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PERFORMANCE STUDY OF SOME SUGAR BEET VARIETIES UNDER SOWING AND HARVESTING DATES.

Aly, M. S. M.
Sugar Crops Research Institute, (A.R.C.) Giza, Egypt.

ABSTRACT

Two field experiments were carried out Sakha Agricultural Research Station, Kafr El-Sheikh Governrate, during 2009/2010 and 2010/2011 seasons to evaluate three sugar beet varieties (Kawemira, Carolla and Farida) under two sowing dates (15th October and 15th November), and two harvesting dates (180 and 210 days from sowing date). Results can be summarize as the following:

1. Sowing sugar beet on 15th Oct. attained the highest values of root length and diameter, root and top fresh weight/plant, sucrose %, Total Soluble Solids %, purity %, root and sugar yields t/fed.
2. Sugar beet vaieties were differed in the stydied characters: Carolla variety was superior in root and top fresh weight/plant, sucrose %, TSS %, purity %, root and sugar yields/fed.
3. Delaying harvest date up to 210 days from sowing gave the highest root dimension (length, diameter), root fresh weight/plant, root yield/fed and the best quality (sucrose %, TSS %) root and sugar yields/fed.
4. A significat interaction between sowing dates and harvesting dates gave the highest values of sucrose %, root and sugar yields/fed in both seasons, root diameter in the first season and total soluble solids in the second season only.
5. Results cleared that significantly interaction between harvesting dates and varieties in root fresh weight/plant Carolla variety gave the highest value of root fresh weight/plant at harvesting date 180 days from sowing.

Generally, it could be recommended that sowing sugar beet variety Carolla on 15th Oct. with delaying harvesting date up to 210 days from sowing under Kafr El-Sheikh conditions to obtain the higher sucrose % and root and sugar yields/fed.

INTRODUCTION

Improving sugar beet productivity is an urgent demand to meet sugar consumption or at least to decrease the Egyptian gap from sugar. In Egypt, sowing sugar beet usually takes place during the period extended from Sept. to Nov. Many investigators showed the effect of sowing dates on growth, yields and quality characteristics of sugar beet varieties. Fadel (2002) reported that the highest sugar yield was recorded by sowing sugar beet on 15th October. He revealed that delaying sowing date gradually and significantly decreased top yield of sugar beet. Moreover, he explained that the relative advantage of early sowing on 15th October could be due to the rapid growth and better maturity, consequently higher sugar content. Mohamed (2002) clarified that the decrease in root yield might be due to the increase in consumption of sucrose throughout or during respiration process. He declared that the loss in the weight of leaves at later stages of growth might be mainly attributed to the death of leaves. Moreover, he stated that sugar yield of sugar beet was affected by root yield, sucrose percentage and impurities content.

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 %. Ismail *et al* (2006) tested nine sugar beet genotypes under three sowing dates. They indicated that genotypes differed significantly in growth (length, diameter, and fresh root weight), yield (roots and sugar/fed) and quality characteristics in both seasons. The interaction between varieties and sowing dates had significant effect on root length, root and sugar yields/fed as well as sucrose%.

Harvesting age one of the main factors which directly affected on maturity consequently juice quality.Abo Salama and 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) she found that juice quality traits (sucrose% and purity%), root and sugar yields/fed were significantly increased by delaying in harvest date up to 210 days. More over, she found differences among the genotypes for yield traits (root and sugar yields/fed) and for quality traits (sucrose%). 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 plants were harvested at 180-210 days after sowing date. They also add that varying and harvesting dates affected sucrose and juice purity percentages, root and sugar yields/fed. 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 signinficantly affected productivity traits such as root fresh weight/plant, sugar yield/fed and root quality i. e. three harvesting dates i. e. sucrose and juice purity % in both seasons.They found the highest productivity and quality traits were produced from harvesting after 210 days from sowing. Aly (2006) he found that delaying harvest dates up to 210 days from sowing increased significantly root fresh weight, sucrose%, root and sugar yields/fed. He added that Marathon variety was surpassed significantly the others 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 at 210 days after sowing significantly effect on root fresh weight, sucrose%, and purity %, as well as root and sugar yields/fed. Interaction between harvest dates x 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. The objective of the present work was to find out the optimal sowing and harvesting dates and the best sugar beet varieties to obtain the maximum root and sugar yields/fed.

