Response of Sweet Sorghum Cultivar to Maturity Stage, Nitrogen and Potassium Fertilizations

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ABSTRACT

Tow field experiments were conducted in two successive seasons 2000 and 2001 at Sabahia Agric Res . Station at Alexandria governorate to study the effect of two maturity stages milk and dough , four levels of nitrogen 0,40, 80 and120 kg N/fed.and two levels of potassium 0 and 48 kg K_2O/fed . on yield, yield components and quality attributed to " Honey" cultivar of sweet sorghum the treatment were arranged in split-split plot experimental design in four replecations. The following are the most important results . The mean values of total soluble solids % and sucrose content % in juice at different maturity stages , gave the highest values at dough stage . The application of 120 kg N and 48 kg K_2O / fed . gave the maximum values of gross stalks , stripped stalks , forage , bagasse , Juice , syrup yields , juice , syrup extraction % , T.S.S, sucrose and purity percentage in juice . However , no significant difference between 80 and 120 kg N / fed . in sucrose and purity % in juice . Finally, harvest at dough stage and fertilization with 120 kg N + 48 kg K_2O/ fed . could be recommended at sabahia to achieve the maximum syrup production of sweet sorghum .

INTRODUCTION

Sweet sorghum (*Sorghum bicolor (L)) Moench* also called sorge has been used for many years as a sucrose of table syrup in the United States. In Egypt, sugar production is not sufficient to cover the local consumption due to population increasing and nearly constant cane planting syrup could be one of the important substitute for sugar. So that improving yield and quality of syrup is main target for many countries. Increasing productivity of sweet sorghum as one of syrup sources could be achieved by improving cultural practices and choosing the proper time for maturity stage . Also nitrogen and potassium fertilization is one of the most important factors for increasing sorghum production .

Maturity stage are one of the most important factor affecting yield and syrup quality of sweet sorghum . Nour , (1963) , revealed that Brix % and purity % progressively increased from milk to reach the maximum value at dough to ripe stage . El – Maghraby and Abd El – Aal (1991) evaluated the quality and analysis profiles of sorghum syrups prepared at different stages of sweet sorghum ripening. They reported that the juice yield and total sugars were high at dough ripening stage than either at milk or starch stage of ripening . Thus dough stage of ripening was of good quality. Abbas and Taha (2000) , studied

the effect of harvesting at different maturity stages on the yield , yield components and syrup characteristics of sweet sorghum . They found that gross , stripped stalks , forage , juice and bagasse yields were the highest at milk stage , while the syrup yield was the lowest .The highest value of the syrup yield (2.7) ton / fed. was found at the dough stage. The T.S.S and purity values of juice were low at milk stage and increased at dough and ripe stages.

Many workers studied the relationship between N and K_2O under Egyptian conditions indicated that increasing .N levels up to 120 kg / fed . resulted in significant increases in yields of forage , stalks , baggasse , juice and syrup as well as extraction percentages of juice and syrup yield , T.S.S ; sucrose and purity percentages of sweet sorghum .

Also , Phaltan (1984) , reported that the application of 150 kg (K_2O) / ha gave 21.9 t the stalk compared with 10.34 for control treatment. Chauhan and Singh (1986) , mentioned that the yield of sweet sorghum stalks were not affected by the application of 30 kg (K_2O) / ha . Sarma and Subramanian (1991) , grown two sorghum cultivars on medium deep Alfisol , given 20 , 40 or 60 kg K_2O /ha . They reported that applied K_2O increased L A I , flag leaf area and DM production . Agnal *et al.* (1993) , found that juice quality and sugar concentration were highest at 120 days after sowing . They added that percentage extractable juice increased with increasing K_2O rate up to 30 kg K_2O / ha . and was highest in cv . Rio . Mean while , sucrose concentration was not significantly affected by K_2O application .

