FACULTY OF AGRICULTURE

Minia J. of Agric. Res. & Develop.
Vol. (28) No. 3 pp 469 -494, 2008

ASSESSMENT OF THE OPTIMUM SEEDING RATE AND NITROGEN LEVEL FOR FIVE SUGARCANE VARIETIES

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Received 8 June 2008 Accepted 10 July 2008

ABSTRACT

Three field experiments were performed at El-Mattana Agricultural Research Station during 2005/2006 and 2006/2007 seasons (in two plant and first ratoon crops) to investigate the effect of different levels of nitrogen (180, 210 and 240 kg N/fed) and seeding rates (37800 and 50400 buds/fed) as well as their combinations on yield and yield components of five sugarcane varieties (G.T.54-9, Ph.8013, G.99-103, G.98-28 and G.84-47). Split-split plot design with four replications was used. Sugarcane varieties were arranged in the main plots, while seeding rates were randomly distributed in the sub-plots and the sub-sub plots were assigned for nitrogen fertilization levels.

Results indicated that the promising sugarcane variety was G.99-103 which surpassed the other varieties in millable cane height, diameter as well as cane and sugar yields.

Planting sugarcane using 50400 buds/fed resulted in higher values of number of millable cane/m2, millable cane height, cane and sugar yields/fed, while using 37800 buds/fed gave the thicker millable canes.

Increasing nitrogen fertilization level up to 240 kg N/fed increased number of millable cane/m2, millable height, diameter

and cane and sugar yields. Applying 180 kg N/fed gave the highest brix % and sucrose % in the first plant cane crop.

Under conditions of the present investigation, planting the promising sugarcane variety G.99-103 by 50400 buds/fed and fertilized with 240 kg N/fed can be recommended to obtain the highest cane and sugar yields/fed.

INTRODUCTION

It is known that sugarcane varieties and their nutritional status are the corner stones for maximizing the recoverable sugar obtained from the unit area. Many investigators pointed out the important role of varieties in respect to their influence on yield and quality (El-Geddawy *et al* 2003; Taha *et al* 2003; Azzazy, *et al.* 2005; Nassar *et. al.* 2005, Bekheet 2006 and El-Shafai and Ismail 2006) who also showed the variability among cane varieties in yield and quality traits.

Optimum seeding rate is a vital point to obtain high yield of sugar cane. Many investigators reported that cane yield increases when seeding rate increases to an optimal level (Shafshak *et al.* 2001; Ahmed 2003; El-Sogheir and Mohamed 2003; El-Geddawy *et al.* 2005 and Galal. 2008).

Nitrogen plays an important role in enhancing the meristemic activity which contributes to the production of the high yield and the best quality. Many investigations indicated to an evidence of nitrogen role in improving all sugar cane characters (Altaf and Rehman 1998; Mahender, *et al.* 2002; El-Geddaw *et al* 2004; Tiwari *et al.* 2004; El-Sayed *et al.* 2005; Ali 2007 and El- Amir 2008).

The aim of the present work was to determine the optimum seeding rate and nitrogen level for five sugar cane varieties under Upper Egypt conditions.

MATERALS AND METHODS

Three field experiments were performed at El-Mattana Agricultural Research Station during 2005/2006 and 2006/2007

seasons (in two plant and first ratoon crops) to investigate the effect of different levels of nitrogen (180, 210 and 240 kg N/fed) and seeding rates (37800 and 50400 buds/fed) as well as their combinations on yield and yield components of five sugarcane varieties (G.T.54-9, Ph.8013, G.99-103, G.98-28 and G.84-47). Nitrogen was added in the form of Urea (46.5 % N) in two equal doses. In the two plant cane crops, the first dose was applied after 60 days from planting, In the first ratoon, the first N-dose was added after 30 days after harvesting of the plant cane. The second one was added 30 days later, for both plant and first ratoon crops. Planting dates were during the 1st week of March in the two seasons, while harvesting was done in the 2nd week of March in both seasons.

A split-split plot design with three replications was used. Sugarcane varieties were arranged in the main plots, while seeding rates were randomly distributed in the sub-plots and the sub-sub plots were assigned for nitrogen fertilization levels. Plot area was 42 m^2 including six ridges of one meter apart and seven meters in length. All plots received normal recommended agronomic practices for the growing sugarcane crop.

Recorded data:

At harvest, the following characters were determined:

1. Number of millable cane/m^2.

   A sample of twenty millable canes from each treatment was randomly taken to determine the following characters:

2. Millable cane height (cm) was measured from soil surface up to the top visible dewlap.
3. Millable cane diameter (cm) was measured at the middle part of stalks.
4. Brix percentage in cane juice was determined by using "Brix Hydrometer" according to the method described by the chemical control Lab of the Sugar and Integrated Industries Company (Anonymous, 1981).
5. Sucrose percentage in cane juice was determined using "Saccharemeter" according to A.O.A.C. (1995).

6. Sugar recovery percentage was calculated according to the equation described by Yadave and Sharma (1980):
   Sugar recovery % = [sucrose % - 0.4(brix % - sucrose %)] x 0.73.
7. Cane yield (ton/fed) was calculated based on plot area.
8. Sugar yield (ton/fed) was estimated as follows:
   Sugar yield (ton/fed) = cane yield (ton/fed) x sugar recovery %.

The collected data were statistically analyzed according to Snedecor and Cochran (1981).

RESULTS AND DISCUSSION

Number of millable canes/m^2:

Data in Table 1 reveal that tested sugarcane varieties significantly differed in number of millable canes/m^2 in the plant and first ratoon crops. The highest number of millable canes/m^2 was produced by G.84-47 variety in the two plant and first ratoon crops. The superiority of this variety in this trait may be genetically controlled and is reflected in its capacity in producing more tillers and the increase in their survival till harvest compared to the other varieties. These finding are in agreement with those obtained by Taha *et al* (2003) and Nassar *et. al.* (2005) who found significant differences among the tested varieties in number of millable canes/m^2.

