EFFECT OF HARVESTING DATES ON QUALITY AND YIELD CHARACTERISTICS OF SOME SUGAR BEET VARIETIES.

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ABSTRACT

Two field experiments were carried out at Belkas district, El-Dakhlia Governorate during 2008/2009 and 2009/2010 seasons to evaluate quality and yields of five sugar beet varieties namely (LP11, LP12, LP13, Demapoly and Kawemira) under three harvesting dates (175, 190 and 205 days after sowing). Results can summarize as the following:

1. Delaying harvesting dates from 175 to 205 days after sowing led to significantly increases in root fresh weight, root and sugar yields/fed, as well as, significantly improved juice quality (sucrose%, Extraction sugar% and Extractability%). Moreover, impurities (K, Na and α- amino N %) were significantly decreased with delaying harvest date at 205 days from sowing.
2. Results revealed the clear superiority of Kawemira variety in root fresh weight/plant, root and sugar yields/fed. waile, LP_{12} and/or Demapoly varieties had the highest value for sucrose, extraction sugar and extractability percentages in one or both seasons.
3. Interaction between harvest dates x varieties had insignificant effect on all studied traits in both seasons.
4. Under the conditions of this study, Kawemira, P_{12} and Demapoly varieties were the proper varieties for El-Dakhlia Governorate environment.

INTRODUCTION

Sugar beet (*Beta vulgaris* L.) is considered to be a prospective sugar crop in Egypt. Improving its productivity is an urgent demand to meet the increased sugar consumption or at least to decrease the Egyptian gap from sugar. Variety is considered the cornerstone for production process, selecting the superior varieties among the imported ones is the main purpose of the breeder. The differences between varieties in gene expression could be detected when they evaluated under the same environmented conditions and throw some light on thair relative impotence. Studying varietal performances through the growing seasons would be reflected their censistancy. Harvesting age is one of the main factors which directly affected maturity and consequently juice quality.

Abo Salama and El-Syiad (2000) found that harvest dates did not significantly affected root yield despite its highly significant effect on sugar%, quality index and sugar yield/fed. The highest sugar yield was produced from middle harvesting date on April 15th. Purity% was at its maximum in late harvesting date due to low values of impurities (N, Na and K %) associated with this date. **Al-Jbawi, Entessar (2000)** evaluated 20 genotypes under two harvesting dates (180 and 210 days after sowing date). She found that sucrose loss to molasses% and impurities (N, Na and K content) were significantly decreased by delaying harvest date in both seasons. While juice quality traits (sucrose, purity and extraction sugar %), root and recoverable sugar yields/fed were significantly increased by delaying harvest date up to 210 days. More over, she found differences among the genotypes for yield traits (root and recoverable sugar yields/fed) and for quality traits (sucrose and extractability %). **Abo El-Magd *et. al.* (2003)** tested the effect of three harvesting dates i.e. 180, 195 and 210 days from sowing on sugar beet variety Gloria. They recorded that harvesting dates were significantly affected productivity traits such as root fresh weight/plant, sugar yield/fed and root quality i.e. sucrose and juice purity% in both seasons. The highest productivity and quality traits were produced from harvesting after 210 days from sowing. **Abd El-Razek (2003 and 2006)** and **Mahmoud *et. al.* (2008)** reported that the maximum root and

sugar yields/fed were obtained when sugar beet was harvested at 180-210 days after sowing date. They also added that varying and harvesting dates affected sucrose and juice purity percentages, root and sugar yields/fed. **Abd Elrahim *et. al*. (2005)** found highly significances among varieties (Del 937, Del 938 and Del 939) in root yield, sodium content, and sucrose% and sugar loss to molasses%. **Aly (2006)** studied the effect of harvesting dates 170, 190 and 210 days from sowing on eight sugar beet varieties. He found that delaying harvest dates up to 210 days from sowing significantly increased root fresh weight, sucrose%, alpha amino nitrogen%, sucrose loss to molasses%, extractable sugar%, root and sugar yields/fed. He added that Marathon variety was surpassed the other seven ones in root fresh weight, root and sugar yields/fed. **El-Sheikh *et. al*. (2009)** evaluated six sugar beet varieties under three harvesting dates (180, 195 and 210 days after sowing). They found that delaying harvesting date to 210 days after sowing had significantly effect on root fresh weight, sucrose%, and purity %, as will as root and sugar yields/fed. Interaction between harvest dates and varieties had insignificant effect on all studied traits in both seasons. They recommended that Demapoly is the proper variety in all traits compared with the other varieties. **Abd El-Aal *et. al*. (2010)** revealed significant variation in yield productivity and root quality among sugar beet varieties. Kawemira and Gloria varieties followed by Nejma gave the highest sugar yield; on the other hand Lola variety exhibited the lowest sugar yield. Oscar poly, Carola, Raspoly, Kawemera and Mont Bianko varieties were more response to added nitrogen fertilizer.

