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YIELD AND QUALITY OF SOME SUGAR BEET VARIETIES AS AFFECTED BY DIFFERENT METHODS OF POTASSIUM APPLICATION

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ABSTRACT: *Two field trials were carried out at Sakha Research Station (Kafr El-Sheikh Governorate) (31°N,30° E at an altitude,elev 6 m) in 2010/2011 and 2011/2012 seasons to study the effect of six potassium application resources [without application, two sprays of potassium compound (30% K_2O + 8%N), 24 kg K_2O/fed, 24 kg K_2O/fed + one spray of potassium compound, 24 kg K_2O/fed + two sprays of potassium compound and 48 kg K_2O/fed] on yield and quality of four sugar beet varieties (Samba,Kawemira,Lola and Raspoly). Sucrose%,purity%,sugar loss to molasses, root fresh weight,root, sugar and top yields characters were studied.*

The results showed that the examind sugar beet varieties differed significantly in root fresh weight kg/plant and root yield (tons/fed). Sugar beet variety Kawemira recorded the highest values of these traits. Potassium application resource treatments effected significantly on root fresh weight/plant, purity %, root and sugar yields in both seasons while sucrose% significantly responded only in the 1st season. Application of 24 kg K_2O/fed + one spray of potassein resulted in the highest root fresh weight/plant, sucrose %, purity %, root and sugar yields (tons/fed) while the highest top yield was recorded by application of 24 kg K_2O/fed + two sprays of potassein. On the other hand, sugars loss to molasses % were not significantly affected by the tested varieties and/or potassium application resource treatments in both seasons.

Under this study, it could be concluded that application of 24 kg K_2O/fed + one spray of potassium compound to sugar beet variety " Kawmera" produced the highest root yield and quality.

Key word: *Sugar beet, varieties, potassium application.*

INTRODUCTION

Sugar beet crop introduced to the Egyptian agricultural rotation in 1981 as a complementary sugar crop to narrow the gap between the consumption and production of sugar. Nowadays , raw sugar from sugar beet amounted to 0.6 million ton/year produced from 420 thousand fed.. Improving quality parameters of sugar beet juice is the main demand for sugar companies to increase the extracted sugar as well as for the growers to incease their net income. Potassium element plays an important role in physiological processes of plants and in sugar beet crop as a storage crop which improves juice quality consequently recoverable sugar. Many investigations stated that sugar beet yield and quality differed greatly by the applied levels of potassium fertilizers as a result to its essential role in sugar translocation . Obara *et al*. (1986) found that increasing K-fertilization significantly increased root yield, sugar content and noxious chemical components such as K, Na, alpha amino-N, but not for sugar yield. Milcheva (1990) found that K application from 0, 80, 160 or 320 kg K_2O/ha increased root sugar contents and sugar yields/ha. Potassium application reduced the noxious-N contents of roots. Basha (1994) noticed that applying 100 kg K_2O/fed increased significantly root fresh weight/plant, root and sugar yields, sucrose and purity percentages. Kruger and Nowakowski (1995) found that increasing the dose of potassium up to 320 K_2O/ha caused increases in root yield, sugar yield and sugar content, but the increase was not proportional to the dose applied. Jaszczolt (1996) noticed that root sugar content was not affected by the K-fertilizer treatment. Moustafa (1996) reported that the increase

in K level up to 48 kg K_2O/fed significantly increased root yield/fed. El-Maghraby *et al.* (1998) mentioned that increasing K-level from zero up to 48 kg K_2O/fed increased significantly root fresh weight/plant, root and sugar yields while sucrose and purity percentages were significantly increased as K-level increased up to 24 kg K_2O/fed. Ibrahim (1998) found that root fresh weight/plant, sucrose and purity percentages, root and sugar yields increased significantly with increasing K-level up to 48 kg K_2O/fed. El-Shafai (2000) obtained a significant increase in root fresh weight/plant, sugar yield and sucrose percentage as K-level increased from zero to 48 kg K_2O/fed while root yield insignificantly increased. Purity percentage was not significantly affected by K- fertilizer level. Soudi *et al.* (2012) showed that increasing potassien fertilizer (NPK as 0 , 8 P_2O_5 and 30 $K2O_5$) from up to 3 l/Fed. gave the highest values of stalk diameter , TSS%, sugar recovery % , millable cane sand recoverable sugar yields/Fed.

