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YIELD AND ITS QUALITY OF FOUR SUGAR BEET CULTIVARS AS AFFECTED BY SOIL SALINITY LEVELS UNDER FIELD CONDITIONS.

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ABCTRACT

Two field trials were conducted at the Experimental Farm of Sakha Agric. Res. Station during two successive seasons 2000/2001 and 2001/2002. The aim of this investigation was to study the effect of three soil salinity levels EC; 4-<8, 8-<10, 10-<14 dS/m under field conditions on yield and its quality of four sugar beet cultivars; Kawemira, Ras Poly, Top and Meazano Poly cultivars. The two experiments were conducted in split polt design with four replicates.

The observed results can be summarized as follows:

* The root yield of sugar beet was affected significantly by soil salinity levels and sugar beet cultivars in the studied two seasons. The shoot yield was affected significantly by soil salinity levels in the second season and with sugar beet cultivars in the two seasons.
* Kawemira cultivar gave the highest values of root and shoot yields associated with the maximum mean values of gross sugar and white sugar yields under all studied soil salinity levels in the two years of experiment.
* Sucrose percentage of sugar beet was not affected significantly by soil salinity levels and sugar beet cultivars in the two seasons. Top cultivar gave the highest mean value of sucrose % under studied soil salinity levels in the two seasons.
* Purity percentage was affected significantly by soil salinity levels in the second season. Top cultivar gave the highest mean values of purity % under studied soil salinity levels in the two seasons.

Keywords : Soil salinity , Sugar beet cultivars, sucrose.

INTRODUCTION

Soil salinity is a worldwide problem for crop production in arid and sami-arid regions such as in Egypt. In general, salinity inhibits plant growth and development through water deficit, nutritional imbalance and toxic effect. Exploitation of salt affected soils requires selection of salt tolerant plant and good management particularly under field conditions. Sugar beet has become an important crop for sugar production in Nile Delta where it can be grown in new cultivated area located in northern regions. Kafr El-Sheikh Governorate is the main area for sugar beet cultivation representing about 78% of national cultivated area. Mass (1986) tabulated a number of economic crop according to their tolerance to salt concentration, he stated that sugar beet crop is the tolerant one. Shehata (1989) found that the effect of soil salinity on sugar beet plants depends on sugar beet varieties. Plaster (1992) found that sugar beet can be stand at level of soil salinity up to ECe 8 –18 dS/m and ESP 40-60%. El-Hawary (1994) found that increasing soil salinity levels decreased significantly root and sugar yields of sugar beet per feddan. Zein *et al.*, (1998) found that yield and quality of sugar beet cultivars were significantly affected by soil salinity (ECe) up to 10 dS/m. The aim of the present investigation was to study the effect of three levels of soil salinity which ranged from 4-14 dS/m on yield and quality of four sugar beet cultivars under field conditions, and also to select the suitable cultivar adopted for this level of salinity and region.

MATERIALS AND METHODS

Two field trials were conducted at the Experimental Farm of Sakha Agric., Res. Station, Kafr El-Sheikh Governorate during two successive seasons, 2000/2001 and 2001/2002. The aim of this investigation was to study the influence of three soil-salinity ECe; (S_1) 4-<8, (S_2) 8-<10 and (S_3) 10-<14 dS/m on yield and its quality of four sugar beet cultivars; (V_1) Kawemira, (V_2) Ras Poly, (V_3) Top and (V_4) Mezano Poly. The experiments were conducted in split plot design with four replicates. The main plot were assigned to soil salinity treatments. Sugar beet cultivars occupied the sub plots. The area of each plot was 2.4 x 3.5= 8.4 square meter. All plots of the experiment were treated with 36.9 Kg P_2O_5/ha as supper phosphate (15.5% P_2O_5). N fertilizer at the rate of 166.6 N/ha was applied in the form of urea (46% N) and splitted in two equal doses. The first dose was added at thinning period (after 40 days from sowing) and the second dose was added after 30 days later. The K fertilizer at the rate of 114.3 Kg K_2O/ha in the form of K_2SO_4 (48% K_2O) was applied after 40 days from sowing. Three seeds were sown in each hill with a distance of 20 cm between hills. Seeds were sown on 10^{th} and 22^{th} of Dec., 2000 and 2001 respectively. Plants were thinned to one plant per hill after 40 days from sowing. The sugar beet was harvested on 12^{th} and 27^{th} of June in 2001 and 2002, respectively. Other agricultural practices were carried out as recommended. Representative samples of sugar beet roots were taken at the same time of harvesting to determine sugar beet constituents such as sucrose%, white sucrose%, sugar losses%, purity% and alkalinity coefficient (K+ Na/aN) in fresh root of sugar beet. These parameters were determined polarimetcrically by means of an automatic sugar polarimeter as described by Mc Ginnus (1971). Gross sugar yield (ton/ha) was calculated from root yield (ton/ha) x sucrose%. White sugar yield (ton/ha) was calculated from root yield (ton/ha) x white sucrose%. Available nitrogen, phosphorus and potassium in the soil samples were determined according to Jackson (1958). Some soil properties of the two experimental sites are presented in Table1.