El — Taweel (1994) found that the application of 90 kg N + 48 kg K_2O /fed . gave the highest values of total , stalk, forage yields , juice and syrup extraction percentage , syrup yield and sucrose of sweet sorghum variety tracy , sucrosorgo 301
(S 301) and sucrosorgo 405 (S 405) .

The main objectives of this work is to find out the proper maturity stage application nitrogen and potassium rate for higher yield and good quality of syrup of sweet sorghum [Honey].

Materials and Methods

Field experiments were conducted for the two years 2000 and 2001 at the sabahia Research Farm in Alexandria Governorate , Egypt . Experiments were designed to study the response of one sweet sorghum cultivar (Honey) at maturity stage (Milk & Dough) , four levels of nitrogen and potassium fertilization . These experiments were performed in a clay loamy soil in the two seasone . The physical and chemical analyses of soil are given in Table (1) .
Each experiment included 16 treatments which were the combination between two maturity stages (milk and dough), four levels of nitrogen (0,40 , 80 and 120 kg N/ fed.) and two levels of potassium (0 and 48 kg K_2O /fed.). The bulk samples including the whole plot were harvested at the different maturity stages

(milk and dough stages) . The ripening stages of sweet sorghum are demonstrated as follows :

Milk stage : seeds contain a thin milk liquid .

Dough stage : seeds are firm and easily crushable between fingers .

The treatments in the two seasons were arranged in split - split plot design with four replications . The maturity stages were arranged at random in the main plot,the nitrogen fertilizer levels was added in the form of Urea (46%) was assigned at random in sub – plots . and potassium fertilizer used was in the form of potassium sulphate (48 % K_2O) were arranged at random within the sub – sub plots., nitrogen fertilizer was applied in two equal doses , one before the first irrigation (21 days after sowing) and the other before the second irrigation (35 days after sowing) .While, potassium fertilizer was applied before the first irrigation (21 days after sowing) . phosphorus fertilizer at the rate dos 15.5 kg P2 O5 / fed . was incorporated in the soil during land preparation in the form of calcium super phosphate (15.5 % P2 O5) . Other cultural practices of growing sweet sorghum were applied The sowing dates wer 20th and 28th may in 2000 and 2001 seasons respectively . The seeding rate was 10 kg / fed. in both seasons. Each plot consisted of 6 ridges , 7.0 meters long and 50 cm apart .The plot size was (7x 3=21m2)and 25Cm between hills.

Thinning was done after two weeks from sowing, each hill consisted of one plants. Harvesting was done at 112 and 125 days from planting the milk & dough stage ,respectively.

growth yield and some technological characters were determined from the four middle ridges. Sample size was taken from 10 plants / plot to detemine the following characters were recorde - : 1- Gross stalks yield ton / fed .

2– stripped stalks yield ton / fed.

3 - forage yield ton / fed. = gross stalks yield - stripped stalks yield ton / fed.

4 – Bagasse yield ton / fed. = stripped stalks yield – juice yield ton / fed.

5 - juice yield ton / fed.

6- Juice extraction % = juice yield ton / fed. x 100 / stripped stalk yield ton / fed.

7 - Syrup yield ton / fed.

8 - Syrup extraction % = syrup ton / fed. / stripped stalks yield ton / fed.

9 - Total soluble solids % was determined using Abbe refractometer standarized at 25 C° as described in Plews , (1970).

10- Sucrose % in juice was determined according to A.O.A.C. , (1995).

11 – purity % = sucrose % x 100 / T.S.S. %

The data were subjected to proper statistical analysis of variance according to Snedecor and Cochran (1980) . Duncan's multiple range test (1955) was used for means separation .

Table 1 . Some physical and chemical properties of the experimental soil.