MATERIALS AND METHODS

This work was carried out at Sakha Agricultural Research Station, Kafr El-Sheikh Governorate, in 2009/2010 and 2010/2011 seasons to evaluate three sugar beet varieties (Kawemira, Carolla and Farida) under two sowing date (15th October and 15th November), and two harvesting dates (180 and 210 days from sowing date). A split-split plot design with three

replicates was used in both seasons. Sowing dates were arranged in the main plots, while, sugar beet varieties were randomly allocate in the sub plot and harvesting dates paced in sub sub plots. Plot area was 16.5 m^2 (1/254 fad.), which consisted of 6- ridges of 5 m in length and 55 cm in width 20 cm spacing between hills. Sugar beet plants were cultivated on 15th Oct.and 15th Nov., 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).

Table 1: physical and chemical properties of tested soil.

Soil analysis	2009/2010	2010/2011
Particle size distribution		
Sand%	25.0	26.0
Silt%	28.3	27.0
Clay%	46.7	47.0
Textural class	Clay	Clay
Available Nitrogen (ppm)	17.4	11.8
$CaCo_3$	0.3	0.2
E.C mmhos/cm	0.9	0.8
PH soil paste	8.0	8.2

Potassium was applied at the rate of 24 kg K_2O/fed as potassium sulfate (48% K_2O) after thinning with the first dose of Nitrogen fertilizer. Other agricultural practices were applied as recommended for growing sugar beet in the region. 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).

Table 2: The temperature and relative humidity percentage

Year	2009/2010 season						2010/2011 season					
Months	Temp. (C°)			Rh %			Temp. (C°)			Rh %		
	Mx.	Min.	Avr.	Mx.	Min.	Avr.	Mx.	Min.	Avr.	Mx.	Min.	Avr.
October	31.0	18.0	25.0	86	40	63.0	30.8	18.3	24.3	82	39	60.5
November	25.3	16.0	21.0	88	39	63.5	26.1	16.7	21.4	80	38	59.0
December	18.0	11.0	15.0	78	35	56.5	19.5	10.2	14.9	79	35	57.0
January	18.4	12.5	15.5	82	34	58.0	19.0	11.6	15.3	79	32	55.5
February	20.0	13.0	16.5	85	34	59.5	20.3	12.0	16.2	83	34	58.5
March	23.5	14.0	18.7	83	38	60.5	24.0	14.4	19.2	85	37	61.0
April	27.0	14.0	20.5	86	40	63.0	28.1	14.9	21.5	85	38	61.5
May	29.3	15.2	22.3	88	44	66.0	29.4	15.7	22.6	87	44	65.5

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

The recorded data:

At harvest times (180 and 210 days from sowing), a random sample of ten roots was taken from each sub-plot to determine:

A. Root growth and yields characteristics::

1. Root length (cm). 2. Root diameter (cm). 3. Root weight (kg).
4.Top weight (kg). 5. Root \top ratio.

B. **Juice quality characteristics:**

1. Sucrose percentage was determined using sacharimeter on basic lead acetate Carruthers and Oldfield (1960).
2. Total Soluble Solids percentage (TSS%) was messured by hand Refractometter.
3. Purity percentage determined by formula: Purity% = Sucrose% X 100 / TSS% .

C. Yields characteristics:

1. Root yields (t/fed). 2. Sugar yield (ton/fed) was calculated according formula: Sugar yield (ton/fed) = (root yield (ton/fed) x sucrose %) /100.

