

EFFECT OF POLLINATION METHODS AND POLLEN SOURCES ON FRUIT SET, YIELD AND FRUIT QUALITY OF SEWY AND SAMANY DATES.

El-Sharabasy, S.¹, A. Seif Eldin², A. El-Bana³ and A.A. Eliwa⁴

1,2,3- Central Laboratory of Date Palm Researches and Development (ARC), Egypt

4- Agricultural Engineering Institute (ARC)

ABSTRACT

This study was carried out during the two seasons of 2001 and 2002, to study the effect of pollination type (Mechanically and Hand pollinations) and pollen sources on fruit set, fruit quality and yield of two date cultivars (Sewy and Samany). Three pollen sources from Aswan, Ismailia and ElEl-Bahria Oasis were used for this study.

Mechanical pollination was the best in case fruit set, while of hand pollination had the highest seed and fruit weight of Sewy and Samany cultivars. The results indicated that mechanical and hand pollination had no significantly effect on fruit length, fruit diameter, pulp weight and fruit chemical properties.

The data also indicated that Ismailia pollen source had a significant effect on physical and chemical fruit properties of Sewy cultivar. While, Aswan pollen source had a significant effect on physical and chemical fruit properties of Samany cultivar.

INTRODUCTION

Date palm was known in the ancient Egyptian temple. Now, date palm is an important fruit and considered one of the leading fruit crops in Egypt. According to the Agricultural censuses of 1997, the total number of female palms is about 7.4 million and the total production attained about 7.4 million tons of fruits (Shawky *et al.*, 1999).

The fruit growers are not interested in increasing the date palm plantations due to the problems of pollination, thinning and harvesting. All of those agricultural practices are still carried out manually which consume a lot of time and costs, besides to the danger of palm climbing (Loghavi, 1993).

Monciero (1950) stated that many researchers designed simple equipments for dustings pollination grains to reduce time and costs of palm pollination. Also, Hamood *et al.* (1986), Abd El-Maksoud *et al.* (1994) and Haffar *et al.* (1997) reported that the mechanical pollination had a positive effect on total yield, due to increasing fruit set. Moreover, most studies reported that changes in yield could be affected by the source of pollen (Khalifa *et al.*, 1980).

Therefore, the success of fruit production depends mainly on the success of pollination and fertilization processes (Soliman, 1999).

The aim of this investigation was to study the effect of pollination methods (mechanical and hand pollination) and pollen sources on fruit set, fruit physical, chemical properties and yield weight of Sewy and Samany cultivars.

MATERIALS AND METHODS

This study was conducted at the Central Laboratory of Date Palm Researches and Development and Agriculture Engineering Institute, Agricultural Research Center, Ministry of Agriculture and Land Reclamation.

Field experiments were carried out at El-Bahria Oasis and El-Kassassin Research Station during two seasons of 2001 and 2002.

Fourteen uniform date palm (*Phoenix dactylifera* L.) trees of Samany in Ismailia and the same number from Sewey in El-Bahria Oasis were used in this experiment.

Treatments were replicated three times using nine fruit bunches per tree in a randomized complete block (RCR) design to compare mechanical pollination with the traditional hand pollination method.

Three sources of pollen grains were used for this study, these sources were seedling male palms grown at Aswan, Ismailia and El-Bahria Oasis.

Two pollination methods were tested to compare between mechanical and hand pollination.

Mechanical pollination equipment consists of a metal chases and four connected joints, can turning 360 and move in (X, Y and Z) manually by all joints, or third and fourth only, whereas pollinate two rows from one way. The device duster 12V (d.c) battery operated, use only in short date (3 - 6 m) from land and long date (>13m) from the top.

Fruit samples were taken at 30 days intervals for Samany cultivar and 40 day intervals for Sewy cultivar after harvesting. The following data, were recorded and calculated.

