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STUDIES ON THE FLOWERING, GROWTH, YIELD, FRUIT QUALITY AND SALT TOLERANCE OF SOME MELON HYBRIDS (CUCUMIS MELO VAR.CANTALOUPENSIS) IRRIGATED WITH SALINE OR FRESH WATER IN NORTH SINAI

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ABSTRACT

This study was performed in North Sinai at Rafah and Arish locations during winter 1998 and 1999 seasons. Where the EC of irrigation water were 640 and 2944 ppm. For the two locations respectively . Six hybrids from melon (*Cucumis melo* var cantaloupensis c.v), Galia, Rafigal, Regal, Ideal, Primal and vicar F_1 hybrid were sowing under Two locations. Seeds were sown directly in sandy soil under low tunnel conditions during December in Two locations of both seasons. The results showed that, the high saline irrigation water in Arish location reduced fresh plant weight, length of plant, early and total fruit weight and size of fruits and increased in fruit quality, i.e. firmness and total soluble solids (TSS) and earliness in appearance of female flowers compared to low saline irrigation water in Rafah location. On the other hand, no effect of high saline irrigation water on number of branch and fruits per plant. The behaviour of various hybrids, the results showed, Ideal, Rafigal and Regal hybrids were significantly higher than, Galia, Primal and Vicar hybrids for fruit quality, vegetative growth and early and total fruit weight. Concerning, the behaviour of various hybrids under two locations (level salinity), the results showed, some hybrids as Ideal, Regal and Rafigal were more tolerance of salinity, where fore, no significant differences between two locations (level salinity) for all characters under study, while, Galia, Primal and Vicar hybrids were more susceptible of salinity, which gave significant differences in most characters between Two locations (level salinity) . Generally, Ideal, Regal and Rafigal hybrids were more goodness for planting in the regions, which irrigated with saline water than other hybrids, addition to more good ness of fruits due to high firmness and TSS in high level salinity.

INTRODUCTION

The many regions in Egypt such as North Sinai and new desert lands which irrigation by wells water. The agriculture production were under irrigation of saline water, which is becoming more important world wide, especially with the continuous demand on fresh water.

This research for studies the effect of saline water should be used for irrigation on the, growth, yield and quality of fruits in melon cultivars (hybrids of cantaloupe), which is one of the major crops grown under low tunnels irrigated with saline water in some regions in North Sinai where fresh water is limited to domestic use. Addition to the comparison of these hybrids from cantaloupe in different their affected of irrigation with saline water; for selected the best hybrids to planting in this regions. The unfavourable effect associated with increasing salinity on most plants is well documented, Maas and Hoffman (1977), Greenway and Munns (1980) and Pasternak (1987) they reported that, the salt tolerance is not constant character in plant but

varies with environment and plant development. Maas and Nieman (1977). Thus, relative tolerance during different stage of plant development may differ. Shannon and Francois (1978) tested three muskmelon cultivars under artificially salinized conditions in pots. They found that the highest yielding cultivar at low salinity and yielded least at high salinity, while were other cultivars least affected with increasing salinity. Mendlinger *et al.* (1988), they showed, that salinity led to a reduction of leaf size and the vegetative growth of some melon cultivars. However the range in variability of salt tolerance among cultivated and related genotypes of melon has not been investigated adequately, Mendlinger and Pasternak (1992) tested 20 melon cultivars under three salinity levels. The results showed that the most tolerant cultivar was " Evan Key ". In addition, four muskmelon cultivar were evaluated (top Mark, Galia, No.1, and BG – 84 – 3) in a field experiment under different salt concentrations (Mendlinger, 1993), his results indicated that increased salinity did not affect the number or timing of staminate and pistillate flowers produced. Moreover, increased salinity significantly reduced vegetative growth of all cultivars. Increasing salinity did not affect the number of fruits produced in the four cultivars but reduced mean fruit weight in three of them. Mean fruit weight and yield of BG – 84 – 3 were not reduced, i.e. as it was salt tolerant. Increasing salinity increased the soluble solids concentration and slightly improved fruit appearance of all cultivars.