Physical properties:					
Particle distribution					
Seasons	Clay%	Silt%	Sand%	Text. Class	$CaCo_3$ %
2000	42.3	43.1	14.6	Clay loam	5.8
2001	43.1	42.8	14.1	Clay loam	6.9
Chemical properties					
Meq./L.					
Seasons	Ca^{2+}	Mg^{2+}	Na^{+}	K^{+}	CO_3^{-2}	HCO^{-3}
2000	17.25	11.30	14.6	1.25	0.00	2.50
2001	16.31	10.20	13.9	0.96	0.01	2.60
Seasons	Cl^{-1}	SO_4^{-2}	dsm^{-1}	PH (1:25)	Total N%	Organic matte %
2000	27.12	13.5	4.75	7.78	0.10	1.38
2001	25.00	14.5	4.62	8.02	0.13	1.25

RESULTS AND DISCUSSION

1 – Gross stalks yield (ton / fed .) :

Results in Table (2) show that maturity stage did not have significant effect on the gross stalks yield ton / fed . in both seasons of this study .

Regarding nitrogen effect , it was obvious that increasing nitrogen fertilizer level from zero to 40 , 80 , 120 kg N / fed . increased significantly the gross stalks yield of sweet sorghum plants during 2000 and 2001 seasons . the highest gross stalks yield ton / fed . were 29 .67 and 30 .95 ton / fed . , obtained by applying 120 kg N / fed . in 2000 and 2001 seasons , respectively . It could be concluded that nitrogen fertilizer application favorably affected the gross stalks yield and plants responded to high doses of nitrogen , which caused a marked increase in this character . Similar trend was obtained by El – Taweel , (1994) Taha *et al.* (1994) .

Results in Table (2) show that gross stalks yield ton / fed . increased significantly by increasing potassium level up to , 48 kg K_2O / fed. . It was noticed that application of 48 kg K_2O / fed . increased the gross stalks yield by 24.90 and 25.59 ton / fed . compared with the unfertilized sweet sorghum plantswhich gave (22.86 and 23.79) ton /fed. This result is in agreement with that reported by El – Toweel (1994) .

The effect of interaction between maturity stage and N ; K 2O levels was not significant on gross stalks yield in both seasons. In the second seasons , the interaction effect of N X K2O on gross stalks yield ton / fed. was significant .

The maximum value of gross stalks yield was 30.80 ton / fed., produced from 120 kg N + 48 kg K2O / fed. Table (6) .

2 – Stripped stalks yield ton / fed :

Date in Table (2) reveals that maturity stages had no significant effect on stripped stalks yield ton / fed in both seasons .

Table (2) shows that N and K_2O levels had significant effect on stripped stalks yield ton / fed. the highest value of stripped stalks yield was 15.74 and 16.46 ton / fed., recorded when plants received 120 kg N / fed . and 12.99 ; 13 .40 ton / fed. produced from adding 48 kg K_2O / fed . in 2000 and 2001 seasons , respectively. These results were in agreement with those reported by Phaltan (1984),Taha (1990) and El – Taweel (1994) .

Interaction between maturity stage and N levels was significant on stripped stalks yield ton / fed . in the second season ,the maximum value of stripped stalks yield was 16 .94 ton / fed ., produced from dough stage + 120 kg N /fed . (Table 5). Interaction between N and K_2O levels was significant on stripped stalks yield in both season (Table 6). The use of 120 kg N + 48 kg K_2O / fed . gave the highest yields .

Table 2. The average values of gross stalks , stripped stalks , forage and bagasse yields ton /fed. as affected by maturity stage, nitrogen and potassium levels at the seasons 2000 / 2001.