Table 1 also shows that increasing seeding rate was accompanied by a significant increase in the number of millable canes/m^2. The highest number of millable canes/m^2 was obtained by planting 50400 buds/fed. This result could be attributed to the increase in the number of buds per unit area which reflected in increasing the number of shoots, consequently increased millable cane number. Similar results were obtained by Ahmed (2003) and El-Sogheir and Mohamed (2003) who found that planting sugarcane using 50400 buds /fed had

Table 1 : Number of millable cane /m^2 of the five sugarcane varieties as affected by seeding rates and nitrogen levels

Varieties	Seeding rates buds/fed.	1st plant crop				2nd plant crop				1st Ratoon crop			
		Nitrogen levels Kg N / fed											
		180	210	240	Mean	180	210	240	Mean	180	210	240	Mean
G.T. 54-9	37800	11.95	13.00	14.18	13.04	12.67	13.67	14.67	13.67	12.00	14.33	15.67	14.00
	50400	12.67	14.33	16.28	14.43	13.67	16.33	14.00	14.67	12.67	15.33	19.67	15.89
Mean		**12.31**	**13.67**	**15.23**	**13.74**	**13.17**	**15.00**	**14.33**	**14.17**	**12.33**	**14.83**	**17.67**	**14.94**
PH 8013	37800	12.00	13.24	14.33	13.19	12.33	13.33	14.00	13.22	11.67	13.33	15.33	13.44
	50400	12.24	13.90	15.00	13.71	13.67	13.00	15.33	14.00	13.00	14.00	15.67	14.22
Mean		**12.12**	**13.57**	**14.67**	**13.45**	**13.00**	**13.17**	**14.67**	**13.61**	**12.33**	**13.67**	**15.50**	**13.83**
G. 99-103	37800	11.00	13.00	13.43	12.48	11.67	12.00	12.67	12.11	11.00	13.67	14.67	13.11
	50400	12.84	13.05	14.05	13.31	12.33	12.33	13.67	12.78	13.67	14.33	16.00	14.67
Mean		**11.92**	**13.02**	**13.74**	**12.89**	**12.00**	**12.17**	**13.17**	**12.44**	**12.33**	**14.00**	**15.33**	**13.89**
G. 98-28	37800	12.57	13.76	14.33	13.55	12.33	12.67	13.33	12.78	14.00	15.00	16.67	15.22
	50400	12.67	14.05	15.00	13.90	12.33	12.33	14.00	12.89	15.33	16.33	17.67	16.44
Mean		**12.62**	**13.90**	**14.67**	**13.73**	**12.33**	**12.50**	**13.67**	**12.83**	**14.67**	**15.67**	**17.17**	**15.83**
G. 84-47	37800	12.76	14.00	15.24	14.00	13.00	14.00	14.33	13.78	14.00	15.67	17.00	15.56
	50400	13.43	14.67	15.83	14.64	13.33	15.00	17.33	15.22	14.67	16.33	18.67	16.56
Mean		**13.09**	**14.33**	**15.54**	**14.32**	**13.17**	**14.50**	**15.83**	**14.50**	**14.33**	**16.00**	**17.83**	**16.06**
Mean of Seeding	37800	12.06	13.40	14.30	13.25	12.40	13.13	13.80	13.11	12.53	14.40	15.87	14.27
	50400	12.77	14.00	15.23	14.00	13.07	13.80	14.87	13.91	13.87	15.27	17.53	15.56
Mean		**12.41**	**13.70**	**14.77**		**12.73**	**13.47**	**14.33**		**13.20**	**14.83**	**16.70**	

LSD at 0.05 level	1st plant crop	2nd plant crop	1st Ratoon crop
Sugar cane varieties (V)	0.47	0.82	1.48
Seeding rates (S)	S	S	S
Nitrogen levels (N)	0.68	1.09	188
V X S	0.48	0.92	1.51
V X N	1.52	2.43	3.62
N X S	0.96	1.54	2.29
V X S X N	2.15	3.43	5.12

significantly higher values of millable cane number/m^2 compared with 37800 buds/fed.

Increasing nitrogen fertilization levels from 180 up to 240 kg N/fed increased significantly the number of millable canes/m^2 compared to the other N levels in the 1st plant crop. This result may be due to the role of nitrogen in enhancing the merismic activity of plant tissues which contributes to the production of new organs as well as to the role of nitrogen in stimulating the metabolic activity in plants contributing to the increase in metabolites which are used in building up plant organs such as tillers. However, in 2nd plant cane and first ratoon crops, the difference between 180 and 210 as well as between 210 and 240 kg N/fed in number of millable cane was insignificant. These results are agreement with those reported by El-Sayed *et al.* (2005) and Ali (2007) who reported that increasing N levels increased the number of millable cane/m^2.

It could be noted that the number of millable canes/m^2 responded significantly to all possible interactions in the two plant and first ratoon crops. In the first plant and ratoon crops, planting sugar cane variety G.T. 54-9 by 50400 buds/fed with the application of 240 kg N/fed produced the highest number of millable canes/m^2 (16.28 and 19.67), respectively, while the highest numbers of millable canes/m^2 (17.33) in second plant crop was obtained from G. 84-47 variety when planted with 50400 buds/fed and fertilized with 240 kg N/fed.

Millable cane height:

Data in Table 2 show that the examined sugarcane varieties differed significantly in millable cane height in both seasons. Sugarcane variety G.99-103 showed the superiority over the other varieties in this trait. These results may be due to genetic differences among cane varieties in the number of internodes and/or in the length of the internode itself. These results are in line with those obtained

Table 2: Millable cane height (cm) of the five sugarcane varieties as affected by seeding rates and nitrogen levels.

Varieties	Seeding rates buds/fed.	1st plant crop				2nd plant crop				1st Ratoon crop			
		Nitrogen levels Kg N / fed											
		180	210	240	Mean	180	210	240	Mean	180	210	240	Mean
G.T. 54-9	37800	307.33	316.67	325.67	316.56	272.50	292.50	298.50	287.83	292.67	302.33	308.00	301.00
	50400	317.67	319.00	327.67	321.44	297.50	298.00	298.50	298.00	299.33	306.00	312.67	306.00
Mean			**312.50**	**317.83**	**326.67**	**319.00**	**285.00**	**295.25**	**298.50**	**292.92**	**296.00**	**304.17**	**310.33**
PH 8013	37800	293.00	295.33	313.67	300.67	264.50	276.33	295.00	278.61	283.33	298.67	302.67	294.89
	50400	299.33	304.00	320.67	308.00	298.50	304.50	313.50	305.50	291.33	300.00	317.33	302.89
Mean			**296.17**	**299.67**	**317.17**	**304.33**	**281.50**	**290.42**	**304.25**	**292.06**	**287.33**	**299.33**	**310.00**
G. 99-103	37800	336.33	340.67	350.00	342.33	295.00	315.33	325.00	311.78	311.67	317.00	339.67	322.78
	50400	339.33	341.33	354.33	345.00	320.00	323.67	326.50	323.39	314.00	331.67	350.00	331.89
Mean			**337.83**	**341.00**	**352.17**	**343.67**	**307.50**	**319.50**	**325.75**	**317.58**	**312.83**	**324.33**	**344.83**
G. 98-28	37800	284.33	295.67	306.67	295.56	264.00	291.67	318.67	291.44	307.67	317.33	325.67	316.89
	50400	287.33	301.33	318.00	302.22	302.33	306.38	321.00	309.90	312.00	319.33	336.33	322.56
Mean			**285.83**	**298.50**	**312.33**	**298.89**	**283.17**	**299.02**	**319.83**	**300.67**	**309.83**	**318.33**	**331.00**
G. 84-47	37800	288.00	294.00	304.00	295.33	282.67	290.65	305.00	292.77	291.33	301.33	324.00	305.56
	50400	293.33	302.00	316.33	303.89	308.33	309.67	338.38	318.79	304.33	307.33	320.00	310.56
Mean			**290.67**	**298.00**	**310.17**	**299.61**	**295.50**	**300.16**	**321.69**	**305.78**	**297.83**	**304.33**	**322.00**
Mean of Seeding	37800	301.80	308.47	320.00	310.09	275.73	293.30	308.43	292.49	297.33	307.33	320.00	308.22
	50400	307.40	313.53	327.40	316.11	305.33	308.44	319.58	311.12	304.20	312.87	327.27	314.78
Mean			304.60	311.00	323.70		290.53	300.87	314.00		300.77	310.10	323.63

