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YIELD AND QUALITY OF SOME PROMISING SUGARCANE VARIETIES AS AFFECTED BY PLANTING PATTERN

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ABSTRACT

The present study was carried out at El-Mattana Agriculture Research Station Qena Governorate, Upper Egypt in 2007/2008 and 2008/2009 growing seasons to evaluate three sugarcane varieties (two promising varieties viz. G. 98-28, Phil. 8013 and the commercial variety G.T. 54-9) grown at three planting pattern; whole stalk as one, two and three pieces. Treatments were arranged in a split-plot design with three replicates. The main plots were assigned to three sugarcane varieties while planting pattern were distributed in the sub plots.

Results showed that sugarcane varieties were significantly differed in stalk diameter, sucrose percentage and sugar yield ton/fed in the second season only. Cane yield was significantly affected by grown varieties in both seasons. Phli. 8013 showed superiority in all significant traits.

Under this study as compared with of her varieties planting pattern were significantly affected in all studied traits except stalk height, brix and sucrose percentages in the second season and number of millable cane/m^2 in both seasons. Planting sugarcane with by cutting cane stalk into three pieces gave the highest values in all studied traits except, stalk diameter which obtained with planting whole stalk.

The interaction effect between varieties and planting pattern was insignificant in all studied traits except in purity percentage in the first season. The height values were obtained when planting Phli.8013 variety by cutting cane stalks into three pieces.

Under conditions of the present work, growing sugarcane varieties i.e., G.T. 54-9, Phil. 8013 and G. 98-28 by cutting cane stalk into three pieces recommended for getting the highest cane and sugar yields/fed.

INTRODUCTION

The last decades of the twentieth century showed a gradual increase in sugar consumption. Thereby, Egypt suffers from a gap between consumption and production of sugar, which reaches nearly 650.000 ton/annually. The commercial variety G.T. 54-9 occupies most of the area planted with sugarcane in Egypt. Recently, Sugar Crops Research Institute produced many promising varieties of sugar cane, among them Phli. 8013 and G. 98-28. It is well known as a fact that sugarcane varieties are completely different in their performance, quality and yields due to great variation in their gene structure, In addition, number of shoots emerged and mortality percentage resulted from the competition among planting seed rate and effects the subsequent crop cycle of sugarcane crop which occupies soil for more than 4-5 growing seasons.

Lee (1984) found that no differences in case of planting sugarcane with whole stalk or three bud-seeds of cv. NA 56-79 without reducing quality. Chavan *et al.* (1985) pointed out that number of buds on seeds had no effect

on cane and sugar yields. Pawar *et al*. (1985) obtained that the maximum millable cane was recorded from planting with cutting seeds contained 1-3 buds. Yadav (1992) studied the effect of cutting size on sugar cane. He found that three bud seeds produced higher cane yield than two bud seeds. Fergany (1997) planted sugarcane varieties F.153, G. 85-37 and G.T. 54-9 under different number of buds 2, 4 and 6 budded setts. He showed that planting by 4-buddded cane cutting produced the highest values of stalk length and diameter, cane and sugar yields. He also, mentioned that brix, purity percentages, number of millable cane/fed were not significantly affected by cutting size. El-Geddawy *et al*. (2002-a) found that sugarcane variety G.T. 54-9 significantly surpassed the other varieties in respect to stalk height and diameter in ratoon crops. However, F. 153 variety attained a significant superiority over the two other varieties in stalk number/m^2. The differences between the examined numbers of buds/setts were not enough to reach the level of significance in respect to the above-mentioned characters. Geddawy *et al*. (2002-b) obtained that sugarcane variety F. 153 almost attained the highest values of juice quality compared with G.T.54-9 and G. 85-37 varieties. Moreover the differences between cutting sizes on these traits were not enough to reach the level of significance.