Data were subjected to statistical analysis according to Snedecor and Cochran (1980).

Table 1: Some chemical and physical properties of the soil surface layer (0-30cm) of the experimental locations.

Partials size Distribution %			Texture	Chemical analysis													
				2000 / 2001						2001/2002							
Clay %	Silt %	Sand %		Soil pH (1:2.5)	O.M. %	Total Carbonate %	Available nutrients, mg/Kg			Soil pH (1:2.5)	O.M. %	Total Carbonate %	Available nutrients, mg/Kg				
							N	P	K				N	P	K		
51.70	24.88	23.42	Clayey	7.80	1.70	2.80	28	8.0	390	7.90	1.50	3.00	24	7.8	375		

RESULTS AND DISCUSSION

1- Yield of sugar beet cultivars as affected by soil salinity levels:

Root yield :

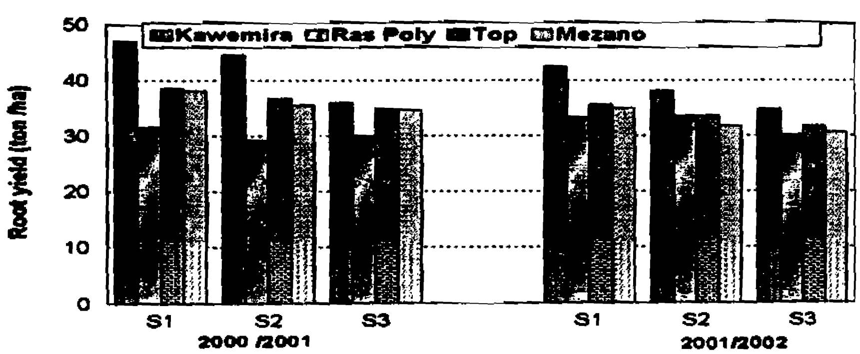
Data in Table 2 and Fig1 show that in two years experiment root yield was affected significantly by soil salinity levels and sugar beet cultivars. The maximum values of root yield (46.97 and 42.57 ton/ha in 2001 and 2002) were obtained under S_1 soil salinity level with Kawemira cultivar in the two seasons. While the lowest values (29.21 and 30.09 ton/ha in 2001 and 2002) were obtained under S_2 and S_3 soil salinity levels in 2001 and 2002, respectively with Ras Poly cultivar. From the obtained results it could be stated that Kawemira cultivar (V_1) gave the highest value of root yield under all soil salinity levels, while Ras Poly cultivar (V_2) generally gave the lowest significant ones in both years. It is common that field crops differ greatly in their response to salinity levels and the differences in salt tolerance often occur between different cultivars of a given species (Jefferies, 1988). The mean values of root yield of sugar beet cultivars as affected by different soil salinity levels over the two seasons were in the following order Kawemira > Top > Mezano Poly > Ras Poly. These results indicated that root yield of Kawemir cultivar tolerates soil salinity more than other studied cultivars under field conditions. These results were supported by the data obtained by Zein *et al.*, (2002) and El-Hawary (1994) who found that root yield of sugar beet was significantly decreased with increasing soil-salinity levels. Regarding the effect of soil salinity levels on root yield the increase in root yield was observed under low soil salinity level S_1, while the lowest values were found under soil salinity levels S_2 and S_3 which may be explained by the fact that saline conditions restrict the synthesis of cytokines in the roots and their translocation to upper plant parts can be inhibited (Meiri and Shalhevet, 1973).

