

EFFECT OF CULTIVAR AND PLANTING DATE ON YIELDING ABILITY, FRUIT CHARACTERISTICS AND STORAGEABILITY OF SOME CANTALOUPE CULTIVARS UNDER LOWER EGYPT CONDITIONS

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ABSTRACT

This research was carried out to investigate the effect of cultivars and planting date on yielding ability, fruit characteristics and storageability of some cantaloupe cultivars under lower Egypt conditions. Eight cultivars were cultivated at El-Arish (North Sinai Governorate) during the winter seasons of 1999/2000 and 2000/2001.

The eight cultivars used in this study were Primal, Regal, Refigal, Vicar, Galor, Ideal, Total and Galia. The main results can be summarized as follows :

- 1- Early, total and marketable yield were higher in the second planting date for the eight tested cultivars compared with the first planting date in both seasons.
- 2- Regal, Primal and Rafigal produced the highest early yield.
- 3- As for the total yield Galor, Total and Vicar were the best.
- 4- Primal, Galor and Rafigal gave the lowest total yield in both seasons.
- 5- Regal, Ideal and Vicar cvs. at the second planting date produced the highest exportable yield.
- 6- Regal and Primal cvs at the second planting date fruits had the highest average fruit weight compared to the others under test.
- 7- Primal and Rafigal showed the higher firmness values at the first and second planting dates than the other cultivars at the same dates.
- 8- Vicar and Ideal cvs at the first or second planting dates exhibited the highest T.S.S. %, total sugar content and vit. C.
- 9- Regarding to storageability, Primal, Regal and Rafigal cvs showed the highest fruit quality physical and chemical properties.
- 10- In the second planting date, cantaloupe fruits had the lowest decay, weight loss percentage and the highest storageability.
- 11- Weight loss and decay % were increased with the prolongation of the storage period, but firmness values as well as chemical compositions in fruits of all cultivars were significantly decreased with prolongation of storage period.

It could be stated that Primal, Regal and Rafigal at the second planting date may be recommended for exportation, which produced under lower Egypt conditions.

INTRODUCTION

Cantaloupe has become, nowadays, one of the important crops in Egypt for both export and local market consumption. At north Sinai Governorate, a sizeable attention has been focused towards this crop

because of the favourite climatological and soil conditions of tendency towards early cropping in late winter and early spring at this area.

Many investigators reported that there were significant differences in characters of all cultivars at picked time as well as during storage period (Ezzat, 1991; Abd El-Khalek, 1996 and Gomes Junior *et al.*, 2001). Moreover, there were changes in physical and chemical contents of melon fruits during storage as reported by Soliman (1980); Hardenburg *et al.* (1986); Ezzat (1991); Abd El-Khalek (1996) and Bigalke and Juyskens-Keil (2001) on melon.

Beside its direct impact on plant transpiration and consequently plant and fruit Ca content, which markedly determined fruit quality and storageability (Mason *et al.*, 1974; Poovaiah, 1986; Wills *et al.*, 1982). Climate factors are temperature, humidity, light intensity and duration, direct sun light exposure, wind ... etc. This increase in field temperature markedly depressed the storageability of cantaloupe fruits particularly if this increase was prior or at harvest (Cantwell, 1996; Kader, 1983; Kasmire, 1978 and Suslow *et al.*, 1997).

Cantaloupes are the chilling sensitive fruits (Cabrera and Saltviet, 1993; Hariyadi and Parkin, 1991; Lester *et al.*, 1988; McCollum, 1989; McCollum and McDonald, 1993; Picha, 1986; Teltel *et al.*, 1989 and Wang, 1994).

When the temperature in the field dropped to levels below the threshold temperature of a certain cantaloupe cultivar for days, fruits will show chilling injury (CI) symptoms and became un-storable. The sensitivity of fruits to CI is markedly increased if the crop is partially chilled in the field (Minorsky, 1985; Morris, 1982 and Wang, 1982). On the other hand, the impact of weather humidity on plant transpiration is well known. Sudden humidity changes in the field may resulted in Ca deficiency (Armstrong and Kirkby, 1979) and consequently fruit storability reduction (Poovaiah, 1985). Growing cantaloupe under the polyethylene tunnels in winter is commonly used in Egypt. Gradual and careful removal of the polyethylene in the beginning of spring months is strongly recommended. Sudden removal of the polyethylene tunnels will sharply affect plant micro-climate, particularly atmospheric humidity, which greatly harm the plants and consequently the grown or harvested fruits. This sort of agricultural management may adversely affect fruit quality and post-harvest storability. The impact of light intensity, direct sun exposure and other climatic factors also affected fruit quality at harvest and consequently its storability (Locascio *et al.*, 1976).