Singh *et al.* (2003) evaluated 12 early maturing sugarcane cultivars in India, showed that cv. VCoSe 95422 gave excellent cane yield and stalk length followed by vv. Co 94024. The number of millable canes was higher in CoSe 95421, while Co 94024 showed higher purity%. Tiwari *et al.* (2004) noticed that cv. CoS 91269 performed better in terms of yield, followed by cvs. CoSe 93232 and Cose 95427 whereas cvs. CoSe 92234 and CoSe 92423 were better in terms of juice quality. Azzazy *et al.* (2005) found that sugar cane cvs. G.T. 54-9, Phli. 8013, G. 95-21, G. 99-165, G. 98-28 and G. 95-19 differed significantly in their stalk height and diameter, brix, sucrose and sugar recovery percentages as well as cane and sugar yields/fed. El-Shafai and Ismail (2006) showed that the commercial sugarcane cv. G.T. 54-9 was superior in stalk height, number of millable cane, cane and sugar yields/fed as compared with Phli. 8013, G. 95-19 and G. 95-21 varieties. El-Sogheir *et al.* (2007) found that cvs. Phli. 8013, G. 84-47 and G. 98-28 in descending order could be cultivated with and/or replace the main cane variety G.T. 54-9 which yielded the best cane yield, juice quality and hence sugar yield per unit area. Ahmed and Khaled (2008) found that the tested sugarcane genotypes differed significantly in all studied traits, except in length, diameter and brix%. G.T. 54-9 yielded the highest values of millable cane length, cane and sugar yields/fed, while Phli.8013 had the thickest millable cane, highest sucrose and sugar recovery percentages. The number of millable cane was higher for G.84-47 genotype. Ahmed *et al.* (2008) cleared that sugarcane variety G. 84-47 surpassed the other two varieties (Phli. 8013 and G. 98-28) in millable cane number/m, stalk height, sugar recovery% and cane yield, meanwhile sugarcane variety Phli. 8013 attained the highest value of stalk diameter, brix%, sucrose% and sugar yield. Ismail and El-Sogheir (2008) reported that sugarcane varieties significantly differed in stalk length, stalk diameter, number of millable cane/m, cane yield/fed, sucrose%, sugar recovery% and sugar yield/fed. The highest cane yield was

recorded by G. 98-28 variety in both seasons. Ismail *et al.* (2008) showed that the tested sugar cane varieties significantly differed in all the studied traits except purity%, cane and sugar yields. The commercial cv. G.T. 54-9 showed superiority in stalk length, purity, sugar recovery percentage and sugar yield/fed.

The objective of this study was investigation the optimal planting pattern as well as the performance of such studied promising varieties of sugar cane to obtain the highest cane and sugar yields.

MATERIALS AND METHODS

Two field experiments were carried out at El-Mattana Agriculture Research Station Qena Governorate, Upper Egypt in 2007/2008 and 2008/2009 growing seasons to investigate the performance of three sugarcane varieties (two promising ones viz. G. 98-28, Phil. 8013 and the commercial variety G.T. 54-9) grown at three planting pattern i.e. whole stalk as one, two and three pieces. Sugarcane varieties were planted on March 1st and harvested 12 months later in both seasons. Treatments were arranged in a split-plot design with three replicates. The main plots were assigned the three sugarcane varieties and planting systems were distributed in the sub plots. The area of sub plot was 35 m^2 (comprised 5 ridges of 1 m apart and 7 m long). The phosphorus fertilizer in the form of calcium super phosphate (15.5% P_2O_5) at the rate of 200 kg/fed was added with preparing of soil for planting. The nitrogen fertilizer was applied as ammonium nitrate (33.5% N) at the rate of 180 kg/fed. at two equal rates while, potassium sulfate (48% K_2O) was applied at the rate of 48 kg K_2O/fed. with the second dose of nitrogen fertilizer the previous cultivated crop was tomato followed by fallow. The other agricultural operations were practiced as recommended in the region. The physical and chemical analysis of the upper 30-cm of soil of the experimental site was showed in Table (1).

Table (1): Mechanical and chemical properties of top-soil (0-30 cm) of the experimental soil.

Soil property	2007/2008	2008/2009	Soluble ions (meq/100 g soil) (1:5)	2007/2008	2008/2009
Sand (%)	34.5	34.0	**Ca^{++}**	2.6	2.5
Silt (%)	32.2	31.5	**Mg^{++}**	1.2	1.4
Clay (%)	33.3	34.5	**Na^{++}**	1.9	1.5
Soil texture	Clay loam	Clay loam	**K^{+}**	0.5	0.4
EC(ds/m) 1:5)	1.6	1.5	**CO_3^{-}**	1.1	1.2
pH (1:1)	7.60	7.40	**Cl^{-}**	2.3	2.5
			$H CO_3^{-}$	0.8	0.9
			So_4	1.9	2.0

Data recorded:

The following data were recorded at harvest:

At harvest ten plants were randomly taken to determine the following traits.

