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EFFECT OF SOWING AND HARVESTING DATES ON PRODUCTIVITY OF SOME SUGAR BEET VARIETIES UNDER SINAI CONDITIONS

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ABSTRACT

Two field experiments were conducted in 2003/2004 and 2004/2005 seasons in Gelbana village, El-Kantra Shark, Sinai to study the effect of three sowing dates (30 September, 15 October and 5 November) and two harvesting dates (180 and 200 days after sowing) on productivity of five sugar beet varieties (Top, Kawemira, Gloria, Pleno and Farida) under sprinkler and drip irrigation systems.

Sowing sugar beet under sprinkler or drip irrigation systems, at middle October recorded the highest root fresh weight/plant, root diameter and root length. Also, when sugar beet sown on 15 October, root and sugar yields/fed attained the highest values. On the other hand, the latest sowing date, namely 5 November produced the highest values of top fresh weight/plant, sucrose %, purity % and top yield/fed.

Delaying harvest sugar beet from 180 till 200 days after sowing improved significantly the individual root characters and juice quality, as well as increased significantly root and sugar yields/fed. That held true under both irrigation systems in the two growing seasons.

It was proved that sugar beet varieties differed under each irrigation system, where, Pleno cv. gave the highest values of root and top fresh weight/plant and root diameter under sprinkler irrigation, while Kawemira and Top cvs. were the best under drip irrigation. Concerning root and sugar yield as well as juice quality, Pleno, Kawemira and Top cvs. were the best under both irrigation systems.

INTRODUCTION

Expanding cultivation of sugar beet on the new reclaimed lands, especially region of eastern and western Suez Canal should be hardly pushed to increase the sugar crop area, consequently increased local production of sugar. Most of these lands are sandy soil and some of them are salt affected. Such lands are very promising for growing sugar beet.

Sprinkler and drip irrigation systems permit more precise control of the timing and amount of water applied than furrow irrigation. Mambelli *et al.*, (1992) and Urbano *et al.*, (1992) stated that yields of sugar beet improved under drip irrigation. Also, Sharmasarkar *et al.* (2001a & b) found that sugar beet yield and sugar content were higher under drip irrigation comparing with furrow (flood) irrigation.

Selecting the proper time of sowing and harvesting is necessary to obtain the maximum yield from the mentioned promising area.

Badawi (1989) reported that there were no significant differences in juice quality as well as root, top and sugar yields between sowing sugar beet at 1st September and at 1st October. El-Kassaby and Leilah (1992) found that sowing sugar beet during October markedly improved individual root

characters, increased root and sugar yields/fed than sowing during November. Early sowing (15th September) recorded the highest root yield without significant difference from 15th October, while 15th October resulted the highest sucrose%, purity %and sugar yield/fed (Leilah and Nasr, 1992). Also, Badawi *et al.*, (1995) and Hassanin (2001) concluded that planting sugar beet during October produced the best growth characters and the highest root yield. Kandil *et al.*, (2002) revealed that planting sugar beet on 15th October gave the the highest values of root yield and its components.

Many investigators recommended delaying harvest date up to 200 or 210 days after sowing to obtained the highest root and sugar yield (Laila *et al.*, 1997; Hassanin, 1999; Basha and Ouda, 2000 ; Abd El-Razek, 2003; Abou-El-Magd *et al.*, 2003 and AboShady *et al.*, 2007).

Mokadem (1999), Hassanin (1999), Ramadan (1999), Nassar (2001), Abd El-Razek (2003) and Al-Naas (2004) demonstrated that sugar beet varieties differed in root and sugar yields as well as juice quality (T.S.S. %, Sucrose % and Purity %). Therefore, selecting the promising cultivars which have better growth, juice and yield characters is among the important factors to produce maximum productivity from sugar beet.

So, the aim of this work was to study the effect of sowing and harvesting dates on the productivity of some sugar beet varieties under the experimental conditions.