In spite of the economic importance of melon, there is not enough information on salt response of melon under low tunnels in local conditions Moreover, the effects of salinity on several parameters of growth other than yield and fruit characters have not been investigated. Based solely on some reports, melon has been classified as moderately salt tolerant (Maas and Hoffman, 1976).

Therefore, the purpose of this study was to evaluate the performance of melon cultivars (some commercial hybrids cantaloupe) under low tunnel irrigated with salinity water or fresh water. By measuring the differences in growth, yield and fruit characteristics and to determine the hybrids tolerance of salinity.

MATERIAL AND METHODS

The experiment were carried out at two location in North Sinai during winter seasons of 1998 / 1999 and 1999 / 2000. The first location at farm in Rafah, where the salinity concentration of irrigation water was 640 ppm, which beemed the treatment of low salinity level, and the second location at farm in EL – Arish where the salinity concentration of irrigation water was 2944 ppm, which deemed the treatment of high salinity level.

Six melon hybrids (*Cucumis melo* var. cantaloupens cv. Primal, Galia, Rafegal, Regal. Ideal and Vicar hybrid, seeds were sowing directly in sandy soil under low tunnel conditions of the two mentioned locations on Fifteen December in both seasons. The seeds of cantaloupe hybrids were sowing in rows, each row was 1.5m wide and 30m long, plant distances were 50 cm a part, each row consisted of sixty plants, viz Ten plants from each hybrid

under study. Cantaloupe plants were grown under low tunnel covered with polyenthylene sheet, the plastic sheet was fixed on the arched wire.

The experiment in each location consisted of four replicates, each replicates was one row, which contain ten plants from each hybrid.

Irrigation water and soil of both locations were analysed and the results are presented in table (1). The system of irrigation was by drip irrigation in both locations. All agriculture practices i.e. sowing, irrigation, fertilization, insects and diseases control for growing cantaloupe was performed.

The treatments of this experiment were contain on two salinity levels low level in Rafah location (640 ppm) and high level in EL – Arish location (2944 ppm) with six cantaloupe hybrids and interaction between them.

Climatic data were recorded during the two seasons at North Sinai using thermohygrograph and the results are presented in table (2).

Table (1): Chemical analysis of soil and irrigation water of two locations Rafah and El–Arish.

Soil depth	ECe p.p.m	PH	Cations (Millequivalent/liter)				Anion (Millequivalent/liter)		
			Ca ++	Mg ++	Na +	K +	Hco_3-	$C1^-$	So_4--
Rafah									
0-20	1990.4	7.72	16.0	11.5	10.52	19.19	0.5	7.0	0.0
40-60	3270.4	7.78	32.5	17.0	15.43	3.89	0.8	13.0	0.0
80-100	2246.4	7.84	24.5	11.5	11.57	1.37	1.0	12.0	0.0
Water	640	7.50	1.8	1.1	7.0	0.10	1.0	8.1	0.9
Arish									
0-20	265.6	8.0	7.1	4.7	8.13	0.73	7.75	9.0	2.56
40-60	107.5	8.3	2.6	1.5	4.82	0.31	1.95	4.25	2.48
80-100	147.8	7.9	2.5	1.1	4.91	0.31	2.0	4.0	2.22
Water	2944	7.3	16.0	12.0	20.8	10.34	3.55	32.5	13.1

Table (2): Climatic data under low tunnel conditions at North Sinai during winter seasons of 1998 and 1999.

Month	First season				Second season			
	Temperature			RH%	Temperature			RH %
	Min.	Max.	Average		Min.	Max.	Average	
December	8.04	18.97	12.92	47	9.83	23.78	15.92	54
January	8.77	18.37	13.46	59	8.47	19.48	13.38	75
February	9.10	21.12	15.45	56	8.25	18.73	14.10	70
March	12.20	33.46	18.12	50	10.65	22.08	16.59	66
April	14.90	28.01	21.82	67	13.37	24.23	18.19	66

Collected data were as follows:

1 – Flowering:

Five plants in each replicate were chosen for every hybrid in each location to determine the number of days to appearance of the first female flower.