1. Stalk height (cm) was measured from land surface up to the point of visible dewlap.
2. Stalk diameter (cm) was measured in the middle part of the stalk.

Plants of the four guarded rows were harvested, cleaned, topped and the following parameters were recorded.

3 Number of millable cane/m^2.

4. Cane yield (tons/fad)

At harvest samples of 25 stalks from each plot were taken at random to determine the following attributes.

1. Brix % of juice (the percent of total soluble solids in 100 cm3 of juice were determined in the laboratory using brix hydrometer.)
2. Sucrose percentage of juice was determined using Sacharemeter according to A.O.A.C. (1995).
3. Purity percentage was calculated according to the following equation:

Purity% = sucrose %/brix%x100

4. Sugar recovery percentage was calculated as follows:

Sugar recovery% = Richness% x Purity%

Where Richness = (sucrose in 100 grams x richness factor)/100.

Richness factor = 100- (fiber% + Physical impurities% + Percent water free from sugar).

5. Sugar yield (tons/fad) was estimated according to the following equation:

Row sugar production = cane yield (tons/fad) x sugar recovery%.

The collected data were subjected to the statistical analysis of split plot design according to the procedure outlined by Snedecor and Cochran (1981). For comparison between means, L.S.D. at 5% level of probability was used.

RESULTS AND DISCUSSION

Stalk height (cm.):

The results as shown in Table 2 revealed that differences between varieties were insignificant in stalk height in both seasons. These results are in harmony with those obtained by Ahmed and Khaled (2008) on the other hand, Azzazy *et al.* (2005); El-Shafai and Ismail (2006) and Ahmed *et al*. (2008) cleared that sugarcane varieties significantly differed in stalk height (cm.).

Planting pattern significantly affected stalk height in the first season only (Table 2). Planting sugarcane with three cuttings gave the highest values of stalk height i.e. 278.33 and 288.67 cm in the 1st and 2nd seasons, respectively. The decrease in stalk height could be due to the competition among plants for place and nutrients. These results are in harmony with these obtained by Fergany (1997).

The interaction between varieties and planting pattern was insignificantly in this trait in both seasons.

Table 2: Effect of sugarcane varieties, planting pattern and their interaction on stalk height (cm.) in 2007/2008 and 2008/2009 seasons.

Varieties (A)	Planting pattern (B)							
	2007/2008 season				2008/2009 season			
	Whole stalk			Mean	Whole stalk			Mean
	One pieces	Two pieces	Three pieces		One pieces	Two pieces	Three pieces	
G.T. 54-9	238.33	265.00	281.67	**261.67**	270.00	281.67	296.67	**282.78**
G. 98-28	243.33	258.33	283.33	**261.67**	278.33	281.00	268.67	**282.00**
Phli. 8013	238.33	250.00	250.00	**252.78**	272.67	281.00	282.67	**278.78**
Mean	**240.00**	**257.78**	**278.33**		**273.67**	**281.22**	**288.67**	
LSD at 0.05 level								
Varieties (A)				**NS**				**NS**
Planting pattern (B)				**10.81**				**NS**
(A) x (B)				**NS**				**NS**

Stalk diameter (cm.):

The presented data in Table 3 cleared that sugarcane varieties significantly differed in stalk diameter in the second season only. Promising variety Phli. 8013 was superior to the other two varieties on stalk diameter with values of 2.99 cm. This result assured that in addition to the effect of agronomical practices, gene mak-up broadly affected growth properties, the fewer number of plants in sugarcane. These results are in harmony with those obtained by Azzazy *et al.* (2005); Ahmed *et al*. (2008) and Ismail *et al.* (2008).

Table 3: Effect of sugarcane varieties, planting pattern and their interaction on stalk diameter (cm.) in 2007/2008 and 2008/2009 seasons.

