

## **COMPARATIVE STUDY ON GROWTH AND FRUITING OF SOME PEACH CULTIVARS GROWN IN TWO DIFFERENT LOCATIONS.**

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### **ABSTRACT**

This investigation was carried out during two successive seasons (2004 and 2005) to evaluate some peach cultivars namely "Florda Prince", "Florda Gold" and "Early Grand" at two locations; El-Wahat El-Baharaia (Sandy loam Soil) and El-Badrashin (Heavy Clayey Soil), Giza, Egypt. This evaluation includes trees canopy characteristics, phynological phases, fruit set, fruit growth and development; fruit physical and chemical characteristics.

Data obtained could be summarized as follows: the tree height of all cultivars were significantly higher in the second location than the first one in both seasons. The tree circumference of studied cultivars was not significantly different in both locations. The trunk diameter of the studied cultivars differed significantly in the two locations and the second one was higher than the first in this respect. Wherever, the first location was earlier in the bud burst, beginning of flowering, fruit set and harvesting of yield than the second location. While, the percentage of leaf buds were significantly different between all cultivars in both seasons, The percentage of leaf buds were the highest in "Florda Gold" (32.8 – 35.4 %) but "Early Grand" gave the lowest average percentage (30.4 – 30.6 %) in both studied seasons respectively, in the first location the percentage was the highest in "Florda Prince" (33.9 – 41.7 %) but "Early Grand" gave the lowest average percentage (30.2 – 38.2 %) in both studied seasons respectively. The highest floral buds in the "Early Grand" cultivar (60.6 – 55.0 %), while "Florda Prince" gave the lowest average percentage (59.0 – 52.7 %) in both seasons respectively. These results were obtained in the first location. But in the second location had, the percentage of floral buds were the highest in "Early Grand" (57.6 – 51.6 %) but "Florda Gold" had the lowest average percentage (50.7 – 49.5 %). The fruit set percentage of studied cultivars in both locations was not significantly different. On the other hand, the increase in both polar and equatorial diameters in the second location were higher than the first location. Regarding the fruit quality, "Early Grand" cultivar gave the highest fruit weight and "Florda Prince" showed the least values in this respect in both locations during both seasons. Thus, the second location was higher than the first one in this respect. Also, the average yield in the first location was higher than the second locations. Moreover, the data indicated that, the difference in T.S.S. % of the studied cultivars was not significant between the two locations. The percentage of total acidity decreased gradually until maturity stage. "Early Grand" cultivar gave the highest values (0.80 and 0.82% in the first location & 0.73 and 0.71% in the second location), while "Florda Prince" cultivar showed the lowest values (0.55 and 0.58% in the first location & 0.55 and 0.53% in the second location) during both seasons respectively. On the other hand, there was significant differences in Total Acidity among the three cultivars and between the two locations. Fruit firmness showed non significant differences between both locations but the differences were among the three cultivars. While, "Early Grand" cultivar showed the highest value of fruit firmness in mature fruits and the least firmness was obtained from "Florda Gold" cultivar.

## INTRODUCTION

Peach is considered one of the most important fruits in the world and also in Egypt. The total cultivated acreage of peach trees in Egypt is approximately 79199 Feddan, most of them located in North Sinai, and Dakahlia Governorate (Ministry of Agriculture, in 2004). Some new cultivars of peach were recently introduced during the 1981 – 1990 by the A.D.S. project and also by some peach growers and distributed on different locations in Egypt, whereas some of these cultivars were not adequately well adapted to different climatic conditions of different locations (Baker *et al*, 1985).

Therefore, the response of vegetative growth, flowering, fruit set, and fruit maturation under different locations clearly varied. Many authors confirmed this concept, (Layne, 1984 & Ali, 1988 & Oki, 1993 & Rouse *et al*, 1995 & Crocker & Sherman, 1996 & El-Shakh, 2001). Also, El-Etreby (1996) found that fruits diameter of Florda sun, Early Grand and Desert Gold cultivars were 4.31 – 4.10 – 3.82 cm respectively. Also, variability in different fruit physical and chemical characteristics were mentioned by many workers ( Okie *et al*, 1992, Pavel & Dejong, 1993 and Brooks *et al*, 1994).

The aim of the present work is to determine and evaluate the range of adaptation, growth behavior, flowering, fruit setting and fruit maturation of three peach cultivars under different environmental conditions.