2 – Growth measurements:

At end of growing season (after 100 to 110 days from sowing) Five plants from each replicate at every hybrid in both location taken for measurement, average fresh weight of plant (Kg.), length of main stem (cm) and number of branches per plant.

3 - Yield:

Early and total yield weight and number of fruits were estimated per plant were then calculated for each hybrid of each location in both seasons.

4 – Fruit characteristic:

Average fruit weight, total soluble solid (TSS) was measured in fruits by using a hand refractometer and fruit firmness was measured in Lb / inch^2 by Magness and Ballauf pressure tester equipped with 3 / 16 inch plunger. These Measurements on fruits were recorded at the samples from every hybrid of each location in both seasons.

The obtained data, the split – plot design was applied with two salinity levels (two locations) as main factor and Six cantaloupe hybrids as sub-main factor, the statistically analyzed according to Steel and Torrie (1984). The treatments mean compared by least significant difference (L.S.D) at 5% level.

RESULTS AND DISCUSSION

The different of salinity irrigation water between two locations and various of cantaloupe hybrids in relation to flowering and vegetative growth :

1– Flowering :

The number of days from planting date to appearance of first female flower, the data presented in table (3) represent the effect of different salinity irrigation water between Rafah (low saline) and EL-Arish (high saline) locations on early production of female flowers on various hybrids of cantaloupe under study. The data show, the high salinity of Arish location gave earliness in appearance of female flowers than the low level of salinity in Rafah location this earliness was significantly higher in both seasons. Regarding, the various hybrids of cantaloupe, the data show, Galia, Primal, Vicar and Regal hybrids were more earliness than Ideal and Rafigal hybrids, this earliness in appearance of first female flower was high significant between Ideal hybrid and Galia, Primal and Vicar hybrids in both seasons.

The interaction between levels of salinity (locations) and various of Cantaloupe hybrids, the data show the hybrids Galia, Premal and Vicar were more earliness in with high level of salinity than low level, while the hybrids Regal, Rafigal and Ideal more tolerance of salinity, which gave not significant difference between the two levels of salinity. On the other hand, the data show, the Ideal hybrid was more delay in appearance of female flower than the other hybrids in two locations. This result was obtained in both seasons.

In general conclusion from this results, the high salinity of irrigation water was abnormal conditions for plant growth, which was due to for early

flowering of some hybrids, which were no tolerant of this conditions, while were some of hybrids more tolerant of salinity which were no difference in flowering time under low or high salinity. These results were in agreement with Maas and Nieman (1977), Shannon and Francois (1978) and Mendlinger *et al.* (1988) on melon.

Table (3): Effect of difference saline irrigation water between Rafah and Arish locations on appearance of first female flower in various hybrids of cantaloupe during 1998 and 1999 seasons.

Hybrids of cantaloupe	No. of days before appearance the first female flower					
	Season 1998			Season 1999		
	Rafah (low saline)	Arish (high saline)	Mean	Rafah (low saline)	Arish (high saline)	Mean
1- Galia	52	44	48.0	54	45	49.5
2- Rafigal	54	51	52.5	56	52	54.0
3- Regal	51	50	50.5	53	50	51.5
4- Ideal	56	52	54.0	58	54	56.0
5- Primal	50	45	47.5	52	46	49.0
6- Vicar	52	46	49.0	53	47	50.0
Mean	52.5	48.0		54.3	49.0	
L.S.D (0.05) Saline		3.5			4.2	
L.S.D (0.05) Hybrids		4.1			5.3	
L.S.D (0.05) Saline × Hybrid		5.7			5.0	

2– Vegetative growth:

A- Plant fresh weight:

Data in table (4) represent the impact of different salinity irrigation water between two locations and various hybrids of cantaloupe on total plant fresh weight. Total plant fresh weight at Rafah location (low salinity) was significantly higher than Arish location (high salinity). Regarding various hybrids of cantaloupe, total plant fresh weight at Regal, Rafigal and Ideal hybrids was significantly larger than the other hybrids in direction the high weight, while no significant difference between them.