1) Fruit set :

The average fruit set was calculated for each date using the following equation:

$$\text{Fruit set\%} = \frac{\text{Total number of fruits per bunch}}{\text{Total number of flowers per bunch}} \times 100$$

2) Fruit physical properties:

- a- Fruit length (cm).
- b- Fruit diameter (cm).
- c- Fruit weight (g).
- d- Pulp weight (g).
- e- Seed weight (g).

At harvest time, representative samples were taken of 30 fruits bunch. Fruit length and diameter were measured in cm for individual fruits from each treatment by a Venire Caliper and averages length and diameter of fruit were calculated.

Average weight of fruits was obtained in grams of samples from each treatments in different positions, and calculating the average, Pulp and seed weights were recorded.

3) Fruit chemical properties:

- a- Reducing sugars%.
- b- Total sugars%.
- c- Total Soluble Solids (T.S.S)%.

Reducing sugar, total sugars and total soluble solids (T.S.S) percentages were determined in fruit juice solution according to the method of Lone and Eynon as described in the AOAC (1990).

4) Yield:

The weight of bunches was determined in Kg at harvest time. The complete randomized design was followed throughout the whole work. The obtained data were subjected to analysis of variance according to Snedecor and Cochran (1980). Treatment means were compared using the L.S.D. method at 5% level.

RESULTS AND DISCUSSION

1) Effect of some pollination methods and different pollen sources on fruit set percentage.

1.1. Fruit set of Sewy cultivar:

Data presented in Table (1) showed that mechanical pollination method gave the highest fruit set percentage (63.30) than hand pollination method (59.03), while Wahat El-Bahria pollen grains gave the highest fruit set (65.36), during the first season. The results in the second season indicated that the mechanical pollination method gave the highest fruit set percentage (63.94) and the pollen of El-Bahria Oasis had the best fruit set percentage (66.10).

Generally the obtained data of the both season indicated that mechanical pollination and El-Bahria Oasis pollen grains source gave the best results of fruit set percentage of Sewy cultivar.

1.2. Fruit set of Samany cultivar:

Data presented in Table (2) noticed that fruit set percentage of Samany cv. was the highest (34.89) when mechanical pollination method was used, and (36.09), (33.89) when Ismailia and El-Bahria Oasis pollen grains were used as sources for the pollination in the first season, respectively. During the second season, the mechanical pollination method and the pollen grains from Ismailia and El-Bahria Oasis gave the best result (34.89), (36.66) and (34.60), respectively. Generally the obtained data of the two seasons showed that the mechanical pollination was the best compared with hand pollination and showed that Ismailia, and El-Bahria Oasis pollen grains were the best.

The obtained results of pollination are in agreement with Hussain *et al.* (1985), Hamood *et al.* (1986), Loghavi (1993) and Abd El-Maksoud *et al.* (1994). Also, these results of pollen sources are in agreement with El-Sabrouh (1969), Shaheen *et al.* (1989b), Rahemi (1998) and Soliman (1999).

2) Effect of some pollination methods and different pollen grain sources on fruit physical properties.

2.1. Fruit length of Sewy cultivar:

The effect of two pollination methods on fruit length were presented in Table (3). The results showed insignificant effect between mechanical and hand pollination in the first and second seasons. The best results of fruit length (4.30 and 4.25 cm) in the first season and (4.17 and 4.12 cm) in the second season when Ismailia and Aswan pollen grains were used respectively.

Table (1): Effect of some pollination methods and pollen sources on fruit set% of Sewy cv.

Female cv.	Season	Pollen sources (A) Methods (B)	Aswan	Ismailia	El-Bahria Oasis	Means (B)
Sewy	2001	Mechanical Pollination	61.13	60.18	68.60	63.30
		Hand Pollination	58.67	56.30	62.11	59.03
		Means (A)	59.90	58.24	65.36	
	2002	Mechanical Pollination	61.72	61.32	68.79	63.94
		Hand Pollination	59.13	57.13	63.40	59.89
		Means (A)	60.43	59.23	66.10	

L.S.D at 0.05 for:

	2001	2002
(A)=	3.83	4.20
(B)=	3.12	3.42
(AxB)=	5.40	5.92

Table (2): Effect of some pollination methods and pollen sources on fruit set% of Samany cv.

