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EFFECT OF POTASSIUM FERTILIZATION ON SOME NEW FODDER BEET VARIETIES AT SOUTH SINAI

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ABSTRACT

Two field experiments were carried out at Ras-Sudr Research Station, Desert Research Center, during 2002/2003 and 2003/2004 growing seasons, to study the effect of potassium fertilization on growth characters, yield and its components and chemical compositions of three fodder beet varieties.

The results revealed that:

1- Significant differences were obtained between the three varieties under study in growth, yield, its components and chemical compositions. The polyaurea, D.L. variety attained the highest values in growth and yield characters. While, the lowest values were obtained from Gent balance variety. It could be concluded that the polyaurea, D.L. variety of fodder beet is more adapted under saline condition South Sinai.

2- Raising potassium concentration added as spraying or soil application caused gradually increasing in growth as well as forage yield characters .

3- The highest values of crude protein and carbohydrate as well as potassium contents in tops and roots were obtained by using polyaurea,D.L.variety and 72Kg.K_2O/fed.

4- N and K contents were higher in top than in root, they reached to maximum values by the interaction treatment of polyaurea,D.L.variety x 72Kg.K_2O/fed.

5- Crude protein and carbohydrate contents were higher in root than in top and reached to it highest values by the interaction treatment of polyaurea,D.L.variety x 72Kg.K_2O/fed.

INTRODUCTION

In Egypt, Production and distribution of fodder crops have become one of the most problem which leads to shortage in available quantities of forage throughout the year. So the increase of cultivated new lands, and reclaimed soils can be improved by using the agricultural practices, which reflected positively on crop productivity under unfavorable conditions. The adverse effects associated with increasing salinity on most plants are well documented (Jaiwal et al, 1997). Wade Sudr area at South Sinai governorate suffered from poor structure, lack of adequate nutritive elements, high CaCo3 content,salnty and unfavorable biological conditions,(El. Sersawy and Khalil, 1991 and Abo-Deya and Nassar, 1994). Fodder beet is one of the most promising winter forage crops for the new reclaimed soils in Egypt, which can be tolerate saline conditions. Potassium is an important element in plant nutrition, especially those having carbohydrate storage such as sugar beet and fodder beet, Also, K is a co-factor activating a number of important enzymes which are involved in many processes in plants such as photosynthesis, respiration and carbohydrate metabolism and translocation. Many investigators reported that K-fertilizers had progressive effect on fodder

or sugar beet growth and yield criteria (Geweifel and Aly, 1996, Mekki and El-Gazzar, 1999 and Hassanin, 2001).The aim of this work ,investigate the response of growth, yield and its components, chemical composition and mineral contents of three fodder beet varieties by adding potassium fertilization under saline irrigation water and highly calcareous soil content of Wadi Sudr, South Sinai Governorate.

MATERIALS AND METHODS

This work was carried out at Research station of D.R.C., Ras-Sudr, South Sinai Governorate throughout 2002/2003 and 2003/2004 growing seasons. The experiment included fifteen four treatments, which were the combination between three fodder beet varieties with five potassium treatments.

The three fodder beet varieties were :

1- Beta voroshenger, 2- Polyaurea, D.L. 3- Gent balance.

Potassium treatments were:

1- control (without treatment).
2- Foliar spray with 0.2% sulphate solution.
3- Foliar spray with 0.4% sulphate solution.
4- Soil application with 48kgK_2O/fed as potassium sulphate.
5- Soil application with 72kgK_2O/fed as potassium sulphate.

The foliar application were done at 45&65 day-old-while the sail application was divider to three doses and applied at 25&45&65 days old.

The treatment were arranged in split plot design with four replicates, where fodder beet varieties occupied the main plots and potassium treatments arranged in sub plots. The experimental plot area was 10.5 m_2 1/400 fed (3.5m length x 3.0m width).

