J. Agric. Sci. Mansoura Univ., 32 (10): 8839 - 8848, 2007

EFFECT OF PLANTING DATES,FORMS AND LEVELS OF NITROGEN FERTILIZATION ON SUGAR BEET IN NORTH DELTA SOILS.

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ABSTRACT

Two Field experiments were carried out in 2004/05 and 2005/06 growing seasons at the Experimental Farm at El-Serw Agricultural Research Station (North of Delta Dommiata Governorate) to study the effect of planting datesas well asand1st November, forms of nitrogen fertilizer ammonium nitrate and urea and nitrogen fertilizer levels of of 30,45and 60kg $Nfed^{-1}$ on growth ,yield and quality of sugar beet (cv.Kawemira).The obtauned results could be summarized as follows:

1-Planting sugar beet in 1st October significantly increased root length, root diameter ,root fresh weight, root and top yields in both seasons.

2-Using Urea as a source fertlizer significantly increased root fresh weight, top fresh weight and total plant fresh weight g/plant in the first season.

3- Increasing nitrogen fertilizer levels from 30,45 to 60kg $Nfed^{-1}$ significantly increased root length,root diameter, root,top fresh weight and total plant fresh weight, top and root yields in both seasons and sugar yield in second season,while it decreased sucrose%,purity % in second seasons.

4- Interaction between date of planting and nitrogen fertilizer significant for root fresh weight in first season, total plant fresh weight in both seasons.,sucrose % in first season.

5- Interaction between date of planting and nitrogen fertilizer level had significant effect on root fresh weight, total plant fresh weight in first season and insignificant effect on rest traits.

6- Interaction between date of planting,source of nitrogen and levels of nitrogen fertilizer had significant effect on total plant fresh weight in first season and insignificant effect on rest traits of sugar beet .

Keywords: planting dates, nitrogen fertilizer levels,nitrogen fertilizer forms, sugar beet

INTRODUCTION

sugar beet is one of the important sugar crops in the world and also in Egypt. It provides about 40% of most the world sugar production. There are many factors affecting yield and quality of sugar beet such as planting dates and fertilization especially nitrogen fertilizer levels and forms. Planting date is an important factor affecting sugar beet production. In Egypt Sugar beet is sown during the periods extends from August to November.

Abd El Aal (2001) found that delaying sugar beet planting from mid Sept. to mid October deceased root yield($tonfed^{-1}$)by about 7.22%.Abou Salama and Elsayed (2000) compared sowing dates on 1st and 15th October as well as 1st November and found that mean root yield was 31.64 ,18.73 and 11.51 ton^{-1}fed from the three dates respectively.

The obtained results by Shalaby *et al* (2003) found significant effect of planting date on sugar beet yield and quality The planting in September gave the best root diameter, root length and weight and also technological

charactersistics T.S.S%,sucrose% ,purity %. The third date of sowing i.e Nov. gave the highest values in top weight/ plant and top yield.

Enan (2004) found that sowing sugar beet early on the 15th September gave the highest values of root length , root diameter ,root fresh weight per plant ,top, fresh weight/ plant, top yield ton per fedan ,root yield per feddan, sugar yield ton fed^{-1}.The early sowing date 15 September had a significant and positive effect on the values of T.S.S% also sucrose percentage over than 15th October. Sowing sugar beet on 15th September recorded the highest of purity percentage (81.13%)compared with 15th October (78.06%)

Nemeat–Alla (1997) Reported that ammonium nitrate as a nitrogen source surpassed other nitrogen fertilizer sources or urea and produced the highest values of root length and diameter and root and top fresh weight, root and top sugar yields as well as T.S.S%.

Nemeat–Alla (2001) in Egypt found that nitrogen fertilizer sources showed that no signifocant effect on total soluble solids , sucrose and juice purity percentages.

Mousa (2004) found that nitrogen fertilizer sources significantly affect root length , diameter tota fresh weight , root and top fresh weight root and sugar yields.He added that maximum values of root length and diameter ,weights of top, root and ugar yields produced from using nitrogen fertilizer in the form of ammonium nitrate 33.5% compared with other nitrogen sources. Also, the highest sugar yield produced from using nitrogen fertilizer in the form of ammonium nitrate 33.5%or urea 46.5% N.

