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EFFECT OF SEED FORM AND NITROGEN FERTILIZER RATES ON YIELD AND QUALITY OF SOME SUGAR BEET VARIETIES IN SANDY SOIL

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ABSTRACT

Two field experiments were carried out in two successive seasons 2022/2023 and 2023/2024 in El-Salhia- Elsharkia Governorate to study the effect of seed form and nitrogen fertilizer rates on some sugar beet varieties. This study included thirty treatments which were the combination between two seeds form i.e. pelleted and incrusted seeds, three nitrogen levels (80, 100 and 120 kg N/fed) and five mono-germ sugar beet varieties imported from Poland by KHBC company i.e. Fantizia, Jamajka, Jampol , Javelin and Melodia.The obtained results showed that sugar beet varieties were significantly differed in root diameter (cm), root length(cm), root fresh weight (g),TSS%, sucrose % , purity %, root yield (ton /fed.) and sugar yield (ton /fed.). Sugar beet variety Javeln gave the highest values of root fresh weight (1105.72 and 1121.50 g), , root yield (44.23 and 45.18 ton /fed.) and sugar yield (6.83 and 5.68 ton /fed.) as compared with all other studied varieties in both seasons, respectively. Sugar beet plants received 120kg N/fed gave the highest values of root fresh weight, TSS%, sucrose % , root yield and sugar yield per fed in both seasons. Sowing sugar beet plants by seed form of pelleted seed surpassed seed form of incrusted seed in all studied character's in both seasons, except purity % in the second season. The highest root yield per Feddan was recorded with fertilized sugar beet variety Melodia ,while applied 120kgN/ fed gave the highest and significant sugar yield per fed of Javelin and Fantizia in 2022/2023 and 2023/2024 seasons, respectively. Sowing variety Javelin by seed form pelleted gave the highest sugar yield per feddan .

Generally it could be recommended that sugar beet Javelin , nitrogen fertilizer at the rate of 120kgN/Feddan and seed pelleted improvement root and sugar yield per Feddan under sandy soil at El-Salhia- Elsharkia Governorate.

Key Wards: Seed forms, fertilizer rater , yield quality, sugar beet varieties and sandy soils.

INTRODUCTION

Sugar beet (*Beta vulgaris* L) ranks as important sugar crop in Egypt and world . Sugar beet is used as a raw material for many industrial products (alcohol, cosmetics, biofuels, sugar and sugar products). It is

widely used in the production of sucrose, which accounts for about 16% of global sugar production **(Yağmur and Yaşar 2023)**. Nowadays, the first important step of the Egyptian strategic is to bridge the jab between sugar production and sugar consumption .The narrower this jab can be achieved by increasing cultivated areas with sugar crops and raising unit area production .Increasing sugar beet production from unit area conceder the major target for raising sugar beet production. Increasing of sugar beet production from unit area can be achieved through applying the optimizing agricultural practices i.e. seed quality, fertilization and cultivating high yielding varieties. .

The effect of sugar beet seeds (prepared and unprepared) on field emergence and root yield of sugar beet was studied by **Michalska-Klimczak *et al.*, (2018).** They showed that priming sugar beet seeds did not affect seed emergence in the field, but increased seed emergence rate and uniformity. The use of prepared seeds also increased the average root weight; meanwhile lower the final plant denisty and it did not increase root yield. **Podlaski *et al.*, (2019),** studied the effect of physical and chemical properties of granules on germination of granulated seeds. They showed that the crushing strength of granules and their water resistance are the main criteria for granule quality. Recently, the number of producers planting pelleted seeds has increased significantly. To prepare sugar beet seeds for pelleting, polishing, dimensional measurement and weight separation are performed. One or all of these operations are performed depending on the physical characteristics of the seed batch to be used. The best treatment was with dimensions ranging from 3.50 to 4.00 mm or 0.25-0.75 mm in thickness at row spacing of 8 and 17 cm **(Tuğrul and Kaya, 2020)**.