At soil preparation it was added of 20 m3 organic manure/fed, 31 kg P2O5/fed, as calcium super phosphate (15.5% P2O5) and 70kg N/fed as ammonium nitrate (33.5%N). Three samples were taken after 100 days and after 150 days from sowing for studies the root and top characters as well as at harvest for determined the yield and some chemical contents. Physical and chemical of soil prosperities were determined as outlined by piper (1950) (Table1).Also, the irrigation water were analysis at each irrigation time (Table2). Five plants for each sample were washed and separated into roots and tops to determine the following characters.

I: Growth characters:

A: Root parameters:

Root length (cm). Root diameter (cm).
Root fresh and dry weight/plant(g.).

B: Top parameters:

Top fresh and dry weight/plant (g.).
Leaf area index (L.A.I.).

II: At harvest time:

The following data were determined at harvest time.

Root fresh yield (ton/fed.). Root dry yield (ton/fed.).

Top fresh yield (ton/fed.). Top dry yield (ton/fed.).
Total fresh yield (ton/fed.). Total dry yield (ton/fed.).

Table (1): Some physical and chaemical properties of the experimental soil at Ras Sudr Research Station at 2002/2003 and 2003/2004 A. Mechanical analysis

Soil depth (cm)	Prticle size distribution (%) Coarse sand 2-0.2mm	Fine sand 0.2-02 mm	Silt 002-0.002 mm	Clay <0.002 mm	Textural class
			2002/2003		
0-30	36.31	41.52	10.38	9.79	Sandy loam
30-60	37.25	42.73	12.35	7.67	Sand loam
			2003/2004		
0-30	4792	34.92	5.96	11.18	Sandy loam
30-60	26.32	60.01	5.13	8.04	Sand loam

B. Chemical analysis

Soil depth (cm)	pH	EC (dS/m)	Soluble cations (me/l) Ca	Mg	Na	K	Soluble anions (me/l) HCC_3	CE	SO_4	O.M. (%)
					2002/200 3					
0-30	7.25	11.78	42.41	14.14	58.39	1.54	3.44	33.09	79.96	0.18
30-60	7.35	10.35	39.26	13.09	47.71	1.34	3.88	39.8	59.15	0.12
					2003/2004					
0-30	7.89	10.25	37.85	12.30	50.80	1.34	2.99	28.79	69.58	0.16
30-60	8.03	9.00	36.06	11.39	41.51	1.17	3.38	34.63	51.46	0.10

Table (2): Average of chemical anal SiS of the applied irrigation water at eve un attn time.

Irrigation number	pH	EC (ds/m)	Soluble cations *(me/l)* Ca	Mg	Na	K	Soluble anions (me/l) HGC	CL	SO_4	TDS ppm
First	7.9	5.73	1416	10.4	3214	0.78	51.12	1.72	4.64	3667
Second	7.9	5.82	13.04	11.02	33.46	0.72	51.67	1.64	4.94	3725
Third	7.9	5.71	12.53	11.65	32.19	0.69	51.14	1.48	4.47	3654
Forth	7.9	5.86	12.62	41.45	33.81	0.64	53.61	1.65	3.28	3750
Fifth	8	5.98	13.48	41.38	34.54	0.48	54.01	1.54	4.36	3827
Sixth	8	6.04	17.2	11.44	31.25	0.56	54.12	1.72	4.68	3866
Seventh	8	6.32	17.32	14.49	31.02	0.42	57.63	1.89	3.76	4045

III: Chemical composition:

Crude protein content was determind by multiplying was estimated by micro-kjldahl (koch&mc-meekin,1924). nitrogen percentage by 6.25,while total carbohydrate content was determined according to the method of Dubois et al (1951).Potassium was determined using Flame photometer .

All obtained data were subjected to statistical analysis according to the producers for analysis of variance (ANOVA) according to Snedecor and Cochran (1990) at 5% level of significance. The combined analysis of the two seasons was done as the results exhibited similar trends.