Table 2: Effect of soil salinity levels on root, shoot yields and root/shoot ratio of four sugar beet cultivars in seasons 2000/2001 and 2001/2002

Sugar beet cultivars	First season 2000/2001				Second season 2001/2002			
	Soil salinity levels (dS/m)							
	S_1 4-<8	S_2 8-<10	S_3 10-<14	V-Mean	S_1 4-<8	S_2 8-<10	S_3 10-<14	V-Mean
Root yield (ton/ha)								
Kawemira (V1)	46.97 a	44.64a	36.00 a	42.54 a	42.57 a	38.17 a	34.73 a	38.49 a
Ras Poly (V2)	31.52 c	29.21 c	29.97 b	30.23 c	33.33 b	33.47 b	30.09 b	32.30 b
Top (V3)	38.61 b	36.70 b	34.88 a	36.73 b	35.63 b	33.57 b	31.71ab	33.63 b
Mezano Poly (V4)	38.19 b	35.46 b	34.67 a	36.11 b	34.89 b	31.64 b	30.54 b	32.36 b
S- Mean	38.82	36.50	33.88	36.40	36.60	34.21	31.77	34.19
Shoot yield (ton/ha)								
Kawemira (V1)	10.89 a	9.42 a	10.67 a	10.32 a	10.10 a	9.34 a	8.79 a	9.41 a
Ras Poly (V2)	9.22 b	7.26 b	8.75 b	8.41 b	8.37 b	7.91 b	7.92 ab	8.06 bc
Top (V3)	9.57 ab	10.02 a	9.47 ab	9.69 a	8.72 b	8.91 a	7.95 ab	8.51 b
Mezano Poly (V4)	9.63 ab	9.62 a	9.28 b	9.51 a	8.01 b	7.99 b	7.64 b	7.88 c
S- Mean	9.83	9.08	9.54	9.48	8.80	8.52	8.07	8.47
Root / Shoot (ratio)								
Kawemira (V1)	4.31 a	4.74 a	3.38 a	4.14 a	4.22 ab	4.09 ab	3.95 a	4.09 a
Ras Poly (V2)	3.42 b	4.03 b	3.43 a	3.62 b	3.99 b	4.23 a	3.80 a	4.00 a
Top (V3)	3.96 ab	3.66 b	3.68 a	3.77 ab	4.09 ab	3.79 b	3.99 a	3.96 a
Mezano Poly (V4)	3.96 ab	3.68 b	3.74 a	3.79 ab	4.37 a	3.96 ab	4.00 a	4.11 a
S- Mean	3.91	4.03	3.55	3.83	4.16	4.02	3.94	4.04

In a column, the means followed by a common letter are not significantly different at the 5% level by DMRT. S: Salinity levels, V: Sugar beet cultivars.

Fig. 1. Effect of soil salinity levels on root yield of four sugar beet cultivars in seasons 2000/2001 and 2001/2002



Shoot yield :

Data in Table 2 show that shoot yield of sugar beet cultivars was affected significantly with soil salinity levels in the second season and with sugar beet cultivars in the two seasons. The maximum values of shoot yield (10.89 and 10.10 ton /ha in 2001 and 2002) were obtained under low soil salinity level S_1 with Kawemira cultivars in the two seasons. While the lowest values were obtained under S_2 and S_3 soil salinity levels with Ras Poly and Mezano Poly cultivars in 2001 and 2002, respectively. In general, it is important to note that Kawemira cultivar gave highest values of root and shoot yields, while Ras Poly cultivar gave the lowest values of root and shoot yields under different soil salinity levels. These results indicate that root and shoot yields of Kawemira cultivar is more tolerant to soil salinity ECe levels from 4-14 dS/m than the other studied cultivars. While Ras Poly cultivar was more sensitive to soil salinity within the same level. These results are in agreement with those obtained by Allam and Ali (1982), El-Yamani (1999) and Zein *et al.*, (2002).

Root /Shoot (ratio) :

Data in Table 2 show that root /shoot ratio was affected significantly with sugar beet cultivars and the interaction between soil salinity levels and sugar beet cultivars was significant in the first season, but it had no significant effect for soil salinity levels and sugar beet cultivars on root/shoot ratio in the second season. The highest values of root/shoot ratio (4.74 and 4.37 in 2001 and 2002) were obtained under S2 and S1 with Kawamira and Mezano Poly cultivars, respectively. The observed results indicated that there was a balance between root and shoot yields of Kawemira cultivar . In genral these cultivar was superior in yield than the other cultivars under study. These results are in agreement with those obtained by Zein *et al.*, (2002).

