EFFECT OF FLORAL BORON AND UREA SPRAY ON YIELD AND FRUIT QUALITY OF ZAGHLOUL AND SAMANY DATE PALMS

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ABSTRACT

The present study was conducted during 2005 and 2006 seasons to investigate the effect of floral spray of boron alone or in combination with urea on yield and fruit quality of Zaghloul and Samany date palms. Six different boron and urea treatments were studied beside the control. It was found that, most of treatments significantly increased yield and improved fruit quality in the two cvs.. Wherease, boron at 0.4% + urea at 0.1% treatment increased both of fruit set percentage and bunch weight in the two cvs.. However, boron at 0.4% + urea at 0.2% treatment improved fruit quality by increasing both of fruit T.S.S., reducing and non-reducing sugars content and peel pigments, and decreasing both of fruit acidity and tannins. Therefore, the above mentioned treatment (boron at 0.4% + urea at 0.2% treatment) are suggested to be a good recommendation for Zaghloul and Samany date palms grown under the resemble conditions for achieving high yield with best fruit quality.

Key words : *Zaghloul dates cv., Samany dates cv., Boron, Urea, date palm.*

INTRODUCTION

Date palm (*Phoenix dactylifera* L.) is one of the oldest cultivated fruit in the world. Date palm tree has an important role in development of new agricultural societies for many resons; i.e. its highly nutritional values, its many industrial production of palm leaves and dates. Also, date palms are more resistance to desertification and able to adopt to the harsh conditions in new reclaimed land at desert regions.

On the other hand, in new lands of Egypt, the trees suffer from the basic reaction and precipitation of micronutrients (such as boron), also they suffer from the losses of nitrogen fertilizers.

Boron is closely connected with cell division in meristematic tissues and synthesis of carbohydrate, protein, nuleic acid and phenol (Amberger, 1974). Also, boron palys an important role in germination and development of pollen tube, however, urea used as a source of nitrogen and helps in absorption of micronutrients spray through plant tissues (El-Shazly, 1999).

The availability of borate to plants decreased with increasing pH and with hight content of free calcium carbonate forming calcium borate of low solubility. In aird regions it tended to accumulate in upper zones of soil. In addition, boron translocated either in inorganic forms or as sugar-borate complex easily in the xylem system in acropetal direction, however, when reached the leaves becomes immobile (Amberger, 1974).

The benfits of boron spray on yield and fruit quality of various fruit trees were studied by many investigators such as Paryea and Drak (1991), Haggag *et al.* (1995), Qin (1996), Ahmed and Ahmed (1997) and El-Nawam (2003). In addition, many investigators have studied the effect of urea spray on different cultivars of fruit trees as Singh *et al.* (1977), Singh (1985), Nevin *et al.* (1990) and Chu and Li (1992).

Therefore, the objective of the present work was to study the effect of floral boron and urea spray on yield and fruit quality of Zaghloul and Samany date palms.

MATERIALS AND METHODS

The present study was conducted during two successive seasons; i.e. 2005 and 2006 on 14-year-old date palms of Zaghloul and Samany cultivars at El-Maamoura Experimental Station of Agriculture Research Center, Alexandria Governorate.

Twenty eight palms from each cultivar was uniform as possible were randomly selected for this study. All selected palms were grown in sandy soil at a part of 10×10m (Table 1) and subjected to the same horticultural practices.

Each experimental date palm fertilized with 1500 gms N as ammonium sulphate 20.5%, divited into four equal doses and broadcasted on the soil surface in February, April, June and August. In addition, each date palm annually received 300 gms P_2O_5 and 500 gms K_2O in February as super phosphate 45% P_2O_5 and potassium sulphate 50% K_2O, respectively. The trees were surface irrigated with Nile water.

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Table (1): Chemical analysis of experimental soil before starting the experiment in 2005 season.