RESULTS AND DISCUSSION

Growth characters

1- Effect of varieties :

The effect of varieties of fodder beet on growth measurements, i.e. root length, root diameter, root fresh weight and root dry weight as well as above ground parts i.e. top fresh weight, top dry weight and leaf area index (L.A.I.) after 100 and 150 days from sowing has shown in (Table 4 and 5). It is clear that polyaurea, D.L. was superior on the other two varieties beta voroshenger and gent balance, respectively,. These result are in accordance to those obtained by El-Shafei (1997) and Nowar, *et al.* (1998).

Table (4): Effect of varieties and potassium fertilization on fodder beet growth characters at 100 days old (combined analysis of the two seasons).

Traits	Root length (cm)	Root diameter (cm)	Root fresh weight (g)	Root dry weight (g)	Top fresh weight (g/plant)	Leaf area index	Top dry weight (g/plant)
v1	12.36	7.46	377.67	36.54	578.14	35.44	3.27
v2	14.48	8.03	410.7	37.62	615.2	36.96	3.58
v3	13.36	7.6	401.22	36.65	696.38	35.48	3.46
LSD 5%	0.284	0.164	8.49	0.84	13.62	0.843	0.07
K1	11.62	6.34	318.15	30.82	461.16	28.87	0.072
k2	13.54	7.84	408.82	36.94	624.36	36.56	2.93
k3	14.13	8.15	429.72	38.46	665.76	38.85	3.71
k4	14.83	8.62	447.12	39.87	691.82	41.39	3.88
K5	15.62	9.19	462.64	41.52	726.57	43.92	4.03
LSD 5%	3.09	1.84	72.64	6.18	72.35	9.14	1.94

VI: Beta voroshenger
V2: Polyaurea-D.L.,
V3: Geant balanche.
K1: Control.
K2: foliar spray with 2.0% K2504,
K3: foliar spray wit 4.0% K2804,
K4: soil application of 48 kg K2O/f
K5: soil application of 72 kg K2O/F

Table (5): Effect of varieties and potassium fertilization on fodder beet growth characters at 150 days old (combined analysis of the two seasons).

Traits	Root length (cm)	Root diameter (cm)	Root fresh weight (g)	Root dry weight (g)	Top fresh weigh (g/plant)	Leaf area index	Top dry weight (g/plant)
v1	24.75	9.67	1373.52	152.28	419.7	19.35	2.35
v2	26.89	10.94	1470.88	160.56	449.56	21.26	3.18
v3	25.64	10.24	1412.11	156.44	422.22	20.24	2.77
LSD 5%	0.77	0.31	71.24	4.86	11.54	0.618	0.086
K1	21.1	817	1155.34	135.55	352.78	17.28	1.46
k2	26.63	10.28	1437.52	160.66	441.56	20.77	2.97
k3	27.77	11.15	1540.41	166.52	470.47	21.62	3.47
k4	28.86	12.24	1620.63	169.62	493.28	22.26	3.72
K5	9.97	13.19	1696.19	174.71	515.14	23.28	3.98
LSD 5%	4.87	2.42	159.14	27.78	75.38	4.08	1.14

2- Effect of potassium.

Also, data in the same Table (4 and 5) show that potassium treatments had a significant effect on fodder beet growth characters. In general, potassium as soil application treatments surpassed on foliar application, The highest values at 100 and 150 days were obtained by using 72 kg K2O/fed . These results may be due to the importance role of potassium in the function of enzymes needed for vital processes and its beneficial effect in the translocation of carbohydrates to the storage oranges (roots). Similar results are in similar trend with those obtained by Barsoum and Zeinab (1995) who found that application of N, K and Zn treatments increased significantly growth characters.

3- Effect of the interaction between varieties and potassium levels.