So that, the aim of this work was conducted to investigate the effect of cultivar and planting date on yield ability, fruit characteristics and storageability of some cantaloupe cultivars produced under conditions of North Sinai Governorate (El-Arish).

MATERIALS AND METHODS

This experiment was conducted at El-Arish(North Sinai Governorate during 1999/2000 and 2000/2001 years. Eight imported cantaloupe cultivars

namely, Primal, Regal, Rafigal, Vicar, Galor, Ideal, Total and Galia were used. Seeds of different cultivar were obtained from Veg. Res. Dept., ARC, El-Dokki, Giza. Seeds of the different cultivars were sown on November 7th and December 10th, for the two years, respectively.

A complete randomized block design with four replicates for each cultivar was adopted. Drip irrigation was used. Seeds were sown in hills 40 cm apart under polyethylene tunnels. Black plastic mulch was used. Twenty days from sowing, plants were thinned to one plant per hill. Normal agricultural treatments of growing cantaloupe were practiced in both studied seasons.

After 45-days from fruit setting were harvested.

Date were recorded as follows :

1- Yield Component :

- I. Early yield (ton/fed.), determined as weight of fruits picked during the first two weeks.
- II. Total yield (ton/fed.), determined as weight of fruits picked all over the season.
- III. Exportable yield (ton/fed.), determined as the total yield after discarding the damage and malformed fruits.

2- Fruit characteristics :

The fruits were used to determine the following characters :

- I. Average fruit weight (gm.), using the Top Balance Loading.
- II. Firmness (in pounds per square inch, using the pressure tester) as stated by Wills *et al.* (1982).
- III. Total soluble solids % (T.S.S.), using hand refractometer (Wills *et al.*, 1982).
- IV. Total sugar contents in the flesh : The modified method of Shaffer and Hartman (1921) was adapted.
- V. Vitamin C : The titration method using 2,6 dichlorophenol endophenol (A.O.A.C., 1970).

3- Keeping quality :

A. Physical properties :

Fruits were immediately transferred to the laboratory, where healthy fruits were chosen. Fruits were stored in cold storage (2.5°C). In both cases fruits were packed in five Kg carton boxes before storage. All treatments were tested in a split-plot design with four replications, of main plots devoted for cultivars while, planting dates fruits in sub-plots.

The determination of physical and chemical properties was done at 7 days intervals during storage for cold storage. Starting at the beginning of storage period.

1- Weight losses of fruits was estimated by the following equation:

Initial weight – weight at sampling date

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$$\text{Weight loss \%} = \frac{\text{Initial weight}}{\text{Initial weight}} \times 100$$

- 2- Decay percent : Decay fruits were removed, weighted and recorded. They included all the injured or spoiled fruits resulting from fungal or bacterial infection. Percentage of decay was calculated in relation to the initial of stored fruits.
- 3- Fruits firmness, determined by Magness and Ballouf pressure tester equipped with 3/16 inch plunger and adjusted in Neuston (as recommended by ASHS post-harvest working group).
- 4- Total soluble solids, measured by hand refractometer (Wills *et al.*, 1982).
- 5- Total sugar contents : analyzed according to Shaffer and Hartman (1921).
- 6- Ascorbic acid contents were determined as mg/100 gm fresh weight using 2,5 dichlorophenol-indophenol for titration (A.O.A.C., 1970).

The data were statistically analyzed according to Snedecor and Cochran (1971).

RESULTS AND DISCUSSION

1- Yield Component :

A. Early yield :

Early yield was higher in the second planting date for the eight tested cultivars compared with the first planting date fruits in both seasons. However, Regal, Primal and Rafigal, produced the highest early yield, while Total and Galor gave the lowest early yield with significant differences between them in both seasons, data in Table (1).

From the obtained results, it can be concluded that the early yield of all cultivars was higher in the second planting date than the first planting date. The cultivars Regal, Primal and Rafigal at second planting date were very productive in both seasons. These might be due to environmental factors.

The mentioned results are in agree with that of Cantwell (1996); Kader (1983); Kasmire (1978); Suslow *et al.* (1997).

B. Exportable yield :

The exportable yield was higher during the second planting date than that of first planting date. Regal, Ideal and Vicar cvs. at the second planting date produced the highest marketable yield while, Total and Galor gave the lowest exportable yield with significant differences between them in both seasons, data in Table (1).

C. Total yield :

Total yield was higher in the second planting date for the eight cultivars compared with the first planting date in both seasons. As for the total

yield, Galor, Total and Vicar cvs. were the best. Primal, Galia and Rafigal gave the lowest total yield in both seasons, data in Table (1).

The mentioned results are in agreement with that of Cantwell (1996) and Suslow *et al.* (1997).

2- Fruit characteristics :

From Table (2), it appears that the planting date had effect on the average fruit weight for all tested cultivars. In this connection, Regal and Primal cvs at the second planting date showed the highest values.