2- Yield quality of sugar beet as affected by soil salinity levels and sugar beet cultivars:

Sucrose percentage:

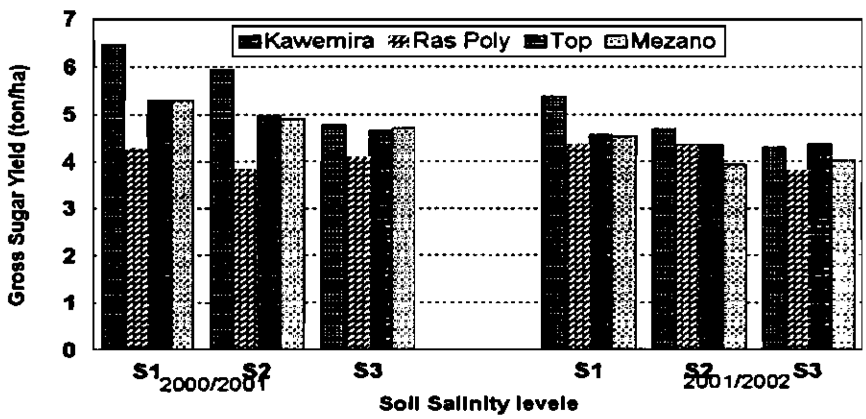
Data in Table 3 show that soil salinity levels and sugar beet cultivars had no significant effect on sucrose percentage in the two seasons. The maximum values of sucrose percentage (13.87 and 13.80% in 2001 and 2002) were obtained under S_1 and S_2 in 2001 and 2002 with Mezano Poly and Top cultivars, respectively. Data also show that the mean values of sucrose % in 2001 as affected by soil salinity levels were in the following order: Mezano Poly >Top > Ras Poly > Kawemira, while in 2002 the mean values were in the order Top > Ras Poly > Mezano Poly > Kawemira. It is interested to note that Kawemira cultivar gave the highest mean values of root yield, while it gave the lowest mean values of sucrose%. This indicated that the sucrose % of Kawemira cultivar was more sensitive to soil salinity than the root yield and or as dilution effect in roots of sugar beet. Similar results were obtained by Zein *et al.*, (1998) and Higazy *et al.*, (1994) who found that the root quality of sugar beet varieties differed in their responses to soil salinity.

Table 3: Effect of soil salinity levels on sucrose %, gross sugar yield and root/shoot ratio of four sugar beet cultivars in seasons 2000/2001 and 2001/2002.

Sugar beet cultivars	First season 2000/2001				Second season 2001/2002			
	Soil salinity levels (dS/m)							
	S_1 4-< 8	S_2 8-<10	S_3 10-<14	V-Mean	S_1 4-<8	S_2 8-<10	S_3 10-<14	V-Mean
Sucrose (%)								
Kawemira (V1)	13.78 a	13.29 a	13.28 a	13.45 a	12.63 a	12.28 a	2.41 b	2.44 b
Ras Poly (V2)	13.60 a	13.11 a	13.73 a	13.48 a	13.11 a	13.11 a	2.44 b	2.89 ab
Top (V3)	13.73 a	13.56 a	13.35 a	13.55 a	12.86 a	12.95 a	3.80 a	3.20 a
Mezano Poly (V4)	13.87 a	13.78 a	13.60 a	13.75 a	13.04 a	12.43 a	3.15 ab	2.87 ab
S- Mean	**13.74**	**13.43**	**13.49**	**13.56**	**12.91**	**12.69**	**12.95**	**12.85**
Gross sugar yield (ton/ha)								
Kawemira (V1)	6.47 a	5.93 a	4.78 a	5.73 a	5.38 a	4.69 a	4.31 a	4.79 a
Ras Poly (V2)	4.29 c	3.83 c	4.11 b	4.08 c	4.37 b	4.39 a	3.82 b	4.19 b
Top (V3)	5.30 b	4.98 b	4.66 ab	4.98 b	4.58 b	4.35 a	4.38 a	4.34 b
Mezano Poly (V4)	5.30 b	4.89 b	4.71 ab	4.97 b	4.55 b	3.93 b	4.02 ab	4.17 b
S- Mean	**5.34**	**4.91**	**4.57**	**4.94**	**4.72**	**4.34**	**4.13**	**4.40**
White possible ext. sugar (B) (%)								
Kawemira (V1)	8.73 a	7.81 ab	7.77 a	8.10 a	7.21 a	6.40 a	6.57 a	6.73 b
Ras Poly (V2)	8.41 a	7.59 b	7.94 a	7.98 a	7.67 a	7.25 a	6.78 a	7.23 ab
Top (V3)	8.73 a	8.39 ab	7.81 a	8.31 a	7.58 a	7.52 a	8.05 a	7.72 a
Mezano Poly (V4)	8.63 a	8.51 a	7.86 a	8.33 a	7.54 a	7.28 a	7.39 ab	7.40 ab
S- Mean	**8.62**	**8.08**	**7.84**	**8.18**	**7.50**	**7.11**	**7.20**	**7.27**