The interaction effect between varieties and potassium treatments was significantly effected on growth characters,. Table (6 and 7). Root length, root diameter, root fresh weight, root dry weight, top fresh weight, top dry weight and leaf area index after (100, 150 days as well as at harvest) It is clear that polyaurea, D.L. was superior on the other two varieties and potassium as soil application treatments by using 72 Kg K2o/fed was superior on the other treatments. Similar results were obtained by Abo-Deya (1991), and El-Shafei (1997) who found that potassium fertilizer at the rate of 48kg K2o as soil application and 4.0% foliar as potassium sulphate and Beta voroshenger variety were superior on the other varieties and other potassium levels.

Table (6). The interaction effect between varieties and potassium fertilization on fodder beet growth characters at 100 days old (combined analysis of the two seasons).

Traits		Root length (cm)	Root diameter (cm)	Root fresh weight (g)	Root dry weight (g)	Top fresh weight (g/plant)	Top dry weight (g/plant)	Leaf area index
Varieties	K							
V1	Kl	10.51	6.01	305.18	30.47	444.63	28.46	2.55
	K2	12.54	7.65	389.28	36.61	608.45	35.64	3.42
	K3	13.18	7.81	411.37	37.74	644.2	37.39	3.46
	K4	13.71	8.53	430.53	39.27	663.08	40.18	3.64
	K5	14.36	8.74	447.48	39.93	686.16	43.54	3.79
V2	Kl	12.5	6.57	329.54	31.57	457.28	29.77	2.81
	K2	14.57	8.17	427.35	37.38	642.75	37.65	3.76
	K3	15.51	8.53	445.35	39.45	699.12	40.66	3.93
	K4	15.96	9.01	466.85	41.92	711.07	43.27	4.12
	K5	16.76	9.82	483.73	43.18	778.22	45.48	4.22
V3	Kl	11.56	6.43	319.22	30.67	452.64	28.45	2.77
	K2	13.56	7.71	406.11	36.62	623.52	36.41	3.54
	K3	13.77	8.12	431.49	38.27	653.58	38.54	3.73
	K4	14.82	8.32	445.2	39.25	693.62	40.66	3.69
	K5	16.75	9.64	457.38	40.28	714.71	43.82	4.07
LSD 5%		2.43	1.6	72.35	178.35	142.15	8.27	1.08

Table (7). The interaction effect between varieties and potassium fertilization on fodder beet growth characters at 150 days old (combined analysis of the two seasons).

traits		Root length (cm)	Root diameter (cm)	Root fresh weight (g)	Root dry weight (g)	Top fresh weight (g/plant)	Top dry weight (g/plant)	Leaf area index
Varieties	K							
V1	KI	20.42	7.57	1137.18	134.24	346.41	16.32	1.38
	K2	25.38	9.55	1397.22	157.64	422.14	20.19	2.3
	K3	26.61	10.49	1508.44	161.52	451.62	20.46	2.89
	K4	27.89	11.53	1562.66	164.46	481.82	21.37	3.37
	K5	28.65	12.29	1623.58	167.92	494.27	22.38	3.66
V2	KI	21.82	8.54	1173.62	137.18	369.5	17.32	1.66
	K2	27.88	11.13	1487.8	164.34	469.63	21.73	3.61
	K3	29.07	11.99	1592.92	171.64	491.28	22.84	3.94
	K4	30.13	13.17	1770.55	175.7	516.22	23.16	4.1
	K5	31.36	14.25	1156.34	181.22	538.18	24.18	4.28
V3	KI	21.08	839	1156.34	134.34	343.41	17.47	1.42
	K2	26.63	10.15	1429.18	160.18	432.62	20.55	2.99
	K3	27.62	10.97	1620.11	165.17	468.3	21.56	3.38
	K4	28.67	12.01	1616.72	169.14	483.28	22.14	3.69
	K5	29.7	13.04	1695.66	173.22	511.14	23.12	4.01
LSD 5%		4.09	3.02	178.52	18.24	111.12	3.62	1.42

B: Yield and its components.

1-Effect of differential varieties.