Depth (cm)	EC Ds/m	pH	$CaCO_3$ %	O.M %	Ca^{++} Meq/L	Mg^{++} Meq/L	Na^{+} Meq/L	K^{+} Meq/L	Cl^{-} Meq/L	HCO^{-}_3 Meq/L
I- Zaghloul orchard :										
0-30	2.23	8.12	4.15	2.03	2.29	1.19	1.63	0.68	4.20	2.36
30-60	2.12	8.30	4.08	2.11	1.46	1.14	1.34	0.57	4.06	2.14
60-90	2.06	8.44	4.22	1.26	2.19	1.07	1.57	0.28	3.78	2.25
II- Samany orchard :										
0-30	2.41	8.35	4.01	2.13	3.16	1.35	1.24	0.54	3.63	3.12
30-60	2.37	8.28	4.13	1.95	2.10	1.22	1.51	0.31	3.11	2.61
60-90	2.18	8.49	4.19	1.04	2.06	1.11	1.75	0.21	2.38	2.47

During the flowering stage, after 2-3 days of spathe craking (during May before pollination), spathes of each experimental palm were sprayed once with one of the following treatments :

1- Water (control) .....(A).
2- Boron at 0.2% .....(B).
3- Boron at 0.2% + urea at 0.1% .....(C).
4- Boron at 0.2% + urea at 0.2%.....(D).
5- Boron at 0.4% .....(E).
6- Boron at 0.4% + urea at 0.1% .....(F).
7- Boron at 0.4% + urea at 0.2% .....(G).

The treated palms pollinated with the same source of pollen grains. The treatments were arranged in completely Randomized Blocks Desigen. Each treatment was replicated four times, with one palm for each replicate; i.e. 7 treatments × 4 replicates = 28 trees for each cultivar.

At the end of June, fruit set percentage was determined, then at the harvest time at (khalal stage), bunch weight (as indices to yield) was recorded. A sample of sixty fruits was taken at random from each palm (replicate) for quality determination. In each sample, physical properties including average fruit weight, length, diameter, L/D ratio and flesh thickness were determined. Also, chemical constituents including, total soluble solids (T.S.S.), acidity, anthocyanine or carotene, reducing sugars, non reducing sugars and tannins were determined.

Total soluble solids (T.S.S) was determined in the prepared fruit juice using a hand refractometer. Titratable acidity percentage was estimated in 5 ml from the prepared fruit juice as malic acid by titration against 0.1 N sodium hydroxide according to A.O.A.C. (1995).

Anthocyanin pigment was determined in Zaghloul peel and expressed as O.D/g of flesh weight according to Geissman (1962). However, carotene pigment was determined in Samany peel according to Roysell *et al.* (1978).

Reducing and non-reducing sugars were determined on dry weight basis according to Malik and Singh (1980), fruit tannins content was determined according to Swain and Hillis (1959).

The data obtained thoughout this study were statistically analyzed according to Snedecor and Cochran (1980) using the analysis of variance as described by SAS (1998).

RESULTS AND DISCUSSION

I- Yield :

The data representing the effect of boron and urea floral spray on yield parameters i.e., fruit set percentage and bunch weight of Zaghloul and Samany date palms are listed in Table (2).

It was abvoius that in both experimental seasons, boron at 0.4% + urea at 0.1% (treatment F) significantly increased fruit set and bunch weight followed by boron at 0.4% + urea at 0.2% (treatment G) than those of control and most remained treatments in regard to studied cvs. However, control (treatment A) had significantly lower fruit set percentage and bunch weight than those of other treatments in both seasons. These results were in agreement with those of Robbertse *et al.* (1991) on avocado and El-Nawam (2003) on Zaghloul date palm. They detected that boron spray increased fruit set. Also, chu and Li (1992) on apricot trees, suggested that fruit set and yield were significantly increased by foliar spray with 0.2% borax + 0.2% urea, 1 week before flowering and peak flowering. Additionally, Ahmed and Ahmed (1997) on Zaghloul date palm and Singh (1985) on guava, they reported that yield and bunch weight or fruit yield per tree were increased by boric acid and urea spray, respectively.