Nitrogen (N) is one of the most important nutrients for crop growth .Nitrogen fertilizers are used to increase soil fertility and field crop production **(Ya˘gmur *et al.*, 2022 and Varga *et al.*, 2023a)**. Optimum fertilization (sufficient fertilization as needed) is essential for the growth and development of field crops to ensure a continuous supply of nitrogen and other nutrients. It is the most important factor in achieving high yields of sugar beet, which has high nutritional requirements. Nitrogen fertilization is of great interest in sugar beet production because of its significant effect on sugar beet root yield and quality. Balanced nitrogen fertilization is vital for stable sugar beet growth and satisfactory root yield and quality **(Varga *et al.*, 2023b**). **Leilah *et al.*, (2017)**, found that increasing nitrogen levels from 69 to 92 and 115 kg N/fed significantly increased root weight, diameter, length, number of leaves, foliage fresh weight/plant and plant weight, while it significantly decreased sucrose, TSS and purity percentages. **Makhlouf and Abd EL-All (2017)**, indicated that root length and diameter, impurities contents, leaf area

index, top, root and sugar yields of sugar beet were significantly increased at rising nitrogen levels from 80 to 120 kg N/fed. Whereas adding 100 kg N/fed gave the highest significant values of sucrose and extractable sugar percentages. **Sarhan and EL-Zeny (2020),** showed that the highest values of yield components, most of root juice quality parameters and yields were produced from fertilizing beet plant with 110 kg N/fed. However, application of 90 kg N/fed gave the highest value of sugar yield and the second best value for each of yield component, root juice quality parameters, top and root yields values significant differences between them in most cases. **Varga *et al.,(* 2023a)** , noted that excess nitrogen reduces the root sucrose content and increases the percentage of sucrose impurities. **El-Geddawy, *et al*., (2023),** found that root dimensions and root yield of sugar beet increased with the increase of nitrogen rates. Also ,nitrogen fertilizer levels had a significant influence on K and Na %.

According the varietal variation **Gobarah, *et al* (2019)**, showed that the variances due to sugar beet varieties were significantly in all studied traits. Ras-Poly variety recorded the highest values of root yield ton/fed,white sugar yield ton/fed and sucrose %. **Salem (2019)**, cleared that Gloria variety significantly surpassed the other two studied varieties in root length, diameter, fresh weight and yield (ton/fed), recoverable sugar, and sugar yield (ton/fed). **Abou- Ellail *et al* (2020)**, cleared that sugar beet varieties significantly differed among them whereas, Sirona variety surpassed the other varieties and attained the highest values of root diameter, root fresh weight /plant, and root yield ton/fed. Meanwhile, the variety Bts 302 registered the highest values of sugar yield. **El-Geddawy, *et al*., (2023)**, studied the attitude of planting the four varieties i.e. Faraida, Jampol, Fantazja and Melodia on sugar beet quality. They mentioned that the varieties did not affect sucrose, purity (QZ), sodium, potassium, α-amino N and sugar recovery percentages in both seasons under their study. **El-Hawary *et al*.,(2024),** reported that sugar beet varieties significantly differed in root and sugar yield per Feddan.

The objective of this study was to determine the influence of seed form and nitrogen fertilizer on growth, yield and quality of some sugar beet varieties in El-Salhia- Elsharkia Governorate condition.