The effect of fodder beet varieties on yield and its components, showed in (Table 8) the results reported that root fresh and dry yields, top fresh and dry yields and total fresh and dry yields were significantly effected. It was considerable increases in polyaurea, D.L. variety over the other two varieties, i.e. beta voroshenger, and geant blanche, respectively, which caused an increases in total fresh yield by 33.96, 31.90 and 32.66 (ton/fed)respectively, as well as total dry yield by 2.43, 2.15 and 2.27 (ton/fed) with varieties, i.e. polyaurea, D.L., beta vorshenger and geant blanche, respectively. Similar results were obtained by Ahmed (1997) and Abd El-Shafy and Younis (2000) and El-Moneim *et al.* (2005).

Table (8): Effect of varieties and potassium fertilization on fodder beet yield (combined analysis over the two studied seasons).

Traits	Root fresh yield	Root dry yield	Top fresh yield	Top dry yield	Total fresh yield	Total dry yield
	(ton/F)					
v1	27.08	1.82	4.96	0.33	31.9	2.15
v2	28.81	2.08	5.15	0.35	33.96	2.43
v3	27.64	1.93	5.01	0.34	32.66	2.27
LSD 5%	0.84	0.06	0.1	0.01	0.66	0.07
kl	22.45	1.51	4.3	0.29	26.75	1.8
k2	28.25	2	5.11	0.34	33.01	2.34
k3	30.02	2.14	5.39	0.36	35.4	2.5
k4	32.49	2.28	5.62	0.37	38.11	2.65
k5	34.64	2.39	5.78	0.39	4042	2.78
LSD 5%	5.18	1.23	0.84	0.065	3.18	1.04

3: Effect of interaction between varieties and potassium fertilization.

Result indicated that the interaction between fodder beet varieties and potassium fertilizer treatments had a significant (Table 9) effect on root yield (fresh and dry) top yield (fresh and dry) and the total yield (fresh and dry). The heaviest yield and its components were obtained by the interaction between polyaurea, D.L. fodder beet variety and potassium fertilizers treatment at the of 72kg K2o/fed as soil application. These results clearly appeared that adding potassium fertilizers have a favorable effect on of soil physical, chemical and biological soil properties which are reflected on growth and yields of fodder beet. Similar results were obtained by El-Khawaga and Zeiton (1993), Abo–Deya and Zainab (1994), Mousa and Sarhan (1996) and El – Shafei (1997).

Table: (9) The interaction effect between varieties and potassium fertilization on fodder beet yield (combined analysis over the two studied seasons).

Traits		Root fresh yield	Root dry yield	Top fresh yield	Top dry yield	Total fresh yield	Total dry yield
Varieties	K	(ton/F)					
	K1	21.65	1.37	4.257	0.284	25.91	1.655
	K2	27.18	1.883	5.021	0.34	31.13	2.223
V1	K3	28.5	2.006	6.293	0.348	33 /9	2.355
	K4	31.75	2.15	5.541	0.362	37.29	2.513
	K5	33.87	2.294	5.705	0.384	39.57	2.678
	K1	23.36	1.636	4.36	0.305	27.72	1.945
	K2	29.27	2.136	5.25	0.355	34.52	2.493
V2	K3	31.62	2.297	5.538	0.369	37.16	2.673
	K4	33.72	2.433	5.742	0.384	39.46	2.806
	K5	36.63	2.49	5.894	0.403	41.52	2.894
	K1	22.33	1.521	4.296	0.29	26.61	1. 811
	K2	28.31	1.978	5.073	0.335	33.38	2.314
V3	K3	29.93	2.109	5.331	0.356	35.26	2.465
	K4	32.01	2.247	5.584	0.371	3759	2.619
	K5	34.43	2.394	5.738	0.387	40.17	2.781
LSD 5%		7.18	0.432	0.487	0.045	3.18	0.943

D: Mineral contents:

The results in (Tables 10 and 11) showed that application of potassium levels (foliar and soil application) and three fodder beet varieties effected significantly nitrogen and potassium contents in both roots and tops .The maximum values of K and N contents were obtained by adding (72 kg K2o/fed as soil application) and polyaurea, D.L. variety) for both roots and tops.