Table (2): Effect of flower boron and urea spray on yield of Zaghloul and Samany date palms in 2005 and 2006 seasons.

Treatments	Zaghloul				Samany			
	Fruit set %		Bunch weight (kg)		Fruit set %		Bunch weight (kg)	
	2005	2006	2005	2006	2005	2006	2005	2006
1- Water (control) .....(A).	60.290^{e}	59.907^{d}	12.60^{e}	12.10^{e}	58.573^{c}	61.076^{f}	14.43^{f}	14.56^{f}
2- Boron at 0.2% .....(B).	85.516^{cb}	60.057^{d}	16.60^{c}	15.96^{c}	72.147^{b}	74.636^{cd}	17.63^{d}	17.73^{d}
3- Boron at 0.2% + urea at 0.1%....(C).	84.830^{d}	63.320^{bc}	17.43^{b}	16.86^{b}	73.970^{b}	72.993^{e}	17.93^{c}	18.10^{bc}
4- Boron at 0.2% + urea at 0.2%....(D).	85.726^{b}	61.187^{cd}	17.40^{b}	16.86^{b}	71.063^{b}	73.870^{de}	16.96^{e}	16.96^{e}
5- Boron at 0.4% .....(E).	85.046^{cd}	60.707^{cd}	16.03^{d}	15.43^{d}	73.430^{b}	75.126^{bc}	17.86^{c}	17.90^{cd}
6- Boron at 0.4% + urea at 0.1%....(F).	87.763^{a}	66.620^{a}	18.00^{a}	17.26^{a}	81.433^{a}	76.936^{a}	18.66^{a}	18.83^{a}
7- Boron at 0.4% + urea at 0.2%....(G).	85.783^{b}	63.660^{b}	17.56^{b}	16.89^{b}	70.493^{b}	75.123^{bc}	18.16^{b}	18.33^{b}
L.S.D. (0.05)	0.552	2.855	0.25	0.36	5.376	1.116	0.15	0.27

In the same colum (for each parameter) means followed by the same letter are not significantly differed.

II- Fruit quality :

a – Physical properties :

The data regarding the effect of floral boron and urea spray on fruit physical properties of Zaghloul and Samany date palms are presented in Tables (3 and 4), respectively as follows :

a-1- Fruit weight :

In both studied cultivars, it evident that boron at 0.4% + urea at 0.2% (treatment G) produced higher fruit weight than those of control and other treatment without significant differences in most cases during the two seasons. On the other hand, the control treatment (A) produced the lowest values in this respect. Ahmed and Ahmed (1997) found that increasing concentrations of boric acid from 0.0 to 0.3%, increased the fruit weight of Bent Eisha date palm. Likewise, Singh *et al.* (1977) reported that urea application increased mango fruit weight.

a-2- Fruit dimensions :

In general, fruit dimensions and L/D ratio of Zaghloul and Samany dates were significantly affected by most of boron and urea treatments in the two seasons (Tables 3 and 4). It found that in both seasons, boron at 0.4% + urea at 0.2% (treatment G) gave the highest fruit length and significantly differed than most treatments in the two studied cvs.. However, the control (treatment A) and boron at 0.4% (treatment E) significantly gave the lowest fruit length of Zaghloul and Samany cvs., respectively in most cases.

Regarding fruit diameter, both of treatments boron at 0.4% + urea at 0.2% (treatment G) and boron at 0.2% + urea at 0.2% (treatment D) gave the highest fruit diameter of Zaghloul and Samany cvs., respectively and differed significantly than most treatments. On the other hand, the control treatment (A) gave the lowest values of fruits diameter in the two seasons.