Regarding the interaction between salinity level at two locations and different hybrids, the largest significant of plant weight was found between Rafah (low salinity) and Arish (high salinity) locations for Galia, Primal and Vicar hybrids, while other hybrids were no significant under two locations. On the other hand, the Regal, Rafigal and Ideal hybrids were high weight of plant than other hybrids in each location. These results obtained in both seasons.

The lower salinity level at Rafah seemed to have a positive impact on plant weight, while the high salinity was negative impact on plant weight, withal the various hybrids were different in tolerance degree of salinity, which was reflacted on plant weight.

B- Plant length:

Data in the same table, show, the effect of different salinity levels in both Rafah and Arish locations and various hybrids of cantaloupe on the plant length, the data show, plant length at Rafah (low salinity) was higher than that at Arish (high salinity) locations in both seasons. Regarding the various hybrids, Regal, Rafigal and Ideal hybrids gave the highest plant length than the other hybrids with significant differences. The interaction between level salinity at two locations and different hybrids, the same trend for plant weight was found with plant length.

C- Number of branches :

The data show in the same table, the effect of different salinity levels in both locations and various hybrids of cantaloupe on the No. of branches in plant. The data represent, no significant difference between Rafah (low salinity) and Arish (high salinity) locations in number of branches per plant, while here was different between hydrides, Regal, Rafigal and Ideal hybrids were more number of branches than other hybrids, the Galia and primal were less of number of branches than other hybrids.

The interaction between level salinity at two locations and different hybrids, no different in number of branches per plant of various hybrids between locations, while there was different between hybrids in each locations, Rafigal, Regal and Ideal hybrids were larger in number of branches than other hybrids in each locations. This result was obtained in both seasons.

It means that vegetative parts (plant weight, plant length and number of branches) related to the vigourus of the plant. It could be agreed that the lower salinity level at Rafah location gave better vegetative growth, addition to the Rafigal, Regal and Ideal hybrids were more tolerance of salinity, they gave better growth in both locations. These results were in agreement with Maas and Hoffman (1976) Mendlinger and Pasternak (1992) Mendlinger (1993) on melon.

3– Yield components:

A- Early yield:

Data in Table (5) represent the effect of salinity levels and various of cantaloupe hybrids on early fruit weight per plant (kg). It was found that early fruit weight per plant at Rafah (low salinity) was significantly higher than Arish (high salinity) locations. This increase was 136% between them. Concerning, the effect of various of cantaloupe hybrids, the data show, there was significant difference between various of hybrids, whereas, Rafigal, Regal and Ideal hybrids were higher of early fruit weight than other hybrids under two locations (level salinity).

The interaction between level salinity (locations) and various hybrids, the largest significant of early fruit weight was found between Rafah and Arish locations of some hybrids as Galia, Primal and Vicar, which gave high early fruit weight in Rafah (low salinity) than Arish (high salinity), while the other hybrids as Rafigal, Regal and Ideal were more tolerance of salinity, therefor no significant difference of early fruit weight between locations, in the same time.

Table (4) : Effect of difference saline irrigation water between Rafah and Arish locations on plant fresh weight, plant length and number of branches Per plant in various hybrids of cantaloupe during 1998 and 1999 Seasons.

