J. Agric. Sci. Mansoura Univ., 27(8): 5421 - 5428, 2002

STUDIES ON THE EVALUATION OF FRUIT CHARACTERISTICS OF SAMANY DATE PALM GROWN IN ASWAN.

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ABSTRACT

This study amid to evaluate physical and chemical fruit characteristics of Samany date palm grown at Kom-Ombo-Aswan Governorate and El-Kanater, Kalubia Governorate. The data reveal that, Samany cultivar grown at El-Kanater gave the highest bunch weight and total yield which compared with those grown at Kom-Ombo in the second season. Fruit moisture content percentages was significantly higher in fruit from El-Kentar, while reducing sugars percentage and crude fiber were not significantly affected under the two locations in both seasons. Samany date palm grown at Kom-Ombo gave the lowest fruit, weight and size, seed and pulp weight in the two seasons, but gave the largest fruit length and diameter in the second season only as compared with the Samany grown at El-Kanater. Samany grown at Kom-Ombo gave the highest total and reducing sugars percentage, total soluble solids percentage and the lowest percentage of total acidity.

It could be generally concluded that Samany cv. produced early yield and gave fruit with better physical and chemical characteristics under Aswan conditions.

INTRODUCTION

Date palm (*phoenix dactylifera L.*) is widely distributed in different districts of the world. In Egypt, date palms are distributed in Nile valley, Oases and desert districts. Date palm cultivars are of three main types according to its fruit moisture content, i.e. soft, semi-dry and dry cultivars (Selim *et al.*, 1970). Date palm trees could grow under unfavorable conditions where many of other fruit species may not grow. Samany cv. is one of the most important soft dates in Egypt. Several investigators have evaluated some date palm varieties, Selim *et al.* (1968, 1970), Salem and Hegazi (1971), Khalifa (1973), El-Azzouni *et al.* (1975), Bondok (1975), Hussein and Hussein (1982), Meligi *et al.* (1983), Habib *et al.* (1984), Hussein *et al.* (1984), Nour *et al.* (1986), Sourial *et al.* (1986), El-Gamdi (1996) and Hussein *et al.* (2001). The main objective of this study is to evaluate the physical and chemical properties of Samany date palm grown under Aswan and El-Kanater conditions.

MATERIALS AND METHODS

The present investigation was carried out in two successive seasons of 2000 and 2001 at Kom-Ombo center, Aswan Governorate, Egypt. Where nine mature Samany date palms of about 12 years old were used. Similarly, nine date palms of Samany cv. grown in El-Kanater-El-Khairia-Kalubia Governorate were used as the standard cultivar for comparison. The trees were of nearly of similar vigor and height. Normal cultural practices were

carried out as usual used for date palms. Only 9 bunches were left on each experimental palm date of pollination was recorded in order to facilitate fruit age calculation in Table (1).

The trees were arranged in a complete randomized statistical design with three replications (three palms for each replication). The yield of experimental palms was harvested at the first of August in the first season but in the second one it was the second half of July (Samany grown at Aswan) and the second half of September (Samany grown at El-Kanater) in each season and the following estimates were carried out.

Table (1): Fruit age (days). Time of pollination and harvesting of Samany date palm grown at Kom-Ombo and El-Kanater region.

Index	Season	Female Palms	
		Kom-Ombo	El-Kanater
Date of pollination	2000	Feb. 15	Apr. 12
	2001	Feb. 07	Apr. 08
Date of harvesting	2000	Aug. 05	Sep. 30
	20001	Jul. 30	Sep. 23
Fruit age	2000	172	171
	2001	174	168

* Season 2000: harvesting early 57 days
** Season 2001: harvesting early 56 days

1- Average yield and bunch weight.

2- Fruit physical properties.

Samples of 90 fruits per each tree (10 fruits/bunch) were taken to determine fruit weight, pulp weight and size, seed weight and fruit dimensions.

3- Fruit chemical properties:

Ten date fruits from each treatment divided into pieces and seeds were omitted. Fifty g of pieces was mixed with 100 ml distilled water using special electric mixer for extraction, then filtered and the filtrate was used for determinations.

Moisture content, total soluble solids (TSS) as a percentage by using hand refractometer, acidity (%) as malic acid, crude fiber content, reducing, non-reducing and total sugars percentages were determined according to A.O.A.C. (1995).