MATERIALS AND METHODS

This work was carried out in private field at Belkas district, El-Dakhlia Governorate during 2008/2009 and 2009/2010 seasons to evaluate five sugar beet varieties (LP11, LP12, LP13, Demapoly and Kawemira) under thee harvesting dates (175, 195 and 205 days from sowing). A split plot design with three replicates was used in both seasons. Harvesting dates were arranged in the main plots, while sugar beet varieties were randomly allocated in the sub plot. Plot area was 16.5 m^2 (1/254 fad.), which consisted of 6- ridge of 5 m length and 55 cm width. Sugar beet seeds were sown in halls spaced by 20 cm on the first week of Oct., in both seasons. Nitrogen fertilizer was applied in the form of urea (46.5% N) in two equal doses after thinning and 30 days later. Phosphorus was added before sowing at the rate of 30 kg P_2O_5/fed in the form of superphosphate (15.5% P_2O_5). Potassium was applied at the rate of 24 kg K_2O/fed as potassium sulfate (48% K_2O). Other agricultural practices were applied as recommended for growing sugar beet in the region.

Table (1): physical and chemical properties of the expermentel field soil.

Soil analysis	2008/2009	2009/2010
Particle size distribution		
Sand%	25.6	26.0
Silt%	33.1	33.1
Clay%	41.3	40.9
Textural class	Clay	Clay
Available Nitrogen (ppm)	29 .2	30.1
$CaCo_3$	3.2	3.0
E.C mmhos/cm	0.9	0.8
PH soil paste	8.3	8.2

Soil samples were taken before sowing for determination the physical and chemical properties for the experimental soil, where illustrated in Table (1) that carried out according to **A.O.A.C (1995**). Mean of temperature and relative humidity percentage are presented in Table (2).

Table (2): The temperature and relative humidity percentage of the region.

Year	2008/2009 season						2009/2010 season					
Months	Temp. (C^o)			Rh %			Temp. (C^o)			Rh %		
	Mx.	Min.	Avr.	Mx.	Min.	Avr.	Mx.	Min.	Avr.	Mx.	Min.	Avr.
October	32.0	18.0	25.0	84	30	57.0	30.8	17.3	24.1	80	26	53.0
November	26.0	16.0	21.0	87	39	61.0	27.1	12.7	19.9	79	28	53.5
December	21.0	11.0	16.0	79	35	57.0	20.2	7.2	13.7	80	35	57.5
January	20.0	10.0	15.0	81	34	57.5	20.1	6.6	13.3	76	32	54.0
February	22.0	10.0	16.0	84	34	59.5	20	5.9	12.9	85	34	59.5
March	24.0	10.0	17.0	80	30	55.0	24.2	8.4	16.3	77	27	52.0
April	28.0	12.0	20.0	79	22	50.5	29.1	12	20.5	75	23	49.0

Source: Agro-meteorological station, Agric. Res. Center, Giza, Egypt. Temp. = Temperature (C^o). Rh% = Relative humidity %. Max. = Maximum. Min. = Minimum. Avr.= Average.

The recorded data:

At harvest, a random sample of ten roots was taken from each sub-plot to determine:

A. Root growth and yields characteristics:

1. Root fresh weight (kg).

Sugar beet plants of inside two rows were up-rooted, topped and weighed to determine root yield (t/fed) to determine:

1. Root yield (t/fed)

2. Recoverable sugar yield (t/fed) was calculated according to **Devillers (1988)** formula: Recoverable sugar yield (t/fed) = (root yield (t/fed) x Ex.S. %)/100.