Yield potentiality of sugar beet cultivars under different environmental conditions has received attention of some investigators: Obara *et al.* (1986) found that Sugar beet c.v Monohikari showed smaller deviations in root yield, sugar content and noxious components than the other varieties (Highgrave, Monofort and Arigo). They added that the interaction between variety and potassium fertilizer regime was significant for the root yield, sugar content, amino N content and sugar content. Takada *et al.* (1988) found that variety Hokkai 54 produced a higher root fresh weight but lower sugar content than the other varieties and that the interaction between variety and level of K fertilizer application was significant for sugar content, Na content, amino-N content and unrefinable sugar content. Increasing levels of fertilization increased K, Na and sugar contents.

This study was conducted to throw some light around the effective role of potassium element in the storage crops such as sugar beet crop as well as to find out the relative response of the different varieties to potassium fertilizer resourses.

MATERIALS AND METHODS

Two field trials were carried out at Sakha Research Station(ARC)(Kafr ELSheik Governorate) in the two successive seasons 2010/2011 and 2011/2012 to study the relative effect of twenty four treatments represent the combination between four sugar beet varieties (Samba, Kawemira,Lola and Raspoly) and six potassium fertilizer treatments on yield and quality of sugar beet. Potassium treatments were as follows:

1. Without potassium fertilization (control).
2. Spraying potassein compound twice one after thinning and the second one month later).
3. 24 kg K_2O/fed after thinning.
4. 24 kg K_2O/fed + one spray of potassein (after thinning).
5. 24 kg K_2O/fed + two sprays of potassein (after thinning and one month later).
6. 48 kg K_2O/fed after thinning.

Potassein is a liquid foliar fertilizer contains 30 % K_2O + 8 % N. It was sprayed at the rate of 3 L/fed. A split-plot design in four replications was used. Sugar beet varieties were allocated in the main plots and fertilization treatments were randomly distributed in the sub-plots. Phosphorus fertilizer was applied in the form of Calcium super phosphate (15% P_2O_5) at the rate of 30 kg P_2O_5 /fed at seed bed preparation. Nitrogen fertilizer was applied as Urea (46% N) at the rate of 80 kg N/fed in two equal doses (one after thinning and the other one month later). Sowing took place during the 1st week of November while harvest was done 7 months later in both seasons. Plot size was 21 m^2. Sugar beet was sown on ridges of 7 m length, 6 ridges, 50-cm apart with 20 cm between hills. The previous crop was maize in both seasons.

The physical and chemical analysis of the upper 30-cm of soil of the experimental site showed that the soil was clay loam containing 27.8 ppm available N, 17.52 ppm P_2O_5 and 281 ppm K_2O. Other agricultural practices were done as recommended by Sugar Crops Research Institute.

Data recorded:

At harvest, a sample of ten guarded plants was taken at random to determine the following characters:

Juice quality characteristics were determined in the fresh roots using an automatic French system (HYCEL):

1. **Sucrose percentage (Pol. %)** was determined using polarimeter on a lead acetate extract of fresh macerate root according to Le-Doct (1927).

2. **Purity %** was calculated according to the following equation:

Purity % = 99.36 - [14.27(Na %+ K %+ α-amino N %) / Sucrose % (Pol %).] (Devillers, 1988).

3. **Sugar loss to molasses (SM)**, sugar extractable and extractability % were calculated according to the following formulas:

Sugar loss to molasses = (Na % +K %) 0.14 + Na % x 0.25 + 0.5, **Devillers (1988).**
Extractable sugar % = Sucrose % (Pol %) - SM - 0.6, **Dexter *et al.* (1967).**
Extractability % = extractable sugar / sucrose %.

Root fresh weight, root, sugar and top yields were determined as follows:

4. **Root fresh weight (kg/plant).**

5. **Root yield (tons/fed)** was determined on the whole plot basis.

6. **Sugar yield (tons/fed)** was calculated according to the following equation:

Sugar yield = root yield x sucrose % x purity %.