Female cv.	Season	Pollen sources (A) Methods (B)	Aswan	Ismailia	El-Bahria Oasis	Means (B)
Samany	2001	Mechanical Pollination	28.23	39.88	36.56	34.89
		Hand Pollination	26.49	32.30	31.22	30.00
		Means (A)	27.36	36.09	33.89	
	2002	Mechanical Pollination	29.11	40.17	37.32	35.53
		Hand Pollination	27.18	33.15	31.87	30.73
		Means (A)	28.15	36.66	34.60	

L.S.D at 0.05 for:

	2001	2002
(A)=	4.16	4.38
(B)=	3.39	3.57
(AxB)=	5.87	6.16

Table (3): Effect of some pollination methods and pollen sources on fruit length (cm) of Sewy cv.

Female cv.	Season	Pollen sources (A) Methods (B)	Aswan	Ismailia	El-Bahria Oasis	Means (B)
Sewy	2001	Mechanical Pollination	4.26	4.30	3.82	4.13
		Hand Pollination	4.23	4.30	3.96	4.16
		Means (A)	4.25	4.30	3.89	
	2002	Mechanical Pollination	4.17	4.22	3.61	4.00
		Hand Pollination	4.07	4.11	3.87	4.02
		Means (A)	4.12	4.17	3.74	

L.S.D at 0.05 for:

	2001	2002
(A)=	0.26	0.22
(B)=	N.S	N.S
(AxB)=	0.39	0.31

2.2. Fruit length of Samany cultivar:

Table (4) showed that there are insignificant differences between the two pollination methods on fruit length of Samany cultivar in both seasons. On the other side, there were significant between differences treatments, due to pollen grains sources in the first season, Aswan pollen grains gave the best value (5.59 cm), but Ismailia pollen grains gave the best value (5.42 cm) in the second season.

Table (4): Effect of some pollination methods and pollen sources on fruit length (cm) of Samany cv.

Female cv.	Season	Pollen sources	Aswan	Ismailia	El-Bahria Oasis	Means (B)
		(A) Methods (B)				
Samany	2001	Mechanical Pollination	5.54	5.51	5.56	5.54
		Hand Pollination	5.63	5.41	5.39	5.48
		Means (A)	5.59	5.46	5.48	
	2002	Mechanical Pollination	5.27	5.46	5.38	5.37
		Hand Pollination	5.48	5.37	5.27	5.37
		Means (A)	5.38	5.42	5.33	

L.S.D at 0.05 for:

	2001	2002
(A)=	0.13	0.09
(B)=	N.S	N.S
(AxB)=	0.18	0.12

2.3. Fruit diameter of Sewy cultivar:

Data of fruit diameter of Sewy cultivar presented in Table (5) indicated that there are insignificant differences between values due to pollination methods in both seasons. While the results of pollen grain source showed that Ismailia source was highest values (2.65 and 2.58 cm) in the first and second seasons, respectively.

Table (5): Effect of some pollination methods and pollen sources on fruit diameter (cm) of Sewy cv.

Female cv.	Season	Pollen sources	Aswan	Ismailia	El-Bahria Oasis	Means (B)
		(A) Methods (B)				
Sewy	2001	Mechanical Pollination	2.64	2.59	2.57	2.60
		Hand Pollination	2.35	2.71	2.32	2.46
		Means (A)	2.50	2.65	2.45	
	2002	Mechanical Pollination	2.57	2.48	2.30	2.45
		Hand Pollination	2.28	2.67	2.25	2.40
		Means (A)	2.43	2.58	2.28	

L.S.D at 0.05 for:

	2001	2002
(A)=	0.18	0.22
(B)=	N.S	N.S
(AxB)=	0.26	0.31

2.4. Fruit diameter of Samany cultivar:

The results in Table (6) did not presented any significant effect on fruit diameter of Samany cultivar of pollination methods in 2001 and 2002 seasons. On the other hand, pollination with Aswan grains had the best effect (3.34 and 3.15 cm) in the first and second seasons, respectively.

