

THE EFFECT OF BUNCHES THINNING ON PHYSICAL AND CHEMICAL CHARACTERISTICS OF FRUIT FOR THREE DATE PALM CULTIVARS

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ABSTRACT

The effect of bunches thinning on yield and quality of three commercial date palm cultivars were studied during 1997 and 1998, at AL Humraniyah Agricultural Experimental Station.

Three treatments of bunches thinning were made, leaving 4 bunches / tree, 8 bunches / tree and 12 bunches / tree.

The results has shown that thinning treatment has improved the quality of fruits in particular, weight, T.S.S., and moisture content.

Severe bunch thinning (4 bunches/tree) had largely reduced the yield.

It can be concluded under the condition of this experiment that moderate bunches thinning (8 bunches /tree), will lead to improve fruit quality at reasonable level of yield.

INTRODUCTION

There are two common methods of date palm fruit thinning, first one, including bunches reduction per tree which leads to elimination of alternative bearing and at the time improve fruit quality and early ripening (1,3,6,7 and 8).

The second technique is to reduce the number of fruits per bunch by cutting: the bunch end, bunch heart, strands or thinning fruit on strands.

The latest method is more effective on improving quality of fruits, particularly, fruit volume, early ripening, and chemical composition.

In UAE there are about 120 cultivars, some of them are commercially distributed. Fruits of these cultivars are recognized by small volume and low grading (8).

Accordingly our aims in this study are to improve fruit characteristics and grading in high standards by date factories.

MATERIALS AND METHODS

This experiment was carried out at Al-Hamraniya Experimental Station, located in northern agriculture region of UAE for two successive seasons, 1997 and 1998, on three commercial cultivars (Lulu, Khasab, and Jash-Habash).

Uniform trees of 9 years old were selected, and number of leaves / tree for each cultivar was similar.

Three treatments of bunches thinning were made at Hababok stage of fruit development (one week after fruit setting).

as follows :

- 1- leaving 4 bunches / tree
- 2 – leaving 8 bunches / tree
- 3 – leaving 12 bunches / tree

At the beginning of Rutab stage , the following analysis were measured :

- 1 – Fruit weight and volume, (100 fruits / tree)
- 2 - Seed “ “ (“ “)
- 3 - Bunch weight, (weighing all bunches per tree),
- 4 – Total soluble solids were determined by a hand refractometer.
- 5 - Fruit moisture content, was estimated by drying fruits in a vacuum oven at 67 C for 24 hs.

All treatments were arranged in a randomized block design. Each treatment was replicated four times with one tree for each replicate.

RESULTS AND DISSCUSION

The results in Tables (1 and 2) show the effect of bunches thinning on fruit and seed weight and volume in 1997 and 1998 seasons. It was found that there is inverse relation between number of bunches per tree and average weight and volume of fruit.

The differences are almost significant between all treatments in both years of experiment. For example in Khasab cultivar in 1997, the weights of fruit were 15.96, 12.76 and 9.95 gm. For 4, 8 and 12 treatments

respectively. The results of 1998 season (Table 2) showed a similar pattern (Fig.1).

These results were in close agreement with those reported by (2, 4, 5).

Thinning of bunches has an effect on the weight and volume of seed. The relationship between the above two parameters was aversive.

Average bunch weight, total yield, soluble solid percent and moisture content in fruits were affected by bunches thinning. These data are shown in Tables 3 and 4 and Fig. 2, which indicates:

- 1- An inverse relation between number of bunches per tree and average bunch weight for all mentioned cultivars and for both 1997 and 1998 years. The differences between treatments were significant. For example in Khasab cultivar, the weight of bunches were, 25.61, 16.27 and 12.30 kg per bunch at 4, 8 and 12 treatments respectively for 1997 season (Table 3). Similar tendency was noticed in 1998 as shown in Table 4.
- 2- Total yield per tree was decreased significantly due to reduction in number of bunches. The production was the highest in 12 bunches per tree treatment for all cultivars under study and in both years followed by the second treatment (8 bunches per tree), as shown in Lulu cv. The total yield per tree was 54.68, 82.664 and 104.64 kg for 4, 8 and 12 treatments respectively, in 1998 season. Similar tendency was found in 1997, (Table 3 and Fig. 2).
- 3- The relationship between number of bunches per tree and fruit's total soluble solids percent was aversive, and the differences between treatments were significant.
In 1997, the T.S.S for Lulu cv. were 43.65, 40.77 and 38.18 % for 4, 8 and 12 treatments respectively. Similar pattern was noted in 1998 as shown in table 4. These data are in agreement with those of (4 and 7).
- 4- The moisture content of fruit was decreased as a result of bunches reduction per tree. Consequently, the fruit ripening in low bunches number treatment will be early, compared to high bunches number treatment.
Decreasing number of bunches per tree improved the chemical characteristics of fruits, and this was in accordance with (2,4 and 5).

