercial cv. “Sakoty” as standard. The following

indices were studied and recorded : yield per palm, physical and chemical properties of fruit. Representative fruit sample (50 fruits) were taken at full Tamr stage. Fruit evaluation included weight of both fruit and seed, fruit dimensions, and pulp%. Total soluble solids T.S.S % in the pulp by using a hand referactometer. Acidity was determined according to the method described in the A.O.A.C (1985). Total and reducing sugars content were determined according to Lane & Eynon volumetric procedure as out lined in A.O.A.C. (1985). Tannins content was determined by procedure made by Washington as out lined in A.O.A.C. (1970).

The final evaluation of any tested types was calculated on the basis of 100 units which were shared between palm yield (50 units) and fruit quality (50 units) Hussein et al., (1982). The latter units were divided on the basis of 10 units for each of fruit weight, pulp%, T.S.S and total sugar percent and 5 units for the percent both acidity and tannins.

Each palm that gave the best results in any character took the full mark specified for this character, while each of the other tested palms took lower units equal to their quality. For instance if palm no. 12 produced the highest yield it will be took all the 50 units specified for this character accordingly by units of any other tested palm for the same character could be calculated as follows:

$$\frac{50 \times \text{yield per palm of tested palm}}{\text{yield of palm no.12}}$$

Similarly, units for any concerned character were calculated in the same way.

The obtained data were compared using L.S.D. at 0.05 (Snedecor and Cochran, 1980).

RESULTS AND DISCUSSION

Yield per palm:

Data in table (1) indicated that yield per palm varied markedly between all tested palms. The average of the two years showed that palm no. 12 produced the highest yield (53.50 kg) followed by palm no. 13, 8, 9 and 11(53.25, 51.25, 49.00 and 49.00, respectively). However, the lowest yield was obtained from palm no. 2, 10, 6 and 7, (35.25, 36.00, 41.25 and 41.75, respectively). While “Sakoty” cv. and other tested palms gave intermediate values in this respect. These results are in agreement with the findings of Mousa (1981) on six seedling date palms grown in Ismaillia, Sourial et al (1982) on Some Iraqi date varieties grown in Egypt, Moustafa (1986) on three seedling date palms grown in El-wady El_Gedid governorate and Abdullah (2002) on three date palm seedling types grown at Dakhla Oasis.

Fruit physical properties:

Data in Table (1) clearly show that the average values for the two years showed that palm no. 12, 1 and 13 showed the highest fruit weight (15.5, 12.79 and 10.6 gm, respectively) as compared to “Sakoty” (7.43gm). However, the smaller fruit weight was obtained from palm no. 10, 2, 7 and 6 (4.79, 5.88, 5.9 and 6.14 gm), respectively. While other tested palms gave intermediate value in this respect.

T1

The obtained results are in accordance with the findings of Khalifa, 1973; Abdalla 1979; Sourial et al 1983; Sourial et al., 1993 and Salem and Hamdy 1993.

The data also reveal that pulp percentage ranged between 75.89 and 87.82% of fruit weight in average in palm no. 5 and 12, respectively. The obtained results are in agreement with those reported by Selim et al (1968) that the percent varied from 79.46 to 92.97% for the fifteen date cvs. grown in Sewa Oasis, Egypt. Also Sourial et al., (1983) found that pulp% of some Iraqi date palm cvs. ranged from 90.77 to 92.51%. In addition Salem and Hamdy (1993) mentioned that pulp percentage of Zahidi 88.2% Hellawy 89.12%, Sayer 91.34% and khadrawy 91.63%. and Mougheith et al (1976) reported that pulp percentage ranged from 85.8 to 90.8% in some Egyptian date cvs.

As for the length of fruit, data clearly showed that fruits of all studied palms are taller than “Sakoty” cv. Except palm no. 7 and 10 which were shorter than “Sakoty” the longest fruits recorded in palm no. 1 and the shortest recorded in palm no. 10 as average value.

Data in table (1) also reveal that, fruits of palm 2 had the least fruit diameter in average (1.66) while palm 1 had the greatest fruit diameter (2.73cm) the other tested palms and “Sakoty” cv came in between. These results are in harmony with those reported by Salim et al (1968), Kalifa (1973) Mousa (1981) and Sourial at al. (1983) for may soft date cultivars grown in Egypt.