Regarding potassium content, it was noticed that potassium content of roots and tops increased K by soil and foliar application treatments. These results are in harmony with those obtained by Barsoum and Zeinab (1995) who mentioned that mineral content (N and K) were higher in tops than in roots. Potassium reached highest content in roots by adding 72K2O/fed. K2SO4 treatment. Apparently, mineral content in tops surpassed that of roots, such increase in mineral contents may be due to increasing potassium fertilizer concentrations which improving the absorption of the other minerals.

Table (10): Effect of varieties and potassium fertilization on nitrogen potassium, analysis crude protein and total carbohydrates. roots and tops of fodder

Traits		Nitrogen		Potassium (%)		Crude Protein (%)		Total carbohdrate(%)	
Varieties	K	Root	Top	Root	Top	Root	Top	Root	Top
v1		1.37	2.31	7.43	10.82	8.51	14.41	12.95	10.71
v2		1.46	2.37	7.78	10.96	8.99	14.83	13.35	11.29
v3		1.33	2.31	7.41	10.89	8.33	14.45	13.24	10.85
LSD 5%		0.04	0.07	0.15	0.33	0.17	0.44	0.26	0.33
kl		1.15	2.15	6.4	10.22	7.16	13.43	11.64	968
k2		1.43	2.37	7.77	11.06	8.85	14.81	13.54	11.2
k3		1.49	2.41	8.08	11.17	9.33	15.07	13.84	11.57
k4		1.57	2.45	8.26	11.27	9.81	15.3	14.27	11.81
k5		1.61	2.48	8.4	11.37	10.07	15.47	14.73	12.04
LSD 5%		0.185	0.214	0.918	1.08	1.28	1.21	2.51	2.18

Table (11) The interaction effect between varieties and potassium fertilization on nitrogen and potassium as well as crud protein and total carbohydrate contents in the roots and tops of fodder beet(combined analysis over the two studied seasons).

Traits		Nitrogen		Potassium (%)		Crude Protein (%)		Total carbohdrate(%)	
Varieties	K	Root	Top	Root	Top	Root	Top	Root	Top
V1	K1	1.158	2.129	6.36	10.21	7.24	13.31	11.45	9.48
	K2	1.402	2.362	7.67	10.99	8.57	14.76	13.1	11.03
	K3	1.465	2.379	7.98	11.07	9.16	14.87	13.56	11.43
	K4	1.544	2.415	8.14	11.15	9.56	15.09	13.99	11.68
	K5	1.563	2.435	8.29	11.23	9.76	15.22	14.49	11.89
V2	K1	1.161	2.184	6.44	10.23	7.25	13.65	11.7	10.11
	K2	1.536	2.4	3.01	11.17	9.59	15	13.8	11.54
	K3	1.586	2.456	8.34	11.29	9.92	15.35	14.15	11.79
	K4	1.641	2.494	8.55	11.42	10.26	15.59	14.7	12.01
	K5	1.672	2.533	8.76	11.53	10.45	15.83	14.99	12.3
V3	K1	1.118	2.142	6.41	10.22	6.99	13.33	11.78	9.46
	K2	1.343	2.35	7.63	11.02	8.39	14.68	13.72	11.02
	K3	1.425	2.396	7.91	11.14	8.9	14.98	13.82	11. 48
	K4	1.537	2.437	8.09	11.23	9.61	15.23	14.12	11. 74
	K5	1.581	2.457	8.15	11.34	10.01	15.36	14.71	11.92
LSD 5%		0.214	0.245.	0.314	0.246	0.314	0.948	2.18	2.43

REFERENCES

Abd El-shafy, A.S. and Yunis, A.A. (2000). Comparative study for three fodder beet varieties under Minufiya Governorate conditions. Proc. 9th conf. Agron., Minufiya univ., 1-2 sept. 601-608.