MATERIALS AND METHODS

Tow field experiments were conducted during 2003/2004 and 2004/2005 seasons at the Experimental Farm of The General Company of land Reclamation in Gelbana village, El-Kantra Shark, Sinai to study the effect of three sowing dates, namely 30 September, 15 October and 5 November and two harvesting dates, namely 180 and 200 days after sowing (DAS) on the productivity of five sugar beet varieties (Top, Kawemira, Gloria, Pleno and Farida) under sprinkler and drip irrigation systems. Table (1) shows types and sources of the sugar beet varieties.

Table (1): Sugar beet varieties (Types and sources).

Variety	Top	Kawemira	Gloria	Pleno	Farida
Seed type	Multigerm				
Growth type	NZ	Z	N	E	EN
Source	Germany		Holland		

* Z (High sucrose content), E (high root yield) and. N (intermediate = normal)

Under each irrigation system, the split-split plot design in four replications was followed, where sowing dates were allocated in the main plots, varieties in the sub plots and harvesting dates in the sub-sub plots. The experimental unit under drip irrigation system consisted of 6 rows, 5 m in length and 60 cm in width (plot area = 18 m^2), while under sprinkler system consisted of 14 rows, 5m in length and 60 cm in width (plot area = 42 m^2). The distances between hills were 20 cm. At 45 DAS, plants were thinned to one plant per hill.

Table (2) shows the chemical and physical proprieties of the experimental sites. Organic matter (Compost) at a rate of 20 m^3 /fed was applied as a basal dose to the soil during land preparing. Table (3) shows the chemical properties of the applied compost. 200 kg calcium super phosphate (15.5% P_2O_5) and sulfur at 50 kg/fed were added in two equal doses, namely at 21 and 51 DAS. 200 kg/fed ammonium nitrate (33.5% N) were applied in three equal doses (21, 51 and 81 DAS). Also, 50 kg/fed potassium sulfate (48% K_2O) were divided in two equal doses (21 and 51 DAS).

At each harvesting date (180, 200 DAS), five plants were taken randomly from each experimental plot to determine yield components (root diameter/plant, root length/plant, root fresh weight/plant and top fresh weight/plant) and juice quality (T.S.S. %, sucrose % and purity %). Root and top yields per feddan were estimated from three inner rows of each experimental unit. Sucrose % was determined as described by Le Docte (1927). Sugar yield was calculated by multiplying sucrose % × root yield per fed. Purity % was calculated according to the following equation: purity %= sucrose % × 100 / T.S.S. %.

The proper statistical analysis of split-split plots design was followed according to Snedecor and Cochran (1967).Duncan multiple range test, (Duncan, 1955) has been used to indicate treatments differences.

Table (2): Chemical and physical analysis of the experimental soil sites at Gelbana village, El-Kantra Shark, Sinai and irrigation water from El-Salam Canal.

Soil Proprieties	Soil sites		Proprieties of Irrigation Water
	Under Sprinkler	Under Drip	
pH (Soil extract 1: 5)	8.19	8.03	7.16
EC (dSm^{-1})	8.09	9.05	2.86
Cations (meq L^{-1})			
Ca^{++}	42.50	45.50	2.00
Mg^{++}	28.00	29.50	8.00
Na^{+}	76.90	63.94	16.55
K^{+}	2.50	2.56	0.49
Anions (meq L^{-1})			
Cl^{-}	115.0	116.0	18.15
HCO_3^{-}	4.9	4.5	6.80
CO_3^{--}	--	--	0.64
SO_4^{--}	30.0	20.5	1.45
Soil texture	sandy	sandy	

Table (3): The chemical properties of the used compost.

pH	Ec	OM%	C:N	N%	P%	K%	mg/kg			
							Fe	Mn	Cu	Zn
7.19	3.97	48.08	20.74	1.34	0.13	1.21	141.15	94.43	32.73	56.65

RESULTS AND DISCUSSION

1. Under sprinkler irrigation system:

1. A. Effect of sowing dates:

Sowing sugar beet at middle October gave the highest root fresh weight/plant, root diameter and root length (Table 4). The latest sowing date,

namely 5 November produced the highest value of top fresh weight/plant. The suitable climatic conditions at middle October pointed that sugar beet plants might be more vigorous in growth than those sown earlier or later. These results are in a good line with those obtained by El-Kassaby and Leilah (1992), Badawi *et al.*, (1995), Hassanin (2001) and Kandil *et al.*, (2002).