Fruit chemical properties:

The obtained data in Table (2) showed that, total soluble solids (T.S.S) values were highest in fruit pulp (86.7%) for palm 13 flowed by 86.0, 85.7, 85.5, 85.5 and 85.1% for palms 9, 8, 11, 4 and 3, respectively. While the lowest values were (76.6%) in palm 7 followed by 78.2, 78. 9 and 80.5 in palms no. 1, 2 and 10, respectively. Fruits of the all tested palm had the highest T.S.S% as compared with six local soft date cultivars (Mougheith et al. 1976). Hussien et al., (1976) stated that T.S.S of Barhi fruits was 47%.

AS for total sugars was (83.2%) in fruits of palm no.13 and followed by 83.19, 83.06, 82.68 and 82.41 for palms 4, 8, 9 and 3, respectively. The lowest values were 73.15, 74.31 and 75.85 for palms 7, 1 and 2, respectively. However “Sakoty” cv. recorded 77.2% in this respect. Hussien et al (1976) reported that total sugars content in Barhi dates was 83.19% (on dry weight basis). Sourial et al (1983) found that total sugars content of Hallawy, sayer and Barhi fruits were 31.28, 26.68 and 24.95%, respectively (fresh weight basis) Abdullah (2002) found that total sugars content ranged from 38.47 to 46.3 (in fresh weight) in some seedling palms grown in Dakhla Oasis.

Data also showed that the highest values for reducing sugars was 41.78 % in palm 5 followed by 41.62, 41.27 and 40.95 for palms no. 11, 10 and 12, respectively. While the lowest values 33.01 and 35.62 % for palms 1 and 8. However “Sakoty” recorded 39.89% in this respect. Salem and Hamdy (1993) revealed that reducing sugars percentage of Sewy, Kadrawy, Barhi, Sayer, Hellawy and Zahdy fruits were (13.9, 11.1, 10.5, 10.1, 9.5 and 8.9 %), respectively (fresh weight bases)

T2

As for non reducing sugars the obtained data show that the highest value is 48.85% recorded in fruits of palm 4 followed by 47.44, 45.71 and 45.18% for palms 8, 6 and 3, respectively.

Data in table (2) also show that the lowest value for acidity is 0.98 in fruits of palm 6 followed by (as ascending order) 1.03 and 1.11 for palms 11 and 5, respectively. However the highest values (1.92, 1.6 and 1.36) were recorded for palms 12, 9 and 13, respectively. While "Sakoty" acidity was 1.49. These results are generally in line with those reported by Sourial et al (1983), Salem and Hamdy (1993).

Data in the same Table show that the lowest tannins content recorded in fruit of palm no. 6 (0.94%) flowed by values 0.99, 1.32 and 1.35% for palms 7, 4 and 10, respectively. While the highest values were recoded for palm no. 2. and "Sakoty" cv. (1.87 and 1.86, respectively). Similar results were obtained by Ragab et al (1956) and Bondok (1975) on some Egyptian soft date cultivars, Sourial et al (1983) on some Iraqi dates grown in Egypt.

General evaluation and final conclusion:

Data tabulated in table (3) show that palm no. 13 and 12 seemed to be the superior types in yield and fruit quality among all the tested palms, as they attained the uppermost score units (92.52 and 89.86, respectively) as compared with the standard cv. "Sakoty" (76.65). On the contrary, palm no. 2 and 10 showed less palm yield and inferior fruit quality.

Thus one can conclude that all 13 selected palms are in a good fruit quality for consumer but only palm 12 and 13 showed the highest yield.

Table (3): evaluation values for crop, physical and chemical fruit properties at harvest for selected date palms grown in Asswan governorate during (2006 and 2007) seasons.