Treatments	Characters							
	Gross stalks yield ton /fed.		Stripped stalks yield ton /fed.		Forage yield ton /fed.		Bagasse yield ton / fed.	
	Seasons							
	2000	2001	2000	2001	2000	2001	2000	2001
Maturity stage :(A)								
Milk stage	23 . 42	24 . 80	12 . 15	12 . 70	11 . 27	12 . 10	5 . 55	5 . 76
Dough stage	24 . 34	24 . 58	12 . 61	13 .05	11 . 73	11 . 08	5 . 93	6 . 25
N level : (B)								
1- 00 kg / fed.	16 .20 d	16 . 61d	8.90 d	9 . 35 d	7.30 d	7 . 26 c	4 . 54 b	4 . 67 d
2- 40 kg / fed.	23.10 c	24.03 c	11.33 c	11.89 c	11.77 c	12.14 b	5.51 ab	5.75 c
3- 80 kg / fed.	26.54 b	27.17 b	13.55 b	13.80 b	12.99 b	13.37 ab	6.26 a	6.44 b
4- 120 kg / fed.	29.67 a	30.95 a	15.74 a	16.46 a	13.93 a	14.50 a	6.66 a	7.17 a
K_2O level : (C).								
1- 00 kg / fed.	22.86 b	23.79 b	11.77b	12.35b	11.09 b	11.44b	5.61	5.84 b
2 - 48 kg/ fed.	24.90 a	25.59 a	12.99a	13.40a	11.91 a	12.19a	5.88	6 .18 a
Interaction effect								
(AB)	N.S.	N .S	N .S	*	N .S	N .S	**	* *
(AC)	N .S	N .S	N .S	N .S	N .S	N .S	N .S	*
(BC)	N .S	**	*	*	N .S	N .S	N .S	N .S
(ABC)	N .S	N .S	N .S	N .S	N .S	N .S	N .S	N .S

3– Forage yield ton / fed .

Data presented in (Table 2) indicated that in both seasons of this study, the forage yield was not significantly affected by maturity stage. This result is in accordance with that obtained by El – Taweel (1994).Forage yield of sweet sorghum plants was significantly increased as nitrogen fertilizer levels from zero to 40, 80 and 120 kg N/ fed. during 2000 and 2001 seasons. Increasing nitrogen application of sweet sorghum plants up to 120 kg N/ fed . gave the maximum value of forage yield 13 .93 and 14.50 ton / fed . in both seasons , respectively . This is true since nitrogen fertilizer increased the plant height , number of branches and leaves / plant , as well as leaves area / plant and L . A . I .These results were in agreement with those reported by Taha (1990) and El – Taweel (1994) .

The mean of forage yield increased significantly by increased potassium level up to 48 kg K_2O / fed . resulted in increased the forage yield by 11.91 and 12.19 ton/fed. during 2000 and 2001 seasons, respectively when compared with zero potassium fertilizer . Similar conclusion was observed by El – Taweel (1994) .

There was no significant interaction of maturity stage X N level, maturity stage x K_2O levels and N x K_2O levels on forage yield.

4 – Bagasse yield ton / fed .

The present results in (Table 2) show that the maturity stage had no significant effect on bagasse yield in both seasons of this study . The application of N fertilizer up to 120 kg N/ fed . gave the highest bagasse yield in the two seasons (6.66 and 7.17 ton / fed.).

Statistical analyses showed that the bagasse yield no significont effect on of different levels of potassium fertilizer in 2000 season . While in 2001 season , the application of 48 Kg K_2O / fed . increased significantly the baggasse yield . Similar trend was obtained by El – Maghraby *et al.*.(1990) and Abbas and Taha (2000) . Interaction between maturity stage and N levels was significantly on bagasse yield Table (5). The maximum mean values of 7.27 and 7.95 ton / fed . recorded when plants received 120 kg N / fed . at dough stage in 2000 and 2001 seasons , respectively . Table (5) .

There was no significant interaction of maturity stage with potassium fertilizer in the first season, but in the second season , the interaction significantly affected this character. The highest bagasse yield 6.58 ton /fed. was obtained by dough stage under the application of 48 kg K_2O / fed . Table (3a) .

Table 3a. The average values of bagasse yield ton/fed. as affected by the interaction between maturity stage and Potassium levels at the season 2001.

Stage	Milk	Dough
K_2O Levels		
00	5.75 b	5.92 b
48	5.77 b	6.58 a

5 – Juice yield ton / fed .