## MATERIALS AND METHODS

This investigation was carried out during two successive 2004 and 2005 seasons to evaluate some peach cultivars namely "Florda Prince", "Florda Gold" and "Early Grand"; under two locations in El-Wahat El-Baharaia (Sandy loam Soil) and El-Badrashin (Heavy Clayey Soil), Giza, Egypt. The trees under study were 12 years old; planted at (5 x 5 m) and budded on Nemagard rootstock.

Tree height, tree circumference and diameter of the trunk on 20 cm above the ground surface were recorded. Ten shoots (one year old) from each tree were randomly selected, labeled on the first week of January and the percentage of floral and vegetative buds were calculated. At the same time, bud burst, beginning of flowering, fruit set, harvest dates and leaf fall were recorded. The total number of flowers at full bloom were determined randomly in 20 shoots per each tree. The initial number of setted fruitlets was also counted at the end of the blooming period. Number of fruits were recorded at one week intervals till the time of harvest for each cultivar in the tow seasons. The fruit set percentage was determined according the following equation:

$$\text{Fruit set (\%)} = \frac{\text{No. of setting fruit lets}}{\text{No. of counted flowers}} \times 100$$

Twenty fruitlets per each tree were labeled one month after full bloom. Both cross and polar diameters were measured periodically at one month interval till harvesting date, (Westwood, 1978). The fruits were picked at maturity stage and weight of the total yield from each tree was determined.

Average fruit weight was determined by weighting sample of 10 fruits from each cultivar and the average fruit weight was calculated. Fruit firmness was expressed Lb/inch<sup>2</sup> by using U.C. firmness tester. Firmness of five fruits was measured and the average was calculated. Total acidity was estimated in terms of anhydrous malic acid percentage after titration against 0.1 N sodium hydroxide using phenolphthalein as an indicator (A.O.A.C. 1985). T.S.S% was estimated using a hand refractometer.

## **RESULTS AND DISCUSSION**

### **1-Tree dimensions:**

It is clear from Table (1) that, the trees height, trunk diameter, circumference, leaf length and leaf width varied considerably within the studied cultivars during the two seasons in both locations El-Wahat El-Baharaia, and El-Badrashin, Giza.

The height of trees at El-Wahat El-Baharaia in "Early Grand" cultivar was (2.20 – 2.60 m) followed by "Florda Prince" (2.06 – 2.30 m), while "Florda Gold" cultivar gave the lowest one in this respect (1.96 – 2.08 m) in both studied seasons respectively. But in the second location: "Early Grand" cultivar gave the lowest one in this respect (2.46 – 2.60 m) and "Florda Gold" was the highest one (3.03 – 3.26 m) while "Florda Prince" cultivar came in between (2.59 – 2.72 m) in the two studied seasons respectively. Generally, no significant difference, were observed in "Florda Prince" cultivar as compared with "Florda Gold" and "Early Grand" cultivars but the height of "Early Grand" tree was significantly higher than "Florda Gold" tree. While, in 2005 season Table (1) shows significant differences between all cultivars in the two locations.

On the other hand, the height of trees in the second location were significantly higher than the first location in both studied seasons. Also, Table (1) showed that, in the second location trees of "Florda Gold" cultivar were significantly larger (5.44 – 5.92 m) than "Early Grand" cultivar (4.46 – 4.86 m) in both seasons respectively. But no significant difference was observed in "Florda Prince" cultivar compared with "Florda Gold" and "Early Grand" cultivars. Wherever, no significant difference between all cultivars in the first location during the two successive seasons in this respect. This data also indicated that, the tree circumference of the studied cultivars showed no significant difference between the two locations. A similar trend was obtained with diameter of trunk, as shown from Table (1) that, the diameter of trunk had not significant difference between "Florda Prince" and "Early Grand" cultivars, but it was significant difference between "Florda Prince" and "Florda Gold" cultivars, also, "Florda Gold" and "Early Grand" cultivars in the two locations during both studied seasons. The trunk diameter was the highest in "Early Grand" cultivar (19.60 – 19.90 cm) and "Florda Gold" gave the lowest one (17.50 – 17.90 cm), while, "Florda Prince" cultivar came in between in this respect (19.50 – 19.60 cm) during 2004 and 2005 seasons respectively; These results in the first location. But in the second location, "Early Grand" cultivar gave the lowest one in this respect (22.60 – 23.04 cm) followed by

"Florda Prince" (23.86 – 24.08 cm) and "Florda Gold" cultivar was the highest one in this respect (26.32 – 26.76 cm) during both studied seasons respectively. Generally, the trunk diameter of the studied cultivars showed significant differences between the two locations and the second location was higher than the first location in this respect.