In a column, means followed by a common letter are not significantly different at the 5% level by DMRT. S: Salinity levels, V: Sugar beet cultivars.

Fig. 2. Effect of soil salinity levels on gross sugar yield of four sugar beet cultivars in seasons 2000/2001 and 2001/2002



Gross sugar yield :

The gross sugar yield is an important yield parameter of sugar beet. Data in Table 3 show that gross sugar yield was affected significantly by soil salinity levels and sugar beet cultivars in the two seasons. The interaction between soil salinity levels and sugar beet cultivars had a significant effect on gross sugar yield in the two years of experiment. The maximum values of gross sugar yield (6.47 and 5.38 ton/ha in 2001 and 2002) were obtained under low soil salinity level S_1 with Kawemira cultivar in the two seasons. In general Kawemira cultivar gave the maximum values of gross sugar yield under studied soil salinity levels in two years of experiment. The mean values of gross sugar yield under studied soil salinity levels were in the following order : Kawemira > Top > Mexano Poly > Ras Poly in the first season and Kawamira > Top > Ras Poly > Mezano Poly in the second season. These results are in agreement with those obtained by Zein *et al* (1998) and Zein *et al* (2002) who found that gross sugar yield was affected significantly by soil salinity levels and sugar beet cultivars. El-Hawary (1994) *found that soil salinity may also affect crop quality in sugar beet, very low* levels of sugar % may be resulted with increasing soil salinity levels.

White sucrose percentage (B) :

Data in Table 3 show also that white sucrose % was affected significantly with sugar beet cultivars, but it was not affected significantly with soil salinity levels in the two seasons. The interaction between soil salinity levels and sugar beet cultivars had no significant effect on sucrose% in the two seasons . The maximum sucrose % (8.73 and 8.05% in 2001 and 2002) were obtained under S_1 and S_3 with Kawemira and Top cultivars in the first season and with Top cultivar in the second season, respectively. These results are in agreement with those obtained by Zien *et al.*, (2002).

White sugar yield:

The white sugar yield is an important yield parameter of sugar beet because it is the final useful form sugar that the consumer uses. Data in Table 4 show that white sugar yield was affected significantly by soil salinity levels, but it was not responded significantly with sugar beet cultivars in the two years of experiment. The maximum values of white sugar yield (4.10 and 3.07 ton/ha in 2001 and 2002) were obtained under low soil salinity level S_1 with Kawemira cultivar in the two seasons. The interaction between soil salinity levels and sugar beet cultivars had no significant effect on white sugar yield in the two seasons. These results are in agreement with those obtained by Khalifa and Header (1995). Data also show that the mean values of white sugar yield of sugar beet cultivars under soil salinity levels were in the following order Kawemira > Top > Mezano Poly > Ras Poly in the two seasons. Similar results were reported by Zein *et al.*, (2002).

The losses from the sugar % (D) :

Data in Table 4 show that sugar loss % was affected by soil salinity levels, but it was not responded significantly to sugar beet cultivars in the two years of experiment. The interaction between soil salinity levels and sugar beet cultivars had no significant effect on sugar loss %. The maximum values of sugar losses% (5.79 and 5.91% in 2001 and 2002) were obtained under the high level of soil salinity with Ras Poly cultivar in the two seasons. Similar results were reported by Khalifa and Header (1995), they found that sugar loss % was increased with increasing soil salinity levels up to 9.40 dS/m. The increase of sugar losses by increasing soil salinity levels may be explained on the fact that Na and K are impurities in the sugar beet root which interfere with the extraction of sucrose and may be associated with reduced sucrose concentration as well as refined sugar production (Carter, 1986).