7. **Top yield (tons/fed).**

The collected data were statistically analyzed according to the method described by Snedecor and Cochran (1981).

RESULTS AND DISCUSSION

1. Sucrose percentage:

Data presented in Table (1) cleared that the tested sugar beet varieties insignificantly effected on sucrose percentage in both seasons. However, variety Lola attained the better value of sucrose percentages over the other varieties.

Potassium application resourses had a significant effect on sucrose percentage in the 1st season. Applying 24 kg K_2O + one spray of potassium compound attained the highest sucrose percentage (17.65 %) compared with the other treatments. These results are in harmony with those reported by Basha (1994), El-Maghraby *et al* (1998), Ibrahim (1998) and El-Shafai (2000). The increase in the values of potassium may be due to the vital role of potassium as a carrier for sucrose from leaves to roots.

The interaction between varieties and potassium application resources on this trait was insignificant in both seasons.

Table (1): Sucrose % as affected by potassium application

Season	2010/2011							2011/2012						
Variety	Potassium application resources						Mean	Potassium application resources						Mean
	1*	2*	3*	4*	5*	6*		1*	2*	3*	4*	5*	6*	
Samba	15.68	17.81	16.79	18.62	17.67	14.66	16.87	15.86	16.72	16.80	16.39	16.03	15.55	16.22
Kawemira	17.38	17.03	17.12	16.90	16.62	16.11	16.86	13.31	14.72	14.82	16.46	15.97	15.62	15.15
Lola	16.81	17.70	16.80	18.11	17.90	18.29	17.60	16.72	18.49	16.90	17.50	16.99	15.37	16.99
Raspoly	15.31	15.28	15.12	16.99	16.65	13.30	15.74	14.93	14.66	16.84	16.51	17.23	15.66	15.95
Mean	16.29	16.95	16.45	17.65	17.21	15.59		15.20	16.14	16.34	16.71	16.55	15.55	

L.S.D. at 5% level for:

Variety (A)	N.S	N.S
Potassium and potassein treatments (B)	1.33	N.S
A x B	N.S	N.S

1* Control , 2*: spraying twice , 3* 24 kg K_2O/fed , 4* : 24 kg K_2O/fed + spraying once , 5* : 24 kg K_2O/fed + spraying twice , 6* 48 kg K_2O/fed after thinning

2- Purity percentage:

Data presented in Table (2) cleared that the studied sugar beet varieties did not reach the level of significance with respect their influence on purity percentages in the two growing seasons. Regardless the significancy , Sultan variety is still attained the highest value of purity percentage (96.15 and 96.63%) in the 1st and 2nd season, respectively compared with the other varieties. This result may be due to the superiority of Sultan variety in the values of sucrose over the other varieties as it shown in Table (1), that is because it is well Known that the higher the sucrose percentage , the higher the purity percentage. The differences between varieties in quality percentage had been reported by Wauters and Tits (1993)

As for , purity percentage as affected by potassium application resources , data obtained in Table (2) revealed that in the two seasons, Application of 24 kg K_2O + one spray of potassium compound produced the highest value of purity percentage (96.55 and 96.49%) in the 1st and 2nd season, respectively. The increase in purity percentage mainly due the superiority of this treatment in sucrose percentage which in turn reflected on the values of purity percentage. These results are in line with those recorded by Basha (1994) and Ibrahim (1998).

The interaction between varieties and potassium application resources did not significantly effect on this trait in both seasons.

3. Sugar loss to molasses (mg/100g sugar)

Data presented in Tables (3) revealed that varieties were not significantly differed in their influence on sugar loss to molasses in both seasons. Variety Lola recorded the lowest values of this trait. This observation mainly due to the real results of properties of this trait which recorded higher sucrose % , higher purity % , higher extractable sugars % and higher extractability percentages which in turn reflected on lower sugar loss in molasses.

Once more sugar loss to molasses insignificantly affected by potassium application resources treatments and / or by the combination between potassium application resources treatments and the examined sugar beet varieties in the 1st and 2nd seasons.