Concerning, the leaf length, it can be noticed from Table (1) that, "Early Grand" cultivar had the longest leaf during both seasons (17.60 and 17.30 cm, in the first location & 18.50 and 17.50 cm, in the second location) respectively, followed by "Florda Gold" cultivar (16.70 and 16.90 cm, in the first location & 18.10 and 17.00 cm, in the second location) respectively, while "Florda Prince" cultivar appeared to have the smallest leaf length (13.70 and 13.80 cm, in the first location & 16.00 and 15.50 cm, in the second location) during both seasons respectively. Also, it is evident from Table (1) that, the leaf width showed significant differences between all cultivars in the two seasons. While, "Florda Gold" cultivar was the highest values (3.20 and 2.90 cm, in the first location & 3.80 and 3.50 cm, in the second location) during both seasons respectively, but the least width was obtained from "Early Grand" cultivar (2.40 and 2.20 cm, in the first location & 2.80 and 2.90 cm, in the second location) in both seasons respectively. Thus, the second location was higher than the first location in this respect.

**Table (1): Tree and leaf dimensions for some Peach cultivars in both locations during 2004 and 2005 seasons.**

Locations		El-wahat El-Baharaia				El-badrashin			
Cultivars		Florda Prince	Florda Gold	Early Grand	L.S.D 5%	Florda Prince	Florda Gold	Early Grand	L.S.D 5%
Subject	Cultivars								
Tree height (m)	2004	2.06	1.96	2.20	0.13	2.59	3.03	2.46	0.47
	2005	2.30	2.08	2.60	0.19	2.72	3.26	2.60	0.47
Circumference (m)	2004	4.21	4.63	4.61	0.67	4.71	5.44	4.46	0.84
	2005	4.38	4.89	4.78	0.57	4.92	5.92	4.86	0.93
trunkdiameter (cm)	2004	19.50	17.50	19.60	0.93	19.60	17.90	19.90	0.96
	2005	23.86	26.32	22.60	0.20	24.08	26.76	23.04	2.04
leaf length (cm)	2004	13.70	16.70	17.60	1.37	16.00	18.10	18.50	1.34
	2005	13.80	16.90	17.30	1.69	15.50	17.00	17.50	1.55
leaf width (cm)	2004	2.70	3.20	2.40	0.32	3.20	3.80	2.80	0.23
	2005	2.70	2.90	2.20	0.39	3.10	3.50	2.90	0.26

**2-Phenological phases:**

Concerning the phenological phases and its extent of some peach cultivars data are presented in Table (2 ). The obtained results showed an obvious varietals difference of bud burst. In the first location: "Florda Prince" cultivars was the earliest one in this respect. While "Florda Gold" cultivar ranked last. In the second location: "Early Grand" cultivar was the earliest one in this respect and "Florda Gold" cultivar was the last one. So, it is concluded that, the first location was earlier in this respect.

The beginning of flowering for different cultivars of both locations varied from year to year. In 2004 season "Florda Prince" and "Early Grand" cultivars were the same (27/1) but "Florda Gold" was latest one (12/2), but in 2005 season "Early Grand" cultivar was the earliest, (January 25<sup>th</sup>), while "Florda Gold" cultivar was the latest one, (February 13<sup>th</sup>). These results recorded in

the first location. While in the second location, "Early Grand" cultivar was earlier by 17 – 18 days than the latest one "Florda Gold" cultivar in 2004 and 2005 seasons respectively. Thus, the second location was later than the first location in this respect. Concerning date of fruit set, the obtained data showed that, "Early Grand" cultivar was the earliest one in this respect which were February 19<sup>th</sup> and February 15<sup>th</sup> during 2004 and 2005 seasons respectively, in the first location and February 25<sup>th</sup> & February 26<sup>th</sup> in the second location respectively. While the latest one was "Florda Gold" (6<sup>th</sup> , 4<sup>th</sup> March) in the first location during 2004 and 2005 seasons respectively, but in the second location, the latest one was "Florda Gold" cultivars March 11<sup>th</sup> during both seasons.