Increasing nitrogen fertlizer level was associated with the highest values of diameter , length and fresh weight of roots and foliage fresh weight as well as root, top and sugar yields fed.$^{-1}$, while the highest values of T.S.S %, sucrose, purity percentage were obtained with addition of the lowest nitrogen fertilizer (60kg N fed.$^{-1}$). Ibrahim *et al* (2005)used Urea 46.5% N at levels of 60 ,90 ,120kg Nfed^{-1} and found that increasing nitrogen fertilizer increased root length, root diameter, root weight and leaves fresh weight ,root and sugar yields percentages of total soluble solids (T.S.S %) , sucrose and purity percentages in both seasons. He added tha the highest values of sucrose and purity percentages were produced from using ammonium nitrate (33.5%N) copmared with other sources in both seasons. Highest percentages of sucrose were produced from using nitrogen fertilizer in the form of ammonium nitrate (33.5%N) or urea 46.5%N without significant differences between them.

Fadel (2002) used ammonium nitrate 33.5% at rates of 60,80,100 kgNfed.$^{-1}$and found that increasing nitrogen fertilizer from 60to 80kg Nfed.$^{-1}$ resulted the highest values of top, root and sugar yield per feddan,maximum values of root length and diameter ,weight of top, root and sugar yields. He added tha the highest values of sucrose and purity percentages were produced from using ammonium nitrate(33.5%N)copmared with other sources in both seasons. Highest percentages of sucrose were produced from using nitrogen fertilizer in the form of ammonium nitrate(33.5%N)or urea 46.5%N without significant differences between them using nitrogen fetilizer in the form of (Urea 46.5%N) at levels of 60,90 and 120 kgNfed.$^{-1}$.They found

also that nitrogen levels affected significantly root length , diameter and freh weight / plant root and sugar yields, while sucrose and purity percentages were not affected by N levels.

Assey *et al* (2005) used nitrogen fertilizer in the form of ammonium sulphate (20.5 %) in levels of zero,50 and 100kg Nfed.$^{-1}$ and found that increasing nitrogen fertilizer increased root and sugar yield fed $^{-1}$.He also found that gross sugar yield fed.$^{-1}$ was positive and highly significant correlated with each of root yield fed.$^{-1}$,sucrose % ,purity % ,top yield fed $^{-1}$ and root diameter

Ismail (2002) found that nitrogen lvels of 60,90,120 affected significantly root length ,diameter and root fresh weight /plant root and sugar yields, while sucrose and purity percentages did not affected by the used N levels

The present investigation was carried out to study the effect of planting dates, forms and levels of nitrogen fertilizer on sugar beet yield in North of Delta Dommiata Governorate**.**

MATERIALS AND METHODS

Two field experiments were carried out at El-Serw Agricultural Research Station during 2004/05 and 2005/06 seasons to study the effect of planting date and nitrogen fertilizer forms and levels as well as their interactions on growth , yield and quality of sugar beet cv.Kawmera.A split split plot design with four replications was adopted. The main plots were occupied by the plantig date i.e the first date in 1st October (D_1)and the second date in 1st November D_2). The sub plots were assigned by the forms of nitrogen fertilizer F_1 Urea (46.5 %)And F_2 nitrate ammonium: (33.5 %).The sub sub plots contained three levels of nitrogen fertilizers (30, 45 , 60kg Nfed.$^{-1}$).The sub-sub plots contained 5 ridges of 60cm width and 3.5m long with area 1/400 fed. The experimental soil was clay soil as shown in Table 1.

Table 1: Mechanical and chemical analysis of the experimental site.

Mechanical and chemical analysis	Seasons	
	2004/05	2005/06
Clay%	62.1	63.1
Silt%	21.7	21.6
Sand%	13.3	13.0
Organic matter%	1.44	1.36
Available N(p.p.m)	52.0	50.3
Available P(p.p.m)	16.3	15.2
Available K (p.p.m)	237.7	226.7
CaCo3%	1.9	2.5
pH	8.0	8.1

The preceeding crop was maize (*Zea maize*, L.) in both seasons.During soil preparation calcium super phosphate (15.5 % P_2O_5) was added at a rate of 100Kg fed.$^{-1}$ After 30 days from sowing, plants were thinned to one plant/hill.

