

EVALUATION OF GROWTH CHARACTERISTICS, ALTERNATE BEARING AND FRUITING OF NINE MANGO CULTIVARS GROWN UNDER SOHAG REGION CLIMATIC CONDITIONS

Hamam, M. S.

Hort. Res .Inst. Agric.Res. Center,Giza , Egypt

ABSTRACT

This study was conducted during- 1999/2000 and - 2000/2001 seasons as an attempt to evaluate nine mango cultivars namely, Awaise Alphonse, Balady, Aremanis, Goleck, Hindy Bisinnara, Mabrouka, Taimour and Tota pari grown under Sohag region conditions . Growth characters, yield incidence of alternate bearing , physical and chemical properties of the fruits , storage ability at room temperature and harvesting date were recorded for the nine mango cultivars .

Results showed that there was a wide variation between the studied mango cultivars in relation to the parameters undertaken in this study . Mabrouka, Aremanis, Alphonse, Hindy Bisinnara, Awaise, and Tota pari mango cultivars produced the highest yield in descending order . the minimum yield was recorded in Goleck and Taimour mangoes. Trees of Alphonse and Goleck characterized by high alternate bearing, while trees of Awaise, Balady and Hindy Bisinnara mangoes characterized by low alternate bearing between the previous extremes. Trees of Aremanis , Mabrouka , Taimour and Tota Pari occupied an intermediate position. The highest storage ability was detected on fruits of Taimour mango . Fruits of balady and Alphonse trees had lower storage ability . Fruits of , Hindy Bisinnara , and Tota Pari ripened early and lately , respectively .Most of studied cultivars except Balady and Tota Pari had fruits with striking quality .

Mabrouka, Aremanis , Alphonse, Hindy Bisinnara , Tota Pari and Awaise Mango cultivars are recommended to be cultivated successfully under Sohag region conditions , based on their higher yield and relatively better fruit quality .

INTRODUCTION

Mango is one of the most important fruit crops all over the world . Mango fruits have high nutritional value due to their own higher amounts of sugars , vitamins and minerals . Growth, nutritional status of the trees and fruiting of mango trees widely vary according to climatic conditions . Several trials were made to evaluate some of these cultivars and many efforts are being made to develop newer ones .

Previous studies approved the wide range of differences among mango cultivars (Nakhlla , 1980 ; Sharma and Biswas , (1981) ; El-Masry, 1982; Chunawat *et al.*, (1985) Ibrahim *et al.*,(1985) and Moti and Mary (1986). Different investigations are needed to evaluate mango cultivars that grown under different regions in Egypt. Singh (1960), Kurup (1967); Dahshan, 1971, Hussein and Youssef (1972) and Dahshan (1977) supported the benefits of carrying out many studies to select the suitable mango cultivars to be cultivated in various regions. There were great variations in growth , yield as well as physical and chemical properties of the fruits of various mango cultivars grown in different climatic conditions (Abo El-Ez, 1988 ; Hussein *et*

Hamam, M. S.

al., (1989) ; Salem (1993); Abd-El-Hamed, (1996) ; Ahmed *et al.* , (1998) and El-Masry and Said – Galila, (1998).

Hence, this study was carried out to try to overcome the incomplete understanding about the mango cultivars grown in the region of Sohag , to use as a guide for growers to select the more suitable for mango cultivars in this region .

MATERIALS AND METHODS

This study was carried out during two consecutive seasons ,1999/ 2000 and 2000/2001 on 20- years old mango trees , grown in a private orchard located at Gazeeret Shandaweel Sohag Governorate . The trees were planted at spacing of 7 X 7 meters in loamy soil. Nine mango cultivars were used in this study, namely Awaise, Alphonse, Balady, Aremanis , Hindy Bisinnara, Mabrouka, Goleck, Taimour and Tota Pari. Four trees were selected at random and replicated 3 times. Trees were chosen as uniform in vigour as possible representing a sample for each cultivar to carry out this evaluation trial . The selected trees received 900 g N, 500g P and 750g K/ tree. The other horticultural practices such as irrigation , hoeing and pest control management were carried out as usual Complete randomized block design was used .

