

(Original Article)



Effect of Spraying Jasmonic Oil and Bud Load Per Tree on Yield and Fruit Quality of “Abiad Aswan” Fig Cultivar

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DOI: 10.21608/AJAS.2024.258883.1320

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Abstract

This study was carried out during 2020 and 2021 seasons, to investigate the effect of spraying jasmonic oil (1.5 ml/L or 3 ml/L) one time at the second week of May, and winter pruning leaving three levels of bud load/tree at 36, 48 or 60 bud/tree and their combination, on yield and fruit quality of “Abiad Aswan” fig cultivar.

Fig trees were grown at the experimental orchard of Pomology, Faculty of Agriculture, Assiut University.

The experiment was set up as split-plot arrangement in a complete randomized block design, three replicates, one tree each, whereas bud load/tree was considered as whole plot (Factor A), and jasmonic concentrations were the split-plots (Factor B).

According to the obtained results, it was found that all treatments induced an improvement on yield, physical and chemical characteristics of “Abiad Aswan” fig cultivar.

Keywords: *Jasmonic oil, Bud load, Fig, Yield, Fruit quality.*

Introduction

The fig (*Ficus carica* L.) is one of the oldest trees of the Mediterranean zone, its fruit considered one of the most common fruits traded internationally. The fruit of fig are used as fresh fruit, draying fruit or for manufacture of jams according to Food and Agriculture Organization (FAO) 2021. Egypt is considered the second largest country (after Turkiya) in the term of fig fruit production followed by Morocco, where the cultivated area with fig trees in Egypt is 70718 feddan (Ministry of Agriculture and Land Reclamation, 2021) which produced about 298497.83 tons.

Using plant extracts is a new alternative compound which use to improve yield and fruit quality, they considered safety agents for environment and human health (El-Salhy *et al.*, 2017; Shaheen *et al.*, 2018 and Mostafa *et al.* 2020).

Pruning is a widespread cultural practice performed to optimize plant growth and fruit quality (Al-Hamadawi *et al.*, 2011; Al-Hmeidawi and Al-Shamari, 2012;

Al-Hameedawi *et al.*, 2014; Hosomi *et al.*, 2015; De-Silva *et al.*, 2022 and Hamid Zare, 2021).

Therefore, this study aimed to investigate the effect of bud load per tree and jasmine oil concentration on yield weight/tree and fruit quality of Abiad Aswan fig cultivar.

Materials and Methods

This investigation was carried out during two studied seasons 2020 and 2021 on thirteen years old “Abiad Aswan” fig trees. Grown in loamy clay soil at the experimental orchard of Pomology, Faculty of Agriculture, Assiut University.

The chosen 27 trees were divided into 9 different treatments from two factors (A and B) the first factor A contained three levels of bud loads:

- (a1) Leaving 36 bud/tree (on the basis of 12 stube x 3 bud).
- (a2) Leaving 48 bud/tree (on the basis of 16 stube x 3 bud).
- (a3) Leaving 60 bud/tree (on the basis of 20 stube x 3 bud).

The second factor (B) included the following three concentrations of jasmine oil 0.0 m/L, 1.5 m/L and 3 m/L.

Each treatment was replicated three times one tree per each.

Winter pruning leaving the three levels of bud load per tree was carried out at the second week of February, during 2020 and 2021 seasons. Jasmine oil extract sprayed one time (at the second week of May) till run-off (2 L/tree), Triton B as a wetting agent was added to all Jasmonic oil extract concentrations.

Harvesting was carried out during three times of harvest at the last week of August, the last week of September and the first week of November. The following measurements were determined as follows:

1-Yield weight (kg/tree): The yield on terms of weight (kg/tree) was recorded three times of harvest (at the last week of August, at the last week of September and at the first week of November), then the total yield was calculated.

2-Number of unripe fruits remaining on tree at the end of growth seasons (at the last week of October) was counted.

3-Physical characteristics of Abiad Aswan fig fruits: Fifteen fruit were randomly picked for each sample (one time every harvest month to determine fruit weight (g), fruit diameter (mm) and fruit height (mm).

4-Chemical characteristics of Abiad Aswan fig fruits: 10 fruits were randomly picked for each sample one time every harvest month to determine. The following parameters:

- Total soluble solids percentages (T.S.S. %): The percentage of total soluble solids (T.S.S.%) in fruit juice was determined by using a hand refractometer.
- Percentage of total acidity was estimated by titration against 0.1 N NaOH using phenolphthalein as indicator (A.O.A.C., 1985).