Abo-Deya, I.B. (1991). Productivity of some fodder beet varieties as influenced by organic and mineral fertilizer under saline conditions of South Saini. Ann. Agric., Sci., Moshtohor,29(1): 29-36.

Abo-Deya, I. B. and Zeinab .M. Nassar (1994). Increasing fodder beet productivity by using soil amendments under saline conditions. Egypt.J. Appl. Sci., 9(9): 219-228.

Ahmed. S.Th. (1997). Effect of some fertilization treatments on yield and chemical composition of fodder beet at Ras- Sudr region. M. Sc. Thesis, Fac. Agric. Ain-Shams, univ. Cairo, Egypt.

Barsoum, M.S. and Zeinab, M. Nassar. (1995). Response of fodder beet to foliar application of N,K and Zn under calcareous soil conditions. J. Agric. Sci. Monsoura, univ. 20(6): 2701-2712.

Bogdevich, T.R.; Shata Iova, R. and Matysh, E. (1993). Yield and quality of fodder beet depending on the degree of soil acidity and rates of nitrogen and potassium fertilizers. Agrokhimiya, 2: 67-72.

Dubois, M.; Gilles, K.; Hamelton, P/A. and Smith, F. (1951). A colorimetic method for the determination sugars. Natures, 168:176.

El- Khawaga, A.A.H. and Zeiton, O.A.A. (1993) Yield and chemical composition of folder beet as affected by nitrogen and potassium fertilization under newly reclaimed area. Egypt, J. Appi. Sci. 8(2): 54-62.

El- Shafei,A. M. A. (2000). Effect of nitrogen and potassium fertilization on yield and quality of sugar beet in Sohag, Egypt. J. Agric. Res., 78(2): 759-767.

El-Moneim,A.M.;Atta,M.E.andEl.Sarag,Emam.I.(2005).Physiological and morphological studies on dodder beet (beta vulgaris, L.) under North Saini conditions. 1- Effect of water stress and fertilizers on growth and development of fodder beet. The 11th conference of Agronomy, Agron. Dept., fac. Agric., Assiut, univ 15-16 Nov.:545-564.

El-Safei,M.A.M. (1997). Effect of potassium fertilization on productivity of some fodder beet varieties. M.Sc. Thesis, Fac. Agric. Moshtoher (Banha Branch) Zagazig, univ. Egypt.

El-Sersawy, M.M. (1996). Improvement of soil –Water poperties and their reflection on fodder beet production under the condition of saline calcareous soil at Wadi-Sudr, South Saini. Desert Inst. Bull., Egypt. 46(2): 241-259.

El-Sersawy,M.M.andKhalil,K.W.(1991).Physico-mdtritiol improvement of Wadi-Sudr Soil through organic manuring and phosphorus fertilization as reflected on wheat growth. Egypt. J. Appl. Sci., 6(12): 174-188.

Geweifel,H.G.M.and Aly,R.M. (1996). Effect of nitrogen and potassium fertilization treatments on growth, yield and quality of some fodder beet varieties. Ann. Agric. Sci. Moshtoher, 34(2) 441-454.

Hassanin, M.A. (2001). Effect of hill spacing and potassium fertilization and two sowing date on sugar beet yield and quality., bull. Fac. Agric., Cairo, univ. 52:27-46.

Koch, F.C.and T.L mc meekin,(1924): the chemical analysis of food and food products. J.amer,chem.,son.,46:2060 (c.f.Jacobs, M.B.,new york,D.van Nostrand comp>inc., 1938)

Mekki, B.B. and El-Gazzar, M.M. (1999). Reaponse of root yield and quality of sugar- beet (beta valgaris, L.) to irrigation with Saline water and foliar potassium fertilization. Ann. Agric. Sci Ain-Shams, univ., Cairo, 44(1): 213-225.