Generally speaking, the first location was earlier than the second location in this respect.

In the first location, "Florda Prince" cultivar had the earliest harvest date (April 29<sup>th</sup> – April 25<sup>th</sup>) and the latest one in this respect was "Florda Gold" cultivar (18<sup>th</sup> – 21<sup>st</sup> May) during 2004 and 2005 seasons respectively. While, the second location, Florda Prince and Early Grand cultivars had similar results in these trend (8<sup>th</sup> , 6<sup>th</sup> May and May 7<sup>th</sup> ), but "Florda Gold" cultivar had harvest date (May 25<sup>th</sup> and May 29<sup>th</sup> ) in 2004 and 2005 seasons respectively. Data also, indicated that, the first location was earlier one in maturity.

These results are in harmony with those reported by Ali, 1988 and El-Etraby, 1996.

**Table (2): Dates of phenological phases for some Peach cultivars in both locations during 2004 &2005 seasons.**

Locations	Cultivars	El-wahat El-Baharaia			El-badrashin		
		Florda Prince	Florda Gold	Early Grand	Florda Prince	Florda Gold	Early Grand
Bud burst	2004	2/1	15/1	3/1	6/1	19/1	5/1
	2005	3/1	14/1	4/1	8/1	20/1	6/1
Beginning of Flowering	2004	27/1	12/2	27/1	2/2	18/2	1/2
	2005	30/1	13/2	25/1	3/2	20/2	2/2
Full Bloom	2004	11/2	25/2	10/2	17/2	2/3	16/2
	2005	13/2	24/2	7/2	18/2	1/3	17/2
Fruit Set	2004	20/2	6/3	19/2	26/2	11/3	25/2
	2005	22/2	4/3	15/2	27/2	11/3	26/2
Harvesting Yield	2004	29/4	18/5	1/5	8/5	25/5	6/5
	2005	25/4	21/5	30/4	7/5	29/5	7/5

### 3-Buds Types and Fruit set:

It is evident from Table (3) that, the percentage of leaf buds were significant differences between all cultivars in the two seasons. The percentage of leaf buds were the highest in "Florda Gold" (32.8 – 35.4 %), while "Early Grand" gave the lowest average percentage (30.4 – 30.6 %) in both studied seasons respectively, in the first location. On the other hand, in the second location, the percentage was the highest in "Florda Prince" (33.9 – 41.7 %) and "Early Grand" gave the lowest average percentage (30.2 – 38.2 %) in both studied seasons respectively. Concerning the percentage of floral buds, Table (7) it was found that, the highest floral buds in the "Early

Grand" cultivar (60.6 – 55.0 %), while "Florda Prince" gave the lowest average percentage (59.0 – 52.7 %) at the two seasons respectively. These results were obtained in the first location. But the second location recorded that, the percentage of floral buds were the highest in "Early Grand" (57.6 – 51.6 %) and "Florda Gold" was the lowest average percentage (50.7 – 49.5 %). In the first location, the percentage of fruit set was the highest in "Florda Prince" (82.50 , 76.80 %), and "Early Grand" cultivar was the lowest one in this respect (45.62 , 50.30 %). But in the second location, "Florda Prince" cultivar gave the highest average percentage (79.50 , 74.50 %) and "Early Grand" cultivar was the lowest one (49.60 , 45.30 %) during the two seasons respectively. These data also, indicated that the percentage of fruit set of the studied cultivars in the two locations showed non significant differences.

These results agree with the findings of Ali, (1988) who recorded that, "Florda Gold", "Florda Bell", "Florda Prince" and "Florda Beauty" gave high percentages of floral buds near to or more than 50 % in both seasons successively, Also, he found that the percentage of fruit set in "Florda Gold", "Florda Prince", "Florda Beauty" and "Florda Belle" cultivars were 77.00 %, 82.40 %, 79.00 % and 81.00 % respectively.