Nitrogen fertilizer was applied at the rates and forms which previousley mentioned in two equal portions after thinning and before the

third irrigation.Potassium fertilizer was added at the rate of 100kg in the form of potassium sulphate in two equal portions with nitrogen fertilizer application.Normal cultural practices of growing sugar beet was conducted according to Ministiry of Agriculture recommendation Harvest was practised when the outer Leaves of plants turned yellow approximately 200 days after sowing. At harvest, a sample of ten guarded plants was taken at random to determine the following characters.

A:Yield components:

1- 1- Root length (cm)
2- Root diameter (cm)
3- Top fresh weight /plant (g)
4- Root fresh weight/plant (g)
5- Total plant fresh weight / plant (g)

B- Quality:

1- T.S.S % Total soluble solids was determined by hand refractometer .
2- Sucrose % was determined as described by **Le Docte (1927).**
3-Purity percentage was calculated according to the following equation:
Purity % = Sucrose% X 100/T.S.S%

C-yield:

1-Root yield (ton fed.$^{-1}$) was estimated on the hole plot basis.
2-Top yield ((ton fed.$^{-1}$)
3-Sugar yield (ton fed.$^{-1}$) was calculated according to the following equation:
Sugar yield = Root yield X Sucrose %

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

RESULTS AND DISCUSSION

1- Effect of planting date:

Data in Table 2 show that there are significant differences between the mean values of root length in secand seasons,root diameter in both seasons, root fresh weight in both seasons due to planting date while there is highly significant effect on root fresh weight due to planting sugar beet seeds in 1st October comparing with planting sugar beet seeds in 1st November. Seadh (2004) found that planting date had significant effect on root fresh weight in 1st October. There is insignificant effect of planting seeds of sugar beet in 1st October or 1st November on top fresh weight in both seasons. The results were (239.94g/plant and and 236.39 g/plant in the first season of 2004/2005.

Concerning the effect of dates of planting on total plant fresh weight there is highly significant effect on total plant fresh weight in second season of 2005/06 comparing with sowing sugar beet seeds in 1st November, while there is no significant differences of date on total plant fresh weight in first season of 2004/ 05. The incresae in total plant fresh weight in second season may be due to the increse in foliage and root fresh weight which is

the result of suitable environmental conditions during this period such as temperature, relative humidity , day length and light intensity which allow to rapid growth and formation good canopy able to make greatest photosynthesis, consequently increasing dry matter accumulation as well as root and top fresh weight /plant (Seadh, 2004).These results are in accordance to Abdou (2001) and Kandil (2002b).

Table 2: Effect of planting date,nitrogen fertilizer forms and levels on growth of sugar beet seasons of 2004/05 and 2005/06.

Treatment	Root length		Root diameter		Top fresh weight		Root fresh weight		Total plant fresh weight	
	2004/05	2005/06	2004/05	2005/06	2004/05	2005/06			2004/05	2005/06
Date of planting										
D_1:1st October	23.63	23.29	11.23	11.86	239.94	172.44	675.89	681.87	854.33	915.83
D_2:1st November	23.37	22.23	11.02	11.71	236.39	172.77	673.88	671.88	842.16	874.28
F.test	N. S	*	*	*	N . S	N . S	N . S	**	**	N . S
Nitrogen fertilizer forms										
Urea 46.5%	23.59	23.65	11.24	11.81	242.89	169.94	637.50	678.55	848.50	919.17
Nitrate Amm. 33.5%	23.46	22.87	11.01	11.76	233.44	172.67	676.32	675.22	847.99	880.39
F.test	N .S	N . S	N .S	N. S	**	N .S	**	N . S	N. S	*
Nitrogen fertilizer levels										
30kg Nfed.$^{-1}$	23.36	23.63	10.70	11.56	229.33	165.46	612.67	658.33	823.79	842.00
45kg Nfed.$^{-1}$	23.45	23.03	11.24	11.68	241.25	172.76	671.57	682.33	855.11	912.75
60kgNfed.$^{-1}$	23.69	23.13	11.43	12.10	243.92	175.83	686.50	690.00	841.98	930.42
F.test	*	*	*	*	**	**	**	**	**	**
LSD0.05	0.22	0.25	-	0.24	9.13	9.75	4.04	0.87	13.24	42.25