Statistical analysis:

Analysis of variance was calculated according to the method described by Snedecor and Cochrane (1967). Treatment means were compared by using LSD at 5% level of probability according to Waller and Duncan (1969).

RESULTS AND DISSCUION

Root length and diameter:

Data in Table 3 show that sowing sugar beet on the 15 th Oct. attained the highest values of root diameter (29.3 and 15.7 cm) in 2009/2010 season and (31.2 and 15.0 cm) in 2010/2011 season, respectively. While, these values were compared with that obtained at 15 th Nov. (27.5 and 14.6 cm) in 2009/2010 season and (30.7 and 14.4 cm) in 2010/2011 season, respectively. It could be noted that the pronounced is mainly due to the enhanced influence of temperature degrees to the rapid growth, which in turn reflected on plant growth. These findings are in agreement with those reported by Abo El-Magd *et al.* (2003) and Ismail *et al.* (2006).

Data presented in Table 3 show that significant difference between sugar beet varieties on root diameter in both seasons. This result was in line with those reported by Al-Labbody (2003) and Ismail *et al.* (2006). Farida variety was superior in root length and diameter in both seasons of the study.

Delaying harvest date at harvesting up to 210 days positively and significantly increased root diameter.

Table 3 : Some sugar beet characteristics as affected by sowing dates, harvesting dates and sugar beet varieties during 2009/2010 and 2010/2011 seasons.

Treatments	Root length (cm)		Root diameter (cm)		Root fresh weight/ plant(kg)		Top fresh weight/ plant(kg)	
	2009/10	2010/11	2009/10	2010/11	2009/10	2010/11	2009/10	2010/11
Sowing dates								
15th October	29.3	31.2	15.7	15.0	1.129	1.104	0.379	0.372
15th November	27.7	30.7	14.6	14.4	0.978	0.984	0.320	0.273
LSD at 5%	**0.9**	**NS**	**NS**	**0.6**	**0.149**	**0.088**	**0.059**	**0.015**
Harvesting dates								
180 days	28.0	30.6	14.7	13.6	0.944	0.940	0.394	0.361
210 days	28.8	31.1	15.6	15.9	1.163	1.148	0.306	0.284
LSD at 5%	**NS**	**NS**	**0.9**	**0.2**	**0.047**	**0.035**	**0.019**	**0.013**
Varieties								
Kawemira	28.3	30.1	15.0	14.6	0.962	0.980	0.350	0.318
Carolla	28.1	31.3	15.1	14.6	1.152	1.121	0.354	0.326
Farida	28.8	31.4	15.4	14.9	1.045	1.031	0.346	0.323
LSD at 5%	**NS**	**NS**	**0.3**	**0.3**	**0.057**	**0.044**	**NS**	**NS**

Root and top fresh weight/plant (kg):

The collected data in Table 3 appeared that delaying sowing date negatively and significantly affected root fresh weight in both seasons. However, sowing sugar beet on 15 th Oct. produced higher root fresh weight as compared with 15 th Nov. The relative increase in the value of root fresh weight almost due to the enhanced influence of the 15 th Oct. which exhibited a good canopy for solar energy trapping in turn high assimilation rate and finally good root weight.

As shown in Table 3 significant differences between sugar beet varieties at these characters under this study in both seasons. The Carolla variety was superior in root and top weights/kg in both seasons. These results are in the same line with those Ismail *et al.* (2006).

Delaying harvest date from 180 to 210 days gradually and significantly increased root fresh and top weights/plant. The relative advantage of increasing duration to harvest on root and top fresh weights/plant could be attributed to more dry matter accumulation with the advance of plant age. The effective role of harvest date on root and top fresh weight was also reported by many investigators such as Abo El-Magd *et al.* (2003), Aly (2006), Mahmoud *et al.* (2008) and El-Sheikh *et al.* (2009).