- Percentage of reducing and total sugars in fruit juice were determined according to A.O.A.C. (1985).

Statistical analysis

The experiments of this study were conducted in a split-plot arrangement of complete randomized block design (CRBD) with three replicates, one tree for each. whereas bud load/tree was considered as whole plot (Factor A), and jasmonic concentrations were the split-plots (Factor B). The obtained data were statistically analyzed according to Gomez and Gomez (1984). The means were compared using new LSD at 5%.

Results and Discussion

1. Effect of jasmonic oil and bud load per tree on monthly and total fruit yield weight of Abiad Aswan fig cv. during 2020 and 2021 seasons

Data presented in Table 1 showed the effect of jasmonic oil and bud load/tree on monthly and total fruit yield weight of Abiad Aswan fig cv. during 2020 and 2021 seasons. It is obvious from the data at both monthly harvest times and at the end of growth season, that all treatments with jasmonic oil concentrations and all different bud load levels significantly increased yield weight of Abiad Aswan fig fruits, compared with control during the two studied seasons. These results may be due to that spraying jasmonic oil and bud load level increased ripe fruit No./tree and fruit weight.

These results are in agreement with those obtained by Ali *et al.* 2016, Shaheen *et al.* 2018, Mostafa *et al.* 2020 and Hamid Zare 2021. Where at the 1st month of fruit harvest the best treatment was 48 bud/tree plus spraying 1.5 ml/L of jasmonic oil, where fruit yield recorded 3.39 and 3.60 kg compared with 2.12 kg and 2.22 kg for controls, respectively, during the two studied seasons. While at the 2nd month of fruit harvest the best treatment was 60 bud/tree plus spraying 1.5 ml/L of jasmonic oil, where yield recorded 2.40 and 2.43 kg compared with controls 1.88 and 1.68 kg, respectively, during the two studied seasons. While at the 3rd harvesting time the best treatment was 48 bud/tree plus spraying 3 ml/L of jasmonic oil, where yield recorded 1.0 and 1.2 kg compared with 0.76 and 0.92 kg for controls, respectively during 2020 and 2021 seasons. While the best treatment of total fruit yield weight (kg)/tree was loading level of 36 bud/tree plus spraying 1.5 ml/L of jasmonic oil, where total fruit yield recorded (6.92 and 7.10 kg) compared with (5.55 and 5.79 kg) for control, respectively, during the two studied seasons.

Table 1. Effect of jasmonic oil and bud load/tree on monthly and total fruit yield weight (kg)/tree of Abiad Aswan fig cv. during 2020 and 2021 seasons

Jasmonic oil conc. (B) Bud load (A)	1 st season 2020				2 nd season 2021			
	Yield weight (kg)/tree at the 1 st month of fruit harvest							
	Jasmonic oil conc.				Jasmonic oil conc.			
	0	1.5	3 ml/L	Mean (A)	0	1.5	3 ml/L	Mean (A)
36	2.13	3.43	3.02	2.86	2.22	2.97	3.83	3.01
48	2.84	3.49	2.95	3.09	2.57	3.60	3.18	3.12
60	3.08	3.52	3.46	3.36	2.66	3.42	3.54	3.21
Mean (B)	2.68	3.48	3.14		2.48	3.33	3.52	
LSD 5%	A= 0.06	B= 0.12	AB= 0.17		A= 0.05	B= 0.04	AB= 0.07	
	Yield weight (kg)/tree at the 2 nd month of fruit harvest							
36	1.88	1.97	2.17	2.01	1.68	2.22	2.15	2.02
48	1.93	1.94	2.21	2.03	1.76	2.09	2.33	2.06
60	1.59	2.40	2.03	2.48	2.11	2.43	2.43	2.32
Mean (B)	1.80	2.10	2.14		1.85	2.25	2.30	
LSD 5%	A= 0.06	B= 0.04	AB= 0.08		A= 0.08	B= 0.06	AB= 0.12	
	Yield weight (kg)/tree at the 3 rd month of fruit harvest							
36	0.76	0.93	1.07	0.92	0.92	1.11	1.18	1.07
48	0.78	0.97	1.09	0.95	1.08	1.15	1.23	1.15
60	0.88	0.99	1.06	0.97	1.02	1.25	1.19	1.15
Mean (B)	0.81	0.96	1.07		1.01	1.17	1.20	
LSD 5%	A= 0.03	B= 0.08	AB= 0.11		A= 0.04	B= 0.06	AB= 0.09	
	Total fruit yield weight (kg)/tree at the end of growth season							
36	5.55	6.92	6.55	6.34	5.79	7.10	7.16	5.92
48	4.77	6.40	6.25	6.07	5.41	6.84	6.74	6.33
60	5.55	6.33	6.26	6.79	4.82	6.30	6.63	6.68
Mean (B)	5.29	6.55	6.35		5.34	6.75	6.84	
LSD 5%	A= 0.06	B= 0.12	AB= 0.18		A= 0.03	B= 0.03	AB= 0.05	