In both seasons of this study, the juice yield was not significantly affected by maturity stage . Similar trend was obtained by Taha , (1963), El – Taweel (1994). With regard to nitrogen effect, juice yield ton / fed . increased significantly by increasing rates of nitrogen fertilizer from zero up to 120 kg N / fed . This increase was 5.82 ; 6.14 and 7.29 ; 7.36 and 9.08 ; 9.29 ton / fed . for 40 , 80 ,120 kg N / fed . during 2000 and 2001 seasons , respectively as compared with the unfertilized plants Table (3) . The result is in harmony with that obtained by Taha (1990) and El – Taweel (1994) . On the other side juice yield significantly increased by increasing potassium (48 kg K_2O / fed). in both seasons .Similar trend was obtained by El – Taweel (1994) .

Statistical analyses showed that juice yield was significantly affected by the interaction between N and K_2O levels Table (6) . The highest juice yield was 9.83 and 9.82 ton / fed in 2000 and 2001 seasons , respectively , obtained from application of 120 kg N / fed . + 48 kg K_2O / fed . There were no significant interaction effect between maturity stage x N and K_2O in both seasons .

6 – Juice extraction percentage :

Results in Table (3) show that there were no significant differences between the averages of juice extraction at milk and dough stages and also indicated that nitrogen levels had a significant effect on juice extraction percentage. The highest percentage of juice extraction was 57.69 and 56.44 % obtained by applying 120 kg N fed in 2000 and 2001 seasons, respectively. Similar trend was obtained by El – Taweel (1994) and Hefni *et al.*.(1997) . Also, juice extraction in sweet sorghum plant was significantly increased by the application of 48 kg K_2O / fed in the first season . The same trend was obtained by Agnal *et al.* . (1993) and El – Taweel (1994) .

The interaction effect between maturity stage and N level was significant on juice extraction percent Tabel (5) the highest values was 60.05 and 60.05 % in both seasons, respectively obtained from the application of 120kg N/fed . at milk stage.

Table 3. The average values of juice yield ton/ fed. , juice extraction %, , syrup yield ton / fed. and syrup extraction % as affected by maturity stage, nitrogen and potassium levels at the seasons 2000 / 2001.

Treatments	Characters: Juice yield ton /fed.		Juice extraction %.		Syrup yield ton /fed.		Syrup extraction %	
	Seasons							
	2000	2001	2000	2001	2000	2001	2000	2001
Maturity stage :(A)								
Milk stage	6.60	6.94	54.32	54.64	1.176	1.229	9.68	9.68
Dough stage	6.68	6.80	52.97	52.11	1.207	1.220	9.57	9.34
N level : (B)								
1- 00 kg / fed.	4.36 d	4.68 d	48.99 b	50.05 b	0.713 d	0. 737 d	8.01 d	7.88 d
2- 40 kg / fed.	5.82 c	6.14 c	51.38 ab	51.64 ab	1.003 c	1.044 c	8.85 c	8.78 c
3- 80 kg / fed.	7.29 b	7.36 b	53.80 ab	53.33 ab	1.317 b	1.338 b	9.72 b	9.69 b
4- 120 kg / fed.	9.08 a	9.29 a	57.69 a	56.44 a	1.735 a	1.779 a	11.02 a	10.81 a
K_2O level : (C).								
1- 00 kg / fed.	6.16 b	6.51 b	52 .34 b	52.71	1.089 b	1.136 b	9.25 b	9.20 b
2 - 48 kg/ fed.	7.11a	7.22 a	54.73 a	53. 88	1.294 a	1.314 a	9.96 a	9. 80 a
Interaction effect								
(AB)	N .S	N .S	*	**	N .S	N .S	N .S	**
(AC)	N .S	N .S	N .S	N .S	N .S	N .S	N .S	N .S
(BC)	*	*	N .S	N .S	**	*	N .S	N .S
(ABC)	N .S	N .S	N .S	N .S	N .S	N .S	N .S	N .S