Varieties (A)	Planting pattern (B)							
	2007/2008 season				2008/2009 season			
	Whole stalk			Mean	Whole stalk			Mean
	One pieces	Two pieces	Three pieces		One pieces	Two pieces	Three pieces	
G.T. 54-9	2.93	2.93	2.87	**2.91**	2.93	2.87	2.80	**2.87**
G. 98-28	2.93	2.90	2.80	**2.88**	3.03	2.90	2.87	**2.93**
Phli. 8013	3.1	2.97	2.93	**3.00**	3.07	2.97	2.93	**2.99**
Mean	**2.99**	**2.93**	**2.87**		**3.01**	**2.91**	**2.87**	
LSD at 0.05 level								
Varieties (A)				**NS**				**0.06**
Planting pattern (B)				**0.04**				**0.06**
(A) x (B)				**NS**				**NS**

Stalk diameter was significantly affected by cutting size in both seasons. Planting sugarcane with whole stalk as one piece gave the highest values of stalk diameter i.e. 2.99 and 3.01 cm in both seasons, respectively. Meanwhile, using whole stalk as three pieces in planting sugarcane gave the lowest values i.e. 2.87 and 2.87 cm in the first and second seasons, respectively. The reduction in stalk diameter accompanying the increase in number of cutting size could be attributed to the aggressive competition

among the emerged plants for space and nutrients. These results are in harmony with that obtained by Fergany (1997).

The interaction between varieties and planting pattern insignificantly differed stalk diameter in both seasons.

Brix percentage:

The results in Table 4 cleared that differences between varieties were insignificant in brix percentage in both seasons. These results are in harmony with those obtained by Ahmed and Khaled (2008), on the other hand Azzazy *et al.* (2005); Ahmed *et al*. (2008) and Ismail *et al.* (2008) reported that sugarcane varieties differed significantly in brix percentage.

Planting pattern significantly affected brix percentages in the first season only. Planting sugarcane by cutting cane stalk into three pieces gave the highest values of brix percentage i.e. 21.84 and 21.45% in the 1st and 2nd seasons, respectively. While the lowest values of brix percentage were obtained from planting sugarcane with whole stalk in both seasons.

The interaction effect between varieties and planting pattern was insignificant in brix percentage in both seasons.

Table 4: Effect of sugarcane varieties, planting pattern and their interaction on brix percentage in 2007/2008 and 2008/2009 seasons.

Varieties (A)	Planting pattern (B)							
	2007/2008 season				2008/2009 season			
	Whole stalk			Mean	Whole stalk			Mean
	One pieces	Two pieces	Three pieces		One pieces	Two pieces	Three pieces	
G.T. 54-9	21.07	21.53	21.86	**21.49**	20.89	21.18	21.20	**21.09**
G. 98-28	21.23	21.43	21.78	**21.48**	20.47	21.24	21.72	**21.23**
Phli. 8013	20.99	21.18	21.87	**21.35**	21.52	21.15	21.24	**21.37**
Mean	**21.10**	**21.38**	**21.84**		**21.05**	**21.19**	**21.45**	
LSD at 0.05 level								
Varieties (A)				**NS**				**NS**
Planting pattern (B)				**0.40**				**NS**
(A) x (B)				**NS**				**NS**

Sucrose percentage:

The results in Table 5 revealed that sugarcane varieties significantly differed in sucrose percentage in the second season only. Promising sugarcane variety phil. 8013 was superposed over other two varieties on sucrose percentage where it gave 17.97%. The differences between varieties under study could be due to genetical aspects. These results are in harmony with those obtained by Ahmed *et al*. (2008) and Ismail and El-Sogheir (2008).

Planting pattern significantly affected sucrose percentage in the first season only. Planting sugarcane with three cuttings gave the highest value of sucrose percentage (18.03%). While the lowest value of sucrose percentage was obtained from planting sugarcane by whole stalk where it gave 16.85%.

The interaction between varieties and planting pattern insignificantly affected sucrose percentage in both seasons.