Sucrose % attained the highest values when sowing occurred late (5 November). (16.50% and 17.41% in the two seasons, respectively), while the lowest sucrose content (15.29 % and 15.70%) was obtained from plants sown at early date. Also, highest juice purity % (83.54 and 81.37%) was obtained from plants sown at late date, but lowest purity % (73.87% and 66.13%) was obtained from plants sown at middle October (Table 5). The late sowing might encourage assimilation and translocation of sucrose from source to sink. Hassanin (1999) found that delaying sowing date up to 10th Nov. reduced sucrose% and purity %. Also, Hassanin (2001) reported that sucrose, T.S.S. and purity percentages were not significantly affected by sowing date (Oct. and Nov.).

Data in Table (6) show clearly that root yield as well as sugar yield of middle sowing date (15 October) surpassed significantly those of early and late sowings (30 th September and 5 th November). In the first season, early and late sowings did not differ significantly from each other in both root and sugar yields/fed, but in the second season, late sowing produced the lower yields of roots and sugar than earlier. It is worthy to mention that, although sucrose % in roots of middle sowing (15 October) was less than that of late sowing, but the increase in root yield compensated and resulted in the higher sugar yield at middle sowing. Top yield/fed of late sowing date (5 November) was the greatest, while the top yield at middle October was the lowest (Table 6). Similar results were obtained by El-Kassaby and Leilah (1992) Leilah and Nasr (1992), Badawi *et al.*, (1995), Hassanin (2001) and Kandil *et al.*, (2002)

1. B. Effect of Varieties:

Data in Table (4) indicates that Pleno cv. gave the highest values of root and top fresh weight/plant as well as the highest value of root diameter, while Top cv. gave the highest root length.

Kawemira cv. gave the highest values of T.S.S. and sucrose percentages in the juice, while Gloria gave the lowest ones for sucrose % and purity % (Table 5). The present results are similar with those of Mokadem (1999), Ramadan (1999) and Nassar (2001).

In both seasons, Pleno cv. surpassed the other varieties in root yield/fed, but the differences with Farida and Top did not reach to the level of significance in the first season. Also, Pleno, Kawemira and Top were the best in sugar yield/fed. Top cv. surpassed the other varieties in top yield/fed followed by Kawemira and Pleno, while Gloria and Farida cvs. produced the lowest top yields/fed (Table 6). These results are in harmony with those of Hassanein (1999) and AL-Naas (2004) who demonstrated differences among sugar beet cultivars in top, root and sugar yields.

Table (4): Effect of sowing and harvesting dates on vegetative characters of some sugar beet varieties under sprinkler irrigation system in 2003/2004 and 2004/2005 seasons.

Treatment s	Root fresh Wt /plant (kg)		Top fresh Wt / plant (kg)		Root diameter (cm)		Root length (cm)	
	2003/2004	2004/2005	2003/2004	2004/2005	2003/2004	2004/2005	2003/2004	2004/2005
Sowing dates (S):								
30 September	0.739 a	0.827 b	0.335 b	0.405 b	9.3 b	12.55 c	12.55 c	16.7 b
15 October	0.781 a	0.900 a	0.260 c	0.402 b	10.4 a	15.76 a	15.76 a	19.0 a
5 November	0.721 a	0.716 c	0.592 a	0.436 a	9.9 ab	13.75 b	13.75 b	17.1 b
F –test	NS	**	**	**	**	*	**	*
Varieties (V):								
Top	0.743 ab	0.817 b	0.334 c	0.389 c	9.6 a	13.57 c	14.74 a	18.1 a
Kawemira	0.711 b	0.778 c	0.408 b	0.390 c	9.7 a	14.52 ab	13.57 c	16.8 b
Gloria	0.715 b	0.773 c	0.337 c	0.396 c	9.9 a	13.27 c	13.27 c	17.7 a
Pleno	0.799 a	0.849 a	0.444 a	0.473 a	10.2 a	14.74 a	14.52 ab	17.8 a
Farida	0.768 ab	0.891 a	0.454 a	0.423 b	10.0 a	14.00 bc	14.00 bc	17.5 a
F –test	*	**	**	**	NS	**	**	*
Harvesting dates (H):								
180 DAS	0.716 b	0.729 b	0.365 b	0.371 b	9.3 b	13.50 b	13.50 b	15.9 b
200 DAS	0.779 a	0.899 a	0.426 a	0.457 a	10.5 a	14.54 a	14.54 a	19.3 a
F –test	**	**	**	**	**	**	**	**
Interactions:								
S × V	NS	**	**	**	NS	**	**	NS
S × H	**	NS	**	**	NS	**	**	**
V× H	NS	**	**	**	NS	**	**	NS
S × V × H	**	**	**	**	NS	**	**	NS