Root/top ratio:

Results presented in Table 4 show clearly that the sowing date of 15th Oct. Significantly affected root/top ratio in the second season 2010/2011 only. However, sowing sugar beet on 15 th Nov. produced higher root/top ratio as compared with 15 th Oct.

Results obtained in Table 4 cleared that there was a significant difference between varieties in root/top ratio, in both seasons. Sugar beet variety Carolla was superior in root/top ratio in both seasons. It gave the highest root/top ratio (3.36 and 3.55) in both seasons, respectively. While, sugar beet variety Kawemira gave the lowest root/top ratio (2.84 and 3.26) in both seasons, respectively.

Data illustrated in Table 4 revealed that delaying harvest dates from 180 to 210 days gradually and significantly increased root/top ratio in both seasons. The increase in root/top ratio might be due to the loss in weight of top at latter stages mainly attributed to the death of leaves and the increase in root weight as a result of better maturity and dry matter accumulation. These results are in agreement with those Mohamed (2000) and Fadel (2002).

Sucrose percentage:

Sucrose percentage is considered one of the final goals for growers to gain more profit and to maximize sugar yield. The results obtained in Table 4 were as similar as that recorded for TSS % it could be noticed that sowing sugar beet plants on 15 th Oct. attained the highest significant values of sucrose in both seasons.

This sowing date increased sucrose percentage over the other sowing date 15 th Nov. The relative advantage of early sowing on 15 th Oct. could be due to rapid growth and better maturity, consequently higher sugar content.

Results given in Table 4 pointed out that the examined sugar beet varieties differed significantly in sucrose percentages. Sugar beet variety Carolla attained the highest value of sucrose percentage in both seasons while, the lowest values of this trait were recorded by Farida variety. This result treasured that this trait is strongly correlated with gene make-up. These results were in same line with those Al-Jbawi, Entessar (2000), Abd El-Razek (2003), Abo El-Magd *et al.* (2003), Abd Elrahim *et al.* (2005).

The effect of harvesting date was significantly increase sucrose percentage in both seasons. Data in Table 4 indicated that delaying sugar beet harvesting up to 210 days from sowing resulted in a significant increase in sucrose percentage. The increase in sucrose % may be due to better maturity, consequently higher sugar content. These results were in the same line with those of Al-Jbawi, Entessar (2000), Aly (2006) and El-Sheikh *et al.* (2009).

Total soluble solids percentage (TSS %):

Results in Table 4 showed that sowing sugar beet on 15 th Oct. attained the highest significant values of total soluble solids percentage (20.12 and 19.59 %) respectively, in both seasons. This sowing date increased (TSS %) over the other sowing date 15 th Nov.

Data illustrated in Table 4 revealed that the tested varieties singnificantly differed in (TSS %) in both seasons. Sugar beet variety Kawemira produced the highest values of (TSS %) they were (20.34 and 19.58 %) in both seasons, respectively**.**

The obtained results in Table 4 revealed that delaying harvest date from 180 to 210 days gradually and significantly increased (TSS %) in both seasons. The increase in (TSS %) might be due to better maturity, consequently higher root content and dry matter accumulation. These results are in agreement with those Abo Salama and El-Syiad (2000), Fadel (2002) and Mohamed (2002).

Table 4 : Some sugar beet characteristics as affected by sowing dates, harvesting dates and sugar beet varieties during 2009/2010 and 2010/2011 seasons.