LSD at 0.05 level			
Sugar cane varieties (V)	5.33	13.32	4.04
Seeding rates (S)	S	S	S
Nitrogen levels (N)	5.72	11.68	6.13
V X S	7.91	NS	4.44
V X N	12.80	26.12	13.70
N X S	8.10	16.52	8.67
V X S X N	18.10	36.94	19.38

by Azzazy, *et al.* (2005) and Galal. (2008) who found significant differences among the tested varieties in millable cane height.

Results revealed that the height of millable cane increased consistently and significantly as seeding rates was increased up to 50400 buds/fed in the two plant and first ratoon crops. Height of millable cane increased remarkably by 1.94, 5.69 and 2.13 % with increasing seeding rate from 37800 to 50400 buds/fed, in 1st, 2nd plant cane and 1st ratoon crop, respectively. These results may be due to that the competition among plants that grown under the high dense population, for the environmental factors such as solar radiation, which led to more elongation than those grown under less dense plantation. Similar results were reported by El-Sogheir and Mohamed (2003) and El-Geddawy *et al.* (2005) who found that sowing rate of 50400 buds/fed recorded the highest values for millable cane length.

Increasing nitrogen fertilization level from 180 up to 240 kg N/fed increased significantly millable cane height in the two plant and first ratoon crops. This result may be due to the role of nitrogen in the division of stalk cells. These results are in harmony with those obtained by Ahmed (2003 and Nassar *et al.* (2005) who found that millable cane height increased by increasing nitrogen levels up to 240 kg/fed.

Millable cane height was significantly affected by the interaction among the three studied factors in there crops except the interaction between varieties and seeding rates in the 2nd plant crop. In the 1st plant and ratoon crops, planting sugarcane variety G.99-103 by 50400 buds/fed with the application of 240 kg N/fed produced the tallest millable canes ,while the tallest millable stalks in the 2nd plant cane crop was obtained from G. 84-47 variety when it was fertilized with 240 kg N /fed.

Millable cane diameter:

Results in Table 3 pointed out a significant difference among the studied varieties in the two plant canes and 1st ratoon crops. Sugarcane G.99-103 variety had the thickest stalks followed by Ph.8013 variety in the 1st, 2nd plant cane and the 1st ratoon crops. This result may be due to that G.99-103 variety had more growth vigour. Similar results were reported by Azzazy, *et al.* (2005) and El-Shafai and Ismail (2006), who concluded that Ph.8013 cv. showed significant superiority in stalk diameter over the other tested varieties.

Results given in the same Table revealed that planting sugarcane at 37800 buds/fed attained markedly thicker millable canes in the two plant and first ratoon cane crops compared with 50400 buds/fed. This result may be attributed to the great inter-plant competition for light and nutrients as well as mutual shading in case of higher seeding rate. Similar results were obtained by El-Sogheir and Mohamed (2003) and Galal (2008), who found that thicker millable cane were produced significantly in case of planting sugarcane with 50400 buds/fed.

Millable cane diameter was significantly affected by nitrogen fertilization levels in the 1st ratoon crop only. The highest value of millable cane diameter was obtained from plants received 210 kg N/fed compared with 180 and 240 Kg N /fed in the 1st ratoon crop. This result may be due to the role of nitrogen in enhancing growth of sugarcane plants and subsequently stalk diameter was increased. These results are in agreement with those obtained by Ahmed (2003), Nassar *et. al.* (2005), who reported that increasing nitrogen rate up to 240 kg N/fed increased the millable cane diameter.

Millable cane diameter was significantly affected by the interaction among the three studied factors in the 1st and 2nd seasons except the combination between cane varieties and nitrogen levels in the 2nd plant cane crop. Overall, the thickest millable canes were

Table 3: Millable cane diameter (cm) of the five sugarcane varieties as affected by seeding rates and nitrogen levels