**Table (3): Percentage of different bud types and fruit set in some Peach cultivars in the two farms during 2004 and 2005 seasons.**

Locations		El-wahat El-Baharaia				El-badrashin			
Cultivars		Florda Prince	Florda Gold	Early Grand	L.S.D 5%	Florda Prince	Florda Gold	Early Grand	L.S.D 5%
Subject	Percentage of 2004	31.80	32.80	30.40	1.38	33.90	33.60	30.20	3.39
	leaf buds % 2005	33.80	35.40	30.60	3.15	41.70	38.50	38.20	3.11
Percentage of 2004	floral buds %	59.00	59.70	60.60	0.89	56.80	50.70	57.60	5.08
	2005	52.70	52.90	55.00	2.01	49.80	49.50	51.60	1.77
Percentage of 2004	fruit set %	82.50	60.60	45.62	20.89	79.50	63.10	49.60	15.10
	2005	76.80	66.50	50.30	10.11	74.50	62.90	45.30	10.50

#### 4-Fruit growth and development:

Data in (Table 4) revealed that, growth of both equatorial and polar diameters were continuously and gradually increased throughout duration from March 15<sup>th</sup> up to Maturity. Whereas both dimensions reached their maximum value. Moreover, after maturity the dimensions remained constant with no detected increase. Such trend was true for changes in both polar and equatorial diameters during both 2004 and 2005 seasons. On the other hand, the increase in both polar and equatorial diameters in the second location were higher than the first location.

These results are in agreement with Mansour & Stino (1986) who reported that, "Florda Prince" and "Early Grand" were medium and medium – large, averaging (4.8 – 4.9 cm) in diameter for the two cultivars respectively. Data also, agree with the findings of Rouse *et al.* (1995) on "Florda Gold".

#### 5-Fruit weight:

It is clear from Table (5) that, "Early Grand" cultivar gave the highest fruit weight (102.3 – 98.0 gm), and "Florda Prince" was the least in this respect (90.4 – 93.9 gm) in the first location in both seasons respectively. At the second location, fruit weight was the highest in "Early Grand" (103.4 – 103.0

gm) and "Florda Prince" cultivar gave the lowest one (96.5 – 97.1 gm) in both studied seasons respectively. Thus, the second location was higher than the first location in this respect.

These results are in line with the previous studies of Mansour & shallout (1986) who found that, the fruit weight of "Mit Ghmr" cultivar was 77.8 gm. Also, Rodriguez and Sherman (1990) concluded that, the fruit weight of "Oro-A" Peach cultivar ranged from 70 – 80 gm.

**Table (4): Fruit growth of some Peach cultivars in both farms during 2004 and 2005 seasons.**

Locations		El-wahat El-Baharaia				El-badrashin				
Subject	Cultivars	Florda Prince	Florda Gold	Early Grand	L.S.D 5%	Florda Prince	Florda Gold	Early Grand	L.S.D 5%	
	15/3	2004	L	2.5	2.5	2.6	.63	2.60	2.40	2.50
D			1.50	1.80	2.20	.39	2.00	2.10	2.40	.39
2005		L	2.6	2.5	2.3	.55	2.20	2.40	2.40	.33
		D	1.20	1.60	2.40	.54	2.10	2.30	2.50	.40
30/3	2004	L	2.70	2.70	3.20	.49	3.30	3.50	3.50	.24
		D	2.60	3.00	3.10	.49	2.90	3.10	3.20	.32
	2005	L	2.70	2.80	2.70	.40	3.80	3.70	3.40	.20
		D	2.40	2.80	3.00	.37	3.10	3.20	3.40	.30
15/4	2004	L	3.8	4.2	4.6	.62	4.1	4.2	4.2	.21
		D	4.0	4.1	4.4	.55	4.20	4.30	4.20	.44
	2005	L	3.7	4.2	4.4	.63	4.6	4.9	4.4	.34
		D	3.7	3.9	4.3	.59	4.20	4.30	4.20	.31
maturity	2004	L	5.1	5.9	5.2	.51	5.70	6.20	5.80	.37
		D	5.00	5.20	5.40	.20	5.60	5.80	5.90	.22
	2005	L	5.1	5.7	5.1	.60	5.60	6.30	5.80	.26
		D	4.80	5.40	5.50	.55	5.40	5.80	6.00	.18