B. **Juice quality characteristics:**

1. Sucrose percentage was Polari-metrically determined according to the methods of **Le-Docte (1927).**

2. Sugar beet impurities including (K, Na and α-amino N) were determined. Potassium (K%) and Sodium (Na%) were determined using Flame Photometer as described by **Page (1982),** while α-amino N was determined using Hydrogenation method according to **Carruthers *et al.* (1962).**

3. Sugars lose to molasses percentage (SLM %) was calculated according to **Devillers (1988)** formula: SLM% = 0.14 (Na + K) + 0.25 (α-amino N) +0.5

4. Extractable sugar percentage (Ex. S. %) was calculated as proposed by **Dexter *et al* (1967)** formula: (Ex. S. %) = Sucrose% - SLM% - 0.6

5. Extractability% = (Extractable sugar%/ sucrose %) x 100

Statistical analysis:

Analysis of variance was calculated according to the method described by **Snedecor and Cochrane (1967)**. Treatment means were compared using LSD at 5% level probability.

RESULTS AND DISCUSSION

A. Root growth and yield characteristics:

1. Root fresh weight (kg) 2. Root yield (t/fed) 3. Sugar yield (t/fed):

Results given in Table (3) point out positive responses in root fresh weight, root and sugar yield/fed, and these responses were significant in both seasons. Delaying harvesting date from 175 to 205 days after sowing showed gradual and significant effect on root fresh weight/plant by (9.8 and 6.2%), root yield/fed by (4.7 and 8.7%) and sugar yield /fed by (9.1 and 15.1%) in both seasons, respectively.

Table (3): Effect of harvesting dates of five sugar beet varieties on root fresh weight (kg), roots and recoverable sugar yields (t/fed) in 2008/2009 and 2009/2010 seasons.

Traits / Variety	Season 2008/2009											
	Root fresh weight (kg)				Root yield (t/fed)				Recoverable Sugar yield (t/fed)			
	Plant age at harvest (days)											
	175	190	205	Means	175	190	205	Means	175	190	205	Means
LP11	0.828	0.879	0.917	**0.875**	23.9	24.7	25.1	**24.6**	3.70	3.99	4.12	**3.94**
LP12	0.819	0.889	0.908	**0.872**	23.3	24.2	24.6	**24.1**	3.82	4.08	4.25	**4.05**
LP13	0.877	0.927	0.938	**0.914**	24.2	25.0	25.4	**24.9**	3.82	4.12	4.22	**4.05**
Demapoly	0.841	0.877	0.909	**0.876**	23.7	24.4	24.7	**24.3**	3.86	4.07	4.22	**4.05**
Kawemira	0.869	0.925	1.021	**0.938**	24.4	24.9	25.6	**24.9**	3.87	4.07	4.14	**4.03**
Means	**0.847**	**0.899**	**0.939**		**23.9**	**24.7**	**25.1**		**3.81**	**4.07**	**4.19**	
LSD at level 5%												
Harvest days (H)				0.026				0.53				0.12
Variety (V)				0.018				0.39				NS
H x V				0.031				NS				NS

Traits / Variety	Season 2009/2010											
	Root fresh weight (kg)				Root yield (t/fed)				Recoverable Sugar yield (t/fed)			
	Plant age at harvest (days)											
	175	190	205	Means	175	190	205	Means	175	190	205	Means
LP11	0.875	0.926	0.955	**0.919**	23.2	23.7	24.9	**23.9**	3.50	3.78	4.09	**3.79**
LP12	0.823	0.802	0.877	**0.834**	22.6	23.4	24.3	**23.4**	3.62	3.92	4.26	**3.93**
LP13	0.934	0.947	0.979	**0.953**	23.8	24.2	25.7	**24.6**	3.69	3.89	4.26	**3.95**
Demapoly	0.860	0.870	0.871	**0.867**	22.7	23.9	24.9	**23.8**	3.69	4.01	4.38	**4.03**
Kawemira	0.930	0.977	1.028	**0.978**	23.8	24.7	27.0	**25.2**	3.74	4.01	4.53	**4.09**
Means	**0.884**	**0.904**	**0.942**		**23.2**	**24.0**	**25.4**		**3.65**	**3.92**	**4.30**	
LSD at level 5%												
Harvest Days (H)				0.040				0.69				0.18
Variety (V)				0.046				0.75				0.16
H x V				NS				NS				NS

These differences in root and sugar yields appeared among the three harvesting dates may be due to increasing of the number of harvested roots and mean root fresh weight by delaying in harvest date. This is one of the most important practices, which has to be accurately determined.

