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GROWTH, FODDER, GRAIN YIELD, AND CHEMICAL COMPONENTS OF SOME SORGHUM MUTANT LINES AS AFFECTED BY NITROGEN FERTILIZER UNDER SALINE CONDITIONS

By

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ABSTRACT

Two successive experiments were carried out at Desert Research Center Agricultural Experimental Station at Wadi Sudr (South Sinai). Salinity of experimental soil and water used in irrigation were 6131, 4953, and 7989, 4690 ppm for the first and second seasons, respectively. The levels of nitrogen fertilizer used were 30, 60, 90 and 15, 30, 45 kg N/fed. in the first and second seasons, respectively. The results indicated that increasing nitrogen fertilizer from 30 to 90 kg N/fed. in first season decreased plant height, fresh and dry weight of stem, forage yield, and grain yield but increasing nitrogen fertilizer from 30 kg N/fed to 60 kg N/fed. increased protein percent and total carbohydrate in stem, leaves, and grain. On the other hand, 30 kg N/fed, gave highest plant height, stem diameter, fresh and dry weight of leaves and stem, and grain weight in second season.

At two seasons, mutant line No. 15 had the highest stem diameter, fresh and dry weight of leaves and stem, leaf area grain yield, total carbohydrate percent and ash percent.

INTRODUCTION

Sorghum (*Sorghum bicolor* (L.) Moench) is widely grown in regions of irrigated agriculture where soil salinity is

not a common problem. The detrimental effects of salt stress on the growth of sorghum are greater during the vegetative stage of plant development than during germination (Francois *et al.*, 1984) or maturation (Maas *et al.*, 1986).

Patel *et al.* (1975) reported that plant growth is characteristically depressed at certain levels of salt concentrations. Sometimes such effect responds to fertilizers even though growth depression can be expected to reduce nutrient requirements and even though fertilizer application increases salinity to same degree.

The present study was conducted to find out the adequate level of nitrogen fertilizer which gives the maximum forage, grain yield and nutritive elements in some sorghum mutant lines under saline conditions.

MATERIALS AND METHODS

Two field experiments were carried out at Ras Sudr Agricultural Experimental Station, South Sinai Governorate during the two successive seasons (1992 and 1993). The physical and chemical properties of the experimental soil are presented in Table (1, a-b) and underground irrigation water analysis is shown in Table (1-c). Each experiment included thirty treatments which were the combination of nine mutant lines from sorghum (*Sorghum bicolor* L. Moench) as well as the parental cultivar Giza 1 and three nitrogen levels i.e. 30, 60, and 90 kg N/fed. in the first season and 15, 30, and 45 kg N/fed in the second season. The design of each experiment was split plot with six replications (three replications were used for fodder yield and the other three replications were used for grain yield). Nitrogen treatments were arranged at random in the main plots and sub plots were assigned for the mutant lines as well as Giza 1. Grains were sown on May 5th 1992 and 1993. The amounts of nitrogen were added to plots according to treatments in the form of ammonium nitrate (33.5% N) as side row. The half was added after 30 days and the other after at 60 days from sowing. The experimental unit consisted of four ridges and the length was 3 meters in length and 50 cm between ridges. The distance between hills was 20 cm on one side of

the ridge. The normal agricultural treatments of growing sorghum plants were applied. At cutting data, the following growth characters were determined, plant height (cm), main stem diameter (cm), leaf area (cm^2) of the third leaf estimated according to Stickler *et al.* (1961). Leaf area = Max. length x max. width x 0.747, fresh and dry weight of blades/plant (gm), fresh and dry weight of stem + Sheathes/plant (g), leaves/ploline % was determined on fresh leaves by the methods which reported by Bates, 1973).

Table (1) Mechanical and chemical properties of soil and chemical analysis of irrigation water of Wadi Sudr Experimental Station.

a) Physical analysis

Growing season	Particle size distribution (%)			Texture Class	O.M.
	Sand	Silt	Clay		
1992	50.50	24.00	25.50	Sand	0.21
1993	65.00	14.40	20.60	Sand	0.48

b) Chemical analysis

Growing season	pH	EC mmhos /cm	Cations (meq/L.)				Anions(meq/L.)				$CaCO_3$ (%)
			Ca^{++}	Mg^{++}	Na^{+}	K^{+}	$CO_3^{=}$	HCO_3^{-}	Cl^{-}	$SO_4^{=}$	
1992	8.10	9.58	22.6	10.60	64.00	0.40	-	21.00	62.1	14.50	52.2
*1993	7.76	6.15	17.1	11.90	30.60	1.60	-	1.80	33.2	30.90	51.2

*another site in the farm.

c) Chemical analysis of irrigation water

Growing season	pH	EC (ppm)	Cations (meq/L.)				Anions (meq/L.)			
			Ca^{++}	Mg^{++}	Na^{+}	K^{+}	$CO_3^{=}$	HCO_3^{-}	Cl^{-}	$SO_4^{=}$
1992	8.10	7989	25.30	27.10	74.10	0.91	-	5.30	76.30	50.10
*1993	7.22	4690	18.90	5.40	30.80	0.29	-	2.60	39.60	22.90

*another ground well in the farm.