(L): Polar diameter

(D): Equatorial diameters

**Table (5): development of fruit weight (gm) of some Peach cultivars in both locations during 2004 and 2005 seasons.**

Locations		El-wahat El-Baharaia				El-badrashin			
Subject	Cultivars	Florda Prince	Florda Gold	Early Grand	L.S.D 5%	Florda Prince	Florda Gold	Early Grand	L.S.D 5%
	15/3	2004	12.9	13.4	11.7	1.60	13.4	12.3	10.3
2005		12.3	13.5	11.8	1.70	13.4	12.8	12.3	0.85
30/3	2004	20.1	26.5	21.3	2.42	21.6	23.5	20.1	1.01
	2005	19.9	25.9	22.4	2.86	26.0	26.1	22.6	0.95
15/4	2004	66.0	67.0	72.1	5.01	68.5	69.7	73.3	3.01
	2005	64.5	68.1	75.2	7.08	70.6	73.6	72.0	1.39
maturity	2004	90.4	94.2	102.3	7.78	96.5	98.6	103.4	3.37
	2005	93.9	94.5	98.0	3.50	97.1	99.1	103.0	3.28

**6-Fruit yield:**

In Table (6), the average yield of "Florda Gold" cultivar was the highest as Kg per Tree or Ton per Feddan (57.25 Kg/tree, 9.98 Ton/Feddan) and (43.25 Kg/tree, 7.27 Ton/Fedden), and the lowest one was "Florda Prince" cultivar (42.90 Kg/tree, 7.20 Ton/Feddan) and 33.70 Kg/tree, 5.66 Ton/Feddan), these results in the first and second locations respectively.

The findings of Mehrotra *et al.* (1988) reported that, "Florda Sun" and "Shan-i-Punjab" cvs. yielded 71.5 and 65.0 Kg/tree respectively. While, El-

Etraby (1996) indicated that, "Desert Gold" cultivar gave the highest yield 80.75 Kg/tree followed by "Early Grand" cultivar 78.50 Kg/tree and "Florida Sun" cultivar was the lowest one 62.73 Kg/tree.

**Table (6): Fruit yield (Kg/Tree) of some Peach cultivars in both farms during 2004&2005 seasons.**

Locations		El-wahat El-Baharaia				El-badrashin			
Subject	Cultivars	Florda Prince	Florda Gold	Early Grand	L.S.D 5%	Florda Prince	Florda Gold	Early Grand	L.S.D 5%
	Yield (Kg/Tree)	2004	40.80	54.50	55.00	2.91	37.70	46.50	39.50
2005		45.00	60.00	52.00	7.99	29.70	40.00	30.00	1.24
Mean		42.90	57.25	53.5	—	33.70	43.25	34.75	—

**7-Total Soluble Solids (T.S.S.):**

The data in Table (7) show that, "Early Grand" cultivar had the highest T.S.S. content (10.87, 10.91 %), while, "Florda Prince" cultivar gave the lowest T.S.S. content (9.50, 9.52 %) in both seasons. These results in the first location when the fruits reached to maturity. On the other hand, the second location gave similar results in this respect. The T.S.S. % of "Early Grand", "Florda Gold" and "Florda Prince" cultivars were 10.88, 10.75 % - 10.69, 10.70 % - 9.53, 9.63 % in 2004 and 2005 seasons respectively. This data also indicated that, the T.S.S.% of the studied cultivars had not significant differences between both locations.

These results are in conformance with Stino & Mansour (1985) who noticed that T.S.S. was 9.3, 10.2 and 12.0 % for "Early Amber", "Spring Crest" and "Spring Time" Peach cultivars respectively. Other studies by El-Sherbini *et al* (1986) reported that, T.S.S. of "Florda Sun" Peach cultivar was 10 – 5 %. Also, El-Etraby (1996) found that, T.S.S. was 9.65, 10.63 and 10.02 % for "Florda Sun", "Early Grand" and "Desert Gold" Peaches respectively.

**Table (7): Development of fruit T.S.S. (%) of some Peach cultivars in both locations during 2004 and 2005 seasons.**

Locations		El-wahat El-Baharaia				El-badrashin			
Subject	Cultivars	Florda Prince	Florda Gold	Early Grand	L.S.D 5%	Florda Prince	Florda Gold	Early Grand	L.S.D 5%
	15/3	2004	2.77	3.10	3.20	0.34	3.00	3.22	3.29
2005		2.93	3.11	3.01	0.04	3.20	3.10	2.09	0.31
30/3	2004	3.73	4.12	4.29	0.22	3.30	3.33	3.43	0.39
	2005	3.87	3.86	4.39	0.42	3.41	3.43	3.28	0.20
15/4	2004	6.68	7.20	7.27	0.62	6.17	6.27	6.05	0.20
	2005	6.52	6.93	7.55	0.78	5.79	6.98	6.25	0.41
maturity	2004	9.50	10.84	10.87	0.25	9.53	10.69	10.88	0.45
	2005	9.52	10.71	10.91	0.60	9.63	10.70	10.75	0.54