MATERIAL AND METHODS

Two field experiments were carried out in two successive seasons 2022/2023 and 2023/2024 in El-Salhia- Elsharkia Governorate ($30^0$35’00”N, $32^0$16’00”E) to study the effect of seed form and nitrogen fertilizer rates on some sugar beet varieties. This study included thirty treatments which were the combination between two seeds form i.e. pelleted and incrusted seeds, three nitrogen levels (80, 100 and 120 kg N/fed) and five mono-germ sugar beet varieties imported from Poland by KHBC company i.e. Fantizia, Jamajka,

Jampol , Javelin and Melodia. Seeds were sown at the 1st week of October in both seasons. A split plot design in three replicates was applied. The tested varieties were distributed in the main plots. Whereas the combination between nitrogen levels and seed form were randomly located in the sub plots. The experimental area was 21 m^2 (6 ridges x 0. 5 m width x 7 m length). The soil characteristics are presented in Table (1). Nitrogen fertilizer in the form of Ammonium nitrate 33.3 N % levels were added in two equal doses, the 1st one after 30 days meanwhile the 2nd one a month later, concerning, potassium fertilization was added once at 48 Kg. K_2O/fed with the 1st application of nitrogen, whereas phosphorus fertilization was applied once at land preparation at 30 kg. P_2O_5/fed. At harvest, sample of five random plants were collected from the inner ridges to determine the following traits:

1-Root diameter (cm) 2- Root length (cm).

3-Root fresh weight (kg\plant). 4- Root and sugar yields (ton\fed).

5- Sucrose percentage. It was determined using automatic sugar polarimetric.

6-Total Soluble Solids (TSS) was determined using hand refractometer.

7- Purity percentage. It was calculated according to the following formula.

Purity % = Sucrose % / TSS %

Data collected were statistically analyzed according to the technique of analysis of variance (ANOVA) according to **Snedecor and Cochran (1980).**

Table (1): Physical and chemical properties of the experimental soil in both seasons

Chemical analysis	1st season	2nd season	Soluble ions in 1.5 soil water exact	
pH	7.19	7.84	Ca+ (me^1)	3.90
E.C.	1.41	1.85	Mg+ (me^1)	3.62
Total N %	0.41	0.43	Na (me^1)	2.54
Available P_2O_5 (ppm)	13.03	12.96	K+ (me^1)	0.34
Available Zn (ppm)	13.035	5.27	CO_3 (me^1)	-
Available K_2O (ppm)	1.41	1.22	HCO^{-3} (me^1)	4.30
Mechanical analysis			Cl (me^1)	4.70
Sand %	42 %	40 %	Cu (me^1)	1.50
Silt %	33 %	37 %	EC (dSm) in 1.5 water extract	0.08
Clay %	25 %	23 %	PH (in 1:25.5 water suspension	8.1.0
Soil texture	Sandy	Sandy	$CaCO_3$ %	22.43

RESULTS AND DISCUSSION

An average of root diameter (cm), root length (cm), root fresh weight (g),TSS%, sucrose % , purity %, root yield (ton /fed.) and sugar yield (ton /fed.) of some sugar beet varieties as affected by nitrogen fertilizer rates and seed form in 2022/2023 and 2023/2024 seasons are shown in Tables 2,3and 4.

Results showed clearly that sugar beet varieties were significantly differed in root diameter (cm), root length(cm), root fresh weight (g),TSS%, sucrose % , purity %, root yield (ton /fed.) and sugar yield (ton /fed.) in both seasons, except TSS% in the second season and sucrose % in the first season it's were insignificant. The obtained results indicated that sugar beet variety Melodia gave the widest root (14.04 and 13.98 cm) and purity% (74.52 and 73.40%). sugar beet variety Jamika gave the longest root (21.80 and 21.95 cm) , while sugar beet variety Javeln gave the highest values of root fresh weight (1105.72 and 1121.50 g), , root yield (44.23 and 45.18 ton /fed.) and sugar yield (6.83 and 5.68 ton /fed.) as compared with all other studied varieties in both seasons, respectively. But it gave the highest values of TSS% (21.07%) in the first season and sucrose % (15.04%) which had insignificant difference with variety Jamika in the second season , respectively.

The superiority of sugar beet variety Javeln in root and sugar yield /feddan may be attributed to it surpassed all other studied varieties in yield components i.e. root fresh weight , TSS% and sucrose % . Therefore it had the higher yields of root and sugar than other varieties.