Table (5): Effect of sowing and harvesting dates on juice quality of some sugar beet varieties under sprinkler irrigation system in 2003/2004 and 2004/2005 seasons.

Treatment s	T.S.S. (%)		Sucrose (%)		Purity (%)	
	2003/2004	2004/2005	2003/2004	2004/2005	2003/2004	2004/2005
Sowing dates(S):						
30 September	20.43 a	23.67 b	15.29 c	15.70 c	75.73 b	67.22 b
15 October	19.93 a	24.90 a	15.71 b	16.47 b	73.87 b	66.13 b
5 November	20.96 a	21.56 c	16.50 a	17.41 a	83.54 a	81.37 a
F –test	NS	**	**	**	**	**
Varieties (V):						
Top	20.27 b	23.85 a	16.26 b	16.85 a	80.70 a	72.35 a
Kawemira	21.44 a	23.27 a	16.90 a	17.03 a	79.16 ab	73.39 a
Gloria	20.27 b	23.10 a	14.96 d	15.80 d	74.28 b	69.38 c
Pleno	19.83 b	23.41 a	15.65 c	16.35 c	75.60 ab	70.68 bc
Farida	20.38 b	23.25 a	15.39 c	16.60 b	78.81 ab	72.08 ab
F –test	*	NS	**	**	*	**
Harvest dates (H):						
180 DAS	20.08 a	22.29 b	14.49 b	15.88 b	72.46 b	70.75 b
200 DAS	20.80 a	24.46 a	17.15 a	17.17 a	82.96 a	72.40 a
F –test	NS	**	**	**	**	*
Interactions:						
S × V	*	NS	**	**	NS	**
S × H	**	NS	**	NS	*	**
V× H	NS	NS	NS	**	NS	NS
S × V × H	NS	NS	**	**	NS	**

Table (6): Effect of sowing and harvesting dates on productivity of some sugar beet varieties under sprinkler irrigation system in 2003/2004 and 2004/2005 seasons.

Treatments	Root yield (t / fed)		Top yield (t / fed)		Sugar yield (t / fed)	
	2003/2004	2004/2005	2003/2004	2004/2005	2003/2004	2004/2005
Sowing dates (S):						
30 September	21.23 b	22.84 b	9.73 b	11.18 b	2.28 b	3.63 b
15 October	22.88 a	24.86 a	8.28 c	11.12 b	3.81 a	4.11 a
5 November	20.98 b	19.86 c	13.36 a	12.04 a	3.32 b	3.46 c
F –test	*	**	**	**	**	
Varieties (V):						
Top	21.58 ab	22.55 b	11.77 a	12.07 a	3.68 a	3.86 b
Kawemira	21.34 bc	21.49 c	11.17 b	11.77 b	3.53 ab	4.04 a
Gloria	20.90 c	20.35 d	9.01 c	10.93 c	3.17 c	3.22 d
Pleno	22.39 a	24.76 a	11.05 b	11.68 b	3.65 a	3.98 ab
Farida	22.30 a	23.44 b	9.29 c	10.78 c	3.32 b	3.57 c
F –test	*	**	**	**	**	**
Harvesting dates (H)						
180 DAS	20.84 b	20.21 b	10.37 a	10.26 b	3.04 b	3.21 b
200 DAS	22.56 a	24.82 a	10.55 a	12.63 a	3.90 a	4.26 a
F –test	**	**	NS	**	**	**
Interactions:						
S × V	**	**	**	**	*	**
S × H	**	*	**	**	**	*
V× H	NS	**	**	**	NS	**
S × V × H	**	**	**	**	**	**