The physical and chemical analysis of soil (according to Wilde *et al.*, 1985) are shown in Table (1).

Table (1): Properties of soil at the trial location :-

Particle size distribution :		
Sand %	:	12.22
Silt %	:	63.00
Clay %	:	24.78
Texture	:	loamy
PH (1:2.5 extract)	:	8.06
E.C(1:2.5 extract) (m mhos /cm 25°C)	:	0.52
O.M.%	:	2.10
CaCO 3%	:	2.74
Total N%	:	0.09
P(ppm)(Olsen)	:	15.0
K(ppm)(Ammonium acetate)	:	416.0
DTPA extractable micronutrients (ppm)		
Fe	:	8.7
Zn	:	2.4
Mn	:	57.40
Cu	:	1.9

Growth characters such as shoot length and thickness (cm), leaf length and width (cm), leaf area (cm)² (according to Ahmed and Morsy, 1999) and number of leaves per shoot were recorded . Panicle length (cm) was also registered .

Harvesting date for each cultivar was recorded . Yield expressed in weight (kg.) and number of fruit per trees was recorded . The incidence of alternate bearing as well as the percentage of such phenomenon were calculated for each cultivar. Besides, fruit quality in terms of fruit weight (g), pulp (%), peel weight (%), seed weight (%), fruit dimensions (length, width and thickness cm.), T.S.S (%), total sugars (%), reducing sugars (%), total acidity (%) (expressed in g . citric acid (100g pulp) and vitamin C (as mg/100g pulp) was determined according to A.O.A.C (1985). Storage duration at room temperature (about 25-30°C) and relative humidity about 45% after harvest for each cultivar (in days) was recorded .

All the obtained data were tabulated and statistically analyzed according to Snedecor and Cochran(1972) using L.S.D test for detecting the significant differences between the studied mango cultivars .

RESULTS AND DISCUSSION

1-Growth characters in various mango cultivars :-

Data in Table (2) clearly show that there was a wide and significant variation on growth characters between most mango cultivars . However , all the studied mango cultivars had nearly the same shoot thickness , leaf width and number of leaves per shoot. The minimum shoot length was recorded with Awaise mango trees. Alphonse mango trees produced the leaves with the highest length and area. The minimum leaf length and area was recorded in Balady mango trees. Leaf area ranged from 89.9 and 87.1 cm² for Balady mango cv. to 137.3 cm² for Alphonse mango cv. in both seasons, respectively. The great variation on growth characters observed between various mango cultivars were supported by the results of Nakhlla (1980); Sharma and Biswas (1981); El-Masry (1982); Salem (1993) and El-Masry and Said – Galila (1998)

2- Panicle length in various mango cultivars :-

It is clear from data in Table (3) that panicle length in the nine mango cultivars was varied significantly. It ranged from 20.3 and 20.5 cm . for balady mango cv. and from 25.3 and 25.8 cm. for Aremanis mango cv. The three mango cvs. Aremanis, Hindy Bisinnara and Tota Pari had nearly the same panicle length. The remained mango cvs had panicle length ranged from 22.3 and 23.1 cm. These results were true in 2000 and 2001 seasons. These results are nearly in the same line with those obtained by chunawat *et al.* (1985) , Ibrahim *et al.* (1985) , Moti and aryo (1986) Abo El-Ez (1988) and Hussein *et al.* (1989).

3- Yield in various mango cultivars :-

Data in table (3) obviously show that number of fruits per tree varied from 500 for Balady and Hindy Bisinnara mango trees to 200 for Taimour and Tota Pari mango trees in the first seasons, while in the second season it varied from 450 for Hindy Bisinnara to 100 for Goleck mango cvs. Awaise , Alphonse and Aremanis had the same number of fruits reached 450 fruits per tree in the first seasons.