These results are in harmony with those recorded by **Abou- Ellail *et al* (2020) ,El-Geddawy, *et al*., (2023) and El-Hawary *et al*.,(2024)** .

Results presented in Tables 2,3 and 4 showed clearly that nitrogen fertilizer rates had a significant effect on root fresh weight (g),TSS%, sucrose % , purity %, root yield (ton /fed.) and sugar yield (ton /fed.) in both seasons as well as it was significant on root diameter(cm) in the first season , on the other hand, it had insignificant effect on root length (cm) in both seasons . The obtained results illustrated that raising nitrogen fertilizer rate from 80kgN/fed up to 120kgN/ fed caused a significant increases in all studied traits in both seasons. Fertilized sugar beet plants by 100kgN/fed gave the highest values of root diameter (13.27cm)in the second season and purity% (74.29 and 73.33%) in both seasons compared to the other rates, respectively .While , sugar beet plants received 120kg N/fed gave the highest values of root fresh weight (1117.47 and 1094.70g),TSS% (21.91 and 22.08 %),sucrose % (15.17 and 15.32%), root yield per fed (44.49 and 43.78 ton) and sugar yield per fed (6.79and 6.74 ton)as compared with all other studied nitrogen fertilizer rates in 2022/2023 and 2023/2024 seasons , respectively.

The increase in root yield per feddan due to fertilized plants by 120kgN/fed may be attributed to this rate caused the higher increase of root fresh weight which increased root yield per feddan ,also it gave the highest percentage in sucrose ,therefore ,recorded the highest values of sugar yield per

feddan which obtained from multiplying root yield per fed in sucrose%. These results are in agreement with those of **Sarhan and El-Zeny (2020)** ,**Varga *et al.*,*(* 2023b)** and **El-Geddawy, *et al.*, (2023)**.

Results presented in Tables 2,3 and 4 showed clearly that seed form significantly differed in all studied traits in both seasons except purity % in the first season . Sowing sugar beet plants by seed form of pelleted seed surpassed seed form of incrusted seed in all studied character's in both seasons, except purity % in the second season. Planting sugar beet plants by belleted seed caused 12.44 and 5.20% increase in root yield per Feddan and 19.06 and 9.78% increase in sugar yield per Feddan compared to those sown by incrusted seed in both seasons respectively. These results are in agreement with those of **(Tuğrul and Kaya, 2020).**

Table(2): Effect of nitrogen fertilizer rates and seed form on the root criteria of some sugar beet varieties in 2022/2023 and 2023/2024 seasons.

Treatments	Root diameter (cm)		Root length (cm)		Root fresh weight g/plant	
	2022/2023	2023/2024	2022/2023	2023/2024	2022/2023	2023/2024
Sugar beet varieties						
Fantizia	12.06	11.63	18.79	18.84	943.22	946.00
Jamajka	13.67	13.67	21.80	21.95	1094.39	1034.50
Jampol	11.6	11.98	18.49	18.65	1050.94	1053.39
Javeln	12.91	12.96	19.84	19.81	1105.72	1121.50
Melodia	14.04	13.98	18.22	18.36	1075.22	1089.17
LSD at 0.05	0.54	0.499	0.91	0.91	51.48	62.31
N-fertilizer levels Kg N/fed						
80 Kg N/ fed	12.72	12.61	19.18	19.25	990.27	1002.93
100 Kg N/ fed	13.13	13.27	19.62	19.95	1053.97	1049.10
120 Kg N/ fed	12.71	12.65	19.49	19.37	1117.47	1094.70
LSD at 0.05	NS	0.30	NS	NS	29.65	39.98
Seed form						
Pelleted seed	13.38	13.33	20.06	20.16	1113.64	1084.07
Incrusted seed	12.33	12.36	18.80	18.88	994.16	1013.76
LSD at 0.05	*	*	*	*	*	*