selected palms	Yield 50 unite	Fruit weight 10 unite	pulp % 10 unite	T.S.S 10 unite	Total sugars 10 unite	Tetratable acidity 5 unite	Tannins 10 unite	Total 100unite
١	47.66	8.25	9.87	9.01	8.93	4.84	0.45	89.01
٢	٣٢,٩٤	٣,٧٩	٩,٢٤	٩,١٠	٩,١١	2.66	0.05	66.89
٣	٤٠,٦٥	٤,٠٧	٩,٦٧	٩,٨١	٩,٩٠	3.65	1.27	79.02
٤	٤١,٨٢	٥,٣٣	٨,٦٨	٩,٨٦	٩,٩٩	3.40	2.95	82.03
٥	٤١,٨٢	٤,٩٣	٨,٦٤	٩,٧١	٩,٧٥	4.34	1.43	80.62
٦	٣٨,٥٥	٣,٩٦	٩,٧٧	٩,٦٣	٩,٦٧	5.00	5.00	81.58
٧	٣٩,٠١	٣,٨٠	٨,٨١	٨,٨٣	٨,٧٩	3.32	4.73	77.29
٨	٤٧,٨٩	٥,٩٩	٩,٧٤	٩,٨٨	٩,٩٨	3.93	1.14	88.55
٩	٤٥,٧٩	٥,٦٢	٩,٣٨	٩,٩١	٩,٩٣	1.85	2.26	84.74
١٠	٣٣,٦٤	٣,٠٩	٩,٤٢	٩,٢٩	٩,٣٤	3.50	2.81	71.09
١١	٤٥,٧٩	٥,٢٥	٩,٤٦	٩,٨٦	٩,٨٧	4.77	3.77	88.77
١٢	٥٠,٠٠	١٠,٠٠	١٠,٠٠	٩,٣٣	٩,٥٧	0.25	0.71	89.86
١٣	٤٩,٧٦	٦,٨٩	٩,٨٣	١٠,٠٠	١٠,٠٠	3.09	2.95	92.52
Sakoty	٤٠,٨٨	٤,٧٩	٩,٨٧	٩,٣٦	٩,٢٧	2.41	0.07	76.65

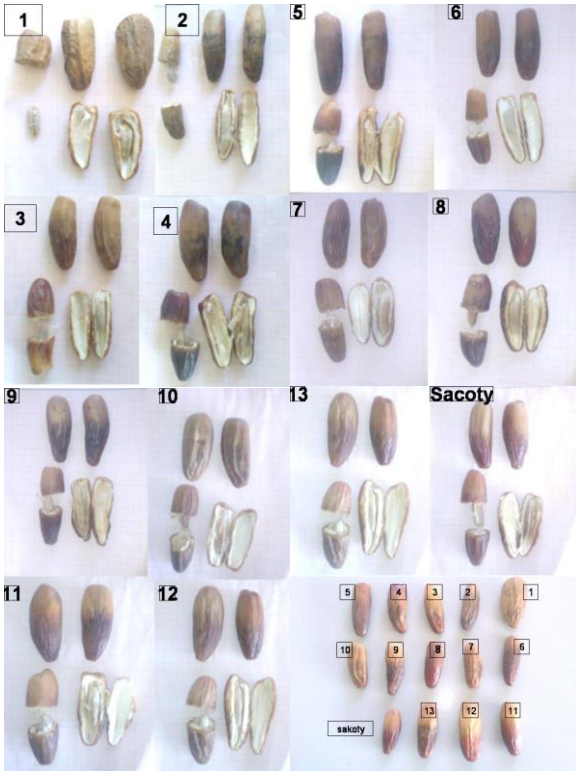

Figure (1) the morphological charactarestics for thirteen date palm seedling types

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تقييم ثلاثة عشر نخيله بذريه ناميه تحت ظروف محافظة اسوان

عباس سعد عبد الله و نادى حسن نادى

معهد بحوث البساتين – مركز البحوث الزراعيه- الجيزه

اجريت هذه الدراسه بغرض تقييم المحصول والصفات الثمريه لثلاثة عشر من النخيل البذري بمحافظة اسوان فى اعوام ٢٠٠٦ و٢٠٠٧ وقد أتخذ الصنف سكوتي المنتشر في هذه المنطقة كأساس للمقارنة وأظهر التقييم العام أن النخلة رقم ١٢ و ١٣ هما أفضل الأشجار المختبرة حيث سجلتا أعلى الدرجات (٩٢,٥٢ و ٨٩,٩٦ وحدة) وذلك لتفوقهما في المحصول والصفات الثمرية بالمقارنة بالصنف السكوتي المستخدم للمقارنه وقد أظهرت الدراسة أن باقى النخيل المختبرأعلي جوده من الصنف السكوتى وذلك من حيث المحصول والصفات الثمرية مثل وزن الثمره ونسبة اللب كما اظهرت الدراسة ارتفاع فى محتوي الثمار من السكريات الكليه والمختزله وغير المختزله وانخفاض فى التانينات.