7 – Syrup yield ton / fed. :

The average value of syrup yield ton / fed. was not significantly affected by Maturity stage in both seasons of the study Table (3) .While,there was a sigificantly increased by increasing levels of nitrogen fertilizer up to 120 kg N / fed. The highest yield of syrup was 1.735 and 1.779 ton / fed., during 2000 and 2001 seasons , respectively .This result is due to the effect of nitrogen on talk and juice yields.Similar trend was obtained by Taha *et al* (1994) and Hefni *et al.* (1997).

The results indicated that syrup yield was significantly affected by the application of potassium fertilizer in both seasons. The highest syrup yield was 1.294 and 1.314 ton / fed . obtained from applying 48 kg K_2O / fed .

The interaction effect between N and K_2O levels was significant on syrup yield during both seasons Table (6). The maximum value of syrup yield 1.911 and 1.909 ton/fed . produced from 120 kg N + 48 kg K_2O /fed .

8 – Syrup extraction percentage. :

Data in Table (3) indicate that the syrup extraction percentage of sweet sorghum plants not significantly affected by maturity stage during both seasons of he study . The average values of syrup extraction percentage significantly increased by increasing N level up to 120 kg N fed . to 11.02 and 10.81 % in both seasons , respectively, (Table 3) . The increase in syrup extraction resulted from the favourable stimulating effect of nitrogen on stalk yield , total soluble solids , sucrose percentage , juice extraction and purity percentage . Similar trend was obtained by El – Taweel (1994) , Taha *et al.* .(1994) and Hefni *et al.* (1997) . Potassium levels had a significant effect on syrup extraction percentage . The use of 48 kg K_2O / fed. gave the highest percentage of syrup extraction . The increase in syrup extraction percentage with the application of potassium fertilizer is mainly due to the role of potassium in synthesis , translocation and accumulation of carbohydrates in plants . Similar trend was obtained by El – Taweel (1994) .

The interaction between maturity stage and N level was significant on syrup extraction in the second season , Table (5) . The maximum values of syrup extraction percentage was 11.37 % , obtained with 120 kg N fed .at milk stage .

9 – Total soluble solids percentage. :

Data presented in Table (4) indicated that total soluble solids of sweet sorghum plants was not significant of maturity stage in the first season, while in the second season , there was significant effect in T.S.S.The highest T.S.S (14.35%) was obtained by dough stage . Nitrogen levels exhibited a significant effect on T.S.S % at the two maturity stages and T.S.S % significantly increased by increasing N level up to 120 kg N fed . at dough stage . The favourable effect of nitrogen fertilizer on this character might be explained as the direct effect of nitrogen as essential element in increasing photosynthesis activity and

subsequently chemical contents such as total soluble solids . Similar trend was obtained by El – Taweel (1994) , Taha *et al.* (1994) , Hefni *et al.* . (1997) and Abbas and Taha (2000) .

Statistical analyses showed that the T.S.S % was not significantly affected by the application of potassium fertilizer in the second season . But in the first season , the application of 48 kg K_2O / fed . increased significantly the T.S.S % by 14.30 % . This result may be due to the potassium function as an ctivator for many enzymes of carbohydrates metabolism . The same trend was obtained by El- Taweel (1994) .

All interactions were not significant with respect to this character in the both seasons .

10 – Sucrose percentage in juice. :

The present results in Table (4) showed that maturity stage had significant effect on the sucrose percentage in juice and were recorded in the second season only, while dough stage gave higher value 8.51 % . The same trend was obtained by El – Maghraby and Abd El – Aal (1991) , El – Taweel (1994) , Hefni *et al.* . (1997) and Abbas and Taha (2000)

The means percentage of sucrose in juice significantly increased by increasing the level of nitrogen fertilizer up to 80 kg N / fed,. However , no significant difference was obtained between 80 and 120 kg N / fed . in sucrose percentage in juice . These results are agree with the fact that adding nitrogen fertilization caused favors growth development which consequently increases sucrose content in juice stalk . Similar trend was obtained by El – Taweel (1994) , Taha *et al.* (1994) , Hefni *et al.* , (1997) and Abbas and Taha (2000) .