2. Effect of spraying jasmonic oil and bud load/tree on monthly and total ripe fruit number/tree of Abiad Aswan fig cv. during 2020 and 2021 seasons

Data presented in Table 2 showed the effect of spraying jasmonic oil as well as bud load/tree and the interaction between them on monthly and total ripe fruit number per tree of Abiad Aswan fig cv. during two studied seasons 2020 and 2021. It is obvious from the data that, at the 1st month of fruit harvest that all treatments significantly increased fruit number/tree, compared with control during the two studied seasons. The best treatment was 60 bud/tree plus spraying 5 ml/L of jasmonic oil, where ripe fruit No. recorded 124.87 and 130.33, compared with 92.20 and 95.87 for control, respectively, during 2020 and 2021 seasons.

As regard to the 2nd month of fruit harvest there were no constant of different treatments during the two studied seasons, while at the 3rd month of fruit harvest all treatments significantly increased ripe fruit No. compared with control, during the two studied seasons. The best treatment was both 48 bud/tree plus 3 ml/L and

60 bud/tree plus 3 ml/L which recorded 70.67 and 73.00 and 73.13 and 71.00, respectively, during 2020 and 2021, compared with 49.87 and 49.33 for control.

Table 2. Effect of spraying jasmonic oil and bud load/tree on ripe fruit number/tree of Abiad Aswan fig cv. during 2020 and 2021 seasons

Jasmonic oil conc. (B) Bud load (A)	1 st season 2020				2 nd season 2021			
	Fruit number/tree at the 1 st month of fruit harvest							
	Jasmonic oil conc.				Jasmonic oil conc.			
	0	1.5	3 ml/L	Mean (A)	0	1.5	3 ml/L	Mean (A)
36	92.20	115.87	115.67	107.91	95.87	117.00	117.00	109.96
48	95.00	120.50	117.67	111.06	109.67	121.67	116.67	116.00
60	125.00	129.00	129.87	127.96	121.33	122.00	130.33	124.56
Mean (B)	104.07	121.79	121.07		108.96	120.22	121.33	
LSD 5%	A= 3.29	B= 1.36	AB= 3.79		A= 3.99	B= 2.96	AB= 5.73	
Fruit number/tree at the 2nd month of fruit harvest								
36	110.67	115.33	127.67	117.89	110.00	142.33	122.67	125.00
48	113.33	114.33	129.00	118.89	113.33	114.50	130.00	119.28
60	96.67	141.17	120.00	119.28	112.67	118.00	125.33	118.67
Mean (B)	106.89	123.61	125.56		112.00	124.94	126.00	
LSD 5%	A= 4.24	B= 2.32	AB= 5.33		A= 1.80	B= 2.31	AB= 3.71	
Fruit number/tree at the 3rd month of fruit harvest								
36	49.87	69.87	70.90	63.54	49.33	64.00	67.00	60.11
48	58.33	69.20	70.67	66.07	54.67	64.33	73.00	64.00
60	52.00	64.33	73.13	66.07	59.83	65.00	71.00	65.28
Mean (B)	53.40	67.80	71.57		54.61	64.44	70.33	
LSD 5%	A= 2.74	B= 1.37	AB= 3.33		A= 2.99	B= 3.19	AB= 5.38	
Total fruit number/tree at the end of growth season								
36	252.74	301.07	314.24	199.02	255.20	223.33	306.67	260.73
48	208.91	304.03	317.34	276.76	277.60	242.50	319.67	279.92
60	273.67	207.50	332.30	286.00	181.16	302.00	223.66	214.27
Mean (B)	244.11	270.87	244.11		237.99	255.94	283.33	
LSD 5%	A= 10.52	B= 4.99	AB= 12.58		A= 5.70	B= 3.98	AB= 7.96	

As regard to total fruit No./tree at the end of growth season, only 3 ml/L jasmonic oil treatment with bud load level of 36 bud/tree or 48 bud/tree, significantly increased total fruit No./tree, where the best treatment is 48 bud/tree plus spraying with 3 ml/L jasmonic acid during the two studied seasons, where total fruit No./tree recorded 317.34 and 319.67 compared with 253.74 and 255.20 for control, respectively in 2020 and 2021 seasons. These results are in agreement with Hamid Zare 2021.