Mousa, M.E. and sarhan, G.M. (1996). Effect of varietals variation on growth and yield of fodder beet in Middle Egypt. Zagazig, J. Agric. Res., 23 (3): 334-344.

Nassar, Zeinab, M.; El- Houssini, A.A. and Barsoum, M.S. (2000). Effect of organic manure and GA3 on fodder beet (Beta valgars, L.) grown under saline conditions. J. Agric. Sci. Mansoura, univ., 25(8): 4865-4876.

Nowar, M.S.; Abd El-Baki, S.M.; Marie, I.F. and Zaki, A.A. (1998). Evaluation of new varieties of fodder beet (Majoral and poly productive) as a new summer forage in Egypt. ZVI international Grassland congresses Nice France, 1998 :859-861.

Ouda, Soheir,M.M.(2001). Response of sugar-beet to N and K fertilizers levels under sandy soil conditions. Zagazig, J. Agric. Res., 28 (2): 275-297.

Sndecor. G.W. and Cochran, W.G. (1982). Statistical met- hods 7th Ed. Iowa State Univ. Press, Ames-Iowa, USA., PP. 507

تأثير التسميد البوتاسى على إنتاجية بعض أصناف بنجر العلف الجديدة بجنوب سيناء

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أقيمت تجربتان بمحطة بحوث رأس سدر التابعة لمركز بحوث الصحراء خلال موسمي ٢٠٠٢/٢٠٠٣ ، ٢٠٠٣/٢٠٠٤ وذلك لدراسة تأثير كل من ثلاث أصناف من بنجر العلف و التسميد البوتاسى على صفات النمو وصفات المحصول ومكوناته والتركيب الكيماوي المحتوى المعدني.

ويمكن تلخيص أهم النتائج المتحصل عليها فيما يلي:-

١- أظهرت النتائج أن الصنف بولي يوريا كان الأفضل في صفات النمو والمحصول وكذلك المكونات الكيماوية عن الصنفين الآخرين وهما بيتا فورشنجر ، جنت بلانس. بينما لم تكن هناك أي فروق معنوية بين الصنفين الآخرين.

٢- أدت زيادة التسميد البوتاسى كإضافة أرضية بمعدل ٧٢ كجم بو٢أ/فدان إلى الحصول على أعلى القيم في صفات النمو والمحصول وكذلك المكونات الكيماوية مقارنة بالرش بمحلول كبريتات البوتاسيوم (٤% & ٦%) على التوالي.

٣- أوضحت النتائج أن الصنف بولي يوريا مع التسميد البوتاسى الأرضي ٧٢كجم بو٢أ/ف كان الأعلى قيما في صفات النمو والمحصول في كل من محصول الجذور والعرش.

كما لوحظ زيادة محتوى العرش والجذور من البروتين على التوالي وتحصل على أعلى محتوى من البروتين من المعاملة (صنف بولي يوريا مع التسميد البوتاسى الأرضي(٧٢ كجم بو٢أ/ف).

بينما تحصل على أعلى محتوى من الكربوهيدرات من معاملة التفاعل (الصنف بولي يوريا مع التسميد الورقي (رش) ٠,٦% بو٢أ/ف) كان الأعلى قيمة.

٤- أشارت النتائج إلى أن محتوى العرش من النيتروجين والبوتاسيوم كان أعلى محتوى من الجذور وقد وصل إلى أقصاه باستخدام معاملة التفاعل (صنف بولي يوريا مع التسميد البوتاسى الأرضي ٧٢ كجم بو٢أ/ف).

٥- وكذلك أشارت النتائج إلى أن محتوى كل من البروتين و الكربوهيدرات كان أعلى في الجذور وقد وصل إلى أقصاه باستخدام معاملة التفاعل (صنف بولي يوريا مع التسميد البوتاسى الأرضي ٧٢ كجم بو٢أ/ف).