Results also reveal that there was a wide variation on the yield of the nine mango cultivars. It ranged from 160 kg for Mabrouka to 80.0 kg for Taimour mango cv. in the first season. Mabrouka , Aremanis , Alphonse, Hindy Bisinnara produced the highest yield in the first season respectively. There was a great fluctuation on the yield on the two studied seasons for some mango cultivars such as Alphonse. Goleck and Aremanis. This variation might be attributed to the existence of alternate bearing in such mango cultivars . The maximum yield (160 and 123 kg) was presented in Mabrouka mango trees. The minimum yield was recorded in Taimour mango trees. The mango cultivars that produced the lowest yield were Taimour , Goleck , Balady and Awaise

The great variation detected in yield due to differing mango cultivars was previously confirmed by the results of El-Masry (1982) , Abd El- Hamed (1996), El-Masry *et al.* (1990), Said –Galila and El-Masry (1992) and Ahmed *et al.* (1998) .

4- Incidence of alternate bearing in the various mango cultivars :-

Data in Table (3) divided state of bearing in the studied nine mango cultivars to three division i.e high, intermediate and light . The light alternate bearing mango cultivars were Awaise (2.66%), Hindy Bisinnara (5.92%), Balady (14.00%)and Taimour (20.00%) Alphonse and Goleck mango trees characterized with high alternate bearing . The reduction in the yield in such two cultivars in off-years reached 50.21 and 49.77 % , respectively. The three mango cultivars namely Aremanis, Mabrouka and Tota pari considered an intermediate alternate bearing

Mango varieties. The reduction in yield in off-year in off year in such mango cultivars ranged from 23.13% for Mabrouka mango cv. To 31.28 % for Aremanis mango cv. These results are in agreement with those obtained by Chundawat *et al.* (1985) and Moti and Maryo (1986).

5-Physical properties of fruits in various mango cultivars :-

Data in Table (3&4) clearly show that fruit weight , percentages of pulp, peel and seeds and fruit dimension were varied significantly in the nine mango cultivars . The maximum fruit weight was presented in mango cvs. Tota Pari (603.0 and 610.0g), Goleck (400.0 and 440.0 g), Mabrouka (400.0 and 410.0 g) and Taimour (400.0 and 410.0 g), in both seasons. Balady , Awaise and Hindy Bisinnara mango trees produced the smallest fruits. Alphonse and Aremanis mango trees produced an intermediate weight of fruit . The maximum pulp weight was presented in the fruits picked from Goleck mango trees . The maximum peel and seeds weight was observed on the fruits harvested from Balady and Hindy Bisinnara mango trees . Goleck mango trees produced fruits with the lowest peel and seed weights followed by Awaise , Goleck and Tota Pari mango trees produced the longest fruits.The maximum fruit width was presented in fruits of mango cvs.Aremanis , Mabrouka and Tota Pari . These results were true in 2000 and 2001 seasons.

Such variations on physical properties of mango cultivars was emphasized by the results of Abd El-Samed (1990), El-Masry *et al.* (1990) , Salem (1993) and Abd El- hamed (1996) .

6- Chemical properties of fruits in various mango cultivars :-

It can be stated from the data in Tables (4&5) that the maximum values of total soluble solids , total and reducing sugars and vitamin C content and the minimum value of total acidity were recorded in the fruits of Awaise mango cv . The other prime mango cvs. were Mabrouka , Alphonse , Aremanis and Goleck . Fruits of Tota Pari mango cv . had the lowest value of total soluble solids, total and reducing sugars and vitamin C content while had the maximum total acidity . Fruits of Balady mango came in the second position , in this connection . Fruits of Hindy Bisinnara and Mabrouka had fairly good fruit quality . These results were true in both seasons .

These results are in agreement with those obtained by Abd El-Hamed (1996), Ahmed *et al.* (1998) and El-Masry and Said- Galila (1998) .