3. Effect of spraying jasmonic oil and bud load/tree on number of unripe fruits remaining tree at the end of growth season of Abiad Aswan fig cv. during 2020 and 2021 seasons

Data presented in Table 3 showed the effect of spraying jasmonic oil and bud load/tree on No. of unripe fruits remaining tree at the end of growth season of Abiad Aswan fig cv. during 2020 and 2021 seasons. From this table we noticed

that spraying jasmonic oil at 1.5 ml/L or 3 ml/L plus bud load at level of both 48 bud/tree or 60 bud/tree, significantly reduced number of unripe fruits remaining tree at the end of growth season of Abiad Aswan fig cultivar, compared with control during the two studied seasons.

The best treatment was spraying 3 ml/L of jasmonic oil plus 60 bud/tree where the No. of unripe fruit remaining tree recorded 19.00 and 19.20 compared with 38.33 and 36.00 for controls, respectively, during 2020 and 2021 season. These results are in agreement with Hamid Zare 2021.

Table 3. Effect of spraying jasmonic oil and bud load/tree on number of unripe fruits remaining tree at the end of growth season of Abiad Aswan fig cv. during 2020 and 2021 seasons

Jasmonic oil conc. (B)	1 st season 2020				2 nd season 2021			
	Jasmonic oil conc.				Jasmonic oil conc.			
Bud load (A)	0	1.5	3 ml/L	Mean (A)	0	1.5	3 ml/L	Mean (A)
36	38.33	38.00	34.67	37.00	36.00	34.67	35.80	35.49
48	26.00	26.00	19.67	23.89	37.33	24.83	19.47	27.21
60	42.44	24.00	19.00	28.44	27.53	24.10	19.20	23.61
Mean (B)	35.56	29.33	24.44		33.62	27.87	24.82	
LSD 5%	A= 5.16	B= 2.13	AB= 5.94		A= 2.34	B= 1.51	AB= 3.15	

4. Effect of jasmonic oil and bud load/tree on physical characteristics of Abiad Aswan fig cv. fruits

Data concerning some physical properties of Abiad Aswan fig fruit as influenced by spraying jasmonic oil and bud load per tree and interaction between them during 2020 and 2021 seasons were presented in Tables 4 to 6. It is obvious from the data that the results took similar trend during the two studied seasons.

Fruit weight (g):

Results shown in Table (4), at the first month of fruit harvest, spraying jasmonic oil at conc. of 1.5 ml/L or 3 ml/L alone or plus different bud load levels (48 or 60 bud/tree) increased fruit weight.

Also, bud level (60 bud/tree) without spraying jasmonic oil, significantly increased fruit weight. Where its values recorded 28.47 and 28.67 g compared with 26.20 and 26.53 g for controls, respectively in 2020 and 2021 seasons.

At the second month of fruit harvest, data showed that all spraying jasmonic oil alone and treatment of bud load at 60 bud/tree alone, significantly increased fruit weight (g), compared with controls during the two studied seasons.

Table 4. Effect of spraying jasmonic oil and bud load/tree on fruit weight (g) at 1st, 2nd and 3rd harvest of Abiad Aswan fig cv. during 2020 and 2021 seasons

Jasmonic oil conc. (B) Bud load (A)	1 st season 2020				2 nd season 2021			
	At the 1 st month of fruit harvest							
	Jasmonic oil conc.				Jasmonic oil conc.			
	0	1.5	3 ml/L	Mean (A)	0	1.5	3 ml/L	Mean (A)
36	26.20	26.87	27.53	26.87	26.53	27.10	28.33	27.32
48	25.93	27.73	28.40	27.36	25.60	27.93	29.13	27.56
60	28.47	27.40	26.67	27.51	28.67	28.90	27.33	28.30
Mean (B)	26.87	27.33	27.52		26.93	27.98	28.27	
LSD 5%	A= 1.10	B= 1.39	AB= 2.24		A= 0.89	B= 1.09	AB= 1.77	
At the 2nd month of fruit harvest								
36	16.37	17.87	17.40	17.21	16.93	18.00	17.67	17.53
48	16.50	17.60	17.73	17.28	16.73	17.90	18.27	17.63
60	18.07	16.30	17.60	17.32	18.50	16.87	17.97	17.78
Mean (B)	16.98	17.26	17.58		17.39	17.59	17.97	
LSD 5%	A= 1.01	B= 0.73	AB= 1.43		A= 1.03	B= 0.63	AB= 1.35	
At the 3rd month of fruit harvest								
36	14.40	13.87	14.47	14.24	14.80	15.40	15.60	15.27
48	14.20	14.80	14.23	14.41	15.13	15.73	15.53	15.47
60	13.60	15.07	14.77	14.48	14.67	16.40	16.33	15.80
Mean (B)	14.07	14.39	14.68		14.87	15.78	15.89	
LSD 5%	A= 0.76	B= 0.50	AB= 1.03		A= 1.01	B= 0.81	AB= 1.52	