Table 5: Effect of sugarcane varieties, planting pattern and their interaction on sucrose percentage in 2007/2008 and 2008/2009 seasons

Varieties (A)	Planting pattern (B)							
	2007/2008 season				2008/2009 season			
	Whole stalk			Mean	Whole stalk			Mean
	One pieces	Two pieces	Three pieces		One pieces	Two pieces	Three pieces	
G.T. 54-9	17.17	17.24	17.85	**17.42**	16.55	17.28	18.46	**17.43**
G. 98-28	16.82	17.16	18.10	**17.36**	17.24	17.48	16.76	**17.16**
Phli 8013	16.54	17.50	18.14	**17.39**	17.47	17.75	18.70	**17.97**
Mean	**16.85**	**17.30**	**18.03**		**17.09**	**17.50**	**17.97**	

LSD at 0.05 level			
Varieties	**(A)**	**NS**	**0.63**
Planting pattern	**(B)**	**0.48**	**NS**
	(A) x (B)	**NS**	**NS**

Purity percentage:

Data in Table 6 revealed that differences between varieties were insignificant in purity percentage in both seasons. These results are in harmony with those obtained by Ismail *et al.* (2008).

Planting pattern significantly affected purity percentage in both seasons. Planting sugarcane with whole stalk (as three piece) gave the highest values of purity percentage i.e. 86.52 and 87.09% in the first and second seasons, respectively. While the lowest values of purity percentage were obtained from planting sugarcane with whole stalk (as one piece) in both seasons.

The interaction effect between varieties and planting pattern was significant in purity percentage in the first season only. The height value i.e. 86.55 was obtained when planting sugarcane Phil. 8013 variety by cutting cane stalk into three pieces.

Table 6: Effect of sugarcane varieties, planting pattern and their interaction on purity percentage in 2007/2008 and 2008/2009 seasons.

Varieties (A)	Planting pattern (B)							
	2007/2008 season				2008/2009 season			
	Whole stalk			Mean	Whole stalk			Mean
	One pieces	Two pieces	Three pieces		One pieces	Two pieces	Three pieces	
G.T. 54-9	83.41	84.30	86.47	**84.73**	82.60	84.41	88.20	**85.07**
G. 98-28	81.62	82.60	86.54	**83.59**	82.91	84.72	86.45	**84.69**
Phli 8013	81.97	85.77	86.55	**84.76**	81.59	83.95	86.63	**84.06**
Mean	**82.33**	**84.22**	**86.52**		**82.37**	**84.36**	**87.09**	

LSD at 0.05 level			
Varieties	**(A)**	**NS**	**NS**
Planting pattern	**(B)**	**0.73**	**1.15**
	(A) x (B)	**1.26**	**NS**

Sugar recovery percentage:

Data in Table 7 showed that differences between varieties were insignificant in sugar recovery percentage in both seasons.

Planting pattern significantly affected sugar recovery percentage in both seasons. Planting sugarcane with whole stalk as three pieces gave the highest values of sugar recovery percentage i.e. 13.04 and 13.77% in the 1st and 2nd seasons, respectively. While the lowest values of sugar recovery percentage were obtained from planting sugarcane with whole stalk as one piece in both seasons.

The interaction between varieties and planting pattern had insignificant effect in sugar recovery percentage in both seasons.

Table 7: Effect of sugarcane varieties, planting pattern and their interaction on sugar recovery percentage in 2007/2008 and 2008/2009 seasons.

Varieties (A)	Planting pattern (B)							
	2007/2008 season				2008/2009 season			
	Whole stalk			Mean	Whole stalk			Mean
	One pieces	Two pieces	Three pieces		One pieces	Two pieces	Three pieces	
G.T. 54-9	10.92	11.68	13.57	**12.06**	11.19	13.54	14.00	**12.91**
G. 98-28	10.71	11.28	12.82	**11.60**	11.63	11.99	13.37	**12.33**
Phli 8013	10.92	11.45	12.72	**11.70**	12.11	12.81	13.93	**12.95**
Mean	**10.85**	**11.47**	**13.04**		**11.64**	**12.78**	**13.77**	
LSD at 0.05 level								
Varieties	**(A)**			**NS**				**NS**
Planting pattern	**(B)**			**0.67**				**0.66**
	(A) x (B)			**NS**				**NS**

Number of millable cane/m^2:

Data in Table 8 revealed that differences between varieties were insignificant in number of millable cane/m^2 in both seasons.

