

DETERMINATION OF THE OPTIMAL POLLINATION PERIOD FOR KHALAS DATE PALM CULTIVAR

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ABSTRACT

This study was carried out at the Fruit Experimental Station in Dibba (East Agriculture region) on Khalas date palm trees to determine the optimal date or period for pollination. The study was conducted during the seasons of 1998, 1999, and 2000 and included four pollination periods, two, four, six and eight days after the spathe cracking. Results of the experiment has briefly shown:

- 1- The fruit setting for Khalas cultivar was differed from one season to another. In general., the fruit settings for Khalas cultivar is low compared to other cultivars.
- 2- The optimal pollination time for Khalas cultivar was between 2-4 days after the spathes cracking.

INTRODUCTION

The period for pollination and fertilization (which referred to as receptivity of female flowers) are differed according to the cultivar of female date palm, (1,2,3,4,5,6,7,& 8). Some cultivars e.g. Saggi and Ashrasi, receptivity are very short and for this reason, pollination has to be done immediately after spathe opening, otherwise delaying pollination will lead to poor setting (1,2,3,4,5,6,&8). But in most cvs., maximum fruit setting will be obtained by pollination within 2-4 days after spathes opening (1). On the other hand, some cvs. can be pollinated throughout 8-10 days.

In addition to the effect of cvs. on the length of receptivity period, climatic factors such as temperature, humidity, wind, and rain might have an effect on the above mentioned character, (1, 2, 7 & 8).

Khalas is one of the best date palm cvs. in UAE. Its fruit is well preferred by consumers, and has a high price value. In the recent years, it has been widely planted in different districts in UAE, (8).

Khalas cv. is characterized by low percent of fruit setting, and it is sensitive to the changes in climatic conditions. For this reason, our aim in this experiment is to determine the proper pollination time in order to get a high yield per tree.

MATERIALS AND METHODS

Pollination was done by using 12 male strands of almost the same length, from same male palm tree in three seasons, 1998, 1999, 2000.

From each date palm tree under present investigation, 12 spathes were taken and covered by paper bags before opening and then divided into four groups. These groups were subjected to the following periods of pollinations:

- 1 - Two days after spathes cracking
- 2 - Four “ “
- 3 - Six “ “
- 4 - Eight “ “

The spathes remained covered for 45 days after pollination.

Maximum, minimum temperature was taken throughout November till March for three years.

The following measurement were made during the period of study:

- 1- Effect of period of pollination on setting percent.
- 2- The effect of seasons on setting % (temperature).
Treatments were arranged in a complete randomized block design with three replications.

RESULTS AND DISCUSSION

Data presented in Table (1) showed that the fruit setting % throughout different times of pollination were low for the three years. The average fruit setting was 59.31%, this is comparatively low in contrast with other cvs. Like Lulu, Barhi, Khasab etc., which have more than 90% (1 & 4). The reason behind that may related to genetic variation.

Percentage of fruit setting was varied by different years of experiment. The highest setting % was obtained in 2000 season, it was 62.35 while in 1999 was 38.2 (Figure 1)

Reducing % of setting in 1998-1999 may be due to increase of minimum temperature at stage of growth and appearance of spathes. The daily of average minimum temperature in December just before spathe appearance in 1998-1999 was 20.5 C and this temperature encourage spathe growth and appearance, meanwhile, the minimum temperature average were 17.4, 17.0 C for the seasons, 1997-1998 and 1999-2000, respectively.

For this reason time of pollination in 1999 was very early and average of temperature was still low, which negatively affected on pollination, fertilizing and fruit setting.

The results in Table (1) also show the effect of time of pollination on fruit setting % of Khalas cultivar, in 1998 the highest setting % was recorded at 4 days after spathe opening, and the lowest % was at 8 days after spathe opening, difference between the two times was significant.

In both seasons, 1999 and 2000 the highest fruit setting % was in 2 and 4 days, and the lowest % was at 8 days after spathe opening. Again the above differences were significant.

Effect of pollination time on fruit setting % as average of 3 years (1998, 1999, 2000) is shown in Fig. (2,3). The highest % was obtained when the pollination was done after 2 or 4 days from spathes opening. The difference between 2 and 4 days was not significant, while it was significant between 2,4 days and 6,8 days.

RECOMMENDATION

Under the conditions of this experiment it is recommended that the pollination of Khalas date palm cultivar has to be done up to 4 days after spathes opening. Any delay will decrease the percent of fruit setting.