Table (٢): Fruit chemical properties of selected date palms grown in Aswan governorate during (2006 and 2007) seasons

selected palms	T.S.S%			Total sugars%			Reducing sugars%			Non reducing sugars%			Acidity			Tanens		
	٢٠٠٦	٢٠٠٧	AV	٢٠٠٦	٢٠٠٧	AV	٢٠٠٦	٢٠٠٧	AV	٢٠٠٦	٢٠٠٧	AV	٢٠٠٦	٢٠٠٧	AV	٢٠٠٦	٢٠٠٧	AV
١	7 8 . 4	78.00	٧٨,٢٥	74.53	74.10	٧٤,٣١	33.13	32.90	٣٣,٠١	41.40	41.20	٤١,٣٥	1.07	0.96	١,٠١	1.87	1.72	1.79
٢	78.80	79.00	٧٨,٩٥	75.85	75.85	٧٥,٨٥	40.40	40.40	٤٠,٤٥	35.45	35.45	٣٥,٤٥	1.45	1.44	١,٤٤	1.87	1.87	1.87
٣	٨٥,٢٠	85.00	٨٥,١٥	82.67	82.15	٨٢,٤١	37.10	37.35	٣٧,٢٢	45.57	44.80	٤٥,١٨	1.19	1.31	١,٢٥	1.56	1.72	1.64
٤	86.00	85.00	٨٥,٥٥	83.19	83.19	٨٣,١٩	34.56	34.12	٣٤,٣٤	48.63	49.07	٤٨,٨٥	1.22	1.38	١,٣٥	1.25	1.40	1.32
٥	85.40	83.00	٨٤,٢٥	81.45	80.84	٨١,١٤	41.79	41.77	٤١,٧٨	39.66	39.07	٣٩,٣٦	1.11	1.12	١,١١	1.66	1.56	1.61
٦	84.00	83.00	٨٣,٥٠	80.93	80.05	٨٠,٤٩	34.48	35.08	٣٤,٧٨	46.44	44.98	٤٥,٧١	1.07	0.90	٠,٩٨	0.94	0.94	0.94
٧	77.20	76.00	٧٦,٦٠	73.60	72.70	٧٣,١٥	36.05	36.25	٣٦,١٥	37.55	36.45	٣٧.00	1.41	1.22	١,٣١	1.04	0.94	0.99
٨	86.40	85.00	٨٥,٧٥	83.19	82.94	٨٣,٠٦	36.50	34.75	٣٥,٦٢	46.69	48.19	٤٧,٤٤	1.17	1.22	١,١٩	1.77	1.56	1.66
٩	86.00	86.00	٨٦.00	82.68	82.68	٨٢,٦٨	39.53	39.53	٣٩,٥٣	43.15	43.15	٤٣,١٥	1.64	1.57	١,٦٠	1.35	1.56	1.45
١٠	81.00	80.00	٨٠,٥٥	77.70	77.73	٧٧,٧١	41.23	41.32	٤١,٢٧	36.47	36.41	٣٦,٤٤	1.28	1.28	١,٢٨	1.39	1.31	1.35
١١	86.00	85.00	٨٥,٥٥	82.15	82.15	٨٢,١٥	41.67	41.58	٤١,٦٢	40.48	40.57	٤٠,٥٢	0.94	1.12	١,٠٣	1.25	1.09	1.17
١٢	81.80	80.00	٨٠,٩٥	79.75	79.60	٧٩,٦٧	40.97	40.93	٤٠,٩٥	38.78	38.67	٣٨,٧٢	1.92	1.92	١,٩٢	1.77	1.72	1.74
١٣	86.90	86.50	٨٦,٧٥	83.20	83.20	٨٣,٢٠	40.28	40.28	٤٠,٢٨	42.92	42.92	٤٢,٩٢	1.28	1.44	١,٣٦	1.25	1.40	1.32
Sakoty	82.40	80.00	٨١,٢٥	77.20	77.20	٧٧,٢٥	39.89	39.89	٣٩,٨٩	37.31	37.31	٣٧,٣١	1.39	1.60	١,٤٩	1.83	1.90	1.86
L.S.D	1 . 8 2	1.65		1.86	1.61		2.67	2.18		3 . 4 7	2.79		0.47	0.28		0.60	0.46	