The average of sucrose percentage as influenced by application of potassium fertilizer was significant in both seasons . The highest sucrose percent 8.71 and 8.48% was obtained by the application of 48 kg K_2O / fed ., respectively , as compared with the control . This result is to be expected since potassium acts as a Co – factor or activator for many enzymes of carbohydrates metabolisum. Similar trend was obtained by El – Taweel (1994).

All interaction effeects were not significant with respect to this traits in both seasons.

Table 4. The average values of total soluble solids %, sucrose content and purity % in juices as affected by maturity stage, nitrogen and potassium levels at the seasons 2000 / 2001.

Treatments	Characters					
	Total soluble solids %		Sucrose content %in juice.		Purity % in juice	
	Seasons					
	2000	2001	2000	2001	2000	2001
Maturity stage :(A)						
Milk stage	13.88	13.85 b	8.18	8.02 b	58.93	57.91
Dough stage	14.29	14.35 a	8.62	8.51 a	60.32	59 .30
N level : (B)						
1- 00 kg / fed.	12.71 b	13.13 c	6.98 c	6.97 c	54.92	53.08 c
2- 40 kg / fed.	13.67 ab	13.83 b	7.89 b	7.78 b	57.72	56.25 bc
3- 80 kg / fed.	14.79 ab	14.50 a	9.57 a	9.33 a	64.70	64.34 a
4- 120 kg / fed.	15.17 a	14.96 a	9.16 a	8.98 b	60.38	60.02 ab
K_2O level : (C).						
1- 00 kg / fed.	13.79 b	13.94	8.08 b	8.05 b	58.59 b	57.75 b
2 -48 kg/ fed.	14.38 a	14.27	8.71 a	8.48 a	60.57 a	59.42 a
Interaction effect						
(AB)	N .S	N .S	N .S	N .S	N .S	N .S
(AC)	N .S	N .S	N .S	N .S	N .S	N .S
(BC)	N .S	N .S	N .S	N .S	N .S	N .S
(ABC)	N .S	N .S	N .S	N .S	N .S	N .S

Table 5. The average values of stripped stalks and bagasse yields ton / fed. Juice and syrup extraction % as affected by the interaction between maturity stage and nitrogen levels at the seasons 2000 / 2001

		Stripped stalks yield ton/ fed.	Bagasse yield ton / fed.		Juice extraction %		Syrup extraction %
Seasons		2001	2000	2001	2000	2001	2001
Stage	N level						
Milk	00	9.31 f	4.59 d	4.66 e	47.10 d	50.00 d	8.18 e
	40	12.19 e	5.48 c	5.95 cd	51.29 c	51.07 cd	8.75 d
	80	13.32 d	6.07 b	6.05 c	54.56 b	54.46 b	9.75 c
	120	15.98 b	6.06 b	6.38 bc	60.05 a	60.05 a	11.37 a
Dough	00	9.39 f	4.49 d	4.69 e	50.17 c	50.04 d	7.92 e
	40	11.59 e	5.54 c	5.54 d	51.49 c	52.23 bcd	8.79 d
	80	14.27 c	6.45 b	6.83 b	52.98 bc	52.07 bcd	9.60 c
	120	16.94 a	7.27 a	7.95 a	55.22 b	53.00 bc	10.26 b

Table 6. The average values of gross stalks, stripped stalks, juice and syrup yields ton / fed. As affected by the interaction between nitrogen and potassium levels at the seasons 2000 / 2001.