Table (2): Purity % as affected by potassium application

Season	2010/20112009/2010							2011/2012						
Variety	Potassium application resources						Mean	Potassium application resources						Mean
	1*	2*	3*	4*	5*	6*		1*	2*	3*	4*	5*	6*	
Samba	95.85	95.99	95.95	96.81	96.14	95.20	95.99	95.33	95.39	96.18	96.78	96.51	96.24	96.07
Kawemira	95.32	95.75	95.67	96.15	95.86	95.96	95.78	95.32	95.65	95.62	96.26	95.93	95.77	95.76
Lola	95.79	95.58	96.39	96.83	96.42	95.90	96.15	96.06	96.60	96.48	96.98	97.19	96.49	96.63
Raspoly	95.21	95.62	95.46	96.40	95.70	95.02	95.54	95.54	95.43	95.66	95.96	96.19	95.82	95.77
Mean	95.54	95.74	95.87	96.55	96.03	95.52		95.56	95.77	95.99	96.49	96.45	96.08	
L.S.D. at 5% level for:														
Variety (A)							N.S							N.S
Potassium and potassein treatments (B)							0.52							0.61
A x B							N.S							N.S

1* Control , 2*: spraying twice , 3* 24 kg K_2O/fed , 4* : 24 kg K_2O/fed + spraying once , 5* : 24 kg K_2O/fed + spraying twice , 6* : 48 kg K_2O/fed after thinning

Table (3): Sugar loss to molasses (mg/100 g sugar) as affected by potassium application

Season	2010/2011							2011/2012						
Variety	Potassium application resources						Mean	Potassium application resources						Mean
	1*	2*	3*	4*	5*	6*		1*	2*	3*	4*	5*	6*	
Samba	1.53	1.58	1.49	1.38	1.55	1.66	1.53	1.79	1.79	1.48	1.29	1.40	1.46	1.53
Kawemira	1.79	1.71	1.64	1.62	1.76	1.69	1.70	1.63	1.67	1.68	1.58	1.72	1.64	1.65
Lola	1.74	1.75	1.48	1.31	1.48	1.60	1.56	1.63	1.49	1.46	1.35	1.24	1.32	1.42
Raspoly	1.86	1.72	1.73	1.59	1.81	1.75	1.74	1.58	1.59	1.69	1.52	1.51	1.54	1.57
Mean	1.73	1.69	1.58	1.48	1.65	1.67		1.66	1.63	1.58	1.44	1.47	1.49	
L.S.D. at 5% level for:														
Variety (A)							N.S							N.S
Potassium and potassein treatments (B)							N.S							N.S
A x B							N.S							N.S

1* Control , 2*: spraying twice , 3* 24 kg K_2O/fed , 4* : 24 kg K_2O/fed + spraying once , 5* : 24 kg K_2O/fed + spraying twice , 6* : 48 kg K_2O/fed after thinning

4- Root fresh weight:

The obtained results in Table (4) showed that root fresh weight kg/plant varied sigsnificantly among sugar beet varieties in only 2010/2011 season. Sugar beet cv. Kawemira exceeded in this trait by 2.79, 2.95 and 6.90 %, respectively than the other varieties viz. Samba, Lola and Raspoly. This result is in line with that obtained by Takada *et al.* (1988) who found that cv. Kokkai produced a higher root fresh weight/plant than the other varieties.

Root fresh weight kg/plant was significantly affected by potassium and potassein treatments in the 1st and 2nd seasons. Application of 24 kg K_2O + one spray of potassein attained the highest value of this trait in both seasons where it attained 1.309 and 1.275 kg/plant in the 1st and 2nd season, respectively. The increase in root fresh weight kg/plant could be due to the physiological role of potassium in enhancing the translocation of photosynthesis products from leaves to roots. These results coincide with those obtained by Basha (1994), El-Maghraby *et al.* (1998) and El-Shafai (2000).

As for as, the interaction effect of the studied factors , the available data demonstrated that the examined varieties significantly differed in their response to the studied potassium treatments with respect to the effect on root fresh weight g/plant, sugar beet variety Raspoly attained the highest value of root fresh weight when sprayed once with potassium compound + 24 kg.K_2O_5 / Fed. with no significant difference with application 24 kg.K_2O_5/fed. with sugar beet variety Lola.