Concerning L/D ratio, it appeared that, in both of treatments, boron at 0.2% (treatment B) and boron at 0.4% + urea at 0.2% gave the highest L/D ratio of Zaghloul and Samany dates, respectively, and differed significantly than most treatments in both seasons. While, boron at 0.4% (treatment E) gave the lowest L/D ratio in the two cvs. and differed significantly than most of other treatments in both seasons. These findings are in agreement with those found by Qin (1996) who showed that boron spray improved fruit size of orange trees. Ahmed and Ahmed (1997) reported that boron spray increased fruit dimentions of Bent Eisha date palm. In addition, Singh *et al.* (1977) on mango and Nevin *et al.* (1990) on avocado, they reported that urea spray resulted in an increase in fruit size.

a-3- Flesh thickness :

The obtained data showed that, in both seasons, all boron and urea treatments significantly increased fruit flesh thickness of the two studied cvs. than those of control treatment. In the same time, in both experimental seasons boron at 0.4% + urea at 0.2% (treatment G) induced the highest flesh thickness of the two dates cvs., and differed significantly than those of control and most or all other treatment in 2005 and 2006, respectively. However, the control treatment (A) induced the lowest flesh thickness of the dates cvs. and differed than those of most treatments in the two seasons. Amberger (1974) pointed out that boron is closely connected with cell division in meristematic tissues. Additionally, Whittington (1959) reported that boron is required for pectin synthesis and declared that cell wall show the highest boron content.

Table (3): Effect of flower boron and urea spray on fruit physical properties of Zaghloul date palm in 2005 and 2006 seasons.

Treatments	Fruit weight (gm)		Fruit length (cm)		Fruit diameter (cm)		L/D index		Flesh thickness (cm)	
	2005	2006	2005	2006	2005	2006	2005	2006	2005	2006
1- Water (control) .....(A).	25.37^{d}	24.76^{d}	5.713^{c}	5.640^{c}	2.853^{f}	2.637^{f}	2.001^{b}	2.140^{b}	0.608^{b}	0.865^{f}
2- Boron at 0.2% .....(B).	27.16^{abc}	27.05^{ab}	5.943^{a}	5.870^{ab}	2.890^{e}	2.675^{e}	2.055^{a}	2.196^{a}	0.920^{a}	0.899^{c}
3- Boron at 0.2% + urea at 0.1%....(C).	26.85^{abc}	27.04^{ab}	5.861^{b}	5.854^{b}	2.898^{d}	2.683^{d}	2.022^{b}	2.183^{a}	0.895^{ab}	0.880^{e}
4- Boron at 0.2% + urea at 0.2%....(D).	27.35^{ab}	26.31^{b}	5.944^{a}	5.871^{ab}	2.939^{b}	2.720^{b}	2.022^{b}	2.160^{ab}	0.903^{ab}	0.892^{d}
5- Boron at 0.4% .....(E).	26.33^{c}	25.54^{c}	5.773^{c}	5.711^{c}	2.891^{e}	2.675^{e}	1.996^{b}	2.085^{c}	0.909^{ab}	0.894^{d}
6- Boron at 0.4% + urea at 0.1%....(F).	26.43^{bc}	26.64^{ab}	5.866^{b}	5.665^{c}	2.918^{c}	2.705^{c}	2.009^{b}	2.137^{b}	0.922^{a}	0.906^{b}
7- Boron at 0.4% + urea at 0.2%....(G).	27.62^{a}	27.23^{a}	5.993^{a}	5.970^{a}	2.964^{a}	2.756^{a}	2.020^{b}	2.166^{ab}	0.929^{a}	0.912^{a}
L.S.D. (0.05)	0.94	0.74	0.076	0.115	0.006	0.007	0.027	0.040	0.309	0.005

In the same colum (for each parameter) means followed by the same letter are not significantly differed.

Table (4): Effect of flower boron and urea spray on fruit physical properties of Samany date palm in 2005 and 2006 seasons.