Concerning fruit firmness, it appears from Table (2) that fruits of the second planting date were firmer than that of first planting date with significant differences between them. Moreover, Primal and Rafigal cvs gave the higher degree of firmness, while Total and Galor showed the lowest values.

Regarding T.S.S., total sugar content and vit. C, Vicar and Ideal cvs at the second planting date exhibited the highest in this respect, data in Table (2).

From all the reported results, it can be concluded that the cultivars Regal, Primal, Vicar and Ideal were the best in respect to fruit characteristics (Avr. fruit weight, firmness, T.S.S., total sugar and vitamin C) compared with the other tested cultivars.

3- Keeping quality :

Mean values of all storageability characters regarding storage period, cultivars and planting dates are presented in Table (3).

A. Effect of storage period:

As shown from data recorded in Table (3) that there are significant differences in storageability of all studied characters of cantaloupe fruits under cold storage conditions with prolongation of storage period.

Regarding weight loss, data in Table (3) show that there was significant and considerable increase in weight loss toward the end of storage period, i.e. 28 days. As it is known that the continuous loss in weight during storage was due to evaporation and respirations, Stanely (1991).

The process of fruit decay, as shown in Table (3) took place after seven days and showed progressive and significant increase as storage period was prolonged. Generally it is clear also that fruits become more susceptible to decay with extension of the storage period (Table 3). The present results are in line with those reported by Ezzat (1991).

The same data indicate also that firmness of cantaloupe fruits stored under cold storage conditions gradually and significantly decreased with prolongation of storage period and reached its lowest value at the end of storage period, i.e. 28 days. The decrease in firmness might be attributed to the conversion of protopectin to soluble forms and/or the decrease of both water and dry matter with prolongation of storage period.

T.S.S., total sugar contents of ascorbic acid (vit. C) were also consistently and significantly decreased with the prolongation of storage period (Table 3).

The decrement in T.S.S. during storage period might be due to the relatively higher rates of sugar loss through respiration. Whereas, the decline in vit. C might be due to the higher rate of ascorbic acid and other organic acids in respiration process with prolongation of storage period.

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B. Effect of cultivars :

Concerning all studied characters, i.e. weight loss %, decay %, firmness, T.S.S., total sugar content and vit. C content of fruits, significant differences are detected in this respect as shown in Table (3). Regarding the weight loss and decay percent Primal, Regal and Rafigal cultivars exhibited the least in these respect compared with the other cultivars, while Total and Galor cvs showed the higher values in both years. However, with respect to fruit firmness, Primal and Rafigal cvs which showed the highest values of firmness compared with the other cultivars. The decrease in weight loss and decay of Primal and Rafigal cvs might be attributed to this firmness. The increase in weight loss of Total and Galor cvs might be due to its low firmness Table (3). This was quite clear in both seasons.

In relation to T.S.S., total sugar contents and vit. C content, Ideal and Vicar cvs showed the higher values compared with other cultivars in both two years. However, Total fruits were significantly lower in these respect.

From the aforementioned result, it could be suggested that Primal, Regal and Rafigal cvs lost lower proportion of weight and decay percent than the other cultivars. Moreover, they were extremely firmer than the others.

The differences between cultivars in storageability might be due to inherited varietal characters.

These results emphasized the finding of Ezzat (1991) and Abd El-Khalek (1996) on melon.

C. Effect of planting date :

It is also clear from the same data in Table (3) that the first planting date cantaloupe fruits had the highest values of weight loss and decay percent under cold storage as compared with the first planting date fruits.

With respect to fruit firmness as affected by planting dates, data in Table (3) also indicate clearly that the second date cantaloupe fruits, in general, led to significant increments in the rate of fruit firmness compared with those of first planting date ones.

It is also obvious from data shown in Table (3) that the second planting date fruits caused significant differences against the first planting date fruits concerning T.S.S., total sugar and Vit. C fruit content.

Thus, obtained results could be attributed to the climate factors which affect cantaloupe fruits storability as stated by Cantwell (1996); Kader (1983) and Suslow *et al.* (1997).

D. Effect of interaction between cultivar and planting dates:

It appears from data shown in Table (4) that the second planting date of all cultivars were the most effective ones in minimizing the weight loss and decay percentage. Moreover, Primal, Regal, Rafigal and Vicar cvs at the second planting date showed the best results with regard to weight loss and decay values (Table 4) compared with the other tested cultivars. Concerning the variability of cultivars in the fruit firmness (pound/inch²), the highest values were obtained for Primal and Rafigal cvs. respectively specially at second planting date. However, the lowest values in this respect were obtained for Total cv at the first planting date.