5. Root yield:

Data presented in Table (5) cleared that sugar beet variety Kawemira over passed the other varieties in roots yield in both season , however this appearance was significantly in the 1st season only, meanwhile variety Rspoly gave the lowest roots yield. The superiority of Kawemira may be attributed to the increase in the individual root fresh weight/plant (Table 4). Differences among sugar beet varieties in root yield were reported by Obara, *et al.* (1986) and Ismagilov *et al.* (1998).

Results given in Table (5) indicated that the diferences between potassium application resources treatments were statistically in both growing seasons , application of 24 kg K_2O/ fed. + one spray by the examined potassium compound produced the highest values of root yield in

both season. The superiority of this treatment amounted by 21.40 % , 9.44 % and 3.61 % in the 1st season corresponding 16.98 % , 10.12 % and 4.39 % in the 2nd season compared with unfertilized treatmeny (control) , spraying twice by the examined potassium compound and application of 24 kg K_2O/fed. respectively. This result pointed out to the relative importance of soil application in addition to spraying treatment These results coincide with those obtained by Basha (1994), Kruger and Nowakowski (1995) and El-Maghraby *et al.* (1998) .

Concerning the interaction between varieties and potassium application resources , it could be noted that fertilizing sugar beet variety Raspoly by 24 kg K_2O/ fed. + one spray by the examined potassium compound treatment attained a significantly effect in root yield in both seasons. However, the difference between this treatment and application of 24 kg. K_2O/ fed. with sugar beet variety Lola was insignificant on root yield/fed. On the contrary found Obara *et al* (1986)that the interaction between variety and potassium fertilizer regime was significant for root yield.

Table (4): Root fresh weight kg/plant as affected by potassium application.

Season	2010/2011							2011/2012						
Variety	Potassium application resources						Mean	Potassium application resources						Mean
	1*	2*	3*	4*	5*	6*		1*	2*	3*	4*	5*	6*	
Samba	1.185	1.197	1.199	1.180	1.145	1.189	1.183	1.188	1.144	1.127	1.122	1.127	1.133	1.140
Kawemira	1.030	1.169	1.214	1.368	1.275	1.250	1.217	1.210	1.139	1.165	1.353	1.250	1.180	1.216
Lola	0.966	1.183	1.435	1.253	1.087	1.165	1.181	0.922	1.150	1.410	1.203	1.039	1.106	1.150
Raspoly	0.903	1.193	1.200	1.436	1.085	0.981	1.133	0.957	1.152	1.175	1.424	1.060	1.086	1.142
Mean	1.021	1.186	1.262	1.309	1.148	1.146		1.087	1.146	1.219	1.275	1.119	1.126	

L.S.D. at 5% level for:		
Variety (A)	0.048	N.S
Potassium and potassein treatments (B)	0.078	0.089
A x B	0.157	0.178

1* Control , 2*: spraying twice , 3* 24 kg K_2O/fed , 4* : 24 kg K_2O/fed + spraying once , 5* : 24 kg K_2O/fed + spraying twice , 6* : 48 kg K_2O/fed after thinning

Table (5): Root yield (tons/fed) as affected by potassium application.

Season	2010/2011							2011/2012						
Variety	Potassium application resources						Mean	Potassium application resources						Mean
	1*	2*	3*	4*	5*	6*		1*	2*	3*	4*	5*	6*	
Samba	29.63	29.93	29.97	29.50	28.61	29.71	29.56	29.68	28.60	28.18	28.04	28.17	28.32	28.50
Kawemira	25.75	29.21	30.34	34.18	31.86	31.25	30.43	30.25	28.47	29.12	33.81	31.24	29.50	30.40
Lola	24.13	29.58	35.86	31.31	27.16	29.13	29.53	24.78	28.74	35.24	30.06	25.98	27.66	28.74
Raspoly	22.58	29.82	30.00	35.91	27.12	24.53	28.33	21.38	28.80	29.38	35.61	26.50	27.13	28.13
Mean	25.52	29.63	31.54	32.73	28.69	28.65		26.52	28.65	30.48	31.88	27.97	28.15	