Concerning the interaction effect between spraying jasmonic oil and bud load/tree, the results indicated that best treatments were spraying 3 ml/L of jasmonic oil plus bud load level of 48 or 60 bud/tree, where fruit weight reached 17.73 and 18.27 g and 17.60 and 17.97 g compared with 16.37 and 16.93 g, for controls respectively, during 2020 and 2021 seasons.

At the 3rd month of fruit harvest, it is obvious that the interaction between spraying jasmonic oil at concentrations of 1.5 ml/L or 3 ml/L and bud load/tree at levels of 48 or 60 bud/tree, caused an increment on weight of Abiad Aswan fig fruits, during the two studied seasons.

5. Effect of jasmonic oil and bud load/tree on fruit diameter (mm) on monthly fruit diameter of Abiad Aswan fig cv. during 2020 and 2021 seasons

From data presented at the 1st month of harvest we can notice that all treatments with jasmonic oil concentrations 1.5 or 3 ml/L under all different bud load levels slightly increased fruit diameter, compared with control during the two studied seasons, while spraying jasmonic oil at concentration of 1.5 or 3 ml/L under bud load level of 60 bud/tree significantly increased fruit diameter. Where fruit diameter reached 36.10 and 35.77 mm and 35.20 and 36.83 mm compared with control which reached 31.37 and 31.80 cm, respectively in 2020 and 2021 seasons (Table 5).

Table 5. Effect of spraying jasmonic oil and bud load/tree on fruit diameter (mm) of Abiad Aswan fig cv. during 2020 and 2021 seasons

Jasmonic oil conc. (B) Bud load (A)	1 st season 2020				2 nd season 2021			
	At the 1 st month of fruit harvest							
	Jasmonic oil conc.				Jasmonic oil conc.			
	0	1.5	3 ml/L	Mean (A)	0	1.5	3 ml/L	Mean (A)
36	31.37	31.53	32.77	31.89	31.80	35.77	33.53	33.70
48	33.37	33.83	33.30	33.50	33.70	34.23	34.17	34.03
60	35.33	36.10	35.20	35.54	35.70	35.77	36.83	36.10
Mean (B)	33.36	33.82	33.77		33.73	35.26	34.84	
LSD 5%	A= 2.05	B= 1.10	AB= 2.56		A= 1.53	B= 1.24	AB= 2.31	
At the 2 nd month of fruit harvest								
36	31.20	34.47	31.20	31.97	33.03	32.63	33.73	33.13
48	32.20	33.67	32.27	32.71	32.77	33.80	32.93	33.17
60	32.30	32.83	33.63	33.47	33.10	34.27	33.30	33.56
Mean (B)	32.12	33.66	32.37		32.97	33.57	33.32	
LSD 5%	A= 0.79	B= 1.45	AB= 2.06		A= 0.71	B= 1.07	AB= 1.66	
At the 3 rd month of fruit harvest								
36	12.37	13.27	12.77	12.80	13.37	14.77	13.67	13.93
48	12.50	14.80	13.37	13.56	13.60	15.09	13.80	14.16
60	13.13	14.37	13.50	13.67	13.97	14.83	14.20	14.33
Mean (B)	12.67	14.14	13.21		13.64	14.90	13.89	
LSD 5%	A= 2.25	B= 0.67	AB= 2.43		A= 0.65	B= 0.82	AB= 1.33	

At the second month of harvest there were no constant effects of treatments during the two studied seasons.

It is obvious from such data that, at the 3rd month of harvest, that all treatment slightly increased fruit diameter compared with control, during the two studied seasons. The best treatment was 48 bud/tree plus spraying 1.5 ml/L of jasmonic oil, which significantly increased fruit diameter, where its value recorded 15.80 and 15.09 mm compared with 12.3 and 13.37 mm, respectively, in 2020 and 2021 seasons. These results are in agreement with Shaheen *et al.* 2018, Hamid Zare 2021 and Hussein *et al.* 2023.