Fodder yield fresh and dry weight (ton/fed), while at harvest time the main head weight (g), 1000 grain weight, grain yield (g/fed.) were estimated.

Samples were dried in an electrical oven at 70°C to constant weight according to (A.O.A.C., 1970). Dry materials were milled to fine powder material and were used for chemical analysis. Total nitrogen was determined with microkjeldahl according to Peach and Tracey (1956) and protein content was

calculated by multiplying the total nitrogen by 6.25. Total carbohydrate determination (T.C.) was determined according to Smith *et al.* (1964). (Crude fiber and Ash percentage were determined in leaves and stem according to the methods described by A.O.A.C. (1970).

The data of all experiments were subjected to proper statistical analysis of variance according to Snedecor and Cochran (1967). The short significant range test was used to compare the means according to Duncan (1955). The means followed by the same letter are not statistically different at 5% levels of significant.

RESULTS AND DISCUSSION

1. Growth and yield:

1.1. Effect of nitrogen fertilizer on growth:

Data in Table (2) show that the difference between all characters studied were significant due to nitrogen fertilizer except stem diameter and leaf area in the first season. In the first season, increasing nitrogen levels decreased plant height, fresh and dry weights of blades and stem + sheaths, forage yield/fed., main head weight, and grain yield per plant. The previous data could be attributed to high concentration of salt cause a decrease in the permeability of roots to water, and hence a decrease in the rate of its entry into plant (Krammer, 1969). Similar results were obtained by Bosemark (1954), Dormar and Ketcheson (1960) and Sabet & Wassif (1970). In the second season, increasing nitrogen fertilizer increased plant height, stem diameter, fresh and dry weight of leaves, stem + sheaths, forage yield, main head weight, and 1000 grain weight.

Similar results were obtained by Bakheit and Abd El Rahium (1984) and Saba *et al.*, (1990). On the other hand, leaf area was not significantly affected by different nitrogen levels treatment in both seasons. In second season low rate (30 kg N/fed.) gave the highest value of leaf area as compared with other nitrogenous levels. This result may be due the low level of N in the second season. Increasing nitrogen fertilizer delayed flowering date in both seasons owing to the nitrogen effect on vegetative period. From previous data, the results

Table (2) : Effect of nitrogen fertilizer levels on yield and its components and proline (%) of some sorghum mutants under saline condition.

N levels kg/fed.	Plant height (cm)	Stem diameter (mm)	Fresh and dry wt.of leaves (g/plant)		Fresh and dry wt.of stem (g/plant)		Forage yield (Ton/fed.)		Leaves/ stem ratio	Leaf area (cm^2)	Flower-ing date	The main head wt. (g)	Grain weight		1000-grain wt. (g)	Proline (%)
			Fresh	Dry	Fresh	Dry	Fresh	Dry					g/head	kg/fed.		
1 9 9 2 growing season																
30	148.7a	12.28a	21.5a	10.65a	97.9a	35.3a	4.26a	1.65a	22.1a	177.2a	62.2c	30.9a	20.30a	649.5a	13.6c	-*
60	132.5b	13.03a	18.8b	9.48b	92.4b	32.3b	3.27b	1.23b	20.5b	172.9a	64.1b	29.1a	18.75b	600.0a	13.5a	-
90	111.1c	12.69a	18.3b	9.11b	87.9c	29.9c	2.72c	1.01c	21.0ab	176.2a	66.1a	21.6b	12.73c	407.1b	13.3b	-
1 9 9 3 growing season																
15	200.6b	11.27b	31.9b	12.46b	120.5b	41.7b	17.89b	8.65b	17.1b	223.9b	63.1c	52.6c	39.33b	1258.7b	13.9b	1.45a
30	213.0a	12.99a	33.7a	13.82a	127.7a	43.7a	20.00a	9.30a	19.2a	242.4a	64.7b	57.4a	43.87a	1403.7a	14.6a	1.26b
45	209.8ab	13.02a	32.7ab	13.10b	122.6b	41.8b	18.88ab	8.48b	17.4b	241.9a	67.0a	54.7b	42.60a	1363.2a	14.0b	1.52a

* Not determined.

showed that the highest values for all characters were obtained by plants received 30 kg N/fed. in both seasons except the flowering date in both seasons and protein percentage in the second season.