The main vegetative growth phase of sugar beet is indeterminate until floral induction occurs. Therefore, harvest must be made to obtain economical adequate yields are attained. Processing factory capacity can't store the yield in piles if the harvest of the total area of sugar beet done in narrow period especially when temperature prevailing during the time of harvest is relatively higher. In order to accommodate the entire crop, some fields must be harvest early but at low tonnage harvesting could be extended over longer period. **Al-Jbawi, Entessar (2000), Aly (2006), and El-Sheikh *et al.* (2009),** realized similar trend. Who found such effect of late harvest might have results from increased dray matter accumulation in roots, which was reflected in improving root characteristics expressed as length, diameter and weight and juice quality (sucrose, sugar extraction and extractability%)

The influence of the studied sugar varieties on root fresh weight/plant and root yield/fed was of significantly effects in both seasons, while was of insignificantly effect on sugars yield/fed character in the 1st season only. Sugar beet variety Kawemira surpassed other varieties in this respect followed by LP13 and Demapoly. These effects were fairly true in both growing seasons.

The differences among varieties in roots yield were mainly due to varied varietial performance of the individual root fresh weight, meanwhile, the differences in sugar beet varieties for sugar yield/fed were mainly due to the performance of sugar beet varieties in root yield and extraction sugar% (Table 5). These results are agreement with those obtained by **Aly (2006) and El-Sheikh *et al*. (2009).**

The interaction between harvesting dates and varieties had insignificant effects on all traits in both seasons.

B. Juice quality characteristics:

1. Impurities% (α- amino N%, Na% and K %):

Results presented in Table (4) show that harvesting date from 175 to 205 days from sowing significantly affected the impurities (K, Na and α- amino N %) in both seasons.

Delaying in harvesting date up to 205 days from sowing decreased Potassium content by (16.3 and 10.8%), Sodium by (19.3 and 11.1%) and alpha amino nitrogen by (19.1 and 19.1%) in both seasons, respectively. This result is in agreement with those of **Aly (2000), Al-Jpawi, Entessar (2000), Abo El-Magd *et. al*. (2003) and El-Sheikh *et. al* (2009),** how found that late harvesting dates up to 210 days from sowing significantly reduced all impurities contents. As shown in Table (4) differences among mean values of sugar beet varieties in impurities characteristics percentages were highly significant. LP12 variety was of the lowest mean values of Potassium by (24.2 and 11.5%), Sodium by (31.4 and 8.4%) and alpha amino nitrogen by (20.2 and 10.3%), where LP 11 variety was of the highest values in most traits in both seasons, respectively. The other varieties were ranked in between. These results are in line with those obtained by **Al-Jbawi, Entessar (2000), Abd Elrahim *et. al*. (2005), and Aly (2006).**

The interaction between harvesting dates and varieties was not reached to the level of significance for all traits.

The collected data in Table (5) show that harvesting dates from 175 to 205 days after sowing had significant effected for sucrose, extraction sugar and sugar loss to molasses percentages in both seasons. Delaying harvesting date up to 205 days from sowing significantly improved sucrose% by (3.2 and 6.3%) and Extraction sugar% by (4.4 and 7.3%) in both seasons, respectively. On the contrary, late harvest date at 205 days from sowing caused significant reduction in sugar loss to molasses% by (11.1 and 7.1%) in both seasons, respectively. Such useful effects of delaying in harvesting up to 205 days after sowing might be due to the favorable climatic conditions prevailing prior to harvesting time without any effect on respiration rate and consequently increased root dray matter and hence sucrose in roots accompanying by reduction in impurities contents sugar loss to molasses% see Table (2).

Either LP12 nor Demapoly varieties (being insignificant effect) were significantly superiority for Sucrose% by 3.2 and 6.5%) and Extraction sugar % by (4.8 and 6.2%) in both seasons respectively, while LP12 variety gave the lowest mean values for sugar loss to molasses% by (12.2 and 4.3%) in both seasons compared the LP11 variety, and the other varieties were ranked in between them. These results are in agreement with **Al-Jpawi, Entessar (2000) and Aly, (2006).**

There was insignificant interaction between the harvest dates and varieties.

Table (4): Effect of harvesting dates of five sugar beet varieties on impurities percentages (K, Na and N %) in 2008/2009 and 2009/2010 seasons.