Table (3) Effect of nitrogen fertilizer rate and seeds form on juice quality of some sugar beet varieties in 2022/2023and 2023/2024 seasons

Treatments	TSS %		Sucrose %		Purity %	
	2022/23	2023/24	2022/23	2023/24	2022/23	2023/24
Sugar beet varieties						
Fantizia	20.80	20.70	15.02	15.15	71.87	73.17
Jamajka	20.20	20.82	14.97	15.37	72.19	72.95
Jampol	20.58	20.80	14.61	14.04	70.92	67.56
Javeln	21.07	20.70	15.31	15.04	72.60	72.28
Melodia	19.68	20.26	14.69	14.85	74.52	73.40
LSD at 0.05	0.74	NS	NS	0.51	2.25	2.95
N-fertilizer levels Kg N/fed						
80 Kg N/ Fed	19.54	19.39	14.47	14.26	73.98	72.91
100 Kg N/ Fed	19.96	20.51	15.11	15.09	74.29	73.33
120 Kg N/ Fed	21.91	22.08	15.17	15.32	69.00	69.38
LSD at 0.05	0.56	0.61	0.48	0.41	1.17	1.46
Seed form						
Pelleted seed	20.87	21.27	15.01	15.12	72.70	71.28
Incrusted seed	20.06	20.04	14.92	15.31	72.14	72.46
LSD at 0.05	0.46	0.50	NS	*	NS	1.11

Table (4): Effect of nitrogen fertilizer rate and seed form on root and sugar yields of some sugar beet varieties in 2022/2023and 2023/2024 seasons

Varieties	Root yield (ton/fed)		Sugar yield (ton/fed)	
	2022/2023	2023/2024	2022/2023	2023/2024
Fantizia	37.74	41.38	5.68	6.30
Jamajka	43.75	42.14	6.57	6.51
Jampol	41.98	43.37	6.19	6.14
Javeln	44.23	45.18	6.83	6.79
Melodia	42.74	43.56	6.32	6.50
LSD	1.65	1.51	0.106	0.250
N-fertilizer levels Kg N/fed				
80 Kg N/ fed	39.61	39.22	5.76	5.56
100 Kg N/ fed	42.16	41.96	6.40	6.36
120 Kg N/ fed	44.49	43.78	6.79	6.74
LSD at 0.05 level of significance	1.35	1.16	0.169	0.141
Seeds form				
Pelleted seed	44.55	42.71	6.87	6.51
Incrusted seed	39.62	40.60	5.77	5.93
LSD at 0.05	*	*	*	*

Results recorded in Tables 5,6 and 7 indicated the interaction effect between sugar beet varieties and nitrogen fertilizer rate on root diameter (cm), root length(cm), root fresh weight (g),TSS%, sucrose % , purity %, root yield (ton /fed.) and sugar yield (ton /fed.) in both seasons. The obtained results illustrated the this interaction effect was insignificant on root diameter , sucrose % and root yield / fed in the first season. As well as it was insignificant on TSS% in the second season . On the other hand, it had insignificant effect on root length in both seasons. The presented results in Table 5 indicated that fertilized sugar beet variety Melodia by 100 kg N/fed gave significant and the highest root diameter in the first season ,. While fertilized sugar beet variety Jamika by 120 kg N/fed gave significant and highest root fresh weight 1177.33 g in the first

season , but in the second season, fertilized sugar beet variety Jampol by 80 kg N/fed gave significant and highest root fresh weight 1159.67g .

The presented results in Table 6 indicated that fertilized sugar beet variety Javlev by 120 kg N/fed gave significant and highest TSS% 22.75% in the first season and sucrose % 16.22% in the second season .in this connection , fertilized sugar beet variety Melodia by 100 kg N/fed gave significant and highest purity % 76.63 and 76.56% in both seasons. The highest root yield per Feddan 46.04 ton was recorded with fertilized sugar beet variety Melodia by 120kgN/fed in the first season. While applied 120kgN/ fed gave the highest and significant sugar yield per fed of Javelin 7.83ton and Fantizia 7.05ton in 2022/2023 and 2023/2024 seasons, respectively (Table 7).