Table 3: shows insignificant effect of date of sugar beet planting on T.S.S% in both seasons. Planting in 1st November resulted the highest values of T.S.S% of 20.63,20.65g in both seasons.Kandil *et al*(2002c) Seadh (2004) came to similar results. Table 3 shows also insignificant effect of dates of planting on sucrose percentage in both seasons whil ,the higest values of sucrose percentage (19.83%)was found in second season when planting sugar beet seeds in 1st November. There is insignificant effect of date planting seeds on purity percentage in first seasons and significant effect in second season. The values of purity percentage in the second season (88.24%) were obtained with planting in 1st November , whereas, purity percentage is 84.77% in the first season. These results are not in accordance with shalaby *et al* (2003), Enan (2004), who found that sowing sugar beet early recorded the highest of purity percentage (81.13%) compared with 15th October (78.06%). Concerning the effect of date planting seeds of sugar beet on top yield, there is insignificant effect in both seasons. Table 4 shows the higest values (6.306 ton fad^{-1}) was obtained with planting in 1st November for second season only Similar results were obtained by Abd El Aal (2001) , Shalaby *et al* (2003), Enan (2004)

Data revealed also that there are asignificant effect of date of planting sugar beet seeds on root yield (ton/ fedd.) on both season The highest values of 21.39 ton fed.$^{-1}$ with the planting in 1st October in second season.These results are confirmed with Shalaby *et al* (2003) and Enan

(2004), who found that sowing sugar beet early gave the highest values of root length , root diameter ,root fresh weight per plant , root yield per feddan

Asignificant effect of data planting on sugar yield was found in the second season, while there is no significant effect of date planting on sugar yield in the first season (tab.4). The highest sugar yield was 3.46 ton fed.$^{-1}$in the 1st season when the date of planting was 1st October. Enan(2004) found that sowing sugar beet early gave the highest values of root fresh weight per plant ,top, fresh weight/ plant, top yield (ton per fedaan) ,root yield per feddan.

2-Effect of forms of nitrogen fertilizes:

Data presented in Table 2 reveal that there is insignificant effect of fertilizer forms on root length, root diameter,sugar yield in both seasons, while there is highly significant effect of using Urea 46.5% on sugar beet fresh weight. The increase was 6 09% more than that related withammonium nitrate. Top fresh weight increased by using Urea fertilizer 46.5% by 2.6% in the first season compared with ammonium nitrate 33.5%, while it has insignificant effect on root fresh weight in second season. Total plant fresh weight increased by using urea fertilizer in first season by 4.40%, while it has insignificant effect in second season.

Table 3: Effect of planting dates, forms and levels of fertilizer of nitrogen fertilizer on quality of sugar beet in seasons of 2004/05 and 2005/06

Treatments	T.S.S%		Sucrose%		Purity%	
	2004/05	2005/06	2004/05	2005/06	2004/05	2005/06
	Date of planting					
D_1 :1st October	21.17	22.63	19.17	19.16	88.81	84.77
D_2:1st November	20.63	21.87	18.92	19.38	91.56	88.237
F.test	N S	N S	N S	N S	N S	**
	N- fertilizer forms					
Urea 46.5%	21.17	22.44	18.93	19.17	89.59	85.544
Nitrate Amm.33.5%	20.648	22.05	19.17	19.36	90.77	87.46
F.test	N S	N S	N S	N S	N.S	N .S
	N-fertilizer level					
30kg Nfed.$^{-1}$	20.42	22.13	19.12	19.66	89.60	85.55
45kg Nfed.$^{-1}$	20.89	22.18	19.17	19.38	90.80	87.50
60kg Nfed.$^{-1}$	21.42	22.43	18.84	18.77	85.67	85.41
F.tes	N S	N S	N S	**	*	N S
LSD0.05	-	-	-	0.99	4.5	-

Results in Table 3 indicate that there is insignificant effect of nitrogen fertilizer Forms on T.S.S%,Sucrose percentage, purity percentage, top yield in both seasons, while there is significant effect on root fresh weight. Applying Urea 46.5% increased root fresh weight by 2.53% and 5.42% in both seasons. Nemeat Alla (2001) found that nitrogen fertilizer sources had no

signifocant effect on total soluble solids, sucrose and juice purity percentages. Seadh (2004) reported that highest values of sucrose and purity percentages were produced from using ammonium nitrate (33.5 %N) compared with other sources in both seasons Highest percentages of sucrose were produced from using nitrogen fertilizer in the form of ammonium nitrate (33.5%N) or urea 46.5%N without significant differences between them.