7- Storage ability of various mango cultivars :-

Data in Table (5) clearly show that there was a great variation on the storage duration of the nine mango cultivars . The cultivars of mango that characterized with high storage duration after harvest were Taimour and Tota Pari. Fruits of Taimour mango were stored for 14.5 and 15.0 days in both seasons , respectively . The mango fruits with the lowest storage duration were Alphonse and Balady cvs . They were stored for 6-7 days only. The rest mango fruits were stored for 10 to 11 days . These results were true in both seasons. These results are in harmony with those obtained by Salem (1993),Abd El-Hamed (1996), Ahmed *et al.* (1998) and El-Morsy and Said-Galila (1998).

8- Harvesting date in the various mango cultivars :-

According to the data in Table (5), harvesting date for the nine mango cultivars were varied significantly. The early in harvest mango cultivars were Hindy Bisinnara and Alphonse. They were harvested on mid July and 1st August, respectively. Tota Pari fruits were harvested lately on 1st October. Fruits of Taimour were picked on the first week of ptember. The other mango cultivars namely, Awaise, balady, Aremanis, Goleck and Mabrouka harvested on mid of August. These results were similar in both seasons.

Similar results were obtained by Abd El-Hamed (1996) and Ahmed *et al.* (1998). The great variation occurred between the studied nine mango cultivars might be attributed to the great variation in genetically, adaptability and environmental conditions between these cultivars .

As a conclusion, Mabrouka , Aremanis , Alphonse Hindy Bisinnara , Tota Pari and Awaise mango cultivars are recommended to be cultivated successfully under Sohag region conditions based on their higher yield and relatively better fruit quality .

REFERENCES

- Abd El-Hamed, M.A.(1996). A Comparative studies on ten mango cultivars under Minia Governorate conditions .4th Arabic Conf. For . Hort. Crops, El-Minia , Egypt Part II Pomology, 768-774
- Abd El-Samed, G.A. (1990). Evaluation and variation of some mango cultivars grown under Fayoum conditions. M. Sc. Thesis , Fac. Agric . Fayoum , Cairo Univ.
- Abo El-Ez, A.Th.(1988). Physiological studies on the growth and the yield of some mango cultivars .M.Sc. Thesis , Fac . Agric. Assuit Univ.
- Ahmed, F.F.; A.E.M. Mansour and A.M. Ahmed (1998). A Comparative study on fruiting of nine mango cultivars grown under new reclaimed andy soil. Egypt J. Hort., 25(2): 187-193
- Ahmed, F.F. and M.H. Morsy (1999). A new method for measuring leaf area in different fruit species . Minia J. Agric Res . and Develop., 19 :97–105.
- Association of Official Agricultural Chemists (1985). Official Methods of Analysis (A. O. A. C.) 14th Ed. Washington, D.C., USA.
- Chundawat, B.S.; H.P. Bhuvra and S.B.B. Tikka (1985). Phenotype 7 Stability of fruit yield in mango (*Mangifera indica* L). India J. Hort., 42(3and4): 206-209
- Dahshan, I.M. (1971). Studies concerning growth and fruiting of some mango cultivars . M.Sc. Thesis, Ain shams Univ.
- Dahshan, I.M.(1977). Physiological and histological studies on mango flowering . Ph.D. Thesis, Fac. Agric., Ain Shams Univ.
- El-Masry, H.M. (1982). Physiological studies on alternate bearing in mangoes . Ph .D. Thesis, Fac. Agric., Ain Shams Univ. Egypt
- El-Masry , H.M. and A. Said-Galila (1998). Mango cultivars in Egypt . Horticultural service unite, Agricultural Ministry, 1-233.
- El-Masry, H.M.; G.A. Said and L.F. Hagag (1990). Incidence of inflorescence malformation in eight mango cultivars in relation to their content of carbohydrates and nitrogen. Zagazig J. Agric. Res., 17 (5):1607–1619.
- Hussein, M.A ; K.I. Mahmoud; A. Ahmed and A. Th. Abo El-Ez (1989). Evaluation of the production of some mango cultivars under Assuit climatic conditions . Assuit J. Agric. Sci., 40 (4): 83-97
- Hussein, M.A. and K.F. Youssef (1972). Evaluation of physical and chemical criteria of maturity in Hindy and Taimour mango fruits (*Mangifera indica* L.) Confute Internate. J. Technol. Fruit and Vegetable Processing, 17(6) : 371-377 .
- Ibrahim, A.M.F.; M. M. A. Attia; A.M. Attalla and M. A. Hussein (1985). Some fruit characteristics of nine mango cultivars grown in Behira province . Egypt . J . Agric. Res . Tanta Univ., 11 (2) : 394-404
- Kurup. C.G.R. (1967). The Mango . A hand book . Indian council of Agric . Res ., New Delhi
- Moti , S. and V.N.Mary (1986).Performance of some late mango cultivars in Gangetic plains of North India . Punjab Hort. J., 26 (1 and 4) : 8-14.