With respect to the effect of interaction between planting dates X cultivars on T.S.S., total sugar content, and vit. C (as shown in Table 4), it is noticed that Ideal and Vicar cvs at second planting date exhibited the highest values in T.S.S. and total sugar contents followed by Rafigal, Regal, Primal and Galia cvs at second planting date respectively and at last the lowest one was that Galor cv. At the same date in both seasons.

Regarding the effect of interaction on vit. C data in Table (4) showed that Ideal and vicar at first planting date exhibited the highest values in vit. C contents followed by Primal, Regal, Galia and Galor cvs at second planting date respectively and at last the lowest ones was that Rafigal cv. at same date in both seasons.

These results were in agreement with those reported by Ezzat (1991); Abd El-Khalek (1996) and Gomes Junior *et al.* (2001) on melon.

E. Effect of interaction between cultivars and storage period :

Data presented in Table (5) show a general trend, that prolongation of storage period led to reduction in firmness and all chemical properties, i.e. T.S.S. total sugar and vit. C content and also deterioration of fruits expressed as an increase in weight loss % and percentage of decay fruits for the different cultivars under study. The physical characters, i.e. weight loss %, decay % and firmness showed gradual deterioration with prolongation of storage period under cold storage condition. This reduction in fruit quality became significant after 7 days. The percentage of occurrence of such a trend significantly differs in between cultivars as follows, Total cv showed the highest percentage in the occurrence of the general physical characters trend observed with lower fruit characteristics, i.e. 11.19% weight loss, 14.51% decay and 14.5 pound/inch² firmness (average two seasons). However, Primal and Rafigal cvs exhibited the lowest percentage in the occurrence of the general trend observed with higher fruit characteristics, i.e. 4.39 and 5.23 weight loss %, 5.20 and 6.87 decay % and 23.88 and 22.93 pound/inch² firmness (average two years) for Primal and Rafigal respectively at the end of storage period (28 days) under cold storage conditions.

On the other hand, Primal (ranked the first physical proportion) being the fifth in T.S.S. and total sugar content. Regarding T.S.S. and total sugar content, Ideal and vicar showed the highest values followed by Rafigal; Regal, Primal, Galia, Galor and Total cvs respectively (Table 5).

Chemical properties of cantaloupe fruits stored under cold storage period. This reduction became significant in T.S.S., total sugar content and vit. C, after 7 days based on cultivars.

These results might be due to evaporation, respiration and hereditary differences among the cultivars. Moreover, increasing the storage period may result in increasing the duration through which the pectin esterase perform and this may lead to increase the soluble form of pectin substances, as stated by Wills *et al.* (1982).

F. Effect of interaction between planting date and storage period :

Results in Table (6) clearly show the same trend observed before in (Table 6) concerning the effect of planting dates (first and second) as well as the effect of storage period.

Prolonged storage period led to reduction in firmness, increase in weight loss % and an increase in percentage of decay fruits for all eight cultivars under this study as shown also in (Table 5).

The first planting date exhibited the highest percentage of fruit spoilage during storage. Meanwhile, the second planting date fruits led to the healthy appearance, firm and reduced the percent of loss in weight in comparison with fruits of the first planting date. These results were true in the two seasons of this work.

The effect of such interaction on T.S.S., total sugar content and vit. C content are shown in Table (6). It is clear that the second planting date fruits exhibited significantly higher values at the end of storage period compared with the first planting date fruits. It is also noticed that the second planting date fruits at different storage periods showed higher values in all chemical properties under study. These results are in harmony with those obtained by Ezzat (1991); Abd El-Khalek (1996) and Gomes Junior *et al.* (2001) on melon.

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تأثير الصنف وميعاد الزراعة على القدرة الإنتاجية ومواصفات الثمار والقدرة التخزينية لبعض أصناف الكنتالوب المنزرعة تحت ظروف الوجه البحرى بمصر محسن عبد المقصود عزت معهد بحوث البساتين - مركز البحوث الزراعية - وزارة الزراعة

أجريت هذه الدراسة بهدف دراسة تأثير الصنف وميعاد الزراعة على القدرة الإنتاجية ومواصفات الثمار والقدرة التخزينية لبعض أصناف الكنتالوب المنزرعة تحت ظروف الوجه البحرى بمصر . زرعت ثمانية أصناف فى العريش (محافظة شمال سيناء) فى العروة الشتوية لعامى ١٩٩٩ / ٢٠٠٠ , ٢٠٠٠ / ٢٠٠١ .