Treatments	Root/top ratio		Sucrose %		TSS %	
	2009/10	2010/11	2009/10	2010/11	2009/10	2010/11
Sowing dates						
15th October	3.08	3.06	17.79	17.74	20.12	19.59
15th November	3.16	3.69	17.09	16.85	19.49	18.83
LSD at 5%	**NS**	**0.30**	**0.22**	**0.12**	**0.48**	**0.44**
Harvesting dates						
180 days	2.41	2.65	17.24	16.80	19.32	18.50
210 days	3.82	4.10	17.64	17.80	20.59	19.93
LSD at 5%	**0.20**	**0.20**	**0.22**	**0.09**	**0.33**	**0.21**
Varieties						
Kawemira	2.84	3.26	17.39	17.23	20.34	19.58
Carolla	3.36	3.55	18.00	17.71	19.70	19.11
Farida	3.16	3.33	16.93	16.95	19.38	18.95
LSD at 5%	**0.24**	**0.51**	**0.27**	**0.11**	**0.40**	**0.26**

Purity percentage:

Results in Table 5 showed that sowing sugar beet on 15 th Oct. attained the highest values of purity percentage (88.42 and 90.56 %) respectively, in both seasons. This sowing date increased TSS percentage over the other sowing date of 15 th Nov. While, it was not reached to the level of significance in both seasons.

Data obtained in Table 5 revealed that the tested varieties differed in purity % in both seasons. Sugar beet variety Carolla produced the highest values of purity % (91.37 and 92.67 %) in 2009/2010 and 2010/2011 seasons, respectively.

Results in Table 5 showed that delaying harvest dates from 180 to 210 days gradually and significantly decreased purity % in both seasons. The increase in purity % with early harvesting date (180 days after sowing) might be due to the low values of both impurieties and TSS % in juice. These results were in agreement with those Ramadan and Hassanin (1999), Abo Salama and El-Syiad (2000) and Al-Jbawi, Entessar (2000).

Root yield (t/fed):

Data given in Table 4 showed that the sowing date of 15 th Oct. the higher the root yield (24.54 and 24.48 t/fed) and vice versa, the later sowing date of 15 th Nov. the lower the root yield (21.54 and 22.47 t/fed) in both seasons, respectively. The pronounced effect of sowing date mainly due to the relative advantage of the appropriate temperature prevailed at the sowing date 15 th Oct. which accelerate the assimilation rate from the assimilator organ i.e. top (leaves), consequently such conditions enhanced the relative growth rate and root yield. This result was in the same line with Fadel (2002).

Data in Table 4 cleared that tested sugar beet varieties varied significantly in root yield. The results showed that Carolla variety produced higher value than that recorded by Kawemira and Farida varieties. The values of root yield of the tested varieties had the same tendency of those of root fresh weight/plant. This observation assured that the final yield was affected by root weight of the individual plant as well as by gene make-up in addition to the surrounded environment. The obtained results were similar with those Abd El-Razek (2003), Abd Elrahim *et al.* (2005) and Ismail *et al.* (2006).

Delaying harvest date up to 210 days positively and significantly increased root yield. These results coincided with those obtained by Abo Salama and El-Syiad (2000), Al-Jbawi, Entessar (2000), Abd El-Razek (2003), Abo El-Magd *et al.* (2003), Aly (2006), Mahmoud *et al.* (2008) and El-Sheikh *et al.* (2009).

Regarding to the interaction between sowing and harvesting dates data showed that sowing date on 15th Oct. with harvesting date up to 210 days from sowing attained the higher value of root yield/fed (24.87 and 26.18 t/fed) in the first and second seasons, respectively. This finding may be due to the relative advantage to better maturity and dry matter accumulation.

Table 5 : Some sugar beet characteristics as affected by sowing dates, harvesting dates and sugar beet varieties during 2009/2010 and 2010/2011 seasons.

Treatments	Purity%		Root yield (t/fed)		Sugar yield(t/fed)	
	2009/10	2010/11	2009/10	2010/11	2009/10	2010/11
Sowing dates:						
15th October	88.42	90.56	24.54	24.48	4.37	4.34
15th Nov.	87.69	89.48	21.54	22.47	3.68	3.79
LSD at 5%	**NS**	**NS**	**2.01**	**1.72**	**0.26**	**0.74**
Harvesting dates:						
180 days	89.23	90.81	21.21	20.78	3.66	3.49
210 days	86.94	89.31	24.87	26.18	4.39	4.66
LSD at 5%	**0.78**	**0.73**	**0.39**	**0.37**	**0.09**	**0.07**
Varieties:						
Kawemira	85.50	88.00	22.44	23.18	3.90	3.99
Carolla	91.37	92.67	23.91	24.12	4.30	4.27
Farida	87.36	88.45	22.76	23.14	3.85	3.92
LSD at 5%	**0.96**	**0.78**	**0.48**	**0.46**	**0.11**	**0.08**