Fruit height

Data presented in Table 6 showed the effect of jasmonic oil and bud load/tree on fruit height (mm) of Abiad Aswan fig cv. during 2020 and 2021, it is clear from such table that all treatments increased fruit height (mm) during the three times of harvest, compared with controls, during the two studied seasons.

The effect of jasmonic oil on physical fruit properties may be due to its components such Cis-Jasmonae, Linalool, Benzoic acid, Benzyl Benzoate, etc. Which act as natural growth regulators also pruning bud load/tree, which caused balance between vegetative and fruiting growth.

These results are in agreement with Ahmed *et al.* 2016, Shaheen *et al.* 2018, Ali and El-Zayat 2019 and Mostafa *et al.* 2020.

Table 6. Effect of spraying jasmonic oil and bud load/tree on fruit height (mm) of Abiad Aswan fig cv. during 2020 and 2021 seasons

Jasmonic oil conc. (B) Bud load (A)	1 st season 2020				2 nd season 2021			
	At the 1 st month of fruit harvest							
	Jasmonic oil conc.				Jasmonic oil conc.			
	0	1.5	3 ml/L	Mean (A)	0	1.5	3 ml/L	Mean (A)
36	41.47	44.53	43.57	43.19	41.43	44.33	43.60	43.12
48	45.40	45.83	45.07	45.43	44.27	44.33	44.63	44.01
60	45.07	45.60	48.00	46.22	44.70	43.13	43.93	44.32
Mean (B)	43.98	45.32	45.54		43.47	43.93	44.06	
LSD 5%	A= 1.97	B= 2.41	AB= 3.92		A= 0.39	B= 0.88	AB= 1.30	
At the 2nd month of fruit harvest								
36	40.63	43.73	43.53	42.63	42.47	43.73	43.50	43.23
48	45.73	41.33	44.40	43.82	43.17	43.73	44.33	43.74
60	43.53	47.13	44.50	45.06	43.63	44.07	44.00	43.90
Mean (B)	43.30	44.07	44.14		43.09	43.84	43.94	
LSD 5%	A= 1.73	B= 1.61	AB= 2.85		A= 1.04	B= 0.87	AB= 1.60	
At the 3rd month of fruit harvest								
36	10.70	13.57	14.13	12.80	11.97	13.46	13.57	13.00
48	11.60	15.13	14.90	13.88	13.13	13.87	13.20	13.40
60	12.23	14.23	15.33	13.93	13.80	13.40	14.70	13.97
Mean (B)	11.51	14.31	14.79		12.97	13.58	13.82	
LSD 5%	A= 0.98	B= 0.98	AB= 1.69		A= 0.83	B= 0.67	AB= 1.56	

Data presented in Tables 7, 8, 9 and 10 showed the effect of jasmonic oil and bud load per tree and interaction between them on monthly chemical characteristics of Abiad Aswan fig fruits.

Table 7. Effect of spraying jasmonic oil and bud load/tree on T.S.S. (%) in ripe fruits of Abiad Aswan fig cv. during 2020 and 2021 seasons.

Jasmonic oil conc. (B) Bud load (A)	1 st season 2020				2 nd season 2021			
	At the 1 st month of fruit harvest							
	Jasmonic oil conc.				Jasmonic oil conc.			
	0	1.5	3 ml/L	Mean (A)	0	1.5	3 ml/L	Mean (A)
36	16.34	17.94	16.65	16.98	15.60	15.93	17.93	16.49
48	17.22	17.79	19.72	18.24	17.10	20.50	18.60	18.73
60	16.00	18.27	19.86	18.24	16.20	19.97	17.90	18.02
Mean (B)	16.72	18.00	18.74		16.30	18.80	18.14	
LSD 5%	A= 0.68	B= 0.31	AB= 0.80		A= 0.66	B= 0.66	AB= 1.14	
At the 2nd month of fruit harvest								
36	17.58	17.87	19.98	18.48	17.10	17.33	21.05	18.49
48	20.82	21.65	21.01	21.16	20.10	21.13	21.58	20.94
60	18.88	20.72	20.32	19.97	17.80	20.92	20.69	19.80
Mean (B)	19.09	20.08	20.43		18.33	19.79	21.11	
LSD 5%	A= 0.63	B= 0.42	AB= 0.86		A= 0.78	B= 0.70	AB= 1.26	
At the 3rd month of fruit harvest								
36	17.17	20.09	21.09	19.45	10.40	22.51	21.94	20.29
48	20.09	21.47	21.48	21.32	21.14	22.87	24.18	22.73
60	17.55	20.31	20.62	19.49	17.20	23.41	24.31	21.64
Mean (B)	18.57	20.62	21.06		18.25	22.93	23.48	
LSD 5%	A= 0.56	B= 0.49	AB= 0.89		A= 0.47	B= 0.75	AB= 1.15	