All collected data were subjected to statistical analysis according to Snedecor and Cochran (1980). Treatment means were compared using the Duncan Multiple range test at the 5 percent level of probability in both seasons of experimentation.

RESULTS AND DISCUSSION

1- Yield per palm (Kg):

Data presented in (Table 2) show the average yield and bunch weight of Samany date palm.

Significant difference was detected in yield during in the second season of study. Yet, Samany date palm cultivar grown at Kom-Ombo

produced the lowest yield (136.8 kg) as compared with the same cultivar grown at El-Kanater (160.2kg).

2- Bunch weight (kg):

The bunch weight gave a similar trend to the yield. Since Samany cultivar grown at Kom-Ombo gave the bunch weight (15.2 kg) compared to (17.8 kg) for those grown at El-Kanater.

In this respect, Selim *et al.* (1976) Nour *et al.* (1986) and Hussein *et al.* (2001) reported that number and weight of bunch were affected according to cvs. and district.

Fruit characteristics:

Data concerning the physical and chemical properties of the fruits in the two seasons are presented in Table 2 and 3.

Table (2): Fruit physical characteristics of Samany grown at Kom-Ombo and El-Kanater during 2000 and 2001 seasons.

Location	Yield (kg)	Bunch weight (Kg)	Fruit weight (g)	Seed weight (g)	Pulp weight (g)	Fruit size (cm^3)	Fruit length (Cm)	Fruit diameter (Cm)
2000								
Kom-Ombo	126.9a	14.1a	29.50b	2.40b	27.10b	31.7b	5.6a	3.1a
El-Kanater	127.8a	14.2a	35.58a	2.89a	32.69a	36.9a	5.7a	3.2a
2001								
Kom-Ombo	136.8b	15.2b	26.41b	2.30a	24.11b	27.0b	5.6a	3.0a
El-Kanater	160.2a	17.8a	31.21a	2.67a	28.54a	33.0a	5.4b	2.9b

Table (3): Fruit chemical characteristics of Samany grown at Kom-Ombo and El-Kanater during 2000 and 2001 seasons.

Location	Moisture content (%)	Total soluble solids (T.S.S) (%)	Total Acidity (%)	Sugars (g/100g DW)			g/100 gDW
				Total sugar (%)	Reducing sugar (%)	Non-reducing sugar (%)	Crude fiber
2000							
Kom-Ombo	62.6b	25.7a	0.128b	58.26a	38.11a	20.15a	1.31a
El-Kanater	67.1a	22.9b	0.207a	49.91b	29.95b	19.96a	1.25a
2001							
Kom-Ombo	70.8b	23.9a	0.121b	59.69a	34.29a	25.4a	1.29a
El-Kanater	73.3a	22.5a	0.172a	57.47a	34.27a	23.2a	1.27a

(A) Physical properties :

1- Fruit weight (g):

Samany date palm cultivar grown at El-Kanater had the maximum fruit weight of 35.57 and 31.20 g. These values were significantly higher than those of Samany cultivar grown in Kom-Ombo, 29.50 and 26.4 g in the first and second seasons, respectively.

These results are in agreement with the general trend reported by Ragab *et al.* (1956), Selim *et al.* (1968), Fakhry (1969), Khalifa (1973), Sourial *et al.* (1986) and Hussein *et al.* (2001) on various date cultivars.

2- Fruit size (cm^3):

Concerning the fruit size, the data indicate that are significant differences in the two seasons. Samany date palm grown in Kom-Ombo gave the lowest fruit size (31.7 and 27.0) as compared with the same cultivar grown in El-Kanater (36.9 and 33.0), during the two seasons, respectively.

3- Pulp weight (g):

Regarding the pulp weight, the results indicated significant differences in both seasons. Since Samany date palm grown in El-Kanater gave the highest pulp weight (32.69 and 28.54 g) than those Samany date palm grown at Kom-Ombo (27.10 and 24.11 g) in the first and second seasons, respectively.

4- Seed weight (g):

Concerning seed weight, the results indicated that there are significant differences in Samany cultivar grown in the two regions especially in the first season. Samany date palm grown in Kom-Ombo gave the lowest seed weight (2.40 and 2.30 g), as compared with grown in El-Kanater (2.89 and 2.67 g) in the first and second seasons, respectively. In this respect, Sourial *et al.* (1986) found that the seed weight ranged between 1.88 - 2.39 g for four soft date cultivars. While Hussein *et al.* (2001). Found that the seed weight ranged between 1.18 - 1.67 g for five soft date cultivars.