Sugar yield (t/fed):

Results in Table 5 show that sugar yield t/fed was positively and significantly responded to the sowing date of 15 th Oct. Sowing sugar beet plants on 15 th Oct. attained the highest sugar yield (4.37 and 4.34 t/fed) in 2009/2010 and 2010/2011 seasons, respectively. This effect was observed in root yield/fed, sucrose percentage and purity percentage Table 5 which could be account for the significant increase in sugar yield recorded for 15 th Oct. This result was in agreement with Fadel (2002).

Data in Table 5 cleared that the tested sugar beet varieties varied significantly in sugar yield/fed. The highest sugar yield was recorded by sugar beet variety Carolla (4.30 and 4.27 t/fed) in 2009/2010 and 2010/2011 seasons, respectively. These findings indicated that root yield played an important role for governing the sugar production and hence the sugar yield. Similar results were recorded by Ismail *et al.* (2006).

Data in Table 5 indicate that delaying sugar beet harvesting to 210 days resulted in significant increase in sugar yield. This finding may be due to that increasing days to harvest might be increased sugar accumulation in turn sugar yield/fed. The important effect of harvesting date on sugar yield was reported by Abo Salama and El-Syiad (2000), Al-Jbawi, Entessar (2000), Abd El-Razek (2003 and 2006), Abo El-Magd *et al.* (2003), Aly (2006), Mahmoud *et al.* (2008) and El-Sheikh *et al.* (2009).

Interaction effects:

The results recorded in Table 6 and 7 show the significant interaction effect between sowing dates and harvesting dates on sugar beet characters. Sowing date on 15th Oct. and harvesting at 210 days from sowing gave the highest values of sucrose %, root and sugar yields/fed in both seasons.These results might be due to the enhanced inf luence of temperature degree to the rapid growth which exhibited a good canopy for solar energy trapping in turn high assimilation rate and finally good root weight, dry matter accumulation and better maturity, consequently higher sugar content and dry matter accumulation which reflected on root and sugar yields/fed.

Table 6 : Some sugar beet significant characteristics as affected by interaction between sowing and harvesting dates during 2009/2010 and 2010/2011 seasons

Sowing X Harvesting dates	Root length (cm)	Root diameter (cm)	Top fresh wieght (kg/plant)	Sucrose%	
	2010/11	2009/10	2010/11	2009/10	2010/11
15th Oct. X 180 days	32.2	15.0	0.418	17.32	17.02
15th Oct. X 210 days	30.1	16.3	0.326	18.26	18.47
15th Nov. X 180 days	30.1	14.4	0.304	17.16	16.58
15th Nov. X 210 days	31.1	14.8	0.242	17.02	17.13
LSD at 5%	**1.0**	**0.4**	**0.019**	**0.32**	**0.13**

Table 7 : Some sugar beet significant characteristics as affected by interaction between sowing and harvesting dates during 2009/2010 and 2010/2011 seasons

Sowing X Harvesting dates	TSS%	Root yield (t./fed)		Sugar yield (t./fed)	
	2010/11	2009/10	2010/11	2009/10	2010/11
15th Oct. X 180 days	18.66	22.26	21.55	3.86	3.67
15th Oct. X 210 days	20.52	26.83	27.41	4.90	5.06
15th Nov. X 180 days	18.33	20.16	20.01	3.46	3.32
15th Nov. X 210 days	19.34	22.91	24.94	3.90	4.27
LSD at 5%	**0.26**	**0.56**	**0.53**	**0.13**	**0.10**

The obtained results in Table 8 clear the significant interaction effect between harvesting dates and the tested sugar beet varieties on sugar beet characters.