Table (6): Effect of some pollination methods and pollen sources on fruit diameter (cm) of Samany cv.

Female cv.	Season	Pollen sources (A)	Methods (B)			Means (B)
		Aswan	Ismailia	El-Bahria Oasis		
Samany	2001	Mechanical Pollination	3.30	3.11	3.27	3.23
		Hand Pollination	3.38	3.16	3.22	3.25
		Means (A)	3.34	3.14	3.25	
	2002	Mechanical Pollination	3.18	2.79	3.06	3.01
		Hand Pollination	3.11	2.89	2.90	2.97
		Means (A)	3.15	2.84	2.98	

L.S.D at 0.05 for:

	2001	2002
(A)=	0.13	0.18
(B)=	N.S	N.S
(AxB)=	0.19	0.26

2.5. Fruit weight of Sewy cultivar:

Concerning the effect of some pollination methods on fruit weight, results in Table (7) showed that hand pollination gave the highest fruit weight (17.43 and 17.17 g) in the first and second season, respectively. While the effect of pollen grain sources on fruit weight, data indicated that Ismailia pollen grains had the highest means of fruit weight (18.32 and 18.17 g) in both seasons.

Table (7): Effect of some pollination methods and pollen sources on fruit weight (g) of Sewy cv.

Female cv.	Season	Pollen sources (A)	Methods (B)			Means (B)
		Aswan	Ismailia	El-Bahria Oasis		
Sewy	2001	Mechanical Pollination	17.53	18.23	13.69	16.48
		Hand Pollination	17.32	18.41	16.57	17.43
		Means (A)	17.43	18.32	15.13	
	2002	Mechanical Pollination	17.38	18.12	13.57	16.36
		Hand Pollination	17.11	18.22	16.19	17.17
		Means (A)	17.25	18.17	14.88	

L.S.D at 0.05 for:

	2001	2002
(A)=	0.68	0.82
(B)=	0.54	0.50
(AxB)=	0.93	0.87

2.6. Fruit weight of Samany cultivar:

Table (8) noticed that hand-pollination method had the best effect (32.52 and 32.18 g) in both seasons, respectively. In the first season Aswan pollen grain had the highest effect (31.79 g) than the other sources. While in the second season, Aswan and El-Bahria Oasis pollens grain were the best in case of fruit weight and resulted in 31.02 and 31.01 g, respectively.

Table (8): Effect of some pollination methods and pollen sources on fruit weight (g) of Samany cv.

Female cv.	Season	Pollen sources			Means (B)	
		(A)	Aswan	Ismailia		El-Bahria Oasis
		Methods (B)				
Samany	2001	Mechanical Pollination	30.43	29.83	30.35	30.20
		Hand Pollination	33.15	32.15	32.27	32.52
		Means (A)	31.79	30.99	31.31	
	2002	Mechanical Pollination	29.26	29.10	29.90	29.42
		Hand Pollination	32.78	31.66	32.11	32.18
		Means (A)	31.02	30.38	31.01	
L.S.D at 0.05 for:			2001	2002		
	(A)=	0.74	0.62			
	(B)=	0.61	0.51			
	(AxB)=	1.05	0.88			

2.7. Pulp weight of Sewy cultivar:

The development of pulp weight for Sewy cultivar gave the same result in both seasons when used mechanical or hand-pollination (Table 9). Also, pulp weight in both seasons had nearly the same values (16.17 and 16.07 g), but Ismailia pollen grain source was the best between other sources as shown in Table (9).