- Nakhlla , F. G. (1980). Physiological studies on mangoes . M. Sc. Thesis Fac. Agric. Zagazig Univ.
- Said – Galila, A. and H.M.El-Masry (1992). Evaluation of two new introduced mango cvs . Annals of Agric .Sci, Moshtohor, Zagazig Univ., 30:1 .
- Salem, M. S. (1993). A comparative study on some mango cultivars in sandy soil . Zagazig. J. Agric . Res., 20 (3) : 1115- 1126.
- Sharama, D.D. and P. Biswas (1981). Physicochemical composition of some local cultivars of mango grown in West Bengal . Indian Agric., 25: 7-12.
- Singh, L. B. (1960). The Mango. Leonard Hill Books limited London, 104 – 142 .
- Snedecor, G. W. and W. G. Cochran(1972). Statistical Methods 6th Ed Iowa state Univ. Press Am . Iowa , U. S . A
- Wilde, S.A. ; R.B. Corey; J.G. Lyer and G.K. Voigt (1985). Soil and plant Analysis for Tree Culture. Oxford and IBH Publishing Co., New Delhi India

تقييم صفات النمو والمعاومة والإثمار في تسعة أصناف من المانجو نامية تحت الظروف المناخية لمنطقة سوهاج

محمد سليم همام

معهد بحوث البساتين – مركز البحوث الزراعية – الجيزة – مصر

أجريت هذه الدراسة خلال موسمى ١٩٩٩/٢٠٠٠ و ٢٠٠٠/٢٠٠١ كمحاولة لتقييم تسعة أصناف مانجو (العويس – الفونس – البلدي – الأرومانس – الجوليك – الهندي بسنارة - المبروكة – التيمور – رقية الوزه) نامية تحت ظروف منطقة سوهاج .وقد تم تسجيل صفات النمو والمحصول ودرجة المعاومة والخصائص الطبيعية والكيميائية للثمار والقدرة التخزينية للثمار على درجة حرارة الغرفة وموعد الحصاد لهذه الأصناف التسعة للمانجو . ولقد أشارت الدراسة أن هناك تباين كبير بين هذه الأصناف تحت الدراسة ولقد أعطت أصناف المانجو المبروكة – الأرومانس – الفونس – الهندي بسنارة – العويس - رقية الوزه مرتبة ترتيبا تنازليا اكبر محصول . وكان أقل محصول في أصناف الجوليك والتيمور وكانت أشجار الفونس والجوليك تتصف بارتفاع حدة المعاومة بينما كانت أشجار العويس والبلدي والهندي بسنارة والتيمور تتصف بقلة المعاومة وكانت أشجار الأرومانس والمبروكة ورقبة الوزه تأخذ موقعا متوسطا في هذا الشأن وكانت اكبر مدة تخزين في ثمار التيمور بينما كانت أقل فترة تخزينية في ثمار البلدي والفونس . وقد كانت ثمار الهندي بسنارة مبكرة في النضج على عكس ثمار رقية الوزه وكانت جميع الثمار التي تحت الدراسة ما عدا البلدي ورقبة الوزه ذات جودة عالية. وينصح بزراعة أصناف المانجو المبروكة والأرومانس والفونس والهندي بسنارة ورقبة الوزه وعويس تحت ظروف منطقة سوهاج وذلك لما تتصف به من محصول عالي وخصائص جودة لا بأس بها.