الثمانية أصناف المنزرعة فى هذه الدراسة هى بريمال , ريجال , رافيجال , فيكار , جالور , أيدبال , توتال وجاليا . ويمكن تلخيص أهم النتائج فيما يلى :

- 1- تفوق المحصول المبكر والكلى والصالح للتسويق فى الميعاد الثانى عن الميعاد الأول فى ثمانية أصناف تحت الاختبار فى كل من الموسمين .
- 2- تفوق كل من الأصناف بريمال , ريجال ورافيجال فى المحصول المبكر .
- 3- تفوق كل الأصناف جالور , توتال وفيكار فى المحصول الكلى .
- 4- أعطت أصناف كل من بريمال وجاليا ورافيجال أقل محصول كلى فى كل من الموسمين .
- 5- تفوق أصناف ريجال وأيدبال وفيكار المنزرعة فى الميعاد الثانى فى المحصول الصالح للتصدير .
- 6- أعطت أصناف ريجال والبريمال والمنزرعة فى الميعاد الثانى أعلى قيمة فى متوسط وزن الثمرة بالمقارنة لباقي الأصناف تحت الاختبار .
- 7- أظهرت أصناف بريمال ورافيجال المنزرعة فى الميعاد الأول والثانى أعلى قيم فى صلابة الثمار بالمقارنة لباقي أصناف الثمار والمنزرعة فى نفس الميعادين .
- 8- أعطت أصناف فيكار وأيدبال والمنزرعة فى الميعاد الأول أو الثانى , أعلى قيم فى نسبة المحتويات المواد الصلبة الذائبة والسكريات الكلية وفيتامين ج .
- 9- بالنسب للقدرة التخزينية كانت الأصناف بريمال وريجال ورافيجال أفضل الأصناف من حيث مواصفات الثمار الطبيعية والكيموية .
- 10- أظهرت ثمار الكنتالوب المنزرعة فى الميعاد الثانى نسبة أقل فى فقد الوزن والتالف وقدرة تخزينية عالية .
- 11- يزداد معدل فقد فى الوزن والتالف كما تقل صلابة الثمار وينخفض محتواها من المواد الصلبة الذائبة والسكريات الكلية وفيتامين ج بزيادة فترة التخزين .
- 12- ونصح باستخدام أصناف بريمال وريجال ورافيجال المنزرعة فى الميعاد الثانى لغرض التصدير والمنتجة تحت ظروف الوجه البحرى بمصر .

Table (1) : Effect of cultivars and planting date on early yield, exportable yield and total yield of cantaloupe fruits.

Cultivars	Planting date	1999/2000						2000/2001					
		Early yield		Exportable yield		Total yield		Early yield		Exportable yield		Total yield	
		Weight (Kg/plant)	Weight (ton/fed.)	Weight (Kg/plant)	Weight (ton/fed.)	Weight (Kg/plant)	Weight (ton/fed.)	Weight (Kg/plant)	Weight (ton/fed.)	Weight (Kg/plant)	Weight (ton/fed.)	Weight (Kg/plant)	Weight (ton/fed.)
Primal	First	0.39	1.95	0.68	3.40	1.41	7.05	0.45	2.25	0.74	3.70	1.47	7.35
	Second	1.23	6.14	1.39	6.95	2.23	11.15	1.29	6.45	1.45	7.25	2.29	11.45
Regal	First	0.55	2.76	0.80	4.00	1.53	7.65	0.61	3.05	0.86	4.30	1.59	7.95
	Second	1.45	7.24	1.78	8.91	2.46	12.30	1.51	7.55	1.84	9.20	2.52	12.60
Rafigal	First	0.47	2.34	0.62	3.13	1.38	6.89	0.53	2.65	0.68	3.40	1.44	7.20
	Second	1.18	5.90	1.41	7.05	2.11	10.54	1.24	6.20	1.47	7.35	2.17	10.85
Vicar	First	0.40	1.99	0.70	3.50	1.54	7.69	0.46	2.30	0.76	3.80	1.60	8.00
	Second	1.16	5.80	1.42	7.10	3.14	15.70	1.22	6.10	1.48	7.40	3.20	16.00
Galor	First	0.27	1.35	0.33	1.65	1.88	9.41	0.33	1.65	0.39	1.95	1.94	9.70
	Second	0.81	4.09	0.84	4.20	2.98	14.90	0.87	4.35	0.90	4.50	3.04	15.20
Ideal	First	0.31	1.55	0.60	3.00	1.07	5.33	0.37	1.85	0.66	3.30	1.13	5.65
	Second	1.11	5.55	1.63	8.15	2.55	12.79	1.17	5.85	1.69	8.45	2.61	13.05
Total	First	0.29	1.43	0.41	2.05	1.49	7.45	0.35	1.75	0.47	2.35	1.55	7.75
	Second	0.63	4.13	0.89	4.45	3.12	15.60	0.69	3.45	0.95	4.75	3.18	15.90
Galia	First	0.40	2.00	0.55	2.76	1.22	6.09	0.46	2.30	0.61	3.05	1.28	6.40
	Second	1.01	5.05	1.23	6.14	2.16	10.79	1.07	5.35	1.29	6.45	2.22	11.10
L.S.D. at 0.05 cultivars		0.11	0.55	0.07	0.35	0.10	0.50	0.13	0.58	0.09	0.38	0.14	0.54
Planting dates		0.13	0.59	0.09	0.43	0.12	0.54	0.16	0.63	0.14	0.45	0.17	0.58
Varieties X planting dates		0.09	0.48	0.06	0.35	0.10	0.43	0.12	0.51	0.11	0.36	0.15	0.52

Table (2) : Fruit characters of some cantaloupe cultivars.