Table (9): Effect of some pollination methods and pollen sources on pulp weight (g) of Sewy cv.

Female cv.	Season	Pollen sources			Means (B)	
		(A)	Aswan	Ismailia		El-Bahria Oasis
		Methods (B)				
Sewy	2001	Mechanical Pollination	15.36	16.07	12.02	14.48
		Hand Pollination	14.83	16.26	10.41	13.83
		Means (A)	15.10	16.17	11.22	
	2002	Mechanical Pollination	15.27	16.04	11.91	14.41
		Hand Pollination	14.79	16.09	14.09	14.99
		Means (A)	15.03	16.07	13.00	
L.S.D at 0.05 for:			2001	2002		
	(A)=	0.87	0.73			
	(B)=	N.S	N.S			
	(AxB)=	1.22	1.83			

2.8. Pulp weight Samany cultivar:

The results in Table (10) showed that both methods of pollinations had no significant effect on pulp weight, and gave values of 28.08 and 29.97g, respectively in the first season, while in the second season these values were 27.63 and 29.46 g, respectively. Effect of pollen sources on pulp weight was the highest when used Aswan pollens source, and recorded 29.39 g in the first season and 28.94 g in the second season, respectively.

Table (10): Effect of some pollination methods and pollen sources on pulp weight (g) of Samany cv.

Female cv.	Season	Pollen sources (A) Methods (B)	Aswan	Ismailia	El-Bahria Oasis	Means (B)
Samany	2001	Mechanical Pollination	28.25	27.88	28.10	28.08
		Hand Pollination	30.53	29.70	29.67	29.97
		Means (A)	29.39	28.79	28.89	
	2002	Mechanical Pollination	27.91	27.19	27.78	27.63
		Hand Pollination	29.96	29.11	29.31	29.46
		Means (A)	28.94	28.15	28.55	

L.S.D at 0.05 for:

	2001	2002
(A)=	0.48	0.38
(B)=	N.S	N.S
(AxB)=	0.67	0.53

2.9. Seed weight of Sewy cultivar:

Hand pollination of both seasons had the highest effect (2.27 and 2.18g) in the first and second seasons, respectively. Data in Table (11) showed that Aswan and Ismailia pollen grains had the values of 2.33 and 2.16 g in the first season and 2.22 and 2.11 g in the second season.

Table (11): Effect of some pollination methods and pollen sources on seed weight (g) of Sewy cv.

Female cv.	Season	Pollen sources (A) Methods (B)	Aswan	Ismailia	El-Banna Oasis	Means (B)
Sewy	2001	Mechanical Pollination	2.17	2.16	1.67	2.00
		Hand Pollination	2.49	2.15	2.16	2.27
		Means (A)	2.33	2.16	1.92	
	2002	Mechanical Pollination	2.11	2.08	1.66	1.95
		Hand Pollination	2.32	2.13	2.10	2.18
		Means (A)	2.22	2.11	1.88	

L.S.D at 0.05 for:

	2001	2002
(A)=	0.21	0.16
(B)=	0.17	0.13
(AxB)=	0.29	0.23

2.10. Seed weight of Samany cultivar:

Data of both mechanical and hand pollination in Table (12), indicated that the effect of mechanical pollination was the lowest in both seasons, and recorded (1.89 and 2.00 g) respectively. Also, Aswan and El-Bahria Oasis pollen sources had the lowest effect in both seasons and recorded values of 2.48 and 2.38 g, respectively in the first season as well as 2.24 and 2.23 g) in the second one, respectively.

Table (12): Effect of some pollination methods and pollen sources on seed weight (g) of Samany cv.