It is obvious from data in Table 7 that spraying jasmonic oil at concentration of 1.5 or 3 ml/L under bud load levels at 48 or 60 bud/tree significantly increased total soluble solids percentage during the three-monthly harvest times, this compared with control during 2020 and 2021 seasons.

In addition, data in Tables 8 and 9 indicated that reducing and total sugars percentage significantly responded to the interaction between the two studied factors. Also, it is obvious from the data that the results took similar trend during the two studied seasons.

Table 8. Effect of spraying jasmonic oil and bud load/tree on reducing sugars (%) in ripe fruits of Abiad Aswan fig cv. during 2020 and 2021 seasons

Jasmonic oil conc. (B)	1 st season 2020				2 nd season 2021			
	At the 1 st month of fruit harvest							
	Jasmonic oil conc.				Jasmonic oil conc.			
Bud load (A)	0	1.5	3 ml/L	Mean (A)	0	1.5	3 ml/L	Mean (A)
36	14.56	15.02	14.98	14.85	14.75	14.99	14.85	14.86
48	15.20	16.09	15.54	15.61	14.93	16.05	15.23	15.41
60	14.71	16.00	16.45	15.72	14.88	15.60	17.02	15.83
Mean (B)	14.82	15.52	15.84		14.85	15.28	15.97	
LSD 5%	A= 0.51	B= 0.38	AB= 0.73		A= 0.35	B= 0.34	AB= 0.60	
At the 2 nd month of fruit harvest								
36	14.06	14.45	14.80	14.44	14.16	14.64	17.02	15.27
48	15.10	15.99	15.81	15.64	14.40	16.15	16.94	15.83
60	14.56	16.18	16.55	15.76	16.07	16.89	17.16	16.70
Mean (B)	14.57	15.54	15.72		14.88	15.90	17.04	
LSD 5%	A= 0.25	B= 0.23	AB= 0.41		A= 0.43	B= 0.56	AB= 0.90	
At the 3 rd month of fruit harvest								
36	15.33	17.18	17.65	16.72	14.43	17.91	17.37	16.57
48	16.58	18.40	18.79	17.92	14.73	19.41	18.81	17.65
60	15.41	19.31	19.36	18.03	17.01	18.21	19.30	18.17
Mean (B)	15.78	18.30	18.60		15.39	18.31	18.69	
LSD 5%	A= 0.21	B= 0.38	AB= 0.58		A= 0.65	B= 0.43	AB= 0.89	

On contrary the data in Table 10 reported that during the three-harvesting monthly, total acidity significantly reduced as affected by both jasmonic oil treatments or bud load/tree treatments and interaction between them. The lowest T.A % values were 0.13 and 0.17 and 0.18% for 60 bud/tree without spraying jasmonic oil, respectively at the 1st and the 2nd months of fruit harvest compared with 0.25 and 0.25% and 0.23 and 0.22% respectively at the first and the second harvest months during the two studied seasons.

These results may be due to the effect of bud load/tree and jasmonic oil on improving vegetative growth which is reflected on fruit quality of Abiad Aswan fig fruit. Results are in agreement with Shaheen *et al.* 2018, Ali and El-Zayat 2019, Mostafa *et al.* 2020 and Hamid Zare 2021.

Table 9. Effect of spraying jasmonic oil and bud load/tree on total sugars (%) in ripe fruits of Abiad Aswan fig cv. during 2020 and 2021 seasons