Seasons	Planting date	1999/2000					2000/2001				
		Average fruit weight (g)	Firmness plan/inch ²	T.S.S. (%)	Total sugar mg/100gm edible portion	Vit. C mg/100 ml juice	Average fruit weight (g)	Firmness Plan/inch ²	T.S.S. (%)	Total sugar mg/100gm edible portion	Vit. C mg/100 ml juice
Primal	First	683.0	23.89	14.20	9.23	21.10	749.0	23.49	14.80	9.63	21.7
	Second	776.6	24.13	14.70	9.55	22.90	842.0	24.73	15.30	9.95	23.5
Regal	First	724.0	21.64	14.25	9.26	22.40	840.0	22.24	14.85	9.66	23.00
	Second	830.0	22.71	14.80	9.62	23.80	906.0	23.31	15.40	10.02	24.40
Rafigal	First	659.0	22.54	14.55	9.45	18.40	875.0	23.14	15.15	10.85	19.00
	Second	760.0	23.41	14.95	9.71	19.70	836.0	24.04	15.55	10.11	20.30
Vicar	First	613.0	20.66	15.00	9.75	25.60	786.0	21.26	15.60	10.15	26.30
	Second	729.0	21.33	15.35	9.97	26.50	845.0	21.93	15.95	10.37	27.10
Galor	First	507.0	15.85	13.00	8.45	18.70	693.0	16.43	13.60	8.85	19.30
	Second	643.0	16.12	13.45	8.74	20.90	719.0	16.72	14.05	9.14	21.50
Ideal	First	549.0	19.77	15.20	9.88	25.30	665.0	20.37	15.80	10.28	25.90
	Second	665.0	20.04	15.70	10.22	26.60	781.0	20.64	16.30	10.62	27.20
Total	First	531.0	15.13	11.25	7.31	13.10	607.0	15.73	11.85	7.71	13.70
	Second	647.0	16.20	11.90	7.73	15.30	713.0	16.80	12.50	8.13	15.90
Galia	First	569.0	21.30	14.20	9.23	20.40	685.0	21.90	14.80	9.62	21.00
	Second	685.0	22.29	14.80	9.62	21.70	701.0	22.89	15.40	10.01	22.30
L.S.D. at 0.05 cultivars		0.32	0.61	0.06	0.03	0.11	0.29	0.57	0.05	0.02	0.09
Planting dates		0.36	0.64	0.05	0.04	0.14	0.23	0.51	0.04	0.02	0.10
Varieties X planting dates		0.29	0.62	0.03	0.02	0.08	0.19	0.46	0.04	0.01	0.07

Table (3) : Effect of storage period, cultivars and planting date on keeping quality of cantaloupe fruits.

Seasons	1999/2000						2000/2001					
Characters	Weight loss (%)	Decay (%)	Firmness pound/inch ²	T.S.S. (%)	Total sugar mg/100g edible portion	Ascorbic acid mg/100ml juice	Weight loss (%)	Decay (%)	Firmness pound/inch ²	T.S.S. (%)	Total sugar mg/100g edible portion	Ascorbic acid mg/100ml juice
Effect of storage period :												
0 days	--	--	21.19	15.53	10.46	23.72	--	--	22.51	16.13	11.06	24.32
7 days	3.72	5.66	20.91	15.39	10.39	22.44	4.32	6.26	21.02	15.99	10.99	23.04
14 days	4.96	6.51	19.34	15.20	10.26	21.26	5.56	7.11	19.94	15.80	10.86	21.86
21 days	8.63	8.59	17.83	14.98	10.13	20.29	9.23	9.19	18.43	15.58	10.73	20.89
28 days	10.56	12.65	16.51	14.43	9.80	18.46	11.16	13.25	17.11	15.03	10.40	19.06
L.S.D. at 0.05	00.32	0.29	0.44	0.03	0.02	0.64	0.44	0.37	0.48	0.04	0.03	0.06
Effect of cultivars :												
Primal	3.83	4.90	23.58	15.47	10.43	22.76	4.96	5.50	24.18	16.07	11.03	23.36
Regal	5.02	6.13	21.57	15.54	10.48	22.35	5.62	6.78	22.17	16.14	11.08	22.95
Rafiqal	4.85	6.57	22.64	15.84	10.67	18.47	5.45	7.17	23.24	16.44	11.27	19.07
Vica	7.16	8.05	19.41	16.23	10.93	25.71	7.76	8.65	20.01	16.83	11.53	26.31
Galor	10.23	15.51	14.41	13.95	9.45	19.77	10.83	16.11	15.01	14.55	10.05	20.37
Ideal	8.55	9.12	17.77	16.45	11.07	25.81	9.15	9.72	18.37	17.05	11.67	26.41
Total	10.89	14.21	14.20	12.36	8.41	14.51	11.49	14.81	14.80	12.96	9.01	15.11
Galia	5.47	6.43	19.97	14.74	10.28	20.46	6.07	7.30	20.57	15.34	10.88	21.06
L.S.D. at 0.05	0.11	0.19	0.33	0.04	0.03	0.45	0.15	0.28	0.31	0.03	0.02	0.41
Effect of Planting dates :												
Second	6.09	7.62	20.12	15.63	10.54	22.82	6.70	8.22	20.72	16.23	11.14	23.42
First	7.90	10.11	18.26	14.64	9.89	19.27	8.50	10.71	18.86	15.24	10.49	19.87
L.S.D. at 0.05	0.13	0.16	0.27	0.02	0.04	0.37	0.15	0.19	0.37	0.04	0.03	0.39