1. C. Effect of harvesting dates:

Data in Tables 4, 5 and 6 evidently showed that delay harvest from 180 to 200 DAS significantly increased all the studied characters, except T.S.S.% and top yield/fed in the first season. These results are in a good line with those obtained by Laila *et al.*, (1997), Basha and Ouda (2000), Abd El-Razek (2003), Abou-El-Magd et *al.*, (2003) and AboShady *et al.*, (2007).

1. D. Effect of interactions:

The interactions among the three studied factors namely sowing date (S), varieties (V) and harvesting date (H) had a significant effect on vegetative growth characters of sugar beet plants, except that S×V and V× H interactions in the first season and S×H interaction in the second season had insignificant effect on root fresh wt/plant. Also, all interactions had insignificant effect on root diameter in the first season. Moreover, in the second season, root length was not affected significantly by S×V, V× H and S×V ×H interactions (Table 4).

In both seasons, T.S.S. % was not affected significantly by all studied interactions, except S×V and S×H interactions in the first season. On the other hand, sucrose % affected significantly by all studied interactions, except V×H interaction in the first season and S×H in the second season. Purity % affected significantly by S×H interaction in the first season and S×V, S×H and S×V×H interactions in the second season (Table 5).

Root, top and sugar yields significantly affected by all interactions among the three studied factors, except V×H interaction in the first season not affected root and sugar yields/fed (Table 6).

2. Under drip irrigation system:

2. A. Effect of sowing dates:

It is evident from data illustrated in Tables (7, 8 & 9) that sowing sugar beet at middle October recorded the highest values of root fresh weight/plant, root diameter and root length. Also, sowing beet at middle October produced the highest sucrose content and the best root and sugar yields/fed. These results are in accordance with those obtained by Badawi *et al.*, (1995), Hassanin (2001) and Kandil *et al.*, (2002). On the other hand, delay sowing date until 5th November significantly increased purity % and top yield/fed.

2. B. Effect of Varieties:

Data in Tables (7, 8 & 9) cleared that sugar beet varieties differed in root and top fresh weight/plant as well as in root diameter and root length/plant. Kawemira and Top cvs. produced the highest root and top fresh weights/plant and root diameter. Also, Kawemira cv. recorded the highest values of T.S.S. %, sucrose content and purity %.

Top and Kawemira cvs. surpassed the other studied varieties in root and sugar yields /fed. Moreover, the studied varieties did not differ significantly in sugar yield/fed in the first season (Table 9). Similar results were reported by Mokadem (1999); Nassar (2001); Abd El-Razek (2003) and Al –Naas (2004).

Table (7): Effect of sowing and harvesting dates on vegetative characters of some sugar beet varieties under drip irrigation system in 2003/2004 and 2004/2005 seasons.

Treatments	Root fresh Wt /plant (kg)		Top fresh Wt / plant (kg)		Root diameter (cm)		Root length (cm)	
	2003/2004	2004/2005	2003/2004	2004/2005	2003/2004	2004/2005	2003/2004	2004/2005
Sowing dates (S):								
30 September	0.751 a	0.916 b	0.194 c	0.371 b	8.98 a	11.3 a	13.03 b	20.0 a
15 October	0.753 a	1.004 a	0.259 b	0.365 b	9.10 a	11.0 ab	14.95 a	19.2 a
5 November	0.695 a	0.752 c	0.331 a	0.481 a	9.03 a	10.5 b	14.55 a	19.4 a
F –test	NS	**	**	*	NS	*	**	NS
Varieties (V):								
Top	0.758 ab	0.956 a	0.281 a	0.418ab	9.18 a	11.3 a	13.92 bc	19.7 ab
Kawemira	0.805 a	0.906 ab	0.281 a	0.386ab	9.31 a	11.0 a	13.33 c	18.8 b
Gloria	0.696 bc	0.839 b	0.258 a	0.374b	8.90 ab	10.6 a	14.20 b	19.8 ab
Pleno	0.715 bc	0.846 b	0.265 a	0.409ab	8.96 ab	10.7 a	14.12 b	18.7 b
Farida	0.690 c	0.906 ab	0.222 b	0.440a	8.67 b	11.1 a	15.30 a	20.6 a
F –test	**	*	**	*	*	NS	**	*
Harvesting dates (H):								
180 DAS	0.669 b	0.748 b	0.245 b	0.382 b	9.01 a	10.1 b	13.68 b	17.6 b
200 DAS	0.796 a	1.033 a	0.277 a	0.429 a	8.99 a	11.7 a	14.67 a	21.4 a
F –test	**	**	**	**	NS	**	**	**
Interactions:								
V × S	**	*	**	NS	NS	NS	*	**
H × S	**	*	NS	NS	**	**	**	**
H × V	NS	NS	**	NS	NS	NS	**	*
H × V × S	*	*	**	NS	NS	NS	*	**