Table 8: Effect of sugarcane varieties, planting pattern and their interaction on number of millable cane/m^2 in 2007/2008 and 2008/2009 seasons.

Varieties (A)	Planting pattern (B)							
	2007/2008 season				2008/2009 season			
	Whole stalk (B)			Mean	Whole stalk (B)			Mean
	One pieces	Two pieces	Three pieces		One pieces	Two pieces	Three pieces	
G.T. 54-9	12.40	13.80	14.97	**13.72**	13.27	12.93	14.20	**13.46**
G. 98-28	13.73	14.27	14.07	**14.02**	11.67	11.67	12.73	**12.02**
Phli 8013	12.20	12.47	13.13	**12.60**	12.00	12.60	13.27	**12.62**
Mean	**12.78**	**13.51**	**14.06**		**12.31**	**12.40**	**13.40**	
LSD at 0.05 level								
Varieties	**(A)**			**NS**				**NS**
Planting pattern	**(B)**			**NS**				**NS**
	(A) x (B)			**NS**				**NS**

Planting pattern had insignificantly effect on number of millable cane/m^2 in both seasons. Planting sugarcane with three cuttings gave the highest values of number of millable cane/m^2 i.e. 14.06 and 13.40 plant/m^2 in the 1st and 2nd seasons, respectively. While the lowest values of number of millable cane/m^2 were obtained from planting sugarcane with whole stalk as one piece

in both seasons. These results are in harmony with those obtained by Fergany (1997.

The interaction effect between varieties and planting pattern was insignificant in both seasons.

Cane yield (ton/fed):

The results in Table 9 revealed that varieties differed significantly in cane yield ton/fed. in both seasons. Promising variety Phli. 8013 was superior to the other two varieties in cane yield ton/fed in both seasons where it gave 44.75 and 44.16 ton cane/fed in the 1st and 2nd seasons, respectively. This variability in sugarcane traits among varieties could be attributed to their gene structure. These results stand in harmony with obtained by Azzazy *et al.* (2005); El-Shafai and Ismail (2006); Ahmed and Khaled (2008) and Ahmed *et al*. (2008).

Planting pattern significantly affected cane yield ton/fed in both seasons. Planting sugarcane with whole stalk as three pieces gave the highest values of cane yield i.e. 45.24 and 45.73 ton/fed in the 1st and 2nd seasons, respectively. The lowest of values of this trait were obtained from planting sugarcane with whole stalk as one piece i.e. 40.68 and 40.90 ton cane/fed in both seasons, respectively. These findings are in line with those obtained by Yadov (1992) and Fergany (1997).

The interaction between varieties and planting pattern insignificantly affected cane yield ton/fed in both seasons.

Table 9: Effect of sugarcane varieties, planting pattern and their interaction on cane yield ton/fed in 2007/2008 and 2008/2009 seasons

Varieties (A)	Planting pattern (B)							
	2007/2008 season				2008/2009 season			
	Whole stalk			Mean	Whole stalk			Mean
	One pieces	Two pieces	Three pieces		One pieces	Two pieces	Three pieces	
G.T. 54-9	40.20	43.16	45.61	**42.99**	41.44	43.27	45.96	**43.56**
G. 98-28	39.12	41.32	43.17	**41.20**	38.75	40.08	43.36	**41.95**
Phli 8013	42.72	44.59	46.95	**44.75**	41.50	43.77	47.19	**44.16**
Mean	**40.68**	**43.02**	**45.24**		**40.90**	**43.04**	**45.73**	

LSD at 0.05 level			
Varieties	**(A)**	**0.46**	**0.91**
Planting pattern	**(B)**	**0.45**	**0.41**
	(A) x (B)	**NS**	**NS**

Sugar yield (ton/fed):

The results obtained in Table 10 show cleared that varieties differed significantly in sugar yield ton/fed in the second season only. Promising variety Phli. 8013 surpassed the other two varieties in sugar yield ton/fed where it gave 5.74 ton sugar/fed in the second season. These results came in the similar point view with those reported by Azzazy *et al.* (2005); El-Shafai and Ismail (2006); Ahmed *et al*. (2008) and Ahmed and Khaled (2008).