Traits / Variety	Season 2008/2009											
	Impurities percentages											
	Potassium (K%)				Sodium (Na%)				Alpha amino nitrogen (N%)			
	Plant age at harvest (days)											
	175	190	205	Means	175	190	205	Means	175	190	205	Means
LP11	3.30	2.94	2.88	**3.04**	2.08	2.00	1.80	**1.96**	1.17	1.06	0.97	**1.07**
LP12	2.88	2.54	2.53	**2.65**	1.59	1.65	1.54	**1.59**	0.92	0.89	0.79	**0.87**
LP13	3.59	3.28	2.99	**3.29**	2.07	1.97	1.84	**1.96**	1.11	0.99	0.90	**1.00**
Demapoly	3.18	2.79	2.76	**2.91**	2.34	2.25	1.67	**2.09**	0.95	1.02	0.81	**0.93**
Kawemira	3.11	2.74	2.65	**2.83**	2.12	1.90	1.71	**1.91**	1.13	1.02	0.97	**1.04**
Means	**3.21**	**2.86**	**2.76**		**2.04**	**1.96**	**1.71**		**1.06**	**1.00**	**0.89**	
LSD at level 5%												
Harvest days (H)				0.30				0.17				0.07
Variety (V)				0.17				0.25				0.07
H x V				NS				NS				NS
	Season 2009/2010											
	Potassium (K%)				Sodium (Na%)				Alpha amino nitrogen (N%)			
	Plant age at harvest (days)											
	175	190	205	Means	175	190	205	Means	175	190	205	Means
LP11	2.90	2.62	2.68	**2.73**	2.40	2.18	2.09	**2.22**	1.10	1.07	1.03	**1.07**
LP12	2.64	2.47	2.46	**2.52**	2.21	2.24	2.03	**2.16**	1.02	0.93	0.95	**0.97**
LP13	2.95	2.76	2.72	**2.81**	2.25	2.12	2.07	**2.15**	1.12	1.12	1.00	**1.08**
Demapoly	2.91	2.69	2.54	**2.71**	2.22	2.21	2.02	**2.15**	1.10	1.04	0.87	**1.00**
Kawemira	3.00	2.81	2.61	**2.81**	2.49	2.32	2.19	**2.33**	1.19	1.12	1.04	**1.12**
Means	**2.88**	**2.67**	**2.60**		**2.31**	**2.21**	**2.08**		**1.10**	**1.06**	**0.98**	
LSD at level 5%												
Harvest Days (H)				0.18				0.16				0.09
Variety (V)				0.08				0.13				0.06
H x V				NS				NS				NS

2. Sucrose% **3. Extraction sugar%** **4. Sucrose loss to molasses%**

6. Extractability%

Extractability was significantly affected by plant age at harvest in both seasons (Table 5). Delaying harvesting date at 205 days from sowing gave the maximum values and increased by (1.2 and 1.3%) in both seasons, respectively, compared with plant age 175 days at harvest.

Differences among varieties were shown in Table (5). LP12 and Demapoly varieties (being insignificant effect) over the other varieties by (1.3 and 0.9%) compared with LP11 variety in both seasons respectively, and the other varieties were ranked between them. These results are in agreement with those of **Aly (2006) and El-Sheikh *et. al*. (2009),** who found that delay harvest date up to 210 days from sowing significantly improved purity % and decreased impurities.

The interaction between harvesting dates and varieties were not reached the level of significance.

Table (5): Effect of harvesting dates of five sugar beet varieties on sucrose%, extraction sugar% and sugar loss to molasses% in 2008/2009 and 2009/2010 seasons.