Treatments	Fruit weight (gm)		Fruit length (cm)		Fruit diameter (cm)		L/D index		Flesh thickness (cm)	
	2005	2006	2005	2006	2005	2006	2005	2006	2005	2006
1- Water (control) .....(A).	34.88^{b}	35.20^{d}	4.894^{c}	4.972^{bc}	3.292^{d}	3.240^{g}	1.486^{b}	1.532^{ab}	1.057^{c}	1.035^{g}
2- Boron at 0.2% .....(B).	36.18^{a}	36.76^{a}	5.067^{a}	5.042^{ab}	3.392^{a}	3.339^{b}	1.494^{ab}	1.538^{a}	1.115^{ab}	1.097^{c}
3- Boron at 0.2% + urea at 0.1%..(C).	36.48^{a}	36.59^{ab}	4.927^{c}	5.068^{ab}	3.375^{ab}	3.332^{c}	1.459^{c}	1.518^{bc}	1.097^{b}	1.100^{b}
4- Boron at 0.2% + urea at 0.2%...(D).	36.45^{a}	36.50^{ab}	4.977^{b}	5.059^{ab}	3.403^{a}	3.352^{a}	1.462^{c}	1.507^{c}	1.103^{b}	1.080^{f}
5- Boron at 0.4% .....(E).	34.95^{b}	35.35^{cd}	4.768^{d}	4.846^{c}	3.344^{bc}	3.292^{e}	1.425^{d}	1.469^{d}	1.104^{b}	1.083^{e}
6- Boron at 0.4% + urea at 0.1%...(F).	35.39^{b}	36.00^{bc}	4.801^{d}	4.880^{c}	3.338^{c}	3.285^{f}	1.438^{d}	1.483^{d}	1.107^{ab}	1.087^{d}
7- Boron at 0.4% + urea at 0.2%...(G).	36.67^{a}	36.86^{a}	5.060^{a}	5.123^{a}	3.348^{bc}	3.316^{d}	1.510^{a}	1.543^{a}	1.135^{a}	1.115^{a}
L.S.D. (0.05)	0.67	0.72	0.040	0.136	0.035	0.002	0.020	0.018	0.029	0.073

In the same colum (for each parameter) means followed by the same letter are not significantly differed.

b – Chemical constituents :

The data representing the effect of floral boron and urea spray on fruit chemical constituents of Zaghloul and Samany date palms are listed in Tables (5 and 6), respectively. It is clear that in both seasons, boron at 0.4% + urea at 0.2% (treatment G) produced the highest total soluble solids (T.S.S.), reducing and non-reducing sugars content of Zaghloul and Samany fruits and differed significantly than those of control and remained treatments in most cases. However, the control treatment (A) produced the lowest values in this respect.

In addition, in both seasons, the same treatment (G) significantly produced higher anthocynin and carotene of peel fruits than those of all other treatments in Zaghloul and Samany, respectively. While, the control treatment (A) significantly produced the lowest anthocynin and carotene content of peel fruits during the two seasons.

On the other hand, in both seasons the control treatment (A) or boron at 0.2% (treatment B) produced higher fruit acidity than those of other treatment and differed significantly than most of other treatments specially in Samany cv..

In addition, control treatment (A) produced the highest fruit tannins content in the two cultivars and differed significantly than those of most other treatments during the two seasons. In the meantime, treatment (G) produced the lowest values of acidity and tannins content of Zaghloul and Samany cvs. with significant differences comparing with most other treatments. These results related to the effect of boron and urea spray on fruit chemical consitituents are confermed by numerous investigators such as Gauch and Dugger (1954) who reported that boron facilitates the transport of sugar as boron sugar complex through membranes. Haggag *et al.* (1995) on mango trees and Ahmed and Ahmed (1997) on date palms found that boron spray increased fruit T.S.S., reducing and total sugars, while, fruit acidity was decreased by the same treatment. Rai *et al.* (1988); Paryea and Drak (1991) and Qin (1996) on orange, they found that boron spray advanced and improved fruit coloration. Additionally, both of Singh *et al.* (1977) on mango trees and Singh (1985) on guava trees, they concluded that urea spray improved fruit quality by increasing fruit T.S.S. and sugars content and reducing fruit acidity. Also, El-Nawam (2003) indicated that flower boron spray at 0.4% caused a significant decrease in the percentages of fruit tannins as compared with that of control.