TABLE (1) EFFECT OF BUNCHES THINNING OF DATE PALM TREES
ON FRUIT & SEED WEIGHT & VOLUME (1997)

CULTIVAR	BUNCH NO.	FRUIT WEIGHT gm.	FRUIT VOL. Cm3	SEED WEIGHT gm.	SEED VOL. Cm3
LULU	4	12.70	12.50	1.06	0.95
	8	11.58	11.67	1.09	0.90
	12	9.31	9.17	1.01	0.88
LSD 5%		1.12	1.06	0.081	0.090
KHASAB	4	15.96	16.25	0.95	0.85
	8	12.76	12.83	0.81	0.72
	12	9.95	10.00	0.72	0.60
LSD 5%		1.53	1.72	0.093	0.098
JASH HABASH	4	7.8	8.5	1.12	1.00
	8	6.54	8.00	1.01	0.90
	12	5.65	6.00	0.91	0.80
LSD 5%		1.07	1.13	0.085	0.091

TABLE (2) EFFECT OF BUNCHES THINNING OF DATE PALM TREES
ON FRUIT & SEED WEIGHT & VOLUME (1998)

CULTIVAR	BUNCH NO.	FRUIT WEIGHT gm.	FRUIT VOL. Cm3	SEED WEIGHT gm.	SEED VOL. Cm3
LULU	4	14.09	14.11	1.02	0.91
	8	11.93	11.87	0.97	0.95
	12	10.01	9.95	0.91	0.89
LSD 5%		1.60	1.52	0.062	0.041
KHASAB	4	16.82	17.09	1.01	0.95
	8	13.01	13.00	0.90	0.81
	12	10.12	10.70	0.79	0.72
LSD 5%		1.67	1.89	0.059	0.062
JASH HABASH	4	8.61	8.79	1.00	1.02
	8	7.02	7.31	0.95	0.89
	12	5.94	6.02	0.73	0.80
LSD 5%		1.11	1.09	0.066	0.059

**TABLE (3) EFFECT OF BUNCHES THINNING OF DATE PALM TREES
ON YEILD & SOME CHEMICAL FRUIT CHARACTERISTICS (1997)**

CULTIVAR	BUNCH NO.	BUNCH WEIGHT Kg.	TOTAL PALM YEILD Kg	T.S.S. %	FRUIT MOISTURE %
LULU	4	15.60	62.40	46	57
	8	11.23	83.84	41	61
	12	9.11	109.32	41	68
LSD 5%		2.83	10.22	3.93	3.52
KHASAB	4	25.61	102.44	49	57
	8	16.27	130.16	41	51
	12	12.30	147.60	40	49
LSD 5%		3.71	6.97	4.01	2.79
JASH HABASH	4	16.56	66.24	41	55
	8	12.20	97.60	36	61
	12	10.02	128.24	33	68
LSD 5%		2.01	9.20	2.79	3.68

**TABLE (4) EFFECT OF BUNCHES THINNING OF DATE PALM TREES
ON YEILD & SOME FRUIT CHEMICAL CHARACTERISTICS (1998)**

CULTIVAR	BUNCH NO.	BUNCH WEIGHT KG.	TOTAL PALM YEILD KG	T.S.S. %	FRUIT MOISTURE %
LULU	4	13.67	54.68	43.65	57.88
	8	10.33	82.64	40.77	61.44
	12	8.72	104.64	38.18	64.30
LSD 5%		2.18	9.37	2.91	4.98
KHASAB	4	21.70	86.80	44.15	58.93
	8	18.30	146.40	42.06	60.13
	12	11.95	143.40	40.00	64.50
LSD 5%		3.22	8.71	3.01	5.73
JASH HABASH	4	18.25	73.00	39.71	55.01
	8	12.50	100.00	32.63	62.18
	12	9.25	111.00	32.12	68.38
LSD 5%		2.07	7.83	3.72	5.12

FIG (1) DATE PALM FRUIT WEIGHT AS INFLUENCED BY BUNCHES THINNING (1997)