Female cv.	Season	Pollen sources	Aswan	Ismailia	El-Bahria Oasis	Means (B)
		(A) Methods (B)				
Samany	2001	Mechanical Pollination	2.18	1.45	2.05	1.89
		Hand Pollination	2.57	2.45	2.51	2.51
		Means (A)	2.38	1.95	2.28	
	2002	Mechanical Pollination	2.16	1.80	2.05	2.00
		Hand Pollination	2.31	2.28	2.40	2.33
		Means (A)	2.24	2.04	2.23	

L.S.D at 0.05 for:

	2001	2002
(A)=	0.23	0.18
(B)=	0.18	0.15
(AxB)=	0.32	0.28

The above results of pollination type are in agreement with Haffar *et al.* (1997) who indicated that mechanical pollination had a significant effect on fruit quality. Also, these results of pollen sources are in line with those of Shafaat and Shabana (1980), Khalifa *et al.* (1980), Nasr *et al.* (1982), Shaheen *et al.* (1989a), Rahemi (1998) and Soliman (1999) while indicated that pollen sources had effects on fruit physical properties

3)- Effect of some pollination methods and different pollen grains sources on fruit chemical properties :

3.1. Reducing sugars% of Sewy and Samany cultivars:

Data of Tables (13 and 14) indicated that pollination methods and different pollen sources had no significant effect on reducing sugar content of Sewy and Samany cultivar in both seasons.

Table (13): Effect of some pollination methods and pollen sources on reducing sugars% of Sewy cv.

Female cv.	Season	Pollen sources	Aswan	Ismailia	El-Bahria Oasis	Means (B)
		(A) Methods (B)				
Sewy	2001	Mechanical Pollination	46.66	48.29	46.13	47.03
		Hand Pollination	48.19	47.94	46.40	47.51
		Means (A)	47.43	48.12	46.27	
	2002	Mechanical Pollination	46.69	48.61	46.50	47.27
		Hand Pollination	48.30	48.12	46.81	47.74
		Means (A)	47.50	48.37	46.66	

L.S.D at 0.05 for:

	2001	2002
(A)=	N.S	N.S
(B)=	N.S	N.S
(AxB)=	N.S	N.S

Table (14): Effect of some pollination methods and pollen sources on reducing sugars% of Samany cv.

Female cv.	Season	Pollen sources (A)	Aswan	Ismailia	El-Bahria Oasis	Means (B)
		Methods (B)				
Samany	2001	Mechanical Pollination	40.85	38.15	38.96	39.32
		Hand Pollination	42.25	39.85	40.20	40.77
		Means (A)	41.55	39.00	39.58	
	2002	Mechanical Pollination	39.23	37.44	38.32	38.33
		Hand Pollination	41.17	38.32	39.35	39.61
		Means (A)	40.20	37.88	38.84	

L.S.D at 0.05 for:

	2001	2002
(A)=	N.S	N.S
(B)=	N.S	N.S
(AxB)=	N.S	N.S

3.2. Total sugars% of Sewy and Samany cultivars:

Results of Tables (15 and 16) showed that pollination methods had no significant effect on total sugars content of Sewy and Samany cultivars in both seasons. On the other hand, the obtained results showed significant effect of different pollen sources with Sewy and Samany cultivars in both seasons. Ismailia pollen grains had significant effect during the first season (75.43%) and the second season (75.78%) of Sewy cultivar. While, Aswan pollen source had significant effect of Samany cultivar during the first season (64.82%) and second season (63.75%).

Table (15): Effect of some pollination methods and pollen sources on reducing sugars% of Sewy cv.

Female cv.	Season	Pollen sources (A)	Aswan	Ismailia	El-Bahria Oasis	Means (B)
		Methods (B)				
Sewy	2001	Mechanical Pollination	73.35	75.70	72.11	73.69
		Hand Pollination	74.37	75.15	72.40	73.97
		Means (A)	73.81	75.43	72.26	
	2002	Mechanical Pollination	73.32	75.87	73.20	74.13
		Hand Pollination	74.66	75.68	72.95	74.43
		Means (A)	73.99	75.78	73.08	

L.S.D at 0.05 for:

	2001	2002
(A)=	0.98	1.01
(B)=	N.S	N.S
(AxB)=	1.38	1.43

Table (16): Effect of some pollination methods and pollen sources on reducing sugars% of Samany cv.