Character			Gross stalks yield ton /fed.	Stripped stalks yield ton / fed.		Juice yield ton /fed.		Syrup yield ton /fed.	
Seasons			2000	2000	2001	2000	2001	2000	2001
Levels									
N		K_2O							
00		00	15.66 e	8.79 e	9.30 e	4.22 e	4.62 e	0.676 g	0.707 f
00	48		16.75 e	9.01 e	9.40 e	4.50 e	4.73 e	0.749 g	0.768 f
40		00	22.22 d	10.92 d	11.63 d	5.50 d	6.01 d	0.938 f	0.991e
40	48		23.97 c	11.73 cd	12.15 cd	6.15 c	6.28 d	1.068 e	1.097 de
80		00	25.01 c	12.56 c	12.81 c	6.61 c	6.66 d	1.184 d	1.196 d
80	48		28.07 b	14.54 b	14.78 b	7.98 b	8.05 c	1.449 c	1.479 c
120		00	28.54 b	14.80 b	15.65 b	8.32 b	8.75 b	1.559 b	1.648 b
120	48		30.80 a	16.68 a	17.26 a	9.83a	9.82 a	1.911 a	1.909 a

11 –Purity percentage :

It is clear from the data listed in Table (4) , that the purity % was not significantly affected by maturity stage in both seasons of the study . Nitrogen levels up to 120 kg N / fed . exhibited a significant effect on purity percentage in the second season .

The mean percentages of purity in juice significantly increased by increasing potassium level up to 48 kg K_2O / fed.which gave the highest percentage of purity in both seasons . Results indicated that there was not significont interactions effect between the three main factors factars under this study on purity percentage in both seasons .

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الملخص العربى

استجابة الذرة السكرية في طور النضج للتسميد الآزوتي و البوتاسى.

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قسم بحوث الفسيولوجى و الكيمياء – معهد بحوث المحاصيل السكرية محطة بحوث * الصبحيه –

** سخا مركز البحوث الزراعية

أقيمت تجربتين حقليتين في موسمي ٢٠٠٠ / ٢٠٠١ بمحطة بحوث الصبحيه (الإسكندرية) لدراسة تأثير طورين من أطوار النضج (الحصاد) و التسميد بأربع مستويات من التسميد النيتروجيني صفر ، ٤٠ – ٨٠ – ١٢٠ كجم نتروجين / ف و كذلك مستويين من التسميد البوتاسي صفر ، ٤٨ كجم بوتاسيوم / ف على المحصول و صفات الجودة لعصير و شراب الذرة السكرية للصنف (هني). باستخدام تصميم القطع المنشقة مرتين في أربع مكررات . و أهم النتائج المتحصل عليها :- سجل السكروز و المواد الصلبة الذائبة الكلية فى العصير تفوقا عند طور النضج العجيني إذا ما قورن بطور النضج اللبني . كما أدى تطبيق المعاملة الخاصة بالتسميد النيتروجيني و البوتاسي ١٢٠ كجم نتروجين / ف + ٤٨ كجم بوتاسيوم / ف إعطاء أعلى قيم فى المحصول الكلى و السيقان النظيفة و العلف و ألبا جاس و العصير و الشراب بالطن / ف و كذلك نسبه استخلاص العصير و الشراب % و نسبه المواد الصلبه الذائبة الكلية و السكروز و النقاوة في العصير و لم تكن هناك فروق معنوية بين المعاملتين ٨٠ ، ١٢٠كجم نتروجين بالنسبة للسكروز و النقاوة في العصير. ما سبق يمكن تطبيق معاملة الإضافة للسماد النيتروجيني و البوتاسى بمعدل ١٢٠كجم نتروجين + ٤٨ كجم بوتاسيوم / فدان والحصاد عند طور النضج العجيني وذلك لحصول على أكبر عائد اقتصادي لمحصول الشراب الناتج من الذرة السكرية تحت ظروف منطقة الصبحيه بالإسكندرية .