Planting pattern significantly affected sugar yield ton/fed in both seasons. Planting sugarcane using whole stalk as three pieces resulted in an increase in sugar yield ton/fed amounted to 0.93 and 1.49 ton/fed in the first season

and 0.80 and 1.51 ton/fed in the second season compared with whole stalk as two pieces and one pieces in the 1st and 2nd seasons, respectively. These results are in harmony with those obtained by Yadov (1992) and Fergany (1997). The increase in sugar yield associated with the increasing in the number of cutting piece is due to the increase in number of millable cane and cane yield ton/fed Tables 8 and 9.

The interaction between varieties and planting pattern was insignificant in sugar yield ton/fed in both seasons.

Table 10: Effect of sugarcane varieties, planting pattern and their interaction on sugar yield ton/fed in 2007/2008 and 2008/2009 seasons.

Varieties (A)	Planting pattern (B)							
	2007/2008 season				2008/2009 season			
	Whole stalk			Mean	Whole stalk			Mean
	One pieces	Two pieces	Three pieces		One pieces	Two pieces	Three pieces	
G.T. 54-9	4.39	5.14	6.20	**5.24**	4.64	5.86	6.44	**5.64**
G. 98-28	4.19	4.66	5.54	**4.80**	4.70	5.04	5.89	**5.21**
Phli 8013	4.66	5.11	5.97	**5.25**	5.03	5.61	6.57	**5.74**
Mean	**4.41**	**4.97**	**5.90**		**4.79**	**5.50**	**6.30**	

LSD at 0.05 level			
Varieties	**(A)**	**NS**	**0.34**
Planting pattern	**(B)**	**0.32**	**0.29**
	(A) x (B)	**NS**	**NS**

REFERANCES

A.O.A.C. (1995). Official methods of analysis, Puplished by the A.O.A.C., Box 540, Washington, D.C.

Ahmed, A.Z. and K.A.M. Khaled (2008). Marker assisted selection for yield and some quality traits of sugarcane genotypes under different row spacing. Minia J. Agric. Res. And Develop., 28(4):585-606.

Ahmed, A.Z.; M.S.H. Osman and A. Mahmed (2008). Effect of excessive nitrogen application on yield and quality of three sugarcane varieties. Meeting the Challenges of Sugar Crops and Integrated Industries in Developing countries, 11-14 Sept. Al-Arish, Egypt,. 34-39.

Azzazy, N.B.;A.M.A. El-Shafai and A.M. Abd El-Aal (2005). Performance of some promising plant and ratoon sugarcane varieties under different nitrogen levels. Egypt. J. Appl. Sci., 20(8-A):65-78.

Chavan, D.A.; S.V. Raikhelkar; V.S. Shinde and V.V. Dahiphala (1985). Studies on nitrogen levels and planting methods in seasonal sugar cane variety Co-62175. Indian Sugar J., 35(9): 503-505.

El-Geddawy, I.H.; D.G. Darweish; A.A. El-Sherbiny and E.E.A. El-Hady (2002-a). Effect of row spacing and number of buds/seed setts on: 2. Juice quality of ratoon crop for some sugar cane varieties. Pakistan Sugar J., 17 (4): 10-17.

El-Geddawy, I.H.; D.G. Darweish; A.A. El-Sherbiny and E.E.A. El-Hady (2002-b). Effect of row spacing and number of buds/seed setts on: 1. Growth characters of ratoon crops for some sugar cane varieties. Pakistan Sugar J., 17 (3): 7-14.

El-Shafai, A.M.A. and A.M.A. Ismail (2006). Effect of row spacing on yield and quality of some promising sugarcane varieties. Egypt. J. Appl. Sci., 21(11): 32-46.

El-Sogheir, K.S.; A.Z. Ahmed and N.M.N. Shalaby (2007). Performance of some sugarcane varieties at different planting dates.8th African Crop Science Society Conference, 27-31 October Minia, Egypt.

Fergany, M. (1997). Studies on some factors affecting germination and tillering of sugar cane. M. Sc. Thesis, Fac. Agric., Ain Shams Univ., Egypt.

Ismail, A.M.A. and K.S. El-Sogheir (2008). Seed stets of plant and rations crop in relation to varietal performance of three sugarcane varieties. Egypt. J. Appl. Sci., 23(2-b): 500-513.