Table (8): Effect of sowing and harvesting dates on juice quality of some sugar beet varieties under drip irrigation system in 2003/2004 and 2004/2005 seasons.

Treatments	T.S.S. (%)		Sucrose (%)		Purity (%)	
	2003/2004	2004/2005	2003/2004	2004/2005	2003/2004	2004/2005
Sowing dates (S):						
30 September	22.66 a	23.76 b	15.30 b	16.76 c	69.17	70.50 c
15 October	22.06 b	24.30 ab	15.66 a	17.30 b	69.32	71.13 b
5 November	21.23 c	25.15 a	15.68 a	18.00 a	73.13	71.97 a
F –test	**	*	*	**	*	**
Varieties (V):						
Top	22.16 ab	24.43 ab	15.64 bc	17.43 ab	71.32 a	71.30 ab
Kawemira	22.44 a	24.81 a	16.10 a	17.77 a	73.18 a	71.71 a
Gloria	21.83 bc	23.85 b	15.30 c	16.81 c	67.44 b	71.29 ab
Pleno	22.00 b	24.52 ab	14.82 d	17.41 ab	70.65 ab	70.54 c
Farida	21.50 c	24.29 ab	15.86 ab	17.33 b	70.10 ab	71.18 b
F –test	**	**	**	**	*	**
Harvesting dates (H):						
180 DAS	20.44 b	23.75 b	14.14 b	17.05 b	68.78 b	70.86 b
200 DAS	23.53 a	25.05 a	16.95 a	17.65 a	72.30 a	71.55 a
F –test	**	**	**	*	**	*
Interactions:						
V × S	**	NS	**	**	**	**
H × S	NS	NS	*	**	NS	**
H × V	*	NS	*	**	NS	**
H × V × S	*	NS	**	**	**	**

Table (9): Effect of sowing and harvesting dates on productivity of some sugar beet varieties under drip irrigation system in 2003/2004 and 2004/2005 seasons.

Treatments	Root yield (Ton / fed)		Top yield (Ton / fed)		Sugar yield (Ton / fed)	
	2003/2004	2004/2005	2003/2004	2004/2005	2003/2004	2004/2005
Sowing dates (S):						
30 September	22.18 b	25.04 b	8.30 b	10.17 b	3.49 a	4.20 b
15 October	23.66 a	27.52 a	6.26 c	9.71 b	3.66 a	4.77 a
5 November	21.28 b	20.61 c	9.48 a	13.25 a	3.34 a	3.73 c
F –test	*	**	**	**	NS	**
Varieties (V):						
Top	23.53 a	26.21 a	8.64 a	11.47 a	3.73 a	4.39 a
Kawemira	23.95 a	24.85 b	8.38 a	10.59 b	3.63 a	4.43 a
Gloria	21.86 b	22.99 c	8.06a	10.15 b	3.30 a	3.99 b
Pleno	22.21 b	23.07 c	8.52a	11.42 a	3.60 a	4.04 b
Farida	20.32 b	24.83 b	6.47 b	11.58 a	3.23 a	4.30 a
F –test	**	**	**	**	ns	**
Harvesting dates(H):						
180 DAS	20.41b	20.51 b	7.58 b	10.31 b	2.88 b	3.48 b
200 DAS	24.34a	28.28 a	8.45 a	11.77 a	4.11 a	4.98 a
F –test	**	**	**	**	**	**
Interactions:						
V × S	**	**	**	**	**	**
H × S	**	**	**	Ns	**	**
H × V	Ns	**	**	*	Ns	**
H × V × S	**	**	**	*	*	**