Table 4: Effect of soil salinity levels on white sucrose, the losses from the sugar, sugar purity and alkalinity coefficient on four sugar beet cultivars in seasons 2000/2001 and 2001/2002.

Sugar beet cultivar	First season 2000/2001				Second season 2001/2002			
	Soil salinity (dS/m)							
	S_1 4-<8	S_2 8-<10	S_3 10-<14	V-Mean	S_1 4-<8	S_2 8-<10	S_3 10-<14	V-Mean
White sucrose (ton/ha)								
Kawemira (V1)	4.10 a	3.49 a	2.80 a	3.46 a	3.07 a	2.44 a	2.28 ab	2.60 a
Ras Poly (V2)	2.65 c	2.22 c	2.38 b	2.42 c	2.56 b	2.43 a	2.04 b	2.34 a
Top (V3)	3.73 b	3.08 b	2.68 ab	3.04 b	2.70 b	2.53 a	2.55 a	2.59 a
Mezano Poly (V4)	3.30 b	3.02 b	2.66 ab	2.99 b	2.63 b	2.30 a	2.26 ab	2.39 a
S- Mean	**3.36**	**2.95**	**2.63**	**2.98**	**2.74**	**2.43**	**2.28**	**2.48**
The losses from the sugar % (D)								
Kawemira (V1)	5.23 ab	5.48 a	5.46 a	5.39 ab	5.49 a	5.68 a	5.79 a	5.65 a
Ras Poly (V2)	5.19 ab	5.52 a	5.79 a	5.50 ab	5.40 a	5.69 a	5.91 a	5.67 a
Top (V3)	4.97 b	5.18 a	5.54 a	5.23 b	5.42 a	5.43 a	5.75 a	5.53 a
Mezano Poly (V4)	5.50 a	5.39 a	5.74 a	5.55 a	5.36 a	5.69 a	5.76 a	5.61 a
S- Mean	**5.22**	**5.39**	**5.63**	**5.42**	**5.42**	**5.62**	**5.80**	**5.61**
Sugar purity % (Q Z)								
Kawemira (V1)	63.43 a	58.63 a	58.75 a	60.27ab	56.70 a	52.68 a	53.13 a	54.17 b
Ras Poly (V2)	62.35 ab	57.13 a	57.53 a	59.00ab	58.63 a	56.00 a	53.38 a	56.00 ab
Top (V3)	63.73 a	61.80 a	58.35 a	61.29 a	57.40 a	58.00 a	58.10 a	57.83 a
Mezano Poly (V4)	57.43 b	59.78 a	57.56 a	58.25 b	60.70 a	54.18 a	56.10 a	56.99 ab
S- Mean	**61.73**	**59.33**	**58.05**	**59.70**	**58.36**	**55.21**	**55.17**	**56.25**
Alkalinity coefficient (K+ N /aN) ratio								
Kawemira (V1)	2.52 a	2.21 a	2.00 a	2.24 a	2.23 a	2.01 a	1.93 a	2.06 a
Ras Poly (V2)	2.63 a	2.35 a	2.09 a	2.36 a	2.34 a	1.95 a	1.91 a	2.06 a
Top (V3)	2.89 a	2.45 a	2.12 a	2.49 a	2.50 a	2.28 a	2.00 a	2.26 a
Mezano Poly (V4)	2.58 a	2.04 a	1.90 a	2.17 a	2.06 a	1.94 a	1.82 a	1.94 a
S- Mean	**2.65**	**2.26**	**2.03**	**2.31**	**2.28**	**2.04**	**1.91**	**2.08**

In a column, means followed by a common letter are not significantly different at the 5% level by DMRT. **S: Salinity levels, V: Sugar beet cultivars.**

Sugar purity % (QZ) :

Data in Table 4 show that sugar purity % was affected significantly with soil salinity levels in the second season, but it was responded significantly to sugar beet cultivars in the two seasons. The interaction between soil salinity levels and sugar beet cultivars had no significant effect on sugar purity % in the two seasons. The maximum values of purity % (63.73 and 60.70% in 2001 and 2002) were obtained under low soil salinity level S_1 in the two seasons with Top and Mezano Poly cultivars, respectively. These results indicate that purity % was decreased by increasing soil salinity levels (ECe) up to 14 dS/m. This reduction in purity % with increasing soil salinity levels may be due to increasing K and Na concentration in the root relatively decreased the purity and increased the losses from sugar (Draycott *et al.*, 1971). These results are in agreement with those obtained by Khalifa and Header (1995) and Zein *et al.*, (2002).