**8-Total Acidity:**

In Table (8), the percentage of total acidity decreased gradually until maturity stage. "Early Grand" cultivar gave the highest values (0.80, 0.82 and 0.73, 0.71), while "Florda Prince" cultivar showed the lowest values (0.55, 0.58 and 0.55, 0.53) during both seasons in the two locations respectively,



when the fruits reached to maturity. On the other hand, there was significant differences in "Total Acidity" between the three cultivars and between the two locations in both seasons of study.

These results agree with the findings of Mansour & Stino (1987) and Shaltout (1987) who indicated that, the total acidity as malic acid was about 0.9 – 1.0 in "Florda Prince" cultivar, other studies by El-Etraby (1996) also found that, in "Florda sun", "Early Grand" and "Desert Gold" cultivars were about 0.86, 1.0 and 0.88 respectively.

**Table(8): Development of fruit total acidity (malic acid/100ml) of some Peach cultivars in both locations during 2004 and 2005 seasons.**

Locations		El-wahat El-Baharaia				El-badrashin			
Cultivars		Florda Prince	Florda Gold	Early Grand	L.S.D 5%	Florda Prince	Florda Gold	Early Grand	L.S.D 5%
Subject									
15/3	2004	0.78	0.89	1.03	0.21	0.80	0.96	1.07	0.29
	2005	0.83	1.09	1.12	0.32	0.78	0.99	1.11	0.30
30/3	2004	0.67	0.87	1.42	0.20	0.72	0.95	0.95	0.05
	2005	0.72	1.04	1.05	0.32	0.70	0.95	0.98	0.03
15/4	2004	0.59	0.82	1.00	0.21	0.57	0.70	0.77	0.05
	2005	0.70	0.83	0.85	0.13	0.63	0.72	0.79	0.04
maturity	2004	0.55	0.73	0.80	0.16	0.55	0.66	0.73	0.09
	2005	0.58	0.78	0.82	0.12	0.53	0.64	0.71	0.05

**9-Flash firmness (lb/inch<sup>2</sup>):**

Data in Table (9) indicated that, fruit firmness gradually decreased in all cultivars during the two seasons in the two locations. "Early Grand" cultivar showed the highest value of mature fruit firmness (16.40 and 16.60 lb/inch<sup>2</sup>, in the first location & 16.19 and 16.68 lb/inch<sup>2</sup>, in the second location), and the least firmness was obtained from "Florda Gold" cultivar (14.95, 15.33 lb/inch<sup>2</sup>, in the first location & 15.77 and 15.13 lb/inch<sup>2</sup>, in the second location) during both seasons respectively, when the fruits reached maturity. However, there were no significant differences between the two farms in this respect but the significant differences between three cultivars had maturity in two locations during both seasons.

The above results were confirmed with the finding of El-Sherbini *et al* (1986) reported that, "Florda Sun" cultivar produce medium firm fruits of firmness value 15.5 – 16.7 lb/inch<sup>2</sup>. it was also mentioned that fruit firmness of "Florda Prince" cultivar was 16.5 lb/inch<sup>2</sup> Mansour & Stino (1987).

**Table (9): Development of fruit firmness (lb/inch<sup>2</sup>) of some Peach cultivars in both locations during 2004 and 2005 seasons**

Locations		El-wahat El-Baharaia				El-badrashin			
Cultivars		Florda Prince	Florda Gold	Early Grand	L.S.D 5%	Florda Prince	Florda Gold	Early Grand	L.S.D 5%
Subject									
15/3	2004	31.01	30.08	29.72	0.22	31.01	32.11	30.10	0.00
	2005	30.91	30.89	29.71	0.01	30.70	30.91	30.22	0.23
30/3	2004	29.52	29.16	28.98	1.37	30.25	30.39	29.67	0.52
	2005	29.67	29.68	29.17	1.00	30.04	30.10	29.34	0.38
15/4	2004	22.96	22.62	22.11	0.98	23.65	23.53	22.41	0.65
	2005	23.50	23.57	23.19	1.23	23.56	23.43	22.58	0.55
maturity	2004	15.57	14.95	16.40	0.75	15.27	15.77	16.19	0.39
	2005	15.84	15.33	16.60	0.79	15.60	15.13	16.68	0.44