Varieties	Seeding rates buds/fed.	1st plant crop				2nd plant crop				1st Ratoon crop			
		Nitrogen levels Kg N / fed											
		180	210	240	Mean	180	210	240	Mean	180	210	240	Mean
G.T. 54-9	37800	2.83	3.03	2.93	2.93	2.85	2.79	2.76	2.80	2.52	2.75	2.53	2.60
	50400	2.95	2.95	2.85	2.92	2.76	2.77	2.66	2.73	2.48	2.66	2.51	2.55
Mean		**2.89**	**2.99**	**2.89**	**2.93**	**2.81**	**2.78**	**2.71**	**2.77**	**2.50**	**2.71**	**2.52**	**2.58**
PH 8013	37800	3.09	3.12	3.11	3.11	2.91	2.98	2.93	2.94	2.69	2.81	2.79	2.76
	50400	3.09	3.10	3.07	3.08	2.91	2.91	2.91	2.91	2.64	2.73	2.71	2.69
Mean		**3.09**	**3.11**	**3.09**	**3.10**	**2.91**	**2.95**	**2.92**	**2.93**	**2.67**	**2.77**	**2.75**	**2.73**
G. 99-103	37800	3.07	3.30	3.18	3.19	3.08	3.11	3.09	3.09	2.73	3.36	2.93	3.01
	50400	3.16	3.18	3.18	3.17	3.01	3.13	3.04	3.06	2.60	2.89	2.79	2.76
Mean		**3.12**	**3.24**	**3.18**	**3.18**	**3.05**	**3.12**	**3.06**	**3.08**	**2.66**	**3.13**	**2.86**	**2.88**
G. 98-28	37800	2.94	3.00	3.02	2.99	2.89	3.02	2.94	2.95	2.67	2.91	2.60	2.73
	50400	2.88	2.86	2.82	2.85	2.81	2.94	2.75	2.83	2.72	2.75	2.58	2.68
Mean		**2.91**	**2.93**	**2.92**	**2.92**	**2.85**	**2.98**	**2.85**	**2.89**	**2.69**	**2.83**	**2.59**	**2.70**
G. 84-47	37800	2.64	2.67	2.72	2.68	2.50	2.54	2.46	2.50	2.41	2.55	2.49	2.48
	50400	2.71	2.61	2.68	2.67	2.46	2.47	2.42	2.45	2.36	2.51	2.46	2.44
Mean		**2.68**	**2.64**	**2.70**	**2.67**	**2.48**	**2.51**	**2.44**	**2.48**	**2.39**	**2.53**	**2.47**	**2.46**
Mean of Seeding	37800	2.92	3.02	2.99	2.98	2.85	2.89	2.84	2.86	2.60	2.87	2.67	2.72
	50400	2.96	2.94	2.92	2.94	2.79	2.84	2.76	2.80	2.56	2.71	2.61	2.63
Mean		**2.94**	**2.98**	**2.96**	-	**2.82**	**2.87**	**2.80**	-	**2.58**	**2.79**	**2.64**	-

LSD at 0.05 level			
Sugar cane varieties (V)	0.04	0.04	0.04
Seeding rates (S)	S	S	S
Nitrogen levels (N)	N.S	N.S	0.07
V X S	0.04	0.08	0.04
V X N	0.09	N.S	0.15
N X S	0.05	0.08	0.09
V X S X N	0.12	0.19	0.21

obtained from G.99-103 variety when it was planted by 37800 buds/fed and fertilized with 210 kg N/fed.

Brix percentage:

Data in Table 4 exhibited statistical differences in brix % among the studied cane varieties. It was found that G.T.54-9 variety gave the best values followed by G.84-47 in the 1st plant and ratoon crops, while Ph.8013 variety gave the highest brix % followed by G.84-47 in the 2nd plant crop. These results may be due to the differences in growth reaction to the surrounding environmental conditions prevailing during the formation of soluble solids in plants. Differences between sugarcane varieties were reported by Ahmed (2003), who found statistical differences in Brix % among the studied cane varieties.

Seeding rates had no significant effect on Brix % in three cane crops. This is in harmony with that obtained by Shafshak *et al.* (2001), who indicated that Brix % was not affected by the examined planting densities.

Brix % was significantly affected by nitrogen fertilization levels in the 1st plant cane crop only. The highest values of brix % was obtained from plants fertilized with 180 kg N/fed. This results may be due to the fact that nitrogen increases the vegetative growth of plants and consequently resulted in more metabolites required for the formation of soluble solids. These results are in agreement with those of Altaf-ur-Rehman and Said-Rehman (1998), who noticed that Brix % decreased with increasing N rates

.Data in Table 4 show that brix % was significantly affected by the interaction between varieties and nitrogen levels in the two plant cane crops as well as the interaction between N levels and seeding rates, in the 1st plant cane crop. Moreover, the effect of sugarcane varieties x seeding rates and N levels on brix % was significant in the in two seasons. The highest value of brix % was recorded by sugarcane G.T.54-9 variety, Ph 8013 and G. 84-47 planted by 50400

Table 4 : Brix percentage of the five sugarcane varieties as affected by seeding rates and nitrogen levels

Varieties	Seeding rates buds/fed.	1st plant crop				2nd plant crop				1st Ratoon crop			
		Nitrogen levels Kg N / fed											
		180	210	240	Mean	180	210	240	Mean	180	210	240	Mean
G.T. 54-9	37800	21.38	21.78	22.03	**21.73**	21.12	20.46	21.61	**21.06**	21.09	20.97	21.04	**21.04**
	50400	22.25	21.37	22.02	**21.88**	21.01	21.55	21.26	**21.27**	21.94	21.69	21.43	**21.68**
	Mean	**21.82**	**21.58**	**22.03**	**21.81**	**21.07**	**21.00**	**21.43**	**21.17**	**21.52**	**21.33**	**21.23**	**21.36**
PH 8013	37800	21.09	21.12	20.76	**20.99**	21.41	22.01	21.65	**21.69**	20.01	21.00	21.73	**20.91**
	50400	20.91	20.89	20.98	**20.93**	20.93	22.08	21.72	**21.58**	21.05	20.11	21.09	**20.75**
	Mean	**21.00**	**21.01**	**20.87**	**20.96**	**21.17**	**22.05**	**21.69**	**21.63**	**20.53**	**20.55**	**21.41**	**20.83**
G. 99-103	37800	21.35	21.25	20.92	**21.17**	20.72	20.87	21.56	**21.05**	20.39	20.42	20.18	**20.33**
	50400	21.76	21.48	20.91	**21.38**	21.64	21.78	21.84	**21.75**	20.20	20.30	19.88	**20.13**
	Mean	**21.56**	**21.36**	**20.91**	**21.28**	**21.18**	**21.32**	**21.70**	**21.40**	**20.29**	**20.36**	**20.03**	**20.23**
G. 98-28	37800	21.94	20.85	21.10	**21.30**	21.21	21.28	20.65	**21.05**	20.60	20.52	20.58	**20.57**
	50400	21.52	20.93	20.95	**21.13**	20.75	21.02	20.93	**20.90**	21.27	20.75	20.55	**20.85**
	Mean	**21.73**	**20.89**	**21.03**	**21.22**	**20.98**	**21.15**	**20.79**	**20.97**	**20.93**	**20.63**	**20.56**	**20.71**
G. 84-47	37800	21.64	21.49	21.51	**21.55**	20.87	22.06	21.54	**21.49**	20.30	21.29	21.07	**20.89**
	50400	22.05	21.26	22.03	**21.78**	21.76	20.91	21.84	**21.51**	21.55	21.34	22.03	**21.64**
	Mean	**21.85**	**21.37**	**21.77**	**21.66**	**21.32**	**21.48**	**21.69**	**21.50**	**20.93**	**21.31**	**21.55**	**21.26**
Mean of Seeding	37800	21.48	21.30	21.26	**21.35**	21.07	21.34	21.40	**21.27**	20.48	20.84	20.92	**20.75**
	50400	21.70	21.18	21.38	**21.42**	21.22	21.47	21.52	**21.40**	21.20	20.84	20.99	**21.01**
	Mean	**21.59**	**21.24**	**21.32**		**21.14**	**21.40**	**21.46**		**20.84**	**20.84**	**20.96**	
LSD at 0.05 level													
Sugar cane varieties (V)					0.64				0.53				0.74
Seeding rates (S)					N.S				N.S				N.S
Nitrogen levels (N)					0.33				N.S				N.S
V X S					N.S				N.S				N.S
V X N					0.74				0.81				N.S
N X S					0.47				N.S				N.S
V X S X N					1.05				1.15				1.68

buds/fed with the application of 180, 210 and 240 kg N/fed, in the 1st, 2nd plant canes and 1st ratoon crop, respectively.