Jasmonic oil conc. (B) Bud load (A)	1 st season 2020				2 nd season 2021			
	At the 1 st month of fruit harvest							
	Jasmonic oil conc.				Jasmonic oil conc.			
	0	1.5	3 ml/L	Mean (A)	0	1.5	3 ml/L	Mean (A)
36	15.34	15.68	15.59	15.54	15.64	15.77	15.96	15.79
48	16.17	17.01	16.46	16.55	15.86	16.81	16.02	16.23
60	15.76	17.17	17.92	16.65	15.82	16.44	17.81	16.69
Mean (B)	15.76	16.43	16.54		15.77	16.08	16.86	
LSD 5%	A= 0.42	B= 0.32	AB= 0.61		A= 0.51	B= 0.37	AB= 0.73	
At the 2 nd month of fruit harvest								
36	15.08	15.57	15.91	15.52	15.48	18.01	15.83	16.44
48	15.93	16.68	16.79	16.47	15.58	16.94	18.14	16.89
60	15.71	17.08	17.52	16.77	17.00	17.98	17.83	17.61
Mean (B)	15.57	16.44	16.74		16.02	18.04	16.87	
LSD 5%	A= 0.42	B= 0.31	AB= 0.61		A= 0.51	B= 0.51	AB= 0.88	
At the 3 rd month of fruit harvest								
36	15.90	17.83	18.72	17.48	15.63	18.98	18.00	17.54
48	17.28	19.67	19.19	18.71	15.82	20.11	19.55	18.49
60	15.92	20.23	20.43	18.86	17.61	18.91	19.93	18.81
Mean (B)	16.36	19.24	19.45		16.35	19.15	19.35	
LSD 5%	A= 0.34	B= 0.36	AB= 0.61		A= 0.76	B= 0.56	AB= 1.09	

Table 10. Effect of spraying jasmonic oil and bud load/tree on total acidity (%) in ripe fruits of Abiad Aswan fig cv. during 2020 and 2021 seasons

Jasmonic oil conc. (B) Bud load (A)	1 st season 2020				2 nd season 2021			
	At the 1 st month of fruit harvest							
	Jasmonic oil conc.				Jasmonic oil conc.			
	0	1.5	3 ml/L	Mean (A)	0	1.5	3 ml/L	Mean (A)
36	0.25	0.24	0.18	0.22	0.25	0.24	0.18	0.22
48	0.18	0.25	0.15	0.19	0.19	0.25	0.15	0.20
60	0.13	0.26	0.18	0.19	0.13	0.25	0.19	0.19
Mean (B)	0.19	0.25	0.17		0.19	0.25	0.18	
LSD 5%	A= 0.03	B= 0.01	AB= 0.03		A= 0.01	B= 0.01	AB= 0.02	
At the 2 nd month of fruit harvest								
36	0.23	0.27	0.25	0.25	0.22	0.27	0.24	0.24
48	0.19	0.26	0.19	0.21	0.19	0.23	0.19	0.20
60	0.17	0.19	0.19	0.18	0.18	0.18	0.19	0.18
Mean (B)	0.20	0.24	0.21		0.19	0.22	0.20	
LSD 5%	A= 0.01	B= 0.01	AB= 0.02		A= 0.02	B= 0.02	AB= 0.03	
At the 3 rd month of fruit harvest								
36	0.22	0.26	0.17	0.20	0.24	0.22	0.18	0.21
48	0.18	0.23	0.17	0.19	0.18	0.19	0.20	0.19
60	0.18	0.16	0.18	0.19	0.14	0.18	0.16	0.16
Mean (B)	0.19	0.22	0.17		0.19	0.19	0.19	
LSD 5%	A= 0.01	B= 0.01	AB= 0.02		A= 0.03	B= 0.02	AB= 0.04	

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تأثير رش زيت الياسمين وحمل البراعم لكل شجرة على المحصول وجودة الثمار لصنف التين "أبيض أسوان"

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الملخص

أجريت هذه الدراسة خلال موسمي 2020، 2021، لمعرفة تأثير رش زيت الياسمين (1.5 مل/لتر أو 3 مل/لتر) مرة واحدة في الأسبوع الثاني من شهر مايو، والتقليم الشتوي مع ترك المستويات الثلاثة لحمل البراعم/ شجرة عند 36، 48، 60 برعم/شجرة وتأثيرها على المحصول وجودة الثمار لصنف التين "أبيض أسوان".

تم اجراء المعاملات على أشجار التين بالمزرعة البحثية بقسم الفاكهة بكلية الزراعة - جامعة أسيوط. ونفذت التجربة بتصميم القطع المنشقة وفق تصميم القطاعات الكاملة العشوائية بثلاث مكررات وبواقع شجرة واحدة لكل مكررة . حيث اعتبرت حمولة البراعم القطاعات كاملة العشوائية (العامل A) whole plot واعتبرت تركيزات زيت الياسمين القطع المنشقة كاملة العشوائية (العامل B) split plot

وبناء على النتائج المتحصل عليها فقد وجد أن جميع المعاملات أدت إلى تحسن في المحصول والصفات الفيزيائية والكيميائية لصنف التين "أبيض أسوان".