5- Fruit length

Data indicated was significant differences in fruit length of `Samany dates palm from El-Kanater and Kom-Ombo regions in the second season only. Since, Samany date palm grown in Kom-Ombo gave the largest fruit length (5.6 cm) as compared with the Samany date palm grown in El-Kanater (5.4 cm).

6- Fruit diameter (cm):

Data showed that the fruit diameter produced similar trend as shown from fruit length. Samany date palm grown in Kom-Ombo gave the highest fruit diameter (3.0cm) as compared with those grown at El-Kanater (2.9 cm), in the second season only.

These results were in parallel with those reported by Selim *et al.* (1968), Khalifa (1973), Wakid (1973), Sourial *et al.* (1982) and Hussein *et al.* (2001) working on various soft-date cultivars grown in Egypt.

(B) Chemical Properties:

1- Moisture content (%):

Significant differences were detected in moisture content percentage in both seasons. Samany dates grown in El-Kanater gave the highest moisture percent in the first and second seasons. The results are in line with those of Selim *et al.* (1970), Hussein and Hussein (1982), Nour *et al.* (1986) and Hussein *et al.* (2001).

2- Total Soluble Solids (TSS %):

Results indicated that the total soluble solids percentage was significantly different in Samany date palm grown at El-Kanater and Kom-Ombo regions.

Samany dates grown at Kom-Ombo gave fruit with the highest total soluble soiids percentage (25.7 and 23.9%) as compared with the Samany grown at El-Knater (22.9 and 22.5%) in the first and second seasons, respectively. Al-Ghamdi (1996) and Hussein *et al.* (2001) showed significant differences among cultivars in total soluble solids.

3- Total acidity (%):

Samany date palm grown at El-Kanater revealed higher percentage of total acidity (0.207 and 0.172 %) as compared with Samany date palm grown at Kom-Ombo (0.128 and 0.121 %) in the first and second seasons, respectively.

Generally, differences between Samany grown at Kom-Ombo and El-Kanater regions were significant. In this regard, Khalifa (1973), El-Azzouni *et al.* (1975) and Sourial (1986), working on various date cultivars found that total acidity percentage ranged between (0.082 – 0.128 %).

4- Sugar contents:

4-1- Total sugars (%):

Data indicated that the total sugar percentage was of significant differences between Samany date palm grown at Kom-Ombo and the same cultivar grown at El-Kanater in the first season only. In this respect, Samany date palm grown at Kom-Ombo gave the highest total sugar % (58.26 %) as compared with the Samany grown at El-Kanater (49.91%).

4-2- Reducing sugars (%):

Results indicated that the reducing sugar % was similar to those found of the total sugars.

4-3- Non-reducing sugars (%):

No significant difference was obtained in non-reducing sugar percentage in the two seasons. Samany date palm grown at Kom-Ombo gave the highest non-reducing sugar percentage (20.15 and 25.4%) than those the Samany date palm grown at El-Kanater (19.96 and 23.2%) in the first and second season respectively.

Many other studies reported that the content fruit sugars in some of dry date palm cultivars on dry weight basis. In this respect, Cook and Furr (1953) found that the total sugars ranged between 68.00 - 85.00% for 51.00 cultivars. Selim *et al* (1973) and Hussein (1982) reported that total sugars of fruit ranged between 55.99 to 58.89% for Sakkoty fruit.

5- Crude fibers content

No significant differences were detected in crude fiber during both seasons. Yet, Samany date palm grown at Kom-Ombo gave the highest values (1.31 and 1.39 g/100g DW) as compared with grown at El-Kanater

(1.25 and 1.27 g/100g DW) in the first and second season respectively. These results are in agreement with Melegy (1993) who found that the final crude fibers content had no remarkable trend in relation to different pollen sources.

Hussein *et al* (1976a) working on "Barhee" dates in Saudi Arabia, found that crude fibers content was 2.18% of the dry weight at "Rutab" stage. Furthermore, Kamel *et al.* (1976) found that crude fibers content of "Hallawy" and "Sayer" fruits at harvest was 1.82 and 1.74 %, respectively.