Sucrose percentage

Results in Table 5 show that evaluated sugarcane varieties significantly differed in sucrose% in the three cane crops. In the 1st plant crop cane, G.84-47 variety produced the highest sucrose %. Sugarcane Ph.8013 variety produced the highest values of this trait in the other two crops. The variation among varieties in sucrose % could be attributed to their gene make-up. Differences among cane varieties in sucrose % were also reported by Azzazy, *et al.* (2005) and Bekheet (2006) who found that sugarcane varieties differed significantly in sucrose %.

Data in the same table revealed that sucrose % was significantly affected by seeding rate in the 1st ratoon crop only. The highest value of this trait was obtained from sugarcane planted at rate of 50400 buds/fed. These results are in agreement with those obtained by El-Sogheir and Mohamed (2003), who indicated that higher values of sucrose percentage were significantly obtained by planting sugarcane at 50400 buds/fed.

Sucrose percentage was significantly affected by N fertilization levels in the 1st season only. Increasing the applied N dose from 180 to 210 and to 240 kg N/fed decreased sucrose % by 0.52 and 0.61 %. This reduction may be due to that increasing N level increased water retention in the plants and hence decreased sucrose determined as a percentage. Also, it may be due to that nitrogen increases top growth and consequently decreases the rate of stored sucrose and/or synthesis in plant tissue. In addition, the positive correlation between nitrogen and moisture content in plant tissue, i.e. the increase in nitrogen increases the moisture content of such tissue, which leads to a dilution of sucrose in plant tissue and consequently reduces its content. Similar results were obtained by Tiwari *et al.* (2004) and Nassar *et al.* (2005),

Table 5: Sucrose percentage of the five sugarcane varieties as affected by seeding rates and nitrogen levels

Varieties	Seeding rates buds/fed.	1st plant crop				2nd plant crop				1st Ratoon crop			
		Nitrogen levels Kg N / fed											
		180	210	240	Mean	180	210	240	Mean	180	210	240	Mean
G.T. 54-9	37800	17.99	17.15	18.11	17.75	18.35	16.65	18.43	17.81	18.35	17.16	18.09	17.87
	50400	18.91	17.12	16.92	17.65	16.37	16.97	17.58	16.97	18.67	17.20	18.34	18.07
Mean		18.45	17.14	17.52	17.70	17.36	16.81	18.00	17.39	18.51	17.18	18.22	17.97
PH 8013	37800	16.61	17.29	17.21	17.04	17.54	18.54	17.75	17.94	17.04	17.12	17.61	17.26
	50400	17.38	17.12	17.37	17.29	17.73	18.11	16.84	17.56	18.88	19.88	17.90	18.89
Mean		17.00	17.21	17.29	17.16	17.64	18.32	17.29	17.75	17.96	18.50	17.76	18.07
G. 99-103	37800	16.94	17.12	16.11	16.72	17.44	17.51	18.20	17.72	16.61	17.08	17.26	16.98
	50400	17.19	17.63	16.70	17.17	17.82	17.03	18.11	17.66	17.35	16.71	16.98	17.02
Mean		17.07	17.38	16.41	16.95	17.63	17.27	18.16	17.69	16.98	16.89	17.12	17.00
G. 98-28	37800	17.38	16.56	16.81	16.92	16.83	16.47	16.64	16.65	17.03	17.05	16.66	16.91
	50400	18.44	16.92	16.80	17.39	16.23	16.94	16.40	16.52	17.28	17.29	17.15	17.24
Mean		17.91	16.74	16.81	17.15	16.53	16.71	16.52	16.59	17.16	17.17	16.91	17.08
G. 84-47	37800	19.08	18.09	17.63	18.27	16.44	18.74	17.86	17.68	17.82	17.75	17.63	17.73
	50400	18.09	17.82	18.26	18.06	17.07	15.58	17.88	16.84	18.25	18.13	17.39	17.92
Mean		18.59	17.95	17.95	18.16	16.76	17.16	17.87	17.26	18.03	17.94	17.51	17.83
Mean of Seeding	37800	17.60	17.24	17.17	17.34	17.32	17.58	17.78	17.56	17.37	17.23	17.45	17.35
	50400	18.00	17.32	17.21	17.51	17.05	16.93	17.36	17.11	18.09	17.84	17.55	17.83
Mean		17.80	17.28	17.19	-	17.18	17.25	17.57	-	17.73	17.54	17.50	-
LSD at 0.05 level													
Sugar cane varieties (V)					0.89				1.13				0.74
Seeding rates (S)					N.S				N.S				S
Nitrogen levels (N)					0.44				N.S				N.S
V X S					N.S				N.S				0.87
V X N					0.98				N.S				N.S
N X S					0.62				0.81				N.S
V X S X N					1.38				1.80				N.S

who revealed that increasing nitrogen level up to 240 kg N/fed decreased sucrose percentages.

Sucrose % was significantly affected by the interaction between varieties and seeding rates in the 1st ratoon crop, as well as by the interaction between varieties and nitrogen levels on in the 1st plant crop, while the effect of interaction between nitrogen levels and seeding rates was significant in the 1st and 2nd plant cane crops. The 2nd order interaction was significant in the two plant cane crops. Overall, the maximum sucrose % was obtained from G.84-47 variety when fertilized with 180 and 210 kg N/fed and planted by 37800 buds/fed in 1st and 2nd plant cane crops, respectively.

Sugar recovery percentage:

Data in Table 6 show significant difference in sugar recovery% among the examined sugarcane varieties, with the superiority of G.84-47, in the 1st plant crop, as well as Ph.8013, in the 2nd plant and 1st ratoon crops, respectively. Also, G.99-103 variety gave the highest sugar recovery%, in the 2nd plant cane crop. These results are probably due to higher sucrose% recorded by G.99-103 and Ph.8013 (Table 5). Varietal differences in this trait were also found by Azzazy, *et al.* (2005) and El-Geddawy *et al* (2003), who reported that sugarcane G.T.54-9 variety surpassed G.85-37 variety in sugar recovery percentage.