Table (1) Effect of time of pollination on fruit setting percentage for Khalas cv. In 1998, 1999, 2000 years

Year	Setting %				L.S.D	
	Pollination 2 days after spathes opening	Pollination 4 days after spathes opening	Pollination 6 days after spathes opening	Pollination 8 days after spathes opening	5%	1%
1998	55.70	61.03	58.93	50.20	6.12	7.93
1999	48.95	46.29	30.30	27.28	6.11	8.02
2000	72.27	70.62	56.00	50.94	5.81	7.79

Table (2) Average of maximum and minimum temperatures for 1998, 1999 and 2000 years

Year	Nov.		Dec.		Jan.		Feb.		Mar.	
	Max	Min								
1997-1998	33.9	23.2	28.4	17.4	26.1	13.6	26.0	13.8	29.8	16.5
1998-1999	32.5	21.2	28.2	20.5	26.1	17.4	27.7	16.2	28.7	17.3
1999-2000	31.6	21.9	27.6	17.0	26.3	17.3	26.7	16.9	29.0	19.1

Fig (1) Average setting % of Khalas cv. for 1998, 1999, and 2000 years

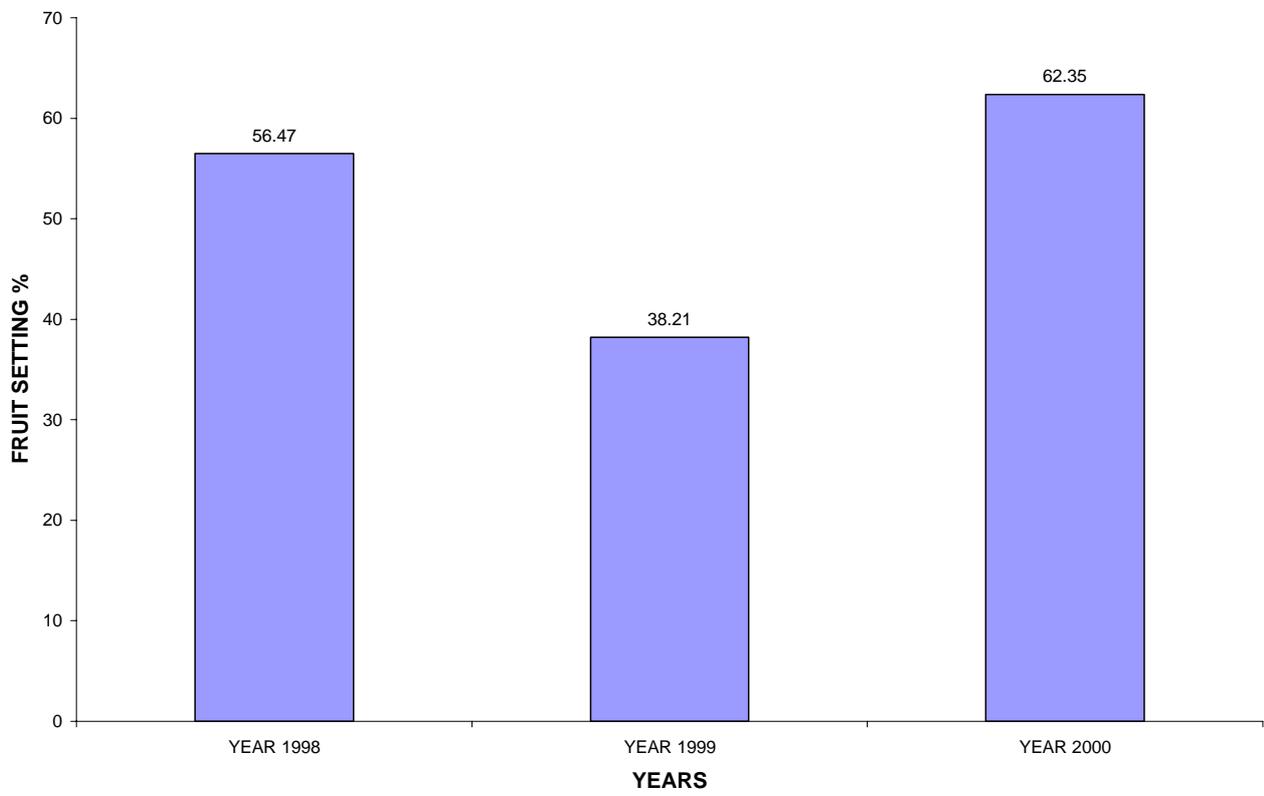
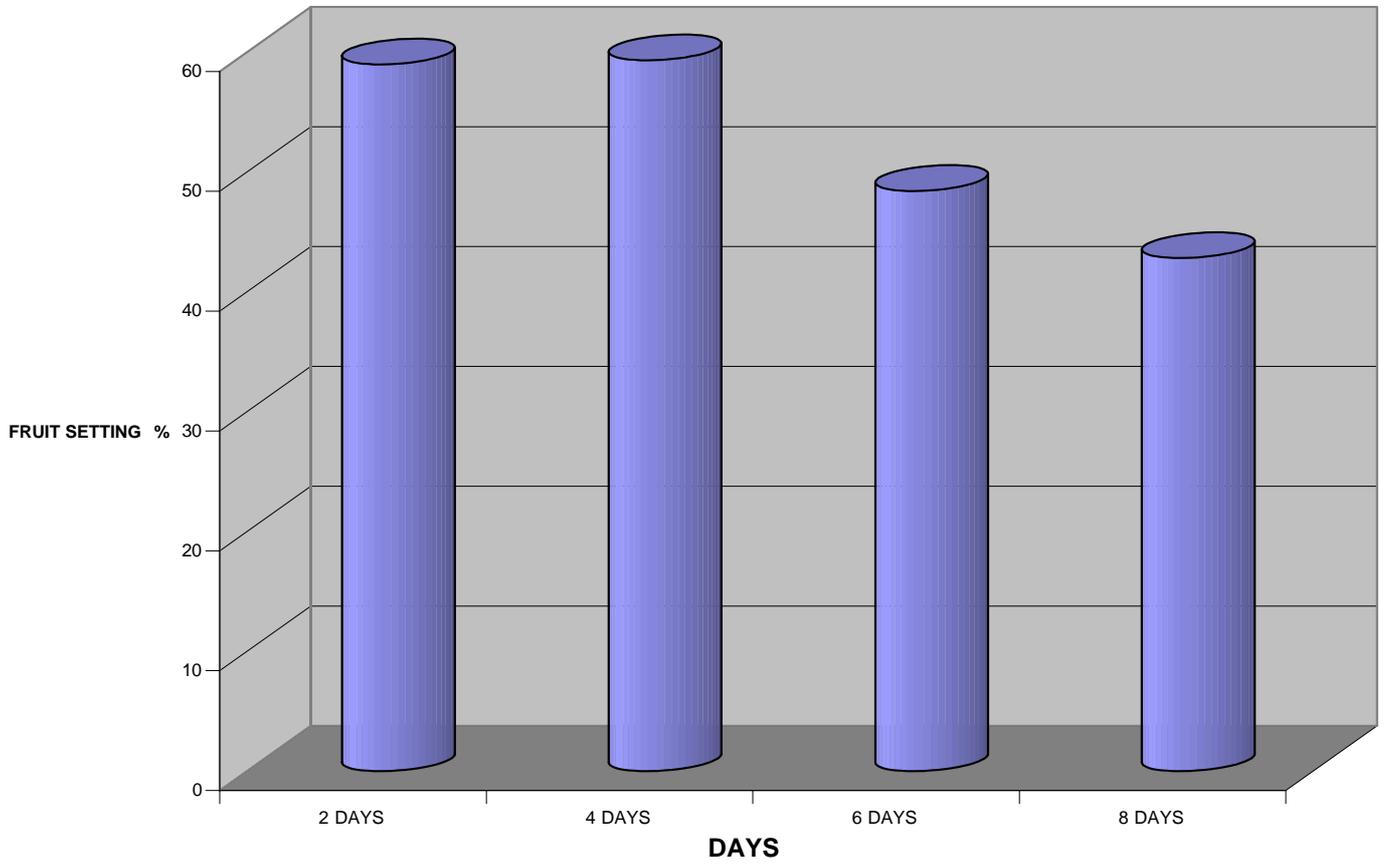


Fig (2) Effect of pollination time on fruit setting of khalas cv. for 1998, 1999 and 2000 seasons.



LSD 5% = 8.49
1% = 10.34

Fig (3) Setted fruits in different treatments (pollination after 2, 4, 6, 8 day of spathes opening)



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