Alkalinity coefficient (K + Na / a N) ratio :

Data in Table 4 show that alkalinity coefficient was affected significantly with soil salinity levels, but it was not responded significantly to sugar beet cultivars in two years of experiment. The interaction between soil salinity levels and sugar beet cultivars had no significant effect on alkalinity coefficient in the two seasons. The maximum values of alkalinity coefficient (2.89 and 2.50 ratio in 2001 and 2002) were obtained under low soil salinity level S_1 with Top cultivar in the two seasons, respectively. These results indicate that alkalinity coefficient was increased significantly with decreasing soil salinity levels (ECe) up to 14 dS/m due to that the content of α – amino – N is low relative to that of Na and K. It is of important to note that the cultivar which gave the highest mean values of sugar purity % was associated with the highest mean values of alkalinity coefficient in the two seasons. This phenomenon may be explained on the fact that chemical characters of sugar beet juice mainly affect the sugar crystallization processes. These have high sources content and low contents of Na, K and α – amino –N and betaine contents. It is also important for the stability of juice in the factory that the content of α – amino –N is low in relative to that of Na and K (Boscmark, 1993).

It can be concluded that kawemira cultivar tolerates soil salinity levels (ECe) from 4 to 14 dS/m under field conditions of the experiments, than the other studied sugar beet cultivars. It gives generally the maximum values of root and shoot yields associated with the maximum mean values of gross sugar and white sugar yields under studied soil salinity levels in the two years of experiment.

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المحصول وجودته لأربعة أصناف بنجر السكر متأثرا بمستويات الملوحة الأرضية تحت ظروف الحقل

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أجريت تجربتين حقليتين فى المزرعة البحثية بمحطة البحوث الزراعية بسخا خلال موسمين متتاليين ٢٠٠٠/٢٠٠١ ، ٢٠٠١ / ٢٠٠٢ وكان الهدف من البحث هو دراسة تأثير ثلاثة مستويات من الملوحة الأرضية (٤– <٨) ، (٨ – < ١٠) ،(١٠ – < ١٤) dS/m تحت ظروف الحقل على المحصول وجودته لأربعة أصناف من بنجر السكر : كواميرا ، راس بولى ، توب ، ميزانوبولى. ونفذت التجربة فى تصميم قطع منشقة مع أربعة مكررات.

ويمكن تلخيص النتائج المتحصل عليها كما يلى :

- تأثر محصول الجذور لأصناف بنجر السكر معنويا بمستويات الملوحة الأرضية وأصناف بنجر السكر خلال الموسمين.
- محصول المجموع الخضرى تأثر معنويا بمستويات الملوحة الأرضية فى الموسم الثانى فقط وبأصناف بنجر السكر خلال الموسمين.
- الصنف كواميرا أعطى أعلى قيمة لمحصول الجذور والمجموع الخضرى إضافة إلى أنه حقق أعلى متوسط لمحصول السكر الخام ومحصول السكر الأبيض تحت جميع مستويات الملوحة الأرضية خلال عامى التجربة.
- النسبة المئوية للسكروز لم تتأثر معنويا بمستويات الملوحة الأرضية وأصناف بنجر السكر خلال موسمى الدراسة.
- الصنف توب (Top) أعطى أعلى قيمة متوسطة للنسبة المئوية للسكروز تحت جميع مستويات الملوحة الأرضية خلال موسمى الدراسة.
- النسبة المئوية للنقاوة تأثرت معنويا بمستويات الملوحة الأرضية فى الموسم الثانى .
- الصنف (Top) أعطى أعلى قيمة متوسطة للنسبة المئوية للنقاوة تحت جميع مستويات الملوحة الأرضية خلال موسمى الدراسة.