Traits / Variety	Season 2008/2009											
	Sucrose%				Extraction sugar%				Sugar loss to molasses%			
	Plant age at harvest (days)											
	175	190	205	Means	175	190	205	Means	175	190	205	Means
LP11	17.6	18.2	18.4	**18.1**	15.49	16.14	16.40	**16.01**	1.55	1.46	1.40	**1.47**
LP12	18.3	18.7	19.1	**18.7**	16.38	16.82	17.23	**16.81**	1.36	1.31	1.27	**1.31**
LP13	18.0	18.5	18.6	**18.4**	15.80	16.45	16.63	**16.29**	1.57	1.48	1.40	**1.48**
Demapoly	18.4	18.7	19.0	**18.7**	16.29	16.67	17.08	**16.68**	1.51	1.46	1.32	**1.43**
Kawemira	18.0	18.4	18.1	**18.2**	15.89	16.36	16.18	**16.14**	1.51	1.41	1.35	**1.42**
Means	**18.1**	**18.5**	**18.7**		**15.97**	**16.49**	**16.71**		**1.50**	**1.42**	**1.35**	
LSD at level 5%												
Harvest days (H)				0.3				0.25				0.09
Variety (V)				0.2				0.23				0.04
H x V				NS				NS				NS
	Season 2009/2010											
	Sucrose%				Extraction sugar%				Sugar loss to molasses%			
	Plant age at harvest (days)											
	175	190	205	Means	175	190	205	Means	175	190	205	Means
LP11	17.2	18.0	18.4	**17.9**	15.12	15.93	16.41	**15.82**	1.52	1.44	1.43	**1.46**
LP12	18.1	18.7	19.5	**18.8**	16.03	16.74	17.50	**16.76**	1.43	1.39	1.37	**1.40**
LP13	17.6	18.1	18.6	**18.1**	15.52	16.07	16.58	**16.06**	1.51	1.46	1.42	**1.46**
Demapoly	18.3	18.8	19.5	**18.9**	16.24	16.79	17.58	**16.87**	1.49	1.45	1.36	**1.43**
Kawemira	17.9	18.3	18.8	**18.4**	15.73	16.23	16.80	**16.26**	1.57	1.50	1.43	**1.50**
Means	**17.8**	**18.4**	**19.0**		**15.73**	**16.35**	**16.97**		**1.50**	**1.45**	**1.40**	
LSD at level 5%												
Harvest Days (H)				0.5				0.51				0.03
Variety (V)				0.4				0.36				0.04
H x V				NS				NS				NS

Table (6): Effect of harvesting dates of five sugar beet varieties on Extractability percentage in 2008/2009 and 2009/2010 seasons.

Traits / Variety	Extractability%							
	Season 2008/2009				Season 2009/2010			
	Plant age at harvest (days)							
	175	190	205	Means	175	190	205	Means
LP11	87.8	88.7	89.1	**88.6**	87.7	88.6	89.0	**88.5**
LP12	89.3	89.8	90.2	**89.8**	88.7	89.4	89.9	**89.3**
LP13	87.9	88.8	89.3	**88.7**	88.0	88.6	89.1	**88.6**
Demapoly	88.5	89.0	89.9	**89.1**	88.6	89.1	90.0	**89.2**
Kawemira	88.3	89.1	89.2	**88.9**	87.9	88.5	89.2	**88.5**
Means	**88.4**	**89.1**	**89.5**		**88.2**	**88.9**	**89.4**	
LSD at level 5%								
Harvest Days (H)				0.3				0.4
Variety (V)				0.3				0.3
H x V				NS				NS

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تأثير مواعيد الحصاد علي صفات الجودة والمحصول لبعض أصناف بنجر السكر

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أجريت تجربتان حقليتان في مركز بلقاس بمحافظة الدقهلية خلال موسمي زراعة ٢٠٠٨/٢٠٠٩ و ٢٠٠٩/٢٠١٠ و ذلك لتقييم صفات الجودة والحاصل من خمسة أصناف بنجر سكر (ل ب ١١، ل ب١٢، ل ب١٣، كاوميره وديمابولي) تحت ثلاثة مواعيد حصاد (١٧٥، ١٩٠ و ٢٠٥ يوم من الزراعة) ويمكن تلخيص النتائج المتحصل عليها كما يلي:

١- أدي تأخير مواعيد الحصاد من ١٧٥ الي ٢٠٥ يوم من الزراعة الي زيادات معنوية في وزن الجذر الغض/نبات، وحاصلا كلاً من الجذور والسكر/فدان، وبالمثل تحسنت معنوياً صفات جودة العصير (نسبة السكروز، نسبة السكر المستخلص ونسبة الاستخلاص). علاوة علي ذلك، انخفضت نسب الشوائب معنوياً (البوتاسيوم، الصوديوم والنيتروجين) مع تأخير الحصاد عند ٢٠٥ يوم من الزراعة.

٢- أوضحت النتائج التفوق الواضح للصنف كاوميرا في صفات الوزن الغض للجذر/نبات، وحاصل كلاً من الجذور والسكر/فدان، بالمثل الصنف LP12 كان الافضل في نسب كل من السكروز، السكر المستخلص و الاستخلاص في الموسمين.

٣- لم يكن هناك اي تفاعلات معنوية بين مواعيد الحصاد و الاصناف لكل الصفات المدروسة.

٤- تحت ظروف هذه الدراسة يفضل زراعة كاوميرا أو LP12 أو ديمابولي لمنطقة الدقهلية.