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**دراسة مقارنة على النمو والأثمار لبعض أصناف الخوخ في مزرعتين مختلفتين**  
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أجريت هذه الدراسة على ثلاثة من أصناف الخوخ المستوردة ذات الاحتياجات القليلة من البرودة وهي فلوريدا برنس وفلوريدا جولد وإيرلي جراند وذلك خلال موسمين متتاليين عامي 2004 و2005. في مزرعتين مختلفتين الأولى في الواحات البحرية وهي ذات تربة رملية أما المزرعة الثانية فهي في البدرشين وذات تربة طينية وعمر الأشجار بهما 12 سنة. وكانت أشجار الخوخ المستخدمة في هذه الدراسة مطعومة على أصل نيماجارد ومنزوعة على مسافات 5 × 5 متر وتخضع لكل العمليات الزراعية الطبيعية من رى وتسميد وتقليم ومقاومة الآفات الحشرية والفطرية. وقد شملت الدراسة الوصف المورفولوجي للأشجار وتحديد المراحل الفينولوجية بداية من تفتح البراعم وحتى النضج وجمع الثمار وكذا تم دراسة نسبة البراعم الخضرية والثمارية ونسبة العقد للأصناف موضع الدراسة وكذا نمو الثمار وتطورها ووزن الثمار ونسبة المواد الصلبة الذائبة ونسبة الحموضة في عصير الثمار وأيضاً تم قياس صلابة الثمار للأصناف موضع الدراسة، ويمكن تلخيص النتائج في الأتي:

- 1- من خلال الدراسة تبين أشجار أصناف المزرعة الثانية كانت أقوى نمواً من أشجار أصناف المزرعة الأولى خلال موسمي الدراسة.
- 2- تم تحديد كل مرحلة من المراحل المختلفة لنمو وتطور البراعم الزهرية بداية من تفتح البراعم، بداية التزهير والأزهار الكامل، العقد ونضج الثمار لكل صنف داخل المزرعتين. ومن خلال الدراسة تبين أن موسم النمو للأصناف موضع الدراسة أقصر في المزرعة الأولى عنه في المزرعة الثانية خلال موسمي الدراسة.
- 3- أوضحت الدراسة أنه يوجد اختلافات معنوية بين الأصناف في كمية محصول الشجرة وبالتالي محصول الفدان وكان أكثر الأصناف إنتاجية صنف فلوريدا جولد (57,25 – 43,25 كجم/شجرة) وأقلهم إنتاجية صنف فلوريدا برنس (42,90 – 33,70 كجم/شجرة) في المزرعتين على التوالي. وعموماً فإن المزرعة الأولى كانت أعلى إنتاجية من المزرعة الثانية.
- 4- أعطى صنف إيرلي جراند أعلى وزن للثمار يليه فلوريدا جولد ثم صنف فلوريدا برنس في كلا المزرعتين خلال موسمي الدراسة.
- 5- تبين من الدراسة أنه لا توجد فروق معنوية بين المزرعتين في محتوى الثمار من المواد الصلبة الذائبة وأن أعلى محتوى منها كان في صنف إيرلي جراند وأقلهم محتوى كان صنف فلوريدا برنس في كلا المزرعتين خلال موسمي الدراسة.
- 6- كان هناك اختلافات معنوية في نسبة الحموضة بين المزرعتين خلال سنتي الدراسة حيث كان محتوى ثمار أصناف المزرعة الأولى من الحموضة أعلى من أصناف المزرعة الثانية. وأعطى صنف إيرلي جراند أعلى محتوى من الحموضة في عصير ثمارة بينما كان عصير ثمار صنف فلوريدا برنس أقلهم محتوى في كلا المزرعتين خلال سنتي الدراسة.
- 7- أعطت ثمار صنف إيرلي جراند أعلى صلابة تلاء صنف فلوريدا برنس ثم صنف فلوريدا جولد أقلهم صلابة، ولم تكن هناك فروق معنوية بين المزرعتين في هذه الصفة ولكن كانت الاختلافات المعنوية بين الأصناف بعضها البعض داخل كل مزرعة.