Female cv.	Season	Pollen sources (A)	Aswan	Ismailia	El-Bahria Oasis	Means (B)
		Methods (B)				
Samany	2001	Mechanical Pollination	64.13	59.80	60.22	61.38
		Hand Pollination	65.51	61.64	62.81	63.42
		Means (A)	64.82	60.87	61.52	
	2002	Mechanical Pollination	63.00	58.50	59.13	60.21
		Hand Pollination	64.50	60.44	62.70	62.55
		Means (A)	63.75	59.47	60.92	

L.S.D at 0.05 for:

	2001	2002
(A)=	2.25	2.14
(B)=	N.S	N.S
(AxB)=	3.17	3.02

3.3. Total soluble solids (T.S.S)% of Sewy and Samany cultivars:

Data presented in Tables (17 and 18) indicated that pollination methods had no significant effect on total soluble solids content of Sewy and Samany cultivars in both seasons. But, in the same tables, data recorded significant effect of different pollen sources on Sewy and Samany cultivars in both seasons. Total soluble solids of Sewy fruits were highest (35.20 and 35.29%) during the first and second season, respectively when Ismailia pollen source was used. While in Aswan, total soluble solids means increase of Samany cultivar pollinated with both pollination methods recorded (24.45 and 24.09%) in both seasons, respectively.

The above results of type pollination are partially in agreement with Hamood *et al.* (1986), who found no differences in fruit set, fruit T.S.S and sugars between mechanical and hand pollination.

The results of pollen sources are partially in agreement with Khalifa *et al.* (1980), Higazy *et al.* (1983), Melegy (1993), Rahemi (1998) and Soliman (1999), who reported chemical properties content differed according to pollen source.

Table (17): Effect of some pollination methods and pollen sources on reducing sugars% of Sewy cv.

Female cv.	Season	Pollen sources (A)	Aswan	Ismailia	El-Bahria Oasis	Means (B)
		Methods (B)				
Sewy	2001	Mechanical Pollination	34.17	34.50	33.27	33.98
		Hand Pollination	34.63	35.89	33.44	34.65
		Means (A)	34.40	35.20	33.36	
	2002	Mechanical Pollination	34.23	34.67	33.69	34.20
		Hand Pollination	34.78	35.91	33.67	34.79
		Means (A)	34.51	35.29	33.68	

L.S.D at 0.05 for:

	2001	2002
(A)=	1.26	1.32
(B)=	N.S	N.S
(AxB)=	1.78	1.86

Table (18): Effect of some pollination methods and pollen sources on reducing sugars% of Samany cv.

Female cv.	Season	Pollen sources (A)	Aswan	Ismailia	El-Bahria Oasis	Means (B)
		Methods (B)				
Samany	2001	Mechanical Pollination	23.11	22.23	24.17	23.17
		Hand Pollination	25.78	24.36	24.55	24.90
		Means (A)	24.45	23.30	24.36	
	2002	Mechanical Pollination	22.87	22.10	23.76	22.91
		Hand Pollination	25.31	24.01	24.18	24.50
		Means (A)	24.09	23.06	23.96	

L.S.D at 0.05 for:

	2001	2002
(A)=	1.08	1.00
(B)=	N.S	N.S
(AxB)=	1.52	1.41

4)-Effect of some pollination methods and different pollen grains sources on yield weight:

Tables (19 and 20) revealed that mechanical pollination and hand pollination methods had no significant effect on yield weight of Sewy and Samany cultivars in both seasons. Also, Table (19) showed that Wahat El-Bahria pollen source gave highest yield weight of Sewy cv. (83.93 and 84.82 kg) in both seasons, respectively. While, Table (20) indicated that Ismailia pollen grains gave the highest weight of Samany cultivar (91.91 and 92.83 kg) in both seasons, respectively.