Table (5): The interaction between sugar beet varieties and nitrogen fertilizer rate on diameter , length and weight of root in 2022/2023and 2023/2024 seasons.

Varieties	Fertilizer Kg N/ fed	Root diameter (cm)		Root length (cm)		Root weight (kg/plant)	
		S1	S2	S1	S2	S1	S2
Fantizia	80	11.92	11.72	18.50	18.63	904.67	964.50
	100	12.22	12.33	19.13	19.12	950.00	1025.50
	120	12.03	10.83	18.75	18.78	975.00	1113.50
Jamajka	80	13.77	13.42	21.73	21.75	1039.50	1006.33
	100	13.48	13.93	21.42	22.67	1066.33	1049.83
	120	13.75	13.65	22.25	21.43	1177.33	1104.00
Jampol	80	11.62	11.78	18.00	18.27	995.67	1159.67
	100	12.22	12.18	19.13	19.23	1097.67	1132.33
	120	10.98	11.98	18.33	18.45	1059.50	1072.50
Javelin	80	12.62	12.57	19.58	19.43	1016.67	862.17
	100	13.35	13.38	20.12	20.20	1100.00	943.50
	120	12.77	12.92	19.83	19.78	1200.50	1032.33
Melodia	80	13.70	13.57	18.07	18.18	994.83	1022.00
	100	14.38	14.50	18.30	18.52	1055.83	1094.33
	120	14.03	13.88	18.30	18.38	1175.00	1151.17
LSD at 0.05		NS	0.71	NS	NS	70.97	91.36

S1= 1st season S2= 2nd season

Table (6): The interaction between sugar beet varieties and nitrogen fertilizer rate on TSS%, purity% and sucrose% in 2023/2022 and 2022/2023 seasons.

Varieties	Fertilizer (kg N/fed)	TSS %		Purity %		Sucrose%	
		S1	S2	S1	S1	S2	S1
Fantizia	80	19.77	19.59	73.60	76.26	14.58	14.84
	100	20.51	20.52	72.15	71.49	14.91	14.76
	120	22.12	21.99	69.87	71.75	15.58	15.75
Jamajka	80	19.52	19.65	76.63	72.64	14.98	14.78
	100	18.42	20.52	75.14	75.17	15.43	15.45
	120	22.67	22.30	64.79	71.03	14.80	15.88
Jampol	80	19.45	19.14	72.89	69.82	14.21	13.38
	100	20.59	20.82	72.92	70.44	15.02	14.72
	120	21.70	22.44	66.96	62.43	14.58	14.04
Javelin	80	19.76	19.35	72.11	71.09	14.24	13.79
	100	20.72	20.48	74.60	72.99	15.47	15.11
	120	22.75	22.28	71.10	72.74	16.21	16.22
Melodia	80	19.18	19.23	74.65	74.73	14.35	14.41
	100	19.56	20.18	76.63	76.56	15.02	15.42
	120	20.31	21.37	72.28	68.92	14.71	14.73
LSD 0.05		1.21	NS	2.94	3.77	NS	0.78

S1= 1st season S2= 2nd season

Table (7): The interaction between sugar beet varieties and nitrogen fertilizer rate on root yield per Feddan **and sugar yield per feddan in 2022/2023 and 2023/2024 season**