L.S.D. at 5% level for:		
Variety (A)	1.19	N.S
Potassium and potassein treatments (B)	1.96	2.24
A x B	3.92	4.49

1* Control , 2*: spraying twice , 3* 24 kg K_2O/fed , 4* : 24 kg K_2O/fed + spraying once , 5* : 24 kg K_2O/fed + spraying twice , 6* : 48 kg K_2O/fed after thinning

6- Sugar yield:

Differences among varieties in sugar yield were not significant in both seasons (Table 6). However, it could be noted that variety Kawemira tended to produce the highest sugar yield with an average of 5.163 and 4.825 tons of sugar in the 1st and 2nd season, respectively.

Data illustrated in Table (6) proved to the importance of potassium elements with respect to the storage crops such assugar beet. The collected data showed a significant response in sugar yield due to potassium application. Application of 24 kg K_2O/ fed. + one spray by the studied potassium compound produced the highest values of root yield followed by application of 24 kg K_2O/ fed. in both season . Application of 24 kg K_2O/ fed. + one spray by the studied potassium compound produced additional increase in the values of sugar yield /Fed. amounted by 28.71 % and 25.20 % over check treatment(control). This result mainly attributed with the effective and positive response for potassium treatment (24 kg K_2O/ fed. + one spray by the studied potassium compound) on root juice quality (Table 1 , 2 ,3) and root yield (Table 5). These findings are in harmony with those obtained by Basha (1994), El-Maghraby *et al.* (1998) and El-Shafai (2000).

Data obtained in Table (6) pointed out that the interaction between varieties and potassium application resource treatments was significant only in the 1st season. Regardless the significance effect of the interaction between the studied factors , it could be noted that fertilizing sugar beet variety Raspoly by 24 kg K_2O/ fed. + one spray by the studied potassium compound recorded the highest values of sugar yield ton / fed. followed by the interaction between sugar beet variety Lola and 24 kg K_2O/ fed.

7- Top yield:

The obtained results in Table (7) revealed that top yield (tons/fed) was not significantly affected by varieties in the 1st and 2nd seasons. However, variety Lola tended to be the highest in top yield with the average of 16.408 and 15.443 tons/fed in 1st and 2nd season, respectively. This result is in agreement with that obtained by Kurosawa (1994) who reported that cv. Monoace exceeded the other cultivars by 20 % for top weight.

Table (6): Sugar yield (tons/fed) as affected by potassium Application .

Season	2010/2011							2011/2012						
Variety	Potassium application resources						Mean	Potassium application resources						Mean
	1*	2*	3*	4*	5*	6*		1*	2*	3*	4*	5*	6*	
Samba	4.458	5.121	4.882	5.333	4.859	4.169	4.804	4.506	4.567	4.583	4.472	4.345	4.228	4.450
Kawemira	4.124	4.984	4.897	5.972	5.509	5.489	5.163	3.852	4.000	4.113	5.360	4.795	4.430	4.825
Lola	4.024	4.813	5.931	5.121	4.361	4.507	4.793	3.987	5.150	5.768	5.108	4.295	4.098	4.734
Raspoly	3.295	4.347	4.322	5.880	4.315	3.108	4.211	3.049	4.020	4.738	5.645	4.395	4.051	4.316
Mean	3.975	4.816	5.008	5.576	4.761	4.202		3.849	4.434	4.800	5.146	4.457	4.202	

L.S.D. at 5% level for:

Variety (A)	N.S	N.S
Potassium and potassein treatments (B)	0.515	0.664
A x B	1.031	N.S

1* Control , 2*: spraying twice , 3* 24 kg K_2O/fed , 4*: 24 kg K_2O/fed + spraying once , 5* : 24 kg K_2O/fed + spraying twice , 6* : 48 kg K_2O/fed after thinning

Table (7): Top yield (tons/fed) as affected by potassium application .