Table (4) : Effect of interaction between cultivars and planting date on keeping quality of cantaloupe fruits.

Seasons		1999/2000						2000/2001					
Characters		Weight loss (%)	Decay (%)	Firmness pound/inch ²	T.S.S. (%)	Total sugar mg/100g edible portion	Ascorbic acid mg/100ml juice	Weight loss (%)	Decay (%)	Firmness pound/inch ²	T.S.S. (%)	Total sugar mg/100g edible portion	Ascorbic acid mg/100ml juice
Cultivars	Planting date												
Primal Second		1999/2000						2000/2001					
First	3.57												
	4.09												
	5.94												
	23.06												
	14.92												
	10.08												
	20.26												
	5.74												
	6.54												
	23.66												
	15.52												
	10.48												
	20.86												
	Regal												
Cultivars	Storage period	Weight loss (%)	Decay (%)	Firmness pound/inch ²	T.S.S. (%)	Total sugar mg/100g edible portion	Ascorbic acid mg/100ml juice	Weight loss (%)	Decay (%)	Firmness pound/inch ²	T.S.S. (%)	Total sugar mg/100g edible portion	Ascorbic acid mg/100ml juice
	23.70												
	22.55												
	21.70												
Regal	0 days	--	--	23.65	15.85	10.58	24.80	--	--	24.25	16.45	11.18	25.40
	7 days	1.72	--	22.56	15.75	10.61	24.04	2.32	--	23.16	16.35	11.21	24.65
	14 days	3.33	4.35	21.51	15.58	10.49	21.80	3.93	4.90	22.11	16.18	11.09	22.40
	21 days	6.59	5.36	20.63	15.45	10.42	21.45	7.19	5.96	21.23	16.05	11.02	22.05
	28 days	8.42	8.82	19.50	15.05	10.16	19.65	9.07	9.42	20.10	15.65	10.76	20.25

Rafigal	0 days	--	--	24.82	16.05	10.81	21.15	--	--	25.42	16.65	11.41	21.75
	7 days	2.59	--	23.62	15.95	10.75	19.85	3.19	--	24.22	16.55	11.35	20.45
	14 days	3.82	4.69	22.59	15.83	10.66	18.90	4.42	5.29	23.19	16.43	11.26	19.50
	21 days	5.55	5.70	21.72	15.60	10.55	17.30	6.35	6.30	22.32	16.20	11.15	17.90
	28 days	7.45	9.33	20.47	15.20	10.26	15.15	8.05	9.93	21.07	15.80	10.86	15.75
Vicar	0 days	--	--	22.39	16.55	11.13	28.05	--	--	22.99	17.15	11.73	28.65
	7 days	3.42	--	20.53	16.45	11.07	26.85	4.02	--	21.13	17.05	11.67	27.45
	14 days	4.77	5.22	19.31	16.35	11.01	25.75	5.37	5.82	19.91	16.95	11.61	26.35
	21 days	9.18	7.43	17.91	16.15	10.88	24.90	9.83	8.03	18.51	16.75	11.48	25.50
	28 days	11.23	11.51	16.88	15.17	10.57	23.00	11.83	12.11	17.48	15.77	11.17	23.60