Varieties	Fertilizer kg N/fed	Root yield(ton/fed)		Sugar yield (ton/fed)	
		S1	S2	S1	S2
Fantizia	80	36.19	38.57	5.31	5.78
	100	38.00	41.02	5.68	6.08
	120	39.02	45.54	6.06	7.05
Jamajka	80	41.57	40.26	6.23	5.98
	100	42.66	41.99	6.49	6.51
	120	47.02	44.17	7.00	7.04
Jampol	80	39.82	41.92	5.70	5.63
	100	43.92	45.28	6.65	6.73
	120	42.19	42.90	6.21	6.06
Javelin	80	40.67	34.49	5.82	4.47
	100	43.99	37.75	6.83	5.73
	120	48.03	41.28	7.83	6.71
Melodia	80	39.79	40.99	5.75	5.92
	100	42.24	43.77	6.38	6.78
	120	46.20	46.04	6.84	6.81
LSD 0.05		NS	2.49	0.321	0.341

S1= 1st season S2= 2nd season

Results presented in Tables 8,9 and 10 showed that the interaction effect among sugar beet varieties and seed form was insignificant on root diameter , root fresh weight and root yield per fed in the first season as well as on root length ,TSS% and sucrose % in both seasons. Sowing variety Melodia by seed form pelleted gave widest root 14.20 cm in the first season, root yield per Feddan 45.80 ton and sugar yield 6.89 ton in the second season , also sowing variety Melodia with incrusted seeds gave the highest purity % 74.60 and 75.10 % in 2022/2023 and 2023/2024 seasons, respectively compared to all other this interaction . In this connection ,sowing variety Jampol by seed form pelleted gave the heaviest fresh root 1243.89g in the second season, as well as sowing variety Javelin by seed form pelleted gave the highest sugar yield per Feddan 7.42 ton in the first season compared to all other this interaction.

Table (8): The interaction between sugar beet varieties and seed form on root diameter, root length and root fresh weight in 2022/2023and 2023/2024 season.

Varieties	Seed s form	Root thickness (cm)		Root length (cm)		Root weight (kg/plant)	
		1st season	2nd season	1st season	2nd season	1st season	2nd season
Fantizia	Pelleted	12.53	12.21	19.66	19.89	982.00	1071.22
	Incrusted	11.58	11.04	17.93	17.80	904.44	997.78
Jamajka	Pelleted	13.98	13.84	22.66	22.98	1141.00	1053.67
	Incrusted	13.36	13.49	20.94	20.92	1047.78	1053.11
Jampol	Pelleted	11.89	12.40	19.29	19.38	1127.33	1243.89
	Incrusted	11.32	11.57	17.69	17.92	974.56	999.11
Javelin	Pelleted	13.74	14.00	20.29	20.10	1169.78	906.44
	Incrusted	12.08	11.91	19.40	19.51	1041.67	985.56
Melodia	Pelleted	14.76	14.20	18.42	18.47	1148.11	1145.11
	Incrusted	13.32	13.77	18.02	18.26	1002.33	1033.22
LSD at 0.05		NS	0.6	NS	NS	NS	76.67

S1= 1st season S2= 2nd season

Table (9): The interaction between sugar beet varieties and seed form on TSS% , purity% and sucrose % in 2022/2023 and 2023/2024 seasons

Varieties	Seeds form	TSS%		Purity %		Sucrose%	
		1st season	2nd season	1st season	2nd season	1st season	2nd season
Fantizia	Pelleted	21.30	21.27	71.38	71.40	15.29	15.26
	Incrusted	20.29	20.14	72.36	74.93	14.75	15.04
Jamajka	Pelleted	20.18	21.48	72.98	73.36	15.52	16.10
	Incrusted	20.22	20.16	71.40	72.54	14.42	14.64
Jampol	Pelleted	21.14	21.63	72.50	66.66	15.35	14.43
	Incrusted	20.02	19.97	69.35	68.47	13.86	13.66
Javelin	Pelleted	21.73	21.10	72.19	73.27	15.72	15.51
	Incrusted	20.42	20.30	73.02	71.28	14.89	14.57
Melodia	Pelleted	20.02	20.87	74.44	71.71	14.93	14.97
	Incrusted	19.35	19.65	74.60	75.10	14.45	14.74
LSD at 0.05		NS	NS	2.58	3.33	NS	NS