Ismail, A.M.A.; M.A. Bekheet and A.S. Abo El-Hamd (2008). Yield and quality of four sugarcane varieties as influensed by seed rate and nitrogen fertilization. Egypt. J. Appl. Sci., 23(1):107-123.

Lee, T.S.G. (1984). Effect of planting whole cane on the germination, development and yield of sugar cane. Candernos Planal Sucar, 3(1): 13-18. [C.F. Hort Absts., 56(2): 10195, 1986].

Pawar, L.G.; R.J. Bhosle; G.S. Kalra and B.P. Patil (1985). Comparative performance of different methods of planting sugar cane. Indian sugar J., 35(7): 395-399. [C.F. Hort Absts., 56(6):4785, 1986].

Singh, I.S.; R. Singh; R.R. Singh and S.B. Singh (2003). Ratooning ability of early maturing sugarcane varieties under Bhat soil. Cooperative Sugar. 34(3): 211-214.

Snedecor, G.W. and W.G. Cochran (1981). Statistical Methods. Seventh Ed., lowa stata Univ. Press, Ames, lowa , USA.

Tiwari, T.N.; S. Sharma; S.B. Singh and D.N. Singh (2004). Performance of some sugarcane varieties with varying nitrogen levels under summer planting conditions of Bhat soil. Indian Sugar, 54(9): 727-732.

Yadav, R.L. (1992). Effect of sett size and row arrangement on yield and quality of sugar cane. Cooperative Sugar, 23(10): 667-670. [C.F. Field Crop Abest., 47(8):5337,1994].

المحصول والجودة لبعض أصناف قصب السكر المبشره وتأثرها بنظم الزراعة

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اقيمت هذه الدراسه بمحطة البحوث الزراعية بالمطاعنة محافظة قنا خلال موسمى ٢٠٠٧/٢٠٠٨ و ٢٠٠٨/٢٠٠٩ لدراسه المحصول والجودة لبعض أصناف قصب السكر المبشرة (جيزه ٩٨-٢٨ و فلبنى ٨٠١٣ مقارنة بالصنف التجارى جيزه-تايوان ٥٤-٩) تحت ثلاث نظم زراعة مختلفه هى (الزراعه بالعود الكامل قطعه واحدة، تقطيع العود الى قطعتين ، تقطيع العود الى ثلاثة قطع) وقد أستخدم تصميم القطع المنشقة مرة واحده حيث وضعت أصناف القصب فى القطع الرئيسية ووزعت نظم الزراعة عشوائيا فى القطع المنشقه.

ويمكن تلخيص أهم النتائج فيمايلى:-

١- تباينت أصناف قصب السكر معنويا فى صفات قطر الساق والنسبة المئوية للسكروز ومحصول السكر فى الموسم الثانى. بينما هذا التباين كان معنويا فى محصول العيدان بالطن للفدان فى كلا الموسمين حيث تفوق الصنف المبشر فلبينى ٨٠١٣ فى جميع الصفات ذات التاثير المعنوى فى الدراسة على الأصناف الأخرى..

٢- أثرت نظم الزراعة معنويا فى جميع الصفات المدروسه فى كلا الموسمين فيماعدا صفات الطول والبركس والسكروز % فى الموسم الثاني وعدد العيدان القابلة للعصير فى كلا الموسمين وقد ظهر تفوق نظام الزراعة بالعود المقسم إلى ثلاث قطع على النظم الأخرى فى الصفات ذات التأثير المعنوي تحت نظم الزراعة المختلفة ما عدا صفة سمك الساق..

٣- لم يؤثر التفاعل بين عاملى الدراسه معنويا على أى من الصفات المدروسه فيما عدا النقاوة فى الموسم الأول حيث حقق الصنف جيزة- تايوان ٥٤-٩ عند الزراعة بعيدان مقسمه الى ثلاث قطع أعلى القيم للنقاوة.

تحت ظروف هذه الدراسة يوصى بزراعة أصناف قصب السكر (جيزة تايوان ٥٤-٩ وجيزة ٩٨-٢٨ والصنف فلبينى ٨٠١٣ بتقطيع عيدان القصب إلى ثلاث قطع للعود للحصول على أعلى محصول من العيدان والسكر.

قام بتحكيم البحث

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