Hybrids of cantaloupe	Plant weight (gm)		Mean	Plant length(cm)		Mean	No. of branches per plant		Mean
	Rafah (low Saline)	Arish (High Saline)		Rafah (low Saline)	Arish (High Saline)		Rafah (low Saline)	Arish (High Saline)	
Season 1998									
1- Galia	323.5	226.0	274.8	248.5	181.7	215.1	4.7	4.3	4.5
2- Rafigal	409.0	351.5	380.3	293.3	261.5	277.4	5.7	5.3	5.5
3- Regal	419.5	357.3	388.4	310.7	288.3	299.5	5.4	4.9	5.2
4- Ideal	397.3	336.0	366.7	308.0	275.0	291.5	5.5	5.1	5.3
5- Primal	321.5	218.5	270.0	238.5	184.5	211.5	4.5	4.3	4.4
6- Vicar	319.0	223.7	271.4	229.3	172.3	200.8	4.7	4.5	4.6
Mean	365.0	285.5		271.4	227.2		4.9	4.7	
L.S.D (0.05) Saline	**71.7**			**37.7**			**N.s**		
L.S.D (0.05) Hybrids	**83.4**			**52.4**			**0.8**		
L.S.D (0.05) Saline × Hybrid	**69.3**			**41.9**			**0.6**		
Season 1999									
1- Galia	364.9	253.1	309.0	265.7	192.5	229.1	4.3	4.1	4.2
2- Rafigal	462.2	393.5	427.9	313.8	277.3	295.6	5.3	5.1	5.2
3- Regal	473.5	399.8	436.7	332.5	305.5	319.0	5.7	5.4	5.6
4- Ideal	448.6	376.3	412.5	329.7	291.5	310.6	5.7	5.3	5.5
5- Primal	362.7	244.2	303.5	255.3	195.5	225.4	4.5	4.3	4.4
6- Vicar	356.5	249.7	302.9	245.3	182.3	213.9	4.3	4.1	4.2
Mean	411.4	319.4		290.4	240.8		5.0	4.7	
L.S.D (0.05) Saline	**83.3**			**32.5**			**N.s**		
L.S.D (0.05) Hybrids	**97.1**			**55.3**			**0.6**		
L.S.D (0.05) Saline × Hybrid	**77.3**			**43.1**			**0.7**		

These hybrids gave higher in early fruit weight than other hybrids within each location.

Concerning, the number of fruit for early yield, the data in the same table, represent no significant different in fruits number of early yield between two locations (level salinity), while there was significant different between the various of hybrids, Regal, Rafigal and Ideal hybrids gave more number of fruits than other hybrids, this increase were significant in both seasons.

The interaction between level salinity (locations) and various hybrids, the data shown, no significant difference between each hybrid in two locations, while there was significant different between the hybrids within each locations for number of fruits, whereas the hybrids as Rafigal, Regal and Ideal gave high number of fruits than other hybrids within each locations (level salinity).

B- Total yield:

Data in Table (5) show the effect of salinity level between two locations and various of cantaloupe hybrids on total fruit weight (kg). It was found from the results that total fruit weight per plant at Rafah (low salinity) was significantly higher than Arish (high salinity) in both seasons. In addition various hybrids gave significant different between them, there as, Rafigal, Regal and Ideal hybrids were higher of total fruit weight than other hybrids under two locations (level salinity).

The interaction between locations (level salinity) and various of hybrids, show that the high significant difference was recorded for Galia, Primal and Vicar hybrids between Rafah and Arish locations, which gave high total fruit weight in Rafah than Arish locations, while the other hybrids as Regal, Ideal and Rafigal were more tolerance of salinity, therefor no different in total fruit weigh between two locations. In the same time this hybrids (Rafigal, Regal and Ideal) were significantly higher of total fruit weight than other hybrids within each location.

Concerning, the total number of fruits per plant, the results indicated that, the same trend obtained from early number of fruits was found of total number of fruits, therefore, no effect of level salinity (locations) no total number of fruits and no effect of two levels salinity on each hybrid, while there was different between various of hybrids and between the various of hybrid within each location in total number of fruits. The high total number of fruits was obtained by Rafigal, Regal and Ideal hybrids in general and within each location than other hybrids in both seasons.