Nitrogen fertilizer levels and seeding rates had no significant effect on sugar recovery % in the two plant cane and first ratoon crops. Similar results were given by El-Geddawy *et al* (2004) who showed that sugar recovery % was insignificantly influenced by nitrogen fertilization. Also, Ahmed (2003) revealed that sugar recovery % was insignificantly affected by the seeding rates

Sugar recovery % was not significantly affected by the interactions among the studied factors, in the two plant cane and 1st ratoon crops, except that between sugarcane varieties and N levels, in the 1st plant crop and the interaction of seeding rates x N levels, in the

Table 6: Sugar recovery percentage of the five sugarcane varieties as affected by seeding rates and nitrogen levels

Varieties	Seeding rates buds/fed.	1st plant crop				2nd plant crop				1st Ratoon crop			
		Nitrogen levels Kg N / fed											
		180	210	240	Mean	180	210	240	Mean	180	210	240	Mean
G.T. 54-9	37800	12.15	11.16	12.08	**11.80**	12.59	11.05	12.53	**12.05**	12.59	11.41	12.34	**12.12**
	50400	12.83	11.26	10.86	**11.65**	10.60	11.05	11.76	**11.13**	12.68	11.25	12.49	**12.14**
Mean		**12.49**	**11.21**	**11.47**	**11.72**	**11.59**	**11.05**	**12.14**	**11.59**	**12.64**	**11.33**	**12.42**	**12.13**
PH 8013	37800	10.81	11.51	11.53	**11.28**	11.68	12.52	11.82	**12.01**	11.57	11.37	11.65	**11.53**
	50400	11.66	11.40	11.63	**11.56**	12.01	12.06	10.86	**11.64**	13.15	14.45	12.13	**13.25**
Mean		**11.24**	**11.45**	**11.58**	**11.42**	**11.84**	**12.29**	**11.34**	**11.83**	**12.36**	**12.91**	**11.89**	**12.39**
G. 99-103	37800	11.08	11.29	10.35	**10.91**	11.77	11.80	12.31	**11.96**	11.02	11.49	11.74	**11.42**
	50400	11.21	11.75	10.97	**11.31**	11.90	11.05	12.14	**11.69**	11.84	11.15	11.55	**11.51**
Mean		**11.15**	**11.52**	**10.66**	**11.11**	**11.83**	**11.42**	**12.22**	**11.83**	**11.43**	**11.32**	**11.65**	**11.47**
G. 98-28	37800	11.36	10.83	11.02	**11.07**	11.01	10.61	10.98	**10.87**	11.39	11.43	11.02	**11.28**
	50400	12.56	11.18	11.06	**11.60**	10.52	11.18	10.65	**10.78**	11.45	11.61	11.53	**11.53**
Mean		**11.96**	**11.01**	**11.04**	**11.34**	**10.77**	**10.90**	**10.81**	**10.83**	**11.42**	**11.52**	**11.27**	**11.41**
G. 84-47	37800	13.18	12.21	11.74	**12.38**	10.71	12.71	11.96	**11.79**	12.28	11.92	11.86	**12.02**
	50400	12.05	12.01	12.23	**12.09**	11.09	9.81	11.89	**10.93**	12.36	12.30	11.34	**12.00**
Mean		**12.61**	**12.11**	**11.98**	**12.24**	**10.90**	**11.26**	**11.93**	**11.36**	**12.32**	**12.11**	**11.60**	**12.01**
Mean of Seeding	37800	11.72	11.40	11.34	**11.49**	11.55	11.74	11.92	**11.74**	11.77	11.52	11.72	**11.67**
	50400	12.06	11.52	11.35	**11.64**	11.22	11.03	11.46	**11.24**	12.30	12.15	11.81	**12.09**
Mean		**11.89**	**11.46**	**11.35**		**11.39**	**11.38**	**11.69**		**12.03**	**11.84**	**11.77**	
LSD at 0.05 level													
Sugar cane varieties (V)					1.04				1.02				0.67
Seeding rates (S)					N.S				N.S				N.S
Nitrogen levels (N)					N.S				N.S				N.S
V X S					N.S				N.S				N.S
V X N					1.24				N.S				N.S
N X S					N.S				0.78				N.S
V X S X N					1.75				1.74				2.97

2nd plant crop, as well as the interaction among the three factors, in the three seasons. Overall, the highest sugar recovery % was obtained from G. 84-47 variety, when it was planted by 37800 buds/fed and supplied with 180 and 210 kg N/fed, in the 1st and 2nd plant crops, respectively. In the 1st ratoon crop, the highest sugar recovery % obtained by planting sugarcane Ph.8013 variety at 37800 buds/fed with the application of 210 kg N/fed.

Cane yield:

Data in Table 7 reveal significant differences among the studied sugarcane varieties in cane yield in the two plant cane and the 1st ratoon crops. Sugarcane G. 99-103 variety produced the maximum cane yield, in the two plant and 1st ratoon cane crops. These results could be attributed to higher values of millble cane height and diameter (Tables 2 and 3). The effective role of varieties on cane yield was also reported by Ahmed (2003) and Azzazy *et al.* (2005) who found that sugarcane varieties differed significantly in cane yields.

Data in the same table indicated that planting sugarcane using 50400 buds/fed increased cane yield significantly by 5.8 % over that resulted from 37800 buds/fed, in the 1st plant cane crop. These results could be probably due to that using 50400 buds/fed gave more millable cane/m^2 at harvest (Table 1) and consequently gave higher cane yield/fed. These results are in harmony with those obtained by El-Geddawy *et al.* (2005), who declared that planting cane with 50400 buds/fed recorded the maximum cane yield.