Consequently, it was evident that the most of the investigated floral boron and urea treatments were significantly affected yield and fruit quality of Zaghloul and Samany date palms as compared with the control. In the meantime, boron at 0.4% + urea at 0.1% (treatment F) was the more effective treatment in increasing fruit yield. However, boron at 0.4% + urea at 0.2% (treatment G) was the most effective treatment in improving fruit quality and was a good recommendation under these study conditions. In addition, other remained treatments had intermediate effect on yield and fruit quality. No phytotoxicity or damage of leaves and floweres were detected by any of the investigated treatments.

Table (5): Effect of flower boron and urea spray on fruit chemical constituents of Zaghloul date palm in 2005 and 2006 seasons.

Treatments	T.S.S. %		Acidity %		Anthocyanin (O.D)		Reducing sugars %		Non-reducing sugars %		Tannins %	
	2005	2006	2005	2006	2005	2006	2005	2006	2005	2006	2005	2006
1- Water (control) .....(A).	24.61^{c}	24.45^{b}	0.145^{a}	0.147^{a}	0.439^{g}	0.397^{f}	56.34^{c}	57.33^{d}	18.09^{b}	17.63^{b}	0.838^{a}	0.856^{a}
2- Boron at 0.2% .....(B).	25.61^{bc}	25.65^{a}	0.143^{ab}	0.147^{a}	0.463^{d}	0.423^{c}	62.63^{ab}	63.61^{c}	19.88^{ab}	18.59^{b}	0.834^{ab}	0.853^{a}
3- Boron at 0.2% + urea at 0.1%...(C).	25.75^{b}	25.96^{a}	0.142^{b}	0.146^{ab}	0.471^{b}	0.432^{b}	60.04^{bc}	64.57^{bc}	20.14^{ab}	20.94^{ab}	0.828^{ab}	0.852^{ab}
4- Boron at 0.2% + urea at 0.2%...(D).	26.31^{ab}	25.90^{a}	0.142^{b}	0.146^{ab}	0.449^{f}	0.409^{e}	64.45^{ab}	65.13^{b}	18.94^{ab}	20.54^{ab}	0.826^{ab}	0.844^{ab}
5- Boron at 0.4% .....(E).	26.27^{ab}	26.24^{a}	0.142^{b}	0.145^{ab}	0.466^{c}	0.428^{c}	62.96^{ab}	64.45^{bc}	19.74^{ab}	18.74^{b}	0.824^{b}	0.836^{b}
6- Boron at 0.4% + urea at 0.1%....(F).	26.14^{ab}	26.21^{a}	0.142^{b}	0.146^{ab}	0.456^{e}	0.416^{d}	64.51^{a}	65.49^{ab}	19.72^{ab}	20.81^{ab}	0.803^{c}	0.809^{c}
7- Boron at 0.4% + urea at 0.2%....(G).	26.81^{a}	26.07^{a}	0.140^{bc}	0.144^{b}	0.487^{a}	0.447^{a}	65.22^{a}	66.36^{a}	21.52^{a}	22.57^{a}	0.791^{c}	0.800^{c}
L.S.D. (0.05)	1.02	1.16	0.003	0.002	0.002	0.005	4.43	1.21	3.16	3.43	0.012	0.017

In the same colum (for each parameter) means followed by the same letter are not significantly differed.

Table (6): Effect of flower boron and urea spray on fruit chemical constituents of Samany date palm in 2005 and 2006 seasons.