Table 8 : Average values of sugar beet significant characteristics as affected by interaction between harvesting dates and varieties during 2009/2010 and 2010/2011 seasons

Harvesting date × Varieties	Root fressh weight (kg/plant)
	2010/11
180 days X Kawemira	1.039
180 days X Carolla	1.187
180 days X Farida	1.085
210 days X Kawemira	0.920
210 days X Carolla	1.055
210 days X Farida	0.977
LSD at 5%	**0.062**

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دراسة سلوك بعض أصناف بنجر السكر تحت مواعيد الزراعة والحصاد

مجدي سعد الدين محمد علي
معهد بحوث المحاصيل السكرية- مركز البحوث الزراعية

أجريت تجربتان حقليتان فى محطة سخا للبحوث الزراعية بمحافظة كفر الشيخ خلال موسمى الزراعة ٢٠٠٩/٢٠١٠ و٢٠١٠/٢٠١١ وذلك لإختبار ثلاثة أصناف من بنجر السكر(كاوميرا وكارولا وفريدا) فى ميعادى زراعة (١٥ أكتوبر و ١٥ نوفمبر) وحصادهم بعد (١٨٠ و ٢١٠ يوماً من الزراعة) **ويمكن تلخيص النتائج كالآتى:**

١- أظهرت النتائج تحت الدراسة أن بنجر السكر المنزرع فى ١٥ أكتوبر أعطى أعلى مواصفات سواءاً للجذرسواءاً الطول والقطر والوزن وكذلك أعلى حاصلاً من الجذور والسكر للفدان وكذلك جودة الجذر (السكروز- المواد الصلبة الذائبة الكلية- النقاوة) ووزن العرش الطازج٠

٢- اختلفت الأصناف فيما بينها فى الصفات المدروسة حيث تفوق الصنف كارولا فى متوسط وزن الجذر والعرش وكذلك نسبة السكروز وحاصل كلا من محصول الجذور والسكر وتلاه الصنف فريدا٠

٣- أعطى تأخير الحصاد عند ٢١٠ يوماً من الزراعة إلى زيادة مواصفات الجذر(الطول والقطر والوزن) وحاصل الجذور/فدان وكذلك أعلى صفات جودة (نسبة السكروز- نسبة المواد الصلبة الذائبة الكلية فضلاً عن حاصل السكر/فدان) ٠

٤- أظهرت النتائج تفاعلاً معنوياً بين ميعاد الزراعة فى ١٥ أكتوبر والحصاد بعد ٢١٠ يوماً قدأعطى أعلى قيم فى نسبة السكروز وحاصل كلا من الجذور والسكر/فدان فى كلا موسمى الزراعة (٢٠٠٩/٢٠١٠ و ٢٠١٠/٢٠١١) وقطر الجذر فى الموسم الأول وسبة المواد الصلبة الذائبة الكلية فى الموسم الثانى فقط٠

٥- أوضحت النتائج أن التفاعل بين ميعادى الحصاد والأصناف كان معنوياً فى وزن الجذر الغض/نبات وكانت أعلى القيم للصنف كارولا عند حصاده بعد ١٨٠ يوماً من الزراعة٠

وعموماً توصى هذه الدراسة بزراعة الصنف كارولا فى ١٥ أكتوبر وتأخير الحصاد عند ٢١٠ يوماً من الزراعة تحت ظروف محافظة كفر الشيخ للحصول على أعلى نسبة سكروز وكذلك حاصل كلا من الجذور والسكر/فدان٠

قام بتحكيم البحث

أ.د / محمد حسين غنيمه — **كلية الزراعة – جامعة المنصورة**
أ.د / احمد مصطفى احمد نصار — **مركز البحوث الزراعية**