Cane yield was significantly affected by nitrogen fertilization levels in both seasons. Fertilizing 240 kg N/fed resulted in the highest cane yield, in the 1st, 2nd plant cane and 1st ratoon crops. These results can be explained through the fact that nitrogen has a vital role in building up metabolites, activating enzymes and carbohydrates accumulation which transferred from leaves to developing stalk which in turn enhanced stalk length and diameter and finally cane yield per

Table 7: Cane yield (ton/fed.) of the five sugarcane varieties as affected by seeding rates and nitrogen levels

Varieties	Seeding rates buds/fed.	1st plant crop				2nd plant crop				1st Ratoon crop			
		Nitrogen levels Kg N / fed											
		180	210	240	Mean	180	210	240	Mean	180	210	240	Mean
G.T. 54-9	37800	49.00	53.47	60.73	**54.40**	51.60	44.13	53.53	**49.76**	49.53	57.33	66.60	**57.82**
	50400	49.33	63.33	65.00	**59.22**	52.13	47.87	50.07	**50.02**	57.20	59.27	69.93	**62.13**
Mean		**49.17**	**58.40**	**62.87**	**56.81**	**51.87**	**46.00**	**51.80**	**49.89**	**53.37**	**58.30**	**68.27**	**59.98**
PH 8013	37800	54.80	61.27	68.13	**61.40**	49.33	58.33	50.00	**52.56**	50.67	64.13	67.13	**60.64**
	50400	60.60	64.27	69.53	**64.80**	50.53	50.73	58.07	**53.11**	57.60	64.73	68.44	**63.59**
Mean		**57.70**	**62.77**	**68.83**	**63.10**	**49.93**	**54.53**	**54.03**	**52.83**	**54.13**	**64.43**	**67.79**	**62.12**
G. 99-103	37800	63.87	73.97	83.53	**73.79**	58.33	66.87	67.67	**64.29**	64.67	76.93	78.33	**73.31**
	50400	71.87	80.40	85.00	**79.09**	60.67	66.73	77.40	**68.27**	75.80	77.43	78.83	**77.36**
Mean		**67.87**	**77.18**	**84.27**	**76.44**	**59.50**	**66.80**	**72.53**	**66.28**	**70.23**	**77.18**	**78.58**	**75.33**
G. 98-28	37800	68.67	71.00	72.00	**70.56**	42.87	59.27	53.47	**51.87**	60.27	63.13	67.27	**63.56**
	50400	70.20	70.47	73.07	**71.24**	45.93	58.20	42.50	**48.88**	57.80	64.87	68.83	**63.83**
Mean		**69.43**	**70.73**	**72.53**	**70.90**	**44.40**	**58.73**	**47.98**	**50.37**	**59.03**	**64.00**	**68.05**	**63.69**
G. 84-47	37800	45.77	58.47	59.73	**54.66**	34.87	44.27	54.60	**44.58**	60.47	66.53	68.80	**65.27**
	50400	56.07	59.27	60.80	**58.71**	51.00	51.67	56.00	**52.89**	66.40	67.80	69.53	**67.91**
Mean		**50.92**	**58.87**	**60.27**	**56.68**	**42.93**	**47.97**	**55.30**	**48.73**	**63.43**	**67.17**	**69.17**	**66.59**
Mean of Seeding	37800	56.42	63.63	68.83	**62.96**	47.40	54.57	55.85	**52.61**	57.12	65.61	69.63	**64.12**
	50400	61.61	67.55	70.68	**66.61**	52.05	55.04	56.81	**54.63**	62.96	66.82	71.12	**66.97**
Mean		**59.02**	**65.59**	**69.75**		**49.73**	**54.81**	**56.33**		**60.04**	**66.22**	**70.37**	

LSD at 0.05 level			
Sugar cane varieties (V)	2.33	7.49	5.84
Seeding rates (S)	S	N.S	N.S
Nitrogen levels (N)	1.72	6.15	5.36
V X S	2.28	N.S	N.S
V X N	3.84	N.S	11.98
N X S	2.43	8.69	7.58
V X S X N	5.43	19.44	16.95

unit area These result are in agreement with those obtained by Mahender, *et al.* (2002) and Ali (2007), who found that increasing N level up to 310 kg N/fed produced the maximum cane yield.

Data shown in Table 7 indicate that cane yield was significantly affected by the 1st and 2nd order interactions in the both seasons, except that between varieties and seeding rates in the 2nd plant and 1st ratoon cane crops, and that between varieties and nitrogen levels, in the 2nd plant cane crop. Overall, the maximum cane yield was obtained by planting sugarcane G.99-103 variety by 50400 buds/fed and fertilizing it with 240 kg N/fed in both seasons.

Sugar yield

Data in Table 8 indicate that the tested sugarcane varieties differed significantly in sugar yield in the three cane crops. Sugarcane G.99-103 variety surpassed G.T.54-9, Ph.8013, G. 98-28 and G 84-47 varieties by 1.35, 1.26, 0.45 and 1.56 ton/fed, in 1st plant crop, as well as 2.06, 1.57, 2.35 and 2.24 ton/fed, in the 2nd plant cane crop, corresponding to 1.39, 0.93, 1.40 and 0. 68 ton/fed, in the 1st ratoon crop, respectively, These results could be attributed to higher values of cane yield recorded by G.99-103 variety (Table 8). Variation among sugarcane varieties in sugar yield was reported by El-Geddawy *et al* (2003) and Taha *et al* (2003), who mentioned that differences among varieties in sugar yield may be mainly due to their gene make-up.

Sugar yield was significantly affected by seeding rates in the 1st plant cane and ratoon crops. Seeding rate of 50400 buds/fed gave the highest sugar yield compared to that given by 37800 buds/fed. This result may be due to that higher cane yield was produced by planting sugarcane with 50400 buds/fed (Table 7). Similar findings were reported by El-Sogheir and Mohamed (2003) and El-Geddawy *et al* (2005), who declared that 50400 buds/fed recorded the highest values of sugar yield.

Table 8: Sugar yield (ton/fed.) of the five sugarcane varieties as affected by seeding rates and nitrogen levels