Table (10): The interaction between sugar beet varieties and seeds form on roots and sugar yields tons/fed in 2022/2023 and 2023/2024 seasons

Varieties	Seed	Root yield (ton/fed)		Sugar yield (ton/fed)	
		1st season	2nd season	1st season	2nd season
Fantizia	Pelleted	39.29	42.85	6.00	6.58
	Incrusted	36.18	39.90	5.37	6.02
Jamajka	Pelleted	45.59	42.15	7.09	6.82
	Incrusted	41.91	42.13	6.06	6.20
Jampol	Pelleted	45.19	46.48	6.97	6.76
	Incrusted	38.76	40.25	5.40	5.52
Javelin	Pelleted	46.79	36.26	7.42	5.49
	Incrusted	41.66	39.42	6.24	5.78
Melodia	Pelleted	45.88	45.80	6.88	6.89
	Incrusted	39.60	41.32	5.76	6.12
LSD at 0.05		NS	2.01	0.236	0.294

The interaction effect between nitrogen fertilizer rates and seed form as well as the interaction effect between sugar beet varieties, nitrogen fertilizer rates and seed form was not reach to the level of significance on all studied traits in both seasons.

CONCLUSION

Generally it could be recommended that sugar beet Javelin , nitrogen fertilizer at the rate of 120kgN/ Feddan and seed pelleted improvement root, sugar yield per Feddan and quality under sandy soil in El-Salhia- Elsharkia Governorate.

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تاثير نوع التقاوى ومعدلات السماد الازوتى على نمو ومحصول وجودة بعض اصناف بنجر السكر فى الاراضى الرملية

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اجريت تجربتان حقليتان فى موسمي 2022/2023 و2023/2024 فى منطقة الصالحية محافظة االشرقية لدراسة تاثير نوع تقاوى بنجرالسكر ومعدلات التسميد النيتروجينى على بعض اصناف بنجر السكر. اشتملت الدراسة على التفاعل بين نوع التقاوى (مغلفة وغير مغلفة) وثلاث مستويات من التسميد النتيروجينى (80-100-120 كجم/فدان) وخمس اصناف بنجر سكر من شركة KHBC/بولندا { وحيد الاجنة مغلف (فانتزيا-جاميكا-جامبول-جافلين) وصنف عديد الاجنة غير المغلف (ميلوديا)}.

اظهرت النتائج اختلاف الاصناف معنويا فى قطر الجذر وطول الجذر ووزن الجذر غض والنسبة المئوية للمواد الصلبة الزائبة الكلية والنسبة المئوية للسكروز والنسبة المئوية للنقاوة ومحصول الجذور ومحصول السكر/فدان. اعطى الصنف جافلين اعلى قيمة من وزن الجذر ومحصول الجذور ومحصول السكر/الفدان بالمقارنة بباقى الاصناف. اعطى التسميد بمعدل 120 كجم نيتروجين /فدان اعلى قيمة فى وزن الجذر و النسبة المئوية للمواد الصلبة الزائبة الكلية والنسبة المئوية للسكروز ومحصول الجذور ومحصول السكر/فدان فى الموسمين. تفوقت نباتات الاصناف المغلفة على الصنف الغير مغلف فى جميع الصفات خلال الموسمين فيما عدا النقاوة فى الموسم الثانى. اعطى محصول الجذور اعلى قيمة مع الصنف ميلوديا، وعند التسميد بمعدل 120 كجم/فدان نيتروجين، اعطى الصنف جافلين والصنف فانتزيا اعلى محصول سكر فى الموسمين. واعطى الصنف المغلف جافلين اعلى محصول سكر.

عموما توصى الدراسة ان الصنف جافلين ومعدل التسميد 120 كجم نيتروجين/فدان، وان الاصناف المغلفة تزيد انتاجية محصول الجذور ومحصول السكر/فدان فى الاراضى الرملية فى منطقة الشرقية.