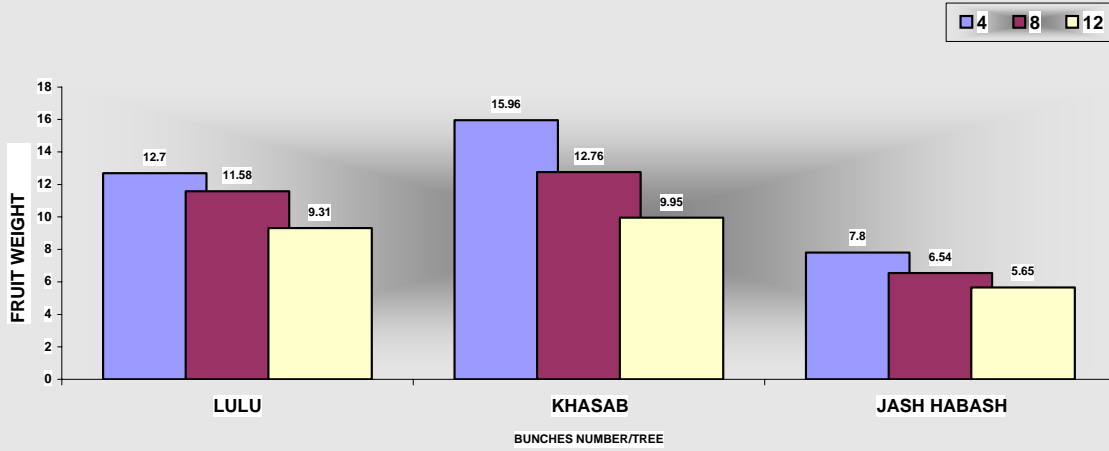
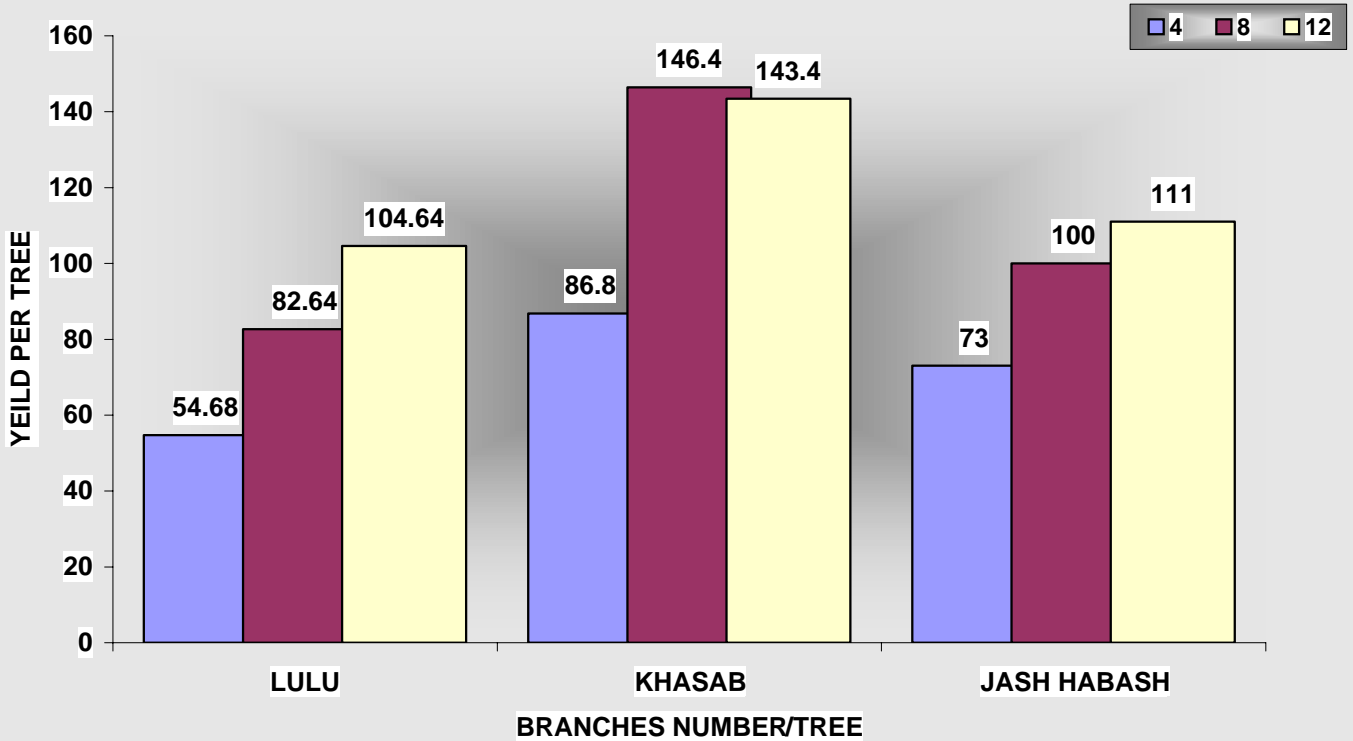


FIG (2) TOTAL YEILD PER DATE PALM TREE AS INFLUENCED BY BUNCHES THINNING (1998)



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