These results of type pollination are in agreement with Hussain *et al.* (1985), Loghavi (1993), Abd El-Maksoud *et al.* (1994) and Haffar *et al.* (1997).

The results of pollen sources in agreement with Khalifa *et al.* (1980), Nasr *et al.* (1982) and Shaheen *et al.* (1989b) who indicated that male type had effects on yield weight.

Table (19): Effect of some pollination methods and pollen sources on yield weight (kg) of Sewy cv.

Female cv.	Season	Pollen sources (A)	Aswan	Ismailia	El-Bahria Oasis	Means (B)
		Methods (B)				
Sewy	2001	Mechanical Pollination	75.89	78.64	84.52	79.68
		Hand Pollination	78.81	77.96	83.33	80.03
		Means (A)	77.35	78.30	83.93	
	2002	Mechanical Pollination	76.32	79.17	84.87	80.12
		Hand Pollination	79.20	78.50	84.77	80.82
		Means (A)	77.76	78.84	84.82	

L.S.D at 0.05 for:

	2001	2002
(A)=	3.33	3.43
(B)=	N.S	N.S
(AxB)=	4.69	4.83

Table (20): Effect of some pollination methods and pollen sources on yield weight (kg) of Samany cv.

Female cv.	Season	Pollen sources	Aswan	Ismailia	El-Bahria Oasis	Means (B)
		(A) Methods (B)				
Samany	2001	Mechanical Pollination	78.90	98.10	84.67	87.22
		Hand Pollination	74.63	85.71	81.42	80.59
		Means (A)	76.77	91.91	83.05	
	2002	Mechanical Pollination	79.50	99.32	85.22	88.01
		Hand Pollination	74.82	86.33	82.23	81.13
		Means (A)	77.16	92.83	83.73	

L.S.D at 0.05 for:

	2001	2002
(A)=	5.06	5.16
(B)=	N.S	N.S
(AxB)=	7.13	7.27

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تأثير طرق التلقيح ومصادر اللقاح علي عقد الثمار والمحصول وجودة الثمار علي نخيل البلح صنفى سيوي وسماني
شريف فتحى علي الشرباصى¹ و عبد الحليم سيف الدين علي¹ و عبد المنعم محمد البنا²
وعاطف عليود³

(١-٢-٣) المعمل المركزي للأبحاث وتطوير نخيل البلح - مركز البحوث الزراعية .

(٤) معهد الهندسة الزراعية - مركز البحوث الزراعية

تمت هذه الدراسة في موسمي ٢٠٠١ ، ٢٠٠٢ لدراسة تأثير كل من طريقة التلقيح (التلقيح الآلي واليدوي) وتأثير مصادر النفاق علي عقد الثمار ، جودة الثمار والمحصول علي صنفى من نخيل البلح (السيوي والسماني). استخدمت ثلاث مصادر من حيوب اللقاح من أسوان ، الإسماعيلية والواحات البحرية. وقد أوضحت النتائج

أن:-

- التلقيح الآلي أدى إلى زيادة نسبة عقد الثمار ، بينما أدى التلقيح اليدوي إلى زيادة وزن كل من البذرة والثمرة في كل الصنفين السيوي والسماني.
- التلقيح الآلي واليدوي ليس بينهم فرق معنوي في التأثير علي طول وحجم للثمرة ، ووزن الثمرة والصفات الكيميائية للثمرة.
- مصدر اللقاح من منطقة الإسماعيلية اعطي تأثير معنوي جيد علي كل من الصفات الكيميائية والفيزيائية بالنسبة للصنف السيوي.
- اعطي مصدر اللقاح من منطقة أسوان تأثير معنوي جيد علي كل من الصفات الكيميائية والفيزيائية علي صنف السماني.