Table 4: Effect of planting dates, forms and levels of fertilizer of nitrogen on top, root and sugar yield of sugar beet

Treatments	Root yield(t fed.$^{-1}$)		Top yield(t fed.$^{-1}$)		Sugar yield(t fed.$^{-1}$)	
	2005/06	2004/05	2005/06	2004/05	2005/06	2004/05
	Date of planting					
D_1:1st October	20.48	21.39	6.06	6.20	3.49	3.45
D_2:1st November	20.04	20.94	6.08	6.31	3.50	3.36
F.test	*	*	*	*	N . S	**
	Nitrogen fertilizer forms					
Urea 46.5%	20.51	21.39	6.13	6.31	3.49	3.39
NitrateAmmonium 33.5%	20.91	20.94	5.96	6.19	3.50	3.42
F.test	N S	*	N S	N S	N.S	N S
	Nitrogen fertilizer level					
30kg Nfed.	19.75	22.13	5.75	6.13	3.46	3.28
45kg Nfed.	20.12	22.18	5.95	6.13	3.48	3.47
60kg Nfed.	21.42	22.43	6.43	6.49	3.55	3.47
F.tes	*	**	*	*	N S	*
LSD0.05	1.57	1.30	0.91	0.47	-	0.34

3-Effect of nitrogen fertilizer levels:

Data in Table 2 and 3 revealed that there is significant effect of nitrogen ferilizer levels of 30,45,60 kg Nfed.$^{-1}$ on root length,root diameter, in both seasons. These results are in agreement with_Hassan and Sohair (2000), Zeinab *et al* (2000), El-Geddawy *et al* (2001), Seadh (2004). While, there is higly significant effect of fertilizer levels on root fresh weight .Using 60 kgNfed.$^{-1}$,which increased root fresh weight by 12.4% as compared with using 30kg Nfed.$^{-1}$in fitst season.

Applying 60kg Nfed.$^{-1}$ significantly increased total plant fresh weight by 11.64% and 2.19 % comparing with 30kg Nfed.$^{-1}$in both seasons.This result could be due to the important role of nitrogen as an essential structural element in building up plant organic substances, El-Shafai (2000) stated that the increase in root fresh weight may be due to the increase of metabolites synthesized by plants .

Sucrose percentage significantly decreased by nitrogen fertilizer levels in second season. Using 60kg Nfed.$^{-1}$ decreased sucrose percentage by 4 56% compared by using 30kg Nfed.$^{-1}$ in second season, while there is no insignificant effect in first season .Kandil *et al* (2002c), Ramadan *et al* (2003) came to same results.

Increasing nitrogen fertilizer to 60kg Nfed.$^{-1}$ significantly decreased purity percentage by 7.36 compared by 30kg Nfed.$^{-1}$in first season but it did not reach of significant effect in second season.

Top yield significantly increased by nitrogen fertilizer in both seasons . 60kg Nfed.$^{-1}$ increased top yield by 11.88 and 5.99% compared by 30kg Nfed.$^{-1}$in both seasons. Root yield significantly incresed by applying N fertilizer in both seasons 60kg Nfed.$^{-1}$ significantly increased root yield by 5.84% and 2.81% compared by 30kg Nfed.$^{-1}$in both seasons.

Sugar yield significantly increased by increasing nitrogen fertilizer to 60kg Nfed.$^{-1}$in second seasod (Table 4) 60kg Nfed.$^{-1}$ significantly increased sugar yield by 5.48% compared by 30kg Nfed.$^{-1}$in second season, while it did not reach significant level in first season.These results are agreement with Ismail (2002), Assey *et al* (2005).

4- Effect of the interactions:

4-1. The interaction of DxF:

The interaction between the date of planting of sugar beet and forms of nitrogen fertilizer was found to be insignificant for root length, root diameter top fresh weight , purity % root and sugar yield in both seasons. However, significant differences were obtained on total plant fresh weight in both seasons. Data in Table 3 shows insignificant effect of interaction between date of planting and nitrogen fetilizelr forms on , root fersh weight ,sucrose % in the 1st season, while it did not reach to significant level in 2nd season The highest values of root fresh weight for the planting in November and ammonium nitrate fertilizer,also total fresh weight of plant has the maximum values 922.1,854.7 g/plant with the interaction of D_1F1 in 1st and 2nd seasons. Also root yield increased when the planting date is 1st October and fertilized with Urea 46.5 %.Althouh the increases were not reach to significant level in both seasons.