Table (2): Some growth characters of nine mango cultivars grown in Sohag region during 2000 and 2001 seasons.

Mango cultivars	Shoot length (cm)		Shoot thickness (cm)		Leaf length (cm)		Leaf width (cm)		Leaf area (cm ²)		No of leaves /shoot		
	2000	2001	2000	2001	2000	2001	2000	2001	2000	2001	2000	2001	
Awaise	20.5	21.0	1.05	1.09	25.3	26.0	6.6	6.4	115.8	115.4	13.0	13.0	
Alphonse	23.0	24.0	1.06	1.09	30.0	29.3	6.6	6.6	137.5	134.3	14.0	14.0	
Balady	23.0	24.3	1.07	1.10	20.0	20.0	6.5	6.3	89.9	87.1	13.0	14.0	
Aremanis	23.0	24.0	1.05	1.06	22.0	22.9	7.0	6.2	106.7	114.4	14.0	14.0	
Goleck	24.5	25.0	1.05	1.09	23.9	24.0	7.0	6.9	116.1	114.9	14.0	14.0	
Hindy Bisinnara	24.3	24.9	1.06	1.09	23.0	24.3	7.0	6.9	111.6	116.3	14.0	15.0	
Mabrouka	24.5	25.0	1.09	1.09	23.0	23.8	7.0	6.8	111.6	112.2	14.0	14.0	
Taimour	24.3	25.0	1.08	1.08	21.0	21.7	6.6	6.5	96.0	97.7	13.0	14.0	
Tota Pari	24.6	25.0	1.09	1.10	24.0	23.8	7.3	7.2	121.6	118.9	13.0	14.0	
L.S.D at	5%	2.2	2.3	N.S	N.S	2.5	2.6	N.S	N.S	3.3	3.2	N.S	N.S
	1%	3.0	3.2	N.S	N.S	3.5	3.6	N.S	N.S	4.6	4.4	N.S	N.S

Table (3): Panicle length, yield and some physical properties of nine mango cultivars grown in Sohag region during 2000 and 2001 seasons.

Mango cultivars	Panicle length (cm)		No of fruits /tree		Yield /tree (kg)		Incidence of alternate bearing		Av. fruit weight (g)		Pulp (%)		
	2000	2001	2000	2001	2000	2001	2000	2001	2000	2001	2000	2001	
Awaise	22.4	23.0	450.0	441.0	112.9	109.9	Light	2.66	250.9	249.3	75.0	76.0	
Alphonse	22.3	23.1	450.0	200.0	144.6	72.0	Light	50.21	321.3	260.0	70.3	71.5	
Balady	20.3	20.5	500.0	400.0	100.0	86.0	High	14.0	200.0	215.0	62.0	63.3	
Aremanis	25.3	25.8	450.0	300.0	157.6	108.3	Light	31.28	350.3	360.9	80.3	81.0	
Goleck	22.3	22.5	250.0	100.0	87.6	44.0	Intermediate	49.77	400.0	440.0	85.6	86.0	
Hindy Bisinnara	25.1	25.0	500.0	450.0	125.0	117.6	Light	5.92	250.0	261.3	60.0	60.9	
Mabrouka	21.0	21.0	400.0	300.0	160.0	123.0	Light	23.13	400.0	410.0	80.0	81.0	
Taimour	22.9	23.0	200.0	156.0	80.0	64.0	Light	20.0	400.0	410.0	75.0	75.5	
Tota Pari	25.0	25.0	200.0	140.0	120.6	85.4	Intermediate	29.19	603.0	610.0	75.3	75.9	
L.S.D at	5%	1.1	1.1	30.0	20.0	3.5	4.0		3.5	31.0	22.0	4.5	3.9
	1%	1.5	1.5	41.4	27.6	4.8	5.5		4.8	42.8	30.4	6.2	5.4

Table (4): Some physical and chemical properties of nine mango cultivars grown in Sohag region during 2000 and 2001 seasons.