Table (5) Contd

Seasons		1999/2000						2000/2001					
Cultivars	Storage period	Weight loss (%)	Decay (%)	Firmness pound/inch ²	T.S.S. (%)	Total sugar mg/100g edible portion	Ascorbic acid mg/100ml juice	Weight loss (%)	Decay (%)	Firmness pound/inch ²	T.S.S. (%)	Total sugar mg/100g edible portion	Ascorbic acid mg/100ml juice
Galor	0 days	--	--	17.62	14.50	9.81	22.10	--	--	18.22	15.10	10.41	22.70
	7 days	6.30	--	15.57	14.30	9.68	20.85	6.95	--	16.17	14.90	10.28	21.45
	14 days	7.73	10.58	14.60	14.08	9.53	19.75	8.33	11.18	15.20	14.68	10.13	20.35
	21 days	12.26	15.26	12.64	13.75	9.32	18.90	12.86	15.86	13.24	14.35	9.92	19.50
	28 days	14.59	20.69	11.63	13.15	8.93	17.25	15.19	21.29	12.23	13.75	9.53	17.85
Ideal	0 days	--	--	21.13	16.80	11.31	27.80	--	--	21.73	17.40	11.91	28.40
	7 days	4.76	--	19.30	16.67	11.22	26.95	4.86	--	19.90	17.27	11.88	27.55
	14 days	6.80	6.56	18.18	16.55	11.14	25.90	7.40	7.16	18.78	17.15	11.74	26.50
	21 days	9.91	8.63	15.87	16.35	11.01	25.05	11.01	9.23	16.47	16.85	11.61	25.65
	28 days	12.23	12.17	14.42	15.85	10.68	23.50	13.33	12.77	15.02	15.45	11.28	24.10
Total	0 days	--	--	16.97	12.90	8.76	17.50	--	--	17.57	13.50	9.36	18.15
	7 days	6.49	5.66	15.72	12.70	8.64	15.60	7.09	6.26	16.32	13.30	9.24	16.20
	14 days	8.31	12.82	14.58	12.45	8.47	14.50	8.91	13.42	15.18	13.05	9.07	15.10
	21 days	13.55	16.16	12.79	12.17	8.36	13.45	14.15	16.76	13.39	12.77	8.96	14.05
	28 days	15.22	22.22	10.96	11.55	7.88	11.50	15.82	22.82	11.56	12.15	8.48	12.10
Galila	0 days	--	--	23.20	15.77	10.64	23.55	--	--	23.80	16.37	11.24	24.15
	7 days	3.72	--	21.48	15.63	10.54	21.90	3.27	--	22.08	16.23	11.14	22.10
	14 days	4.96	4.58	20.37	15.28	10.31	20.35	3.88	5.18	20.97	15.88	10.91	20.95
	21 days	8.63	5.84	18.42	15.00	10.13	19.35	7.51	6.44	19.02	15.60	10.73	19.95
	28 days	10.56	8.89	16.62	14.50	9.81	17.55	9.57	9.49	17.22	15.10	10.41	18.15
L.S.D. at 0.05		0.12	0.18	0.22	0.03	0.04	0.26	0.15	0.17	0.25	0.02	0.03	0.28

Table (6) : Effect of interaction between planting date and storage period on keeping quality of cantaloupe fruits.

Seasons		1999/2000						2000/2001					
Characters		Weight loss (%)	Decay (%)	Firmness pound/inch ²	T.S.S. (%)	Total sugar mg/100g edible portion	Ascorbic acid mg/100ml juice	Weight loss (%)	Decay (%)	Firmness pound/inch ²	T.S.S. (%)	Total sugar mg/100g edible portion	Ascorbic acid mg/100ml juice
Planting dates	Storage period (days)												
Second	0 days	--	--	22.62	15.99	10.78	25.71	--	--	23.22	16.58	11.38	26.32
	7 days	2.90	4.39	21.34	15.88	10.71	24.40	3.27	5.00	21.94	16.47	11.32	25.01
	14 days	4.13	5.41	20.29	15.71	10.59	23.25	4.73	6.01	20.90	16.32	11.20	23.86
	21 days	7.76	7.48	18.84	15.50	10.48	22.29	8.38	8.08	19.43	16.10	11.09	22.89
	28 days	9.57	11.10	17.58	14.91	10.15	20.35	10.17	11.70	18.17	15.51	10.76	20.96
First	0 days	--	--	21.20	15.06	10.14	21.73	--	--	21.81	15.67	10.73	22.34
	7 days	4.54	6.93	19.50	14.90	10.70	20.48	5.14	7.53	20.11	15.51	10.68	21.09
	14 days	5.79	7.60	18.39	14.68	9.94	19.26	6.40	8.20	19.02	15.27	10.54	19.87
	21 days	9.48	9.69	16.81	14.45	9.78	18.30	10.11	10.29	17.41	15.06	10.39	18.91
	28 days	11.55	14.20	15.45	13.94	9.45	16.58	12.15	14.80	16.06	14.53	10.06	17.19
L.S.D. at 0.05		0.15	0.23	0.26	0.02	0.04	0.31	0.11	0.19	0.21	0.01	0.02	0.26