4-2.The interaction of DxN:

Mean values of root length, root diameter, top fresh weight, T.S.S%, Sucrose% purity %, sucose% root yield and sugar yield had no statistically defrence in the two seasons.The maximum of total plant freh weight 932.5 g/ plant with the interactin between the planting in 1st November and fertilized with 60 kgNfed.$^{-1}$in 1st season. Also the highest root yield (21 5 ton fed.$^{-1}$) was found when the planting date was 1st November and fertilized with 60kg Nfed.$^{-1}$in 2nd season, although it is not reach the significant level

4-3. The interaction of FxN:

The interaction between forms and nitrogen fertilizer levels on sugar beet exerted a significant effect on root fresh weight and total plant fresh weight in the 1st season and failed the reach to significant levels in the second season. The maximum values of root and total fresh weight were reached by plant fertilized with 60kg Nfed.$^{-1}$ and ammonium nitrate 33.5% N, while the rest means of root length, diameter,top fresh weight, T.S.S%, Sucrose %, Purity% ,root and sugar yield were not significantly affected by the interaction between sources and levels of nitrogen fertilizers

4-4.The interaction of DxFxN:

The interaction of DxFxN on the all studied traits were not statstically significant in the two seasons except total plant freh weight in the 1st season .The maximum total plant fresh weigh was 945.0 g/ plant with the $D_2F_2N_3$ and the minimum nitrate was 907.7 g/plant with the interaction D1F1N1 in the 1st season

REFERENCES

Abdel-Aal,A.M.(2001)Abundance of weed control programs in sugar beet fields relation to planting dates Ph.D.Thesis,Fac.of Agric.,Ain Shams Univ.

Abdou , U. M. A. (2001).Agronomic studies on sugar beet (Beta vulgaris,L.) M.Sc Thesis, Fac. of Agric.Mansoura Univ.

Abo-Salama,A.A. and S.I.Elsayed (2000).Studies on some sugar beet cultivars Under Middle Egypt conditions1- Response to planti aharvesting Dares. J.of Agric.Sci.31 (1):137-159.

Assey, A.A.H.G.M.Geweifel,M.A.Gomaa and Gehan,A.Amin (2005).Yield analysis Of some sugar beet cultivars under bio andmineral nitrogen of some sugar beet cultivars under bio andmineral nitrogen fertilization Conditions. Zagazig .J.Agric.Rea., 32 (4):1071 -1086.

El-Shafai, 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)754-767.

El-Shafai, A.M.A.(2000).Effect of nitrogen and potassium fertilization on yield and quality of sugar beet in Sohag.Egypt.J.Agric.Res.,78 (8)759-767.

Enan. S.A.M. (2004).Effect of transplanting and soil application of Boron and Zinc Yield and quality of sugar beet .Ph. D Thesis, Fac. of Agric., Al-Azhar Univ.

Fadel,A.M.E.(2002) Effect of sowing dates and nitrogen fertilization levels on some Sugar beet varities in Middle Egypt. M.Sc. Thesis,Fac.of Agric., Al-Azhar Univ.

Hassanin, M.A and Sohair,ED.Elayan (2000).Effectof phosphorus and nitrogen rates and time of nitrogen application on yield and juice quality sugar beet.J. Agric.Sci. Mansoura Univ.,25(12):7389 -7398.

Ismail A.M.A. (2002). Evulation of some sugar beet varieties under different nitrogen levels in El-Fyium . Egypt J. Appl. Sci.,17 (2)

Kandil,A.A. ;M.A .Badawi ;S.A.El-Moursy and U.M.Abdou (2002b) Effect of planting dates,nitrogen levels and biofertilization treatments on 1- Growth attributes of sugar beet (Beta vulgaris,L J.Agric Mansoura Univ., 27(11):7257-7266.

Kandil,A.A. ;M.A .Badawi ;S.A.El-Moursy and U.M.Abdou (2002c).Effec planting dates,nitrogen levels and biofertilization treatments on 2- yield,yield and quality of sugar beet (beta vulgaris,L.). J.Agric.Sci Mansoura univ., 27(11):7257- 7266.

Le-Docte,A.E.(1927) commerical determination of sugar in the beet root using the sachr le Docte Process, Inst.Sugar J.,24:488-492(C.F.Sugar beet Nutrition , April 1927 Applied Sci. Publishers Ltd London Druycott).