Mango cultivars	Peel weight %		Seed weight %		Fruit length (cm)		Fruit width (cm)		Fruit thickness (cm)		TSS (%)		
	2000	2001	2000	2001	2000	2001	2000	2001	2000	2001	2000	2001	
Awaise	16.0	15.8	8.4	8.0	12.0	12.3	7.0	7.0	6.0	6.2	24.0	24.5	
Alphonse	20.0	20.3	9.2	8.0	11.0	11.2	7.0	7.1	7.0	7.1	22.0	22.3	
Balady	28.0	28.5	9.4	8.0	10.0	10.4	6.0	6.2	5.0	5.0	18.0	18.3	
Aremanis	14.3	15.0	5.1	3.9	13.0	13.1	9.0	9.3	8.0	8.2	22.0	22.3	
Goleck	10.9	11.0	3.3	3.0	20.0	20.2	7.0	7.2	6.0	6.2	22.0	22.4	
Hindy Bisinnara	27.0	27.0	12.2	11.8	12.0	12.3	6.0	6.3	5.0	5.0	20.0	20.5	
Mabrouka	14.0	14.5	5.8	4.3	15.0	15.2	9.0	9.2	8.0	8.1	20.0	20.6	
Taimour	16.4	17.0	8.2	7.2	14.0	14.1	8.0	8.1	7.0	7.1	23.0	23.0	
Tota Pari	16.5	16.9	8.0	7.0	18.0	18.2	9.0	9.1	8.0	8.2	16.0	16.3	
L.S.D at	5%	1.9	2.2	0.5	0.3	1.0	1.1	0.8	0.7	0.7	0.8	1.5	1.4
	1%	2.6	3.0	0.7	0.4	1.4	1.5	1.1	1.0	1.0	1.1	2.1	1.9

Table (5): Some chemical properties, storage duration and harvesting date of nine mango cultivars grown in Sohag region during 2000 and 2001 seasons.

Mango cultivars	Total sugars (%)		Reducing sugars %		Total acidity (%)		V. C mg /100 ml pulp		Storage duration (days)		Harvesting date	
	2000	2001	2000	2001	2000	2001	2000	2001	2000	2001	2000	2001
Awaise	19.2	19.4	9.5	9.3	0.225	0.230	56.3	53.5	10.0	11.3	Mid Aug.	Mid Aug.
Alphonse	17.5	17.3	8.6	8.5	0.305	0.309	51.0	50.2	6.0	7.0	1 st week Aug.	1 st week Aug.
Balady	14.5	14.2	7.3	7.0	0.509	0.515	31.2	30.0	6.0	6.0	Mid Aug.	Mid Aug.
Aremanis	17.6	17.3	8.6	8.5	0.307	0.310	50.0	48.6	10.0	10.0	Mid Aug.	1 st week Aug.
Goleck	17.7	17.5	8.6	8.5	0.307	0.309	51.2	50.0	10.0	10.0	Mid Aug.	Mid Aug.
Hindy Bisinnara	16.0	15.8	7.9	7.7	0.322	0.325	53.3	54.0	10.0	11.0	Mid July	1 st week July
Mabrouka	16.0	15.9	8.0	7.7	0.322	0.327	31.2	31.0	10.0	11.0	Mid Aug.	Mid Aug.
Taimour	18.4	18.2	9.1	9.0	0.292	0.294	31.2	30.8	14.5	15.0	1 st week Sep.	1 st week Sep.
Tota Pari	12.5	12.3	6.2	6.0	0.494	0.496	31.0	30.9	11.0	11.0	Mid Oct.	Mid Oct.
L.S.D at 5%	0.9	1.0	0.5	0.4	0.011	0.015	1.2	1.3	1.0	1.1		
L.S.D at 1%	1.2	1.4	0.7	0.6	0.015	0.021	1.7	1.8	1.4	1.5		