(C) Heat requirement

Since, the heat requirement was about 1891 – 1947 at Kom-Ombo and 1668 – 1535 at El-Kanater during the both seasons in the study (Table 4). From this data can be said that Samany grown at Kom-Ombo and the harvest date was earlier than Samany grown at El-Kanater since the harvesting early were 57 and 56 days in the first and second seasons, respectively.

Generally, It could be concluded that Aswan conditions are suitable to give a good growth, early yield and fruits with high quality of Samany date fruits.

Table (4): Heat requirement of Samany date palm under Kom-Ombo and El-Kanater regions during 2000 and 2001 seasons.

"Samany grown at Kom-Ombo"

Month / Year	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Total
Mean daily temperatures (2000)	16.66	20.90	29.42	31.75	33.57	35.47	33.98	_	
Heat requirements (2000)	-18.76	89.90	342.6	426.25	467.10	541.57	79.9	_	1947.32
Mean daily temperatures (2001)	17.39	25.10	28.27	31.03	33.39	34.59	_	_	
Heat requirements (2001)	-13.42	220.1	308.1	403.93	461.70	497.7	_	_	1891.53
"Samany grown at El-Kanater"									
Mean daily temperatures (2000)	_	_	26.00	20.50	33.35	29.10	28.70	23.65	
Heat requirements (2000)	_	_	152.00	77.50	460.50	344.10	331.70	169.50	1535.3
Mean daily temperatures (2001)	_	_	22.25	27.10	28.90	30.05	29.54	28.00	
Heat requirements (2001)	_	_	97.75	282.10	327.00	373.55	357.74	230.00	1668.14

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دراسات على تقييم صفات ثمار نخيل البلح السمانى المنزرع فى أسوان

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من المعروف أن الصنف السمانى من الأصناف الرطبة التى تحتاج إلى مجموع وحدات حرارية تصل إلى نصف ما تحتاجه الأصناف الجافة تقريباً لذا فإنه ينمو ويثمر جيداً فى شمال مصر كالقناطر ورشيد ودمياط وطبقاً لهذه الاحتياجات الحرارية فإنه لم يعرف من قبل بنمو وإثمار صنف البلح "السمانى" فى جنوب مصر لذا فلقد أجريت هذه الدراسة بغرض تقيم سلوك الصفات الطبيعية والكيميائية لثمار نخيل البلح السمانى المنزرع فى كوم أمبو محافظة أسوان وكذلك المحصول وميعاد الجمع وقد أتخذ الصنف السمانى المنزرع فى القناطر كأساس للمقارنة وتمت الدراسة في كلا المنطقتين خلال عامي ٢٠٠٠، ٢٠٠١.
وقد أظهرت النتائج المتحصل عليها ما يلى:

- ظهرت فروق معنوية فى وزن السوباطه والمحصول فى ثمار البلح السمانى المنزرع فى كوم أمبو ومثيله المنزرع فى القناطر، حيث تفوقت الأشجار المنزرعة في القناطر على كوم امبو خاصة في الموسم الثاني.
- أعطى نخيل البلح السمانى المنزرع فى كوم أمبو أقل وزن للثمار وكذلك أقل وزن للبذرة واللحم والحجم بالمقارنة بالسمانى المنزرع فى القناطر وذلك خلال موسمى الدراسة.
- أعطى نخيل البلح السمانى المنزرع فى كوم أمبو زيادة في طول وقطر للثمرة عن مثيله المنزرع فى القناطر وذلك خلال الموسم الثانى فقط.
- ظهرت فروق معنوية فى النسبة المئوية لمحتوى رطوبة الثمار، بينما لم تظهر فروق معنوية في النسبة المئوية للسكريات الغير مختزلة والألياف في ثمار البلح السماني المنزرع في كوم امبو ومثيله المنزرع في القناطر وذلك خلال موسمي الدراسة.
- أعطى نخيل البلح السمانى المنزرع فى كوم أمبو ثماراً ذات حموضة كلية منخفضة مع إرتفاع فى نسبة السكريات الكلية والمختزلة والمواد الصلبة الذائبة الكلية مقارنة بمثيله المنزرع فى القناطر.

وبناء على النتائج المتحصل عليها وجد أنه من الممكن زراعة وإنتشار نخيل البلح السمانى فى جنوب مصر حيث يعطى ثماراً ذات صفات طبيعية وكيميائية مناسبة مع محصولاً مبكراً شهرين تقريباً عن مثيله المنزرع فى القناطر.