Mousa,A.E.(2004) Increasing sugar beet productivity by using different nitrogen fertilizer sources and its time of addition.M.Sc. Thesis,Fac of Agric.Mansoura,Univeristy.

Nemeat-Alla, E.A.E.(1997).Agronomic studies on sugar beet. Ph.D. Thesis, in Agron., Fac. of Agric., Kafr El-Sheikh, Tanta Univeristy.

Nemeat-Alla, E.A.E.(2001).Yield and quality of sugar beet as affected by sources ,levels and application time of nitrogen fertilizer J.Agric Sci.Mansoura Univ.,26(3)450-462.

Ramadan,B.S.H., H.R. Hassan and Fatma, A.A. Abdou (2003).Effect of mineral and biofertilizers on photosynthetic pigments, root quality, yield components and anatomical structure of sugar beet (Beta vulgaris, L.) grown under reclaimed soils. J Agric. Sci Mansoura Univ., 28 (7) : 5139- 5160.

Shalaby,M.T;M.B.Doma;F.A.A.Abd El-Latifand Sohair (2003).Effect of nitrogen application on yield ,chemical consistuents and juice quality characteristics of sugar beet. J.Agric.Mansoura Univ., 28 (3):1853-1864.

Snedecor, G.W. and W.G Cochran.(1981) Statistical Methods Oxford and I.B.H Publish-Ing Ed. 670 PP.

تـأثير مواعيـد الزراعـة ومصـادر ومعدلات التسـميد الازوتـي علـى محصـول وجـودة بنجر السكرفي اراضي شمال الدلتا

الحسيني المرسى السيد خفاجي*، السيد حسن حسن سليم وإبراهيم محمد محمد البنا***

***معهد بحوث الأراضي والمياه والبيئة–مركز البحوث الزراعية–محطة البحوث الزراعية بالسرو**

****معهد بحوث المحاصيل السكرية- مركز البحوث الزراعية-محطة البحوث الزراعية بالسرو.**

اقيمت تجربتان حقليتان بمزرعة محطة البحوث الزراعية بالسرو – محافظة دمياط لدراسة تأثير مواعيد (الاول من اكتوبر,الاول من نوفمبر)ومصادر التسميد النتروجيني(يوريا46.5%و نترات الامونيوم 33.5%)ومعدل التسميد الازوتي (30و45و60كجم ازوت للفدان)على محصول بنجر السكر الصنف كاوميرا وكان التصميم المستخدم القطع المنشقة مرتان وكانت النتائج المتحصل عليهاكما يلي:

1-أدت الزراعة في الاول من شهر اكتوبر إلى زيادة معنويةفي طول الجذر في الموسم الاول وفي قطر الجذر ووزن الجذر غض ومحصول الجذور ومحصول العرش في الموسمين في حين كانت نسبةالمواد الصلبة الذائبة والنقاوة غير معنوية في الموسمين.

2- أدى استخدام التسميد الازوتي (السماد يوريا 46.5% ازوت) الى زيادة وزن الجذر غض ووزن النبات كامل غض في الموسم الاول بينما كانت بقية الصفات تحت الدراسة غير معنويةمقارنة(بنترات الامونيوم 33.5% ازوت).

3- أدى زيادة التسميد الازوتي من 30 إلى45 و60 كجم نيتروجين للفدان إلى زيادة معنويةفي طول الجذر وقطر الجذر ن ووزن الجذر غض والعرش والوزن الكلي للنبات غض ومحصول الجذور والعرش في كلا الموسمين ومحصول السكر في الموسم الثاني .

4- كان التفاعل بين ميعاد الزراعة ومصدر السماد الازوتي معنوي لصفة وزن الجزر غض في الموسم الاول ووزن النبات كامل غض في الموسمين.كذلك كان التفاعل بين ميعاد الزراعة ومستوى التسميد النتروجيني و التفاعل بين مصدر السماد النتروجيني ومستوى السمادالازوتي معنويا لصفة وزن النبات كامل غض في الموسم الاول وغير معنوي لبقية الصفات تحت الدراسة.

من هذة الدراسة يمكن التوصية بزراعة محصول بنجر السكر مبكرا في اول اكتوبر والتسميد بالسماد الازوتي يوريا46.5%بمعدل 60 وحدة ازوت للفدان للحصول على أعلىعائد من محصول الجذور والسكر في منطقة شمال الدلتا المتاثره بالاملاح جنوب بحيرة المنزلة.