Varieties	Seeding rates buds/fed.	1st plant crop				2nd plant crop				1st Ratoon crop			
		Nitrogen levels Kg N / fed											
		180	210	240	Mean	180	210	240	Mean	180	210	240	Mean
G.T. 54-9	37800	5.96	5.95	7.33	**6.41**	6.41	4.87	6.69	**5.99**	6.19	6.53	8.21	**6.98**
	50400	6.33	7.15	7.06	**6.85**	5.40	5.31	5.87	**5.53**	7.26	6.66	8.77	**7.56**
Mean		**6.14**	**6.55**	**7.20**	**6.63**	**5.91**	**5.09**	**6.28**	**5.76**	**6.73**	**6.60**	**8.49**	**7.27**
PH 8013	37800	5.91	7.06	7.87	**6.94**	5.68	7.26	5.91	**6.28**	5.93	7.28	7.82	**7.01**
	50400	7.04	7.32	8.12	**7.49**	6.10	6.22	6.33	**6.22**	7.68	9.33	8.31	**8.44**
Mean		**6.47**	**7.19**	**7.99**	**7.22**	**5.89**	**6.74**	**6.12**	**6.25**	**6.80**	**8.30**	**8.07**	**7.73**
G. 99-103	37800	7.07	8.36	8.64	**8.03**	6.87	7.76	8.33	**7.65**	7.29	8.85	9.17	**8.44**
	50400	8.05	9.44	9.33	**8.94**	7.26	7.35	9.36	**7.99**	8.96	8.64	9.07	**8.89**
Mean		**7.56**	**8.90**	**8.99**	**8.48**	**7.06**	**7.55**	**8.85**	**7.82**	**8.12**	**8.74**	**9.12**	**8.66**
G. 98-28	37800	7.79	7.69	7.94	**7.81**	4.68	6.57	5.74	**5.66**	6.84	7.22	7.43	**7.16**
	50400	8.83	7.88	8.07	**8.26**	4.81	6.45	4.57	**5.28**	6.61	7.52	7.93	**7.36**
Mean		**8.31**	**7.79**	**8.01**	**8.03**	**4.74**	**6.51**	**5.16**	**5.47**	**6.73**	**7.37**	**7.68**	**7.26**
G. 84-47	37800	6.04	7.13	7.02	**6.73**	3.77	5.67	6.56	**5.33**	7.41	7.94	8.15	**7.83**
	50400	6.75	7.12	7.44	**7.10**	5.66	5.14	6.66	**5.82**	8.17	8.33	7.89	**8.13**
Mean		**6.40**	**7.13**	**7.23**	**6.92**	**4.72**	**5.41**	**6.61**	**5.58**	**7.79**	**8.13**	**8.02**	**7.98**
Mean of Seeding	37800	6.55	7.24	7.76	**7.18**	5.48	6.42	6.64	**6.18**	6.73	7.56	8.16	**7.48**
	50400	7.40	7.78	8.00	**7.73**	5.85	6.09	6.56	**6.17**	7.74	8.09	8.40	**8.08**
Mean		**6.98**	**7.51**	**7.88**		**5.66**	**6.26**	**6.60**		**7.23**	**7.83**	**8.28**	

LSD at 0.05 level			
Sugar cane varieties (V)	0.85	0.82	0.58
Seeding rates (S)	S	N.S	S
Nitrogen levels (N)	0.46	0.78	0.81
V X S	0.80	N.S	1.15
V X N	1.04	1.74	1.80
N X S	0.66	1.10	1.14
V X S X N	1.47	2.46	2.55

The results showed that sugar yield increased significantly by 0.53 and 0.90 ton/fed, in the 1st plant cane crop, and 0.60 and 0.94 ton/fed in the 2nd plant cane crop, corresponding to 0.60 and 1.05 ton/fed in the 1st ratoon, when N level was raised to 180 and 240 kg N/fed compared to that produced by applying 120 kg N/fed (Table 8). The increase in sugar yield as affected by increasing N level is probably due to the gradual increase in cane yield (Table 7), which is considered the main component of sugar yield. It may be also due to the increase in sugar recovery% up to 180 kg N/fed (Table 6), which contributes to the obtained sugar yield from the raw sugar material, i.e. cane yield. These are in harmony with those obtained by Mahender, *et al.* (2002), El-Amir (2008), who showed that sugar yields increased significantly by raising nitrogen fertilization levels.

Sugar yield responded significantly to the possible interactions in both seasons, except that between varieties and seeding rates in the 2nd plant crop. The highest sugar yields were obtained from G.99-103 variety received 210 and 240 kg N/fed and planted by 50400 buds/fed in the 1st and 2nd plant cane crop, respectively. In the 1st ratoon crop, the same variety gave the highest sugar yield when it planted by 37800 buds and received 240 kg N/fed.

CONCLUSION

Under conditions of the present investigation, planting the promising sugarcane G.99-103 variety by 50400 buds/fed and fertilizing it with 240 kg N/fed can be recommended to obtain the maximum cane and sugar yields/fed.

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Assessment of optimum seeding rate and nitrogen level for five Sugarcane varieties

تعيين المعدل الأمثل من التقاوي والتسميد النيتروجيني لخمسة من أصناف قصب السكر

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أقيمت ثلاث تجارب حقلية بمزرعة محطة البحوث الزراعية بالمطاعنة مشتملة على محصولي غرس (٢٠٠٥/٢٠٠٦ ، ٢٠٠٦/٢٠٠٧) ومحصول الخلفة (٢٠٠٦/٢٠٠٧) لدراسة تأثير مستويات التسميد النيتروجينى (١٨٠ ، ٢١٠ ، ٢٤٠ كجم ن/فدان) ومعدلين للتقاوي (٣٧٨٠٠ ، ٥٠٤٠٠ برعم/فدان) على المحصول ومكوناته لخمسة أصناف من قصب السكر (جيزة-تايوان ٥٤-٩ ، بى انتش ٨٠١٣ ، جيزة ٩٩-١٠٣ ، جيزة٢٨-٩٨ وجيزة ٨٤-٤٧). استخدم تصميم القطع المنشقة مرتين في ثلاثة مكررات حيث زرعت الأصناف فى القطع الرئيسية ، ووضع معدلى التقاوى فى القطع الشقية الأولى فى حين وزعت مستويات السماد النيتروجينى فى القطع الشقية الثانية .

أشارت النتائج الى ما يلى:

تفوق الصنف المبشر جيزة ٩٩-١٠٣ على الأصناف الأخرى في طول ، قطر العيدان الصالحة للعصر ومحصولي العيدان والسكر.

أدت زراعة القصب بعدد ٥٠٤٠٠ برعم/فدان الى الحصول على أعلى قيم لطول العيدان الصالحة للعصر وكذلك محصولي القصب والسكر في حين أدت الزراعة بعدد ٣٧٨٠٠ برعم/فدان الى زيادة قطر النباتات الصالحة للعصر.

أظهرت النتائج أن زيادة مستويات التسميد النيتروجيني حتى ٢٤٠ كجم نيتروجين للفدان أدت إلى زيادة معنوية في عدد وطول وقطر النباتات الصالحة للعصر وكلا من محصولي القصب والسكر - بينما أعطت اضافة ١٨٠ كجم للفدان أعلى قيم للنسبة المئوية للمواد الصلبه الذائبة الكلية بالعصير (البركس) والنسبة المئوية للسكروز في محصول الغرس الأول.

تحت ظروف هذا البحث يمكن التوصية بزراعة الصنف المبشر جيزة ٩٩-١٠٣ بعدد ٥٠٤٠٠ برعم للفدان وتسميده باضافة ٢٤٠ كجم نيتروجين/فدان للحصول على أعلى محصول عيدان وسكر .