Season	2010/2011							2011/2012						
Variety	Potassium application resources						Mean	Potassium application resources						Mean
	1	1*	2*	3*	4*	5*			1*	2*	3*	4*	5*	
Samba	14.160	12.695	14.455	14.010	14.950	14.220	14.082	13.620	11.540	13.350	13.195	15.900	12.820	13.754
Kawemira	11.410	14.060	16.700	15.050	15.080	12.170	14.078	10.065	13.590	16.350	13.845	14.650	12.995	13.991
Lola	16.130	16.945	15.965	14.220	18.195	16.990	16.408	16.580	16.305	15.035	13.620	14.955	15.270	15.443
Raspoly	14.300	14.990	15.605	18.705	14.900	15.180	15.613	12.865	13.715	15.535	19.105	15.875	14.810	15.255
Mean	14.000	14.647	15.681	15.496	15.781	14.640		13.283	13.788	15.068	14.941	15.663	13.974	
L.S.D. at 5% level for:														
Variety (A)							N.S							N.S
Potassium and potassein treatments (B)							N.S							N.S
A x B							N.S							2.867

1* Control , 2*: spraying twice , 3* 24 kg K_2O/fed , 4* : 24 kg K_2O/fed + spraying once , 5* : 24 kg K_2O/fed + spraying twice , 6* : 48 kg K_2O/fed after thinning

Results given in Table (7) revealed that Neither potassium application resources treatments nor the examind varieties had a significant effect on the values of sugar beet top yield/Fed.. This observation was completely true for the two growing seasons.

Once more , regarding the interaction between varieties and potassium application resources treatments, it could be noted that the application of 24 kg K_2O + one spray of potassium compound with variety Raspoly attained the highest top yield in both seasons , meanwhile_, this significance was statistically in the 2nd season only.

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استجابة بعض أصناف بنجر السكر لطريقة إضافة البوتاسيوم

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الملخص العربي

أقيمت تجربتان حقليتان بمحطة بحوث سخا بكفر الشيخ موسمى ٢٠١٠/٢٠١١ و ٢٠١١/٢٠١٢ لدراسة تأثير مصادر إضافة التسميد البوتاسى (بدون معاملة- رشتين من مركب البوتاسيوم – ٢٤ كجم بو٢ا/ف – ٢٤ كجم بو٢ا/ف + رشة من مركب البوتاسيوم – ٢٤ كجم بو٢ا/ف + رشتين من مركب البوتاسيوم – ٤٨ كجم بو٢ا/ف) على بعض صفات الجودة والصفات التكنولوجية والمحصولية لأربعة أصناف بنجر السكر (Samba,Kawemira, Lola and Raspoly) تمت الرشة الأولى بعد الخف والرشة الثانية بعد الاولى بشهر. وتم دراسة صفات النسبة المئوية للسكروز والنسبة المئوية للنقاوة والسكر المفقود في المولاس والوزن الطازج للجذر ومحصول الجذور ومحصول السكر ومحصول العرش بالطن للفدان . وقد أوضحت النتائج أن الأصناف المختبرة اختلفت معنويا فى صفات الوزن الطازج للجذر ومحصول الجذور للفدان وقد أظهر الصنف Kawemira تفوقا فى الوزن الطازج للجذر ومحصول الجذور ، كما أثرت معاملات مصادر البوتاسيوم المضاف معنويا على وزن الجذر للنبات والنسبة المئوية للنقاوة ومحصول الجذور والسكر فى الموسمين بينما أثرت تلك المعاملات على النسبة المئوية للسكروز والاستخلاص فى الموسم الأول وقد أعطت المعاملة ٢٤ كجم بو٢ا/ف + رشة من مركب البوتاسيوم أعلى قيم لتلك الصفات وقد أظهر التفاعل بين الاصناف ومعاملات البوتاسيوم تأثيرا معنوبا على وزن الجذر للنبات ومحصول الجذور والسكر والاوراق ، كما أوضحت النتائج أيضا عدم تأثر السكر الفاقد فى المولاس بالاصناف المختبرة وكذلك بمعاملات التسميد البوتاسى.

تشير نتائج التجربة اجمالاً أن استخدام الصنف Kawemira المسمد بمعدل ٢٤ كجم بو٢ا/ف مع رشة واحدة من مركب البوتاسيوم يعطى افضل محصول وجودة من جذور بنجر السكر.