The general conclusion from this results, the difference of level salinity by two locations was very effective on some hybrids which were susceptible of salinity as Galia Primal and vicar hybrids, while there was no effect on the other hybrids which were more tolerance of salinity as Rafigal, Regal and Idial hybrids for early and total fruit weight. In addition there was significant different between the various hybrids in early and total fruit weight. No effect of salinity level of two locations for number of fruits in early or total yield. On the other hand, there was interaction between the locations (level salinity) in some hybrids as Galia, Primal and Vicar, while the other hybrids as Rafigal Regal and Ideal were no significant different between two locations for early and total fruit weight and numbers. The same trend of this hybrids there was within each location. Similar results were found by Mendlinger (1993), Maas and Hoffman (1976) and Mendlinger and Pasternak (1992) on melon.

Table (5): Effect of difference saline irrigation water between Rafah and Arish locations on early and total fruit weight and numbers per plant in various hybrids of cantaloupe during 1998 and 1999 seasons.

Hybrids of cantaloupe	Early Yield						Total Yield					
	Weight (kg) per plant			No. of fruits per plant			Weight (kg) per plant			No. of fruits per plant		
	Rafah (low saline)	Arish (high saline)	Mean	Rafah (low saline)	Arish (high saline)	Mean	Rafah (low saline)	Arish (high saline)	Mean	Rafah (low saline)	Arish (high saline)	Mean
Season 1998												
1- Galia	0.89	0.54	0.72	1.11	0.98	1.05	1.94	1.26	1.60	2.43	2.31	2.37
2- Rafigal	1.38	1.09	1.24	1.67	1.46	1.57	2.39	2.07	2.23	3.27	3.32	3.30
3- Regal	1.62	1.32	1.47	1.88	1.82	1.85	2.47	2.28	2.38	3.43	3.62	3.53
4- Ideal	1.44	1.13	1.29	1.78	1.59	1.69	2.36	2.18	2.27	3.15	3.41	3.28
5- Primal	1.12	0.75	0.94	1.31	1.25	1.28	1.85	1.34	1.62	2.47	2.53	2.50
6- Vicar	1.02	0.64	0.83	1.26	1.15	1.21	1.89	1.41	1.65	2.44	2.56	2.50
Mean	1.24	0.91		1.50	1.38		2.15	1.76		2.87	2.96	
L.S.D (0.05) Saline		**0.28**			**N.S**			**0.37**			**N.S**	
L.S.D (0.05) Hybrids		**0.31**			**0.27**			**0.43**			**0.57**	
L.S.D (0.05) Saline x Hy		**0.34**			**0.33**			**0.47**			**0.61**	
Season 1999												
1- Galia	0.99	0.61	0.80	1.34	1.14	1.24	2.19	1.68	1.94	2.63	2.65	2.64
2- Rafigal	1.52	1.31	1.42	1.97	2.14	2.06	2.63	2.41	2.57	3.21	3.51	3.37
3- Regal	1.79	1.52	1.66	2.18	2.24	2.21	3.04	2.76	2.90	3.85	3.97	3.91
4- Ideal	1.63	1.39	1.51	2.09	2.23	2.16	2.52	2.44	2.48	3.12	3.38	3.25
5- Primal	1.11	0.72	0.92	1.45	1.22	1.34	2.01	1.56	1.79	2.58	2.40	2.49
6- Vicar	1.07	0.66	0.87	1.42	1.17	1.30	1.93	1.50	1.72	2.45	2.41	2.43
Mean	1.34	1.04		1.74	1.69		2.39	2.08		2.97	3.05	
L.S.D (0.05) Saline		**0.23**			**N.S**			**0.26**			**N.S**	
L.S.D (0.05) Hybrids		**0.33**			**0.47**			**0.39**			**0.44**	
L.S.D (0.05) Saline x Hy		**0.35**			**0.51**			**0.41**			**0.47**	

4– Fruit characteristics:

A- Average fruit weight:

Data in Table (6) showed that average fruit weight at Rafah location (low salinity) was significantly higher than that at Arish location (high salinity) in both seasons. While no significant differences were found between various hybrids in average fruit weight during the two seasons. These results indicated that the higher average fruit weight could be attributed to the positive impact of lower salinity level at Rafah than Arish locations not to the various of hybrids. Thus, higher total fruit weight per plant could be attributed to the higher average fruit weight rather than the total number of fruits per plant.