Treatments	T.S.S. %		Acidity %		Carotene (mg/100 gms)		Reducing sugars %		Non-reducing sugars %		Tannins %	
	2005	2006	2005	2006	2005	2006	2005	2006	2005	2006	2005	2006
1- Water (control) .....(A).	25.54^{b}	25.59^{b}	0.148^{a}	0.147^{a}	9.478^{g}	9.258^{d}	63.90^{c}	62.15d	15.56^{d}	16.27^{c}	0.815^{a}	0.725^{a}
2- Boron at 0.2% .....(B).	26.33^{ab}	26.55^{ab}	0.145^{ab}	0.146^{ab}	9.874^{c}	9.613^{bc}	70.10^{b}	68.35^{c}	19.19^{abc}	18.80^{ab}	0.805^{a}	0.681^{c}
3- Boron at 0.2% + urea at 0.1%...(C).	27.23^{a}	26.00^{ab}	0.144^{b}	0.143^{c}	9.851^{d}	9.509^{c}	71.07^{b}	69.23^{bc}	17.47^{cd}	17.55^{bc}	0.766^{ab}	0.690^{bc}
4- Boron at 0.2% + urea at 0.2%...(D).	26.96^{a}	26.72^{ab}	0.144^{b}	0.146^{ab}	9.667^{f}	9.449^{c}	73.10^{a}	71.58^{ab}	20.26^{ab}	16.99^{c}	0.808^{a}	0.686^{bc}
5- Boron at 0.4% .....(E).	27.07^{a}	26.88^{a}	0.143^{b}	0.145^{b}	9.959^{b}	9.769^{bc}	73.77^{a}	71.87^{ab}	17.76^{bcd}	17.01^{c}	0.768^{ab}	0.679^{c}
6- Boron at 0.4% + urea at 0.1%....(F).	27.21^{a}	26.59^{ab}	0.142^{b}	0.145^{b}	9.816^{c}	9.593^{c}	73.20^{a}	72.08^{ab}	15.18^{d}	19.06^{a}	0.789^{ab}	0.700^{b}
7- Boron at 0.4% + urea at 0.2%....(G).	27.25^{a}	27.07^{a}	0.140^{b}	0.143^{c}	10.001^{a}	9.814^{a}	73.84^{a}	72.37^{a}	21.57^{a}	19.99^{a}	0.744^{b}	0.654^{d}
L.S.D. (0.05)	1.38	1.13	0.004	0.002	0.006	0.167	2.01	2.85	2.65	1.35	0.052	0.016

In the same colum (for each parameter) means followed by the same letter are not significantly differed.

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الملخـــص العـــربى

تأثير رش الأزهار بالبورون واليوريا على المحصول وجودة الثمار لنخيل البلح صنفىّ الزغلول والسمانى

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أجريت هذه الدراسة خلال موسمىّ ٢٠٠٥ و ٢٠٠٦ لبحث تأثير الرش بواسطة البورون منفرداً أو مع اليوريا. وذلك على كـل مـن المحصول وجودة الثمار لصنفىّ نخيل البلح الزغلول والسمانى. حيث تم دراسة تأثير ستة معاملات بالإضافة إلى معاملة المقارنة (الكنترول) .

وقد وجد أن معظم معاملات الرش بالبورون واليوريا أدت إلى تحسن معنوى فى المحصول وجودة الثمار لكلا الصنفين . فقد وجد أن معاملة البورون بتركيز ٠,٤% + اليوريا بتركيز ١,٠% قد أدت لزيادة كل من عقد الثمار ووزن السباطة لكـلا الـصنفين ، بينمـا معاملـة البورون بتركيز ٠,٤% + اليوريا بتركيز ٠,٢% قد حسنت جودة الثمار وذلك عن طريق زيادة كل من المواد الصلبة الذائبة الكلية والـسكريات المختزلة والغير مختزلة وصبغات القشرة ، كما قللت كل من الحموضة والتانينات وذلك لثمار كلا الصنفين. ونقترح التوصية بالمعاملة (بورون بتركيز ٠,٤% + يوريا بتركيز ٠,٢%) لنخيل البلح صنفىّ الزغلول والسمانى المنزرع تحت الظروف المماثلة لظروف هـذه الدراسـة وذلـك للحصول على محصول عالى مع أحسن جودة للثمار .