2. C. Effect of harvesting date:

Delay harvest up to 200 DAS significantly increased root fresh wt/plant, top fresh wt/plant, root diameter, and root length (Table7). Moreover, root diameter not affected by harvest date in the first season. .Also, delaying harvest till 200 days after sowing improved juice quality (T.S.S. %, sucrose % and purity %) as well as root, top and sugar yields/fed (Tables 8 & 9).

2. D. Effect of the interactions:

Statistical analysis of variance revealed that the interaction between sowing dates and varieties (S × V) affected root fresh weight/plant, root length, sucrose %, purity %, as well as root, top and sugar yields/fed in the two seasons, while top fresh weight, TSS % were affected by (S × V) in the first season only. Sowing date x harvest date exerted significant effects on all studied traits, except that top fresh weight/plant and T.S.S. % in both seasons, purity % in the first season and top yield/fed in the second season were not affected by this interaction. Also, harvest date x sugar beet varieties (H × V) had significant effect on all studied traits, except that this interaction not affected significantly on root fresh weight/plant and root diameter in both seasons, purity %, root yield and sugar yield in the first season, and top fresh weight/plant and T.S.S.% in the second season. However, all studied traits were found to be affected high significantly or significantly by the second order interaction (S x V x H), except root diameter in the two seasons, top fresh weight/plant and T.S.S. % in the second season only were not affected significantly by this interaction.

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تاثير مواعيد الزراعة والحصاد على انتاجية بعض اصناف بنجر السكر تحت ظروف سيناء

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اجريت تجربتان حقليتان فى موسمى ٢٠٠٣/٢٠٠٤ ، ٢٠٠٤/٢٠٠٥ فى فريـة جليانـة ، القنطرة شرق بسيناء. تهدف التجربة لدراسة تاثير ثلاثة مواعيـد للزراعـة (٣٠ سـبتمبر ، ١٥ اكتوبر، ٥ نوفمبر) ، وميعادان للحصاد (١٨٠ ، ٢٠٠ يوم بعد الزراعة) علـى انتاجيـة خمسة اصناف من بنجر السكر (توب ، كاوميرا ، جلوريا ، بلينو ، فريدا) تحت نظامى الرى بـالرش والرى بالتنقيط.

اعطت زراعة بنجر السكر سواء تحت الرى بالرش او الرى بالتنقيط فى منتصف اكتـوبر اعلى وزن للجذر غض /نبات وقطر الجذر وطول الجذر. ايضا حقق محصول الجـذور والـسكر اعلى القيم عند زراعة البنجر فى ١٥ اكتوبر . بينما ميعاد الزراعة المتاخر (٥ نـوفمبر) اعطـى اعلى القيم لوزن العرش غض/نبات ،نسبة السكروز ، نسبة النقاوة ، ومحصول العرش للفدان.

تاخير ميعاد الحصاد من ١٨٠ الى ٢٠٠ يوم بعد الزراعةادى الى تحسن معنوى فى صفات الجذر وجودة العصير والى زيادة معنوية فى محصول الجذور والسكر للفدان وكان ذلك واضـحا تحت نظامى الرى وكلا من موسمى الزراعة.

اختلفت اصناف بنجر السكر تحت نظامى الرى ، فبينما سجل الصنف بلينو اعلى القيم قـى وزن الجذر والعرش للنبات وقطر الجذر تحت الرى بالرش، سجل الصنفان كاوميرا وتوب افضل هذه النتائج تحت الرى بالتنقيط. سجلت الاصناف بلينو وكاوميرا وتوب افضل النتائج مـن حيـث محصول الجذور و السكر وجودة العصير تحت كل من نظامى الرى.