The interaction between salinity level (locations) and various hybrids showed that the highest significant average fruit weight was obtained in Galia, Primal and Vicar hybrids at Rafah than Arish locations, while was Rafigal, Regal and Ideal hybrids no significant different between two locations for average fruit weight. On the other hand, no different between various hybrids within each salinity level (location).

B- Total Soluble Solids (TSS%):

In the same table, it could be seen that TSS was significantly increased in Arish (high salinity) than Rafah (low salinity) in both seasons. The highest TSS was found in Regal than Galia hybrids only, while no different between other hybrids in TSS. The interaction between salinity levels (locations) and various of hybrids showed that the highest significant TSS was found at Arish (high salinity) for all hybrids than Rafah (low salinity) locations, this result were in both seasons, while no significant different between all hybrids within each location for TSS.

This results, indicated that, the higher TSS at Arish location (high salinity) could be attributed to the higher level of salinity, which led to higher salt concentration drawon lower water content in fruits rather than lower level and large amount of water at Rafah, there fore the high of salinity was cause for increase of TSS in fruits.

C- Fruit firmness:

It is obvious from the obtained results that firmness of fruits produced at Arish location (high salinity) was significantly higher than those produced at Rafah location (low salinity) in both seasons (Table 6). Regarding, the various hybrids of cantaloupe the highest fruit firmness were recorded by, Ideal, Primal and Vicar which was significantly higher than Galia, Rafigal and Regal hybrids in both seasons. The interaction between salinity levels (locations) and various of hybrids, showed that the highest significant of fruit firmness was found at Arish location for all hybrids than Rafah location, the same result was obtained between the hybrids in each location. These results were found in both seasons.

These results were mainly due to salt concentrations addition to genetic characters of each hybrid. These results were in agreement with Mendlinger

(1993) who mentioned that increasing salinity increased the fruit firmness of all melon cultivars under his study.

Table (6): Effect of difference saline irrigation water between Rafah and Arish locations on average fruit weight, TSS and firmness of fruits in various hybrids of cantaloupe during 1998 and 1999 seasons.

Hybrids of cantaloupe	Fruit characteristics								
	Average fruit weight (g)			T.S.S			Fruit firmness		
	Rafah (low saline)	Arish (high saline)	Mean	Rafah (low saline)	Arish (high saline)	Mean	Rafah (low saline)	Arish (high saline)	Mean
Season 1998									
1- Galia	798	545	672	12.66	15.92	14.29	19.1	23.7	21.4
2- Rafigal	730	623	676	13.58	17.66	15.62	19.3	23.3	21.3
3- Regal	720	630	675	14.75	18.75	16.75	20.3	23.9	22.1
4- Ideal	749	639	694	13.92	16.92	15.42	23.1	27.8	25.5
5- Primal	748	530	639	12.83	16.58	14.71	23.3	26.3	24.8
6- Vicar	774	550	662	12.92	16.83	14.75	23.1	26.7	24.9
Mean	753	586		13.44	17.11		21.4	25.3	
L.S.D (0.05) Saline		**127**			**2.75**			**3.1**	
L.S.D (0.05) Hybrid		**N.S**			**2.44**			**2.3**	
L.S.D (0.05) Saline × Hybrid			**187**		**2.88**			**2.1**	
Season 1999									
1- Galia	833	634	734	12.58	15.83	14.21	18.7	24.3	21.5
2- Rafigal	819	687	753	13.66	17.58	15.62	19.8	24.7	22.8
3- Regal	790	695	743	14.58	18.58	16.58	20.6	24.8	23.2
4- Ideal	808	721	765	14.83	17.92	16.38	24.3	24.6	26.5
5- Primal	779	650	715	12.92	16.75	14.84	23.7	28.6	25.6
6- Vicar	788	622	705	13.58	17.66	15.62	23.3	27.1	25.2
Mean	803	668		13.69	17.39		21.7	26.5	
L.S.D (0.05) Saline		**113**			**2.81**			**2.7**	
L.S.D (0.05) Hybrids		**N.S**			**2.35**			**1.9**	
L.S.D (0.05) Saline × Hybrid			**130**		**2.97**			**2.2**	