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Table (1): Yield and fruit phsical properties of selected date palms grown in Aswan governorate during (2006 and 2007) seasons.

selected palms	yield			Fruit weight			Seed weight			pulp %			Fruit length			Fruit diameter		
	٢٠٠٦	٢٠٠٧	AV	٢٠٠٦	٢٠٠٧	AV	٢٠٠٦	٢٠٠٧	AV	٢٠٠٦	٢٠٠٧	AV	٢٠٠٦	٢٠٠٧	AV	٢٠٠٦	٢٠٠٧	AV
١	٥٤,٠	48.0	51.00	12.7	12.88	١٢,٧	1.68	1.72	١,٧	86.77	86.64	86.70	5.71	5.67	٥,٦٩	2.79	2.67	٢,٧٣
٢	35.5	35.0	٣٥,٢٥	5.92	5.85	٥,٨٨	1.1	1.11	١,١٠	81.41	81.02	81.22	5.74	5.17	٥,٤٥	1.72	1.60	١,٦٦
٣	42.0	45.0	٤٣,50	6.28	6.35	٦,٣١	0.94	0.96	٠,٩٥	85.03	84.88	84.95	5.29	4.77	٥,٠٣	1.90	2.00	١,٩٥
٤	٤٥,٠	44.5	٤٤,٧٥	8.35	8.19	٨,٢٧	1.98	1.94	١,٩٦	76.28	76.31	76.30	5.64	5.00	٥,٣٢	2.21	2.00	٢,١٠
٥	٤٥,٠	44.5	٤٤,٧٥	7.66	7.65	٧,٦٥	1.87	1.82	١,٨٤	75.58	76.20	75.89	5.44	5.00	٥,٢٢	1.98	1.93	١,٩٥
٦	٤٢,٠	40.5	٤١,٢٥	6.09	6.20	٦,١٤	0.87	0.87	٠,٨٧	85.71	85.96	85.84	5.39	4.80	٥,٠٩	1.90	1.63	١,٧٦
٧	٤٠,٠	43.5	٤١,٧٥	5.95	5.86	٥,٩٠	1.35	1.32	١,٣٣	77.31	77.47	77.39	5.00	4.57	٤,٧٨	1.95	1.71	١,٨٣
٨	٥٠,٠	52.5	٥١,٢٥	9.26	9.32	٩,٢٩	1.35	1.32	١,٣٣	85.42	85.83	85.62	5.29	4.88	٥,٠٨	2.17	1.96	٢,٠٦
٩	٤٨,٠	50.0	49.00	8.63	8.82	٨,٧٢	1.53	1.53	١,٥٣	82.27	82.65	82.46	5.64	5.42	٥,٥٣	2.10	1.83	١,٩٦
١٠	٣٥,٠	37.0	36.00	4.78	4.80	٤,٧٩	0.82	0.83	٠,٨٢	82.84	82.70	82.77	4.67	4.40	٤,٥٣	1.94	1.87	١,٩٠
١١	٥٠,٠	48.0	49.00	8.07	8.21	٨,١٤	1.37	1.38	١,٣٧	83.02	83.19	83.10	5.50	4.62	5.06	2.21	1.95	٢,٠٨
١٢	55.0	52.0	٥٣,50	15.60	15.40	١٥,٥	1.55	2.22	١,٨٨	90.06	85.58	87.82	5.26	5.33	٥,٢٩	2.31	1.33	١,٨٢
١٣	52.5	54.0	٥٣,٢٥	10.67	10.72	١٠,٦	1.48	1.44	١,٤٦	86.12	86.56	86.34	5.52	5.04	٥,٢٨	2.30	2.10	٢,٢٠
Sakoty	45.0	42.5	٤٣,٧٥	7.42	7.44	٧,٤٣	0.97	1.00	٠,٩	86.92	86.55	86.74	4.90	4.83	٤,٨٦	1.91	1.79	١,٨٥
L.S.D				0.69	0.78		.090	0.12					0.14	1.74		0.10	0.55	