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دراسات على الإزهار والنمو والمحصول وجودة الثمار وتحمل الملوحة فى بعض هجن الشمام (الكنتالوب) المروى بالماء المالح والماء العذب فى شمال سيناء

يوسف طلعت إمام الليثى

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أجريت هذه الدراسة فى شمال سيناء فى منطقتى رفح والعريش فى شتاء موسمى ١٩٩٨ و ١٩٩٩ وكانت ملوحة مياه الرى فى هاتين المنطقتين ٦٤٠ و ٢٩٤٤ جزء فى المليون على التوالى .

سته هجن من الكنتالوب كانت مستخدمة فى هذه الدراسة هى هجين جاليا – رافيجال – ريجال – إيديال – بريمال وفيكار . زرعت بذور الهجن فى الأرض مباشرة تحت نظام الأقبية البلاستيكية وكانت طبيعة الأرض رملية فى كل من المنطقتين وكان ميعاد الزراعة فى ١٥ ديسمبر من كل عام فى المنطقتين .

وكانت الدراسة على تأثير إرتفاع الملوحة بماء الرى فى منطقة العريش ومقارنتها بمنطقة رفح التى تروى بالماء العذب (منخفض الملوحة) وذلك على الإزهار – والنمو والمحصول المبكر والكلي ووزن وعدد وجودة الثمار ومدى تحمل الهجن تحت الدراسة لإرتفاع الملوحة . وكانت النتائج المتحصل عليها من هذه الدراسة كما يلـــى :

١ــ أدى إرتفاع الملوحة بماء الرى بمنطقة العريش إلى إنخفاض معنوى فى الوزن الطازج للنبات وطول النبات والمحصول المبكر والكلى وزن فقط وفى حجم الثمار مقارنة بمنطقة رفح .

٢ــ أدى إرتفاع الملوحة فى ظهور الأزهار المؤنثة مبكرا ويعلل ذلك بأن الظروف الغير ملائمة لنمو النبات (إرتفاع الملوحة) أدى إلى إندفاع النبات للتزهير المبكر .

٣ــ أدت الملوحة إلى زيادة صلابة الثمار و إلى إرتفاع نسبة السكر (T SS) فى الثمار .

٤ــ لم يؤثر إرتفاع مستوى الملوحة بماء الرى على عدد الأفرع والثمار على النبات .

٥ــ كانت سلوك الهجن تحت الدراسة تتلخص فى تأثر بعض الهجن بالملوحة والذى أدى إلى إظهار تأثيرات الملوحة السابقة بوضوح عليها و أعتبرت هذه الهجن حساسة لإرتفاع الملوحة وكانت هذه الهجن جاليا – بريمال – فيكار .

٦ــ أظهرت بعض الهجن تحملها لإرتفاع الملوحة مما أدى إلى عدم ظهور تأثير الملوحة على الأزهار والنمو والمحصول بدرجة معنوية وهذه الهجن هى إيديال ، رافيجال ، ريجال بالإضافة إلى أن إرتفاع الملوحة أدى إلى جودة الثمار فى هذه الهجن بإرتفاع صلابتها وإرتفاع نسبة السكر بها مما ينصح باستخدام هذه الهجن بالمناطق التى تروى بماء ترتفع فيه نسبة الملوحة .