1.2. Mutation lines differences:

Data in Table (3) indicate that mutant lines No. 15 and 21 had tallest plant in both seasons. Similar results were obtained by Bakheit and Abdel Rahium, (1984). In the first season, mutant line No. 15 and 32 had the highest stem diameter but mutant line No. 28 and 32 in the second season had the highest stem diameter. Fresh and dry leaves and stem of mutant No. 15 and 43 had the highest value in both seasons. The high forage yield could be attributed to the high value of plant height, stem diameter, fresh and dry leaves, and fresh and dry stem per plant. From the previous data, it could be concluded that mutant line No. 15, 32, and/or 43 could be recommended to be cultivated under saline conditions. In both seasons, mutant line No. 21 and 26 had the highest ratio of leaves/stem. Such result indicates that the both mutant lines had better forage yield. On the other hand, mutant lines No. 32 and 15 had the highest leaf area in the first and second seasons, respectively. Mutant lines No. 16 in first season and mutant line No. 15 in second season had the highest grain yield. This could be attributed to the increase in head weight, 1000 grain weight, and grain yield/head. Similar results were obtained by Shannon *et al.* (1981). It could be concluded that mutant lines No. 15, 16, 17, 32, and 43 as relatively later mature genotypes, had a larger vegetative organs and hence produced high assimilator that increased dry forage yield.

1.3. Effect of the interaction between genotypes and nitrogen levels:

All characters in this investigation were significant in relation to the effect of the interaction between genotypes and nitrogen levels (Table 4). Significantly of these interactions with N fertilizer levels related mainly to the different ranking of genotypes from one N-fertilizer level to another. Under 30 kg N/fed. levels mutant lines 15 and 12 had tallest plant in the first

Table (3) : Effects of some sorghum mutant lines on yield and its components under saline conditions.

Code No. of mutant line	Plant height (cm)	Stem diameter (mm)	Fresh and dry wt.of leaves (gm/plant)		Fresh and dry wt.of stem (g/plant)		Forage yield (Ton/fed.)		Leaves/ stem ratio	Leaf area (cm^2)	Flower-ing date	The main head wt. (g)	Grain weight		1000-grain wt. (g)	Proline (%)
			Fresh	Dry	Fresh	Dry	Fresh	Dry					g/head	kg/fed.		
1992 growing season																
Giza-1	116.7d	11.20c	17.7d	9.00	90.5d	32.3cd	3.16cd	1.21d	19.6cde	153.7ef	64.4b	23.6bc	14.13bc	452.1c	13.0cd	- *
2	134.8b	12.98ab	19.6a-d	10.06abc	96.8abc	33.4bc	3.63b	1.35bc	20.2b-e	164.1de	53.4d	27.2b	16.96b	542.6b	13.2c	-
15	153.7a	13.90a	18.3cd	9.36bcd	100.3a	37.0ad	3.94a	1.57a	18.2e	191.4b	65.0b	26.7b	16.94b	542.3b	13.8b	-
16	128.3c	12.89abc	21.0ab	10.49a	94.2bcd	30.8dd	3.24c	1.18de	22.4a-d	185.6bc	64.9b	32.1a	21.94a	702.1a	12.5e	-
17	130.9bc	12.61abc	19.4bcd	10.11abc	95.9a-d	33.8bc	3.28c	1.25cd	20.3a-e	147.1f	65.4b	34.4a	23.79a	761.1a	12.1f	-
21	157.1a	12.59abc	19.9abc	9.64a-d	83.5e	27.3e	3.27c	1.18de	24.0a	188.1b	62.7c	22.0c	13.21c	422.7c	13.0d	-
26	135.0b	13.21ab	18.5cd	9.20cd	81.2e	27.2e	2.94d	1.06e	23.0ab	176.0cd	62.3c	22.6c	13.63c	436.1c	14.0b	-
28	120.1d	11.62bc	17.8d	9.02d	91.8cd	31.6cd	3.16cd	1.16de	19.5de	172.3d	63.9bc	26.3b	15.62bc	500.0bc	13.2cd	-
32	103.8e	13.86a	21.5a	10.25ab	95.4a-d	35.2ab	3.71ab	1.48ab	22.5abc	203.0a	74.0a	32.9a	22.08a	706.4a	14.7a	-
43	127.4c	11.60bc	21.5a	10.36a	97.8ab	36.4a	3.84ab	1.49a	22.1a-d	173.0d	65.1b	24.1bc	14.27bc	456.6bc	13.3c	-
1993 growing season																
Giza-1	198.7cd	12.48ab	32.8bcd	13.23b-e	121.1c	42.9c	19.45ab	8.71bc	17.2de	234.8d	65.4b	54.7d	41.11d	1315.6d	14.1c	1.27bc
2	207.9bc	12.51ab	34.5ab	14.77a	129.9a	44.8a	20.00ab	9.31ab	17.2de	245.8a	54.7e	61.0b	43.89c	1404.4c	14.0c	1.47abc
15	209.6ab	12.67b	34.9a	14.36ab	126.2b	43.4bc	19.73ab	9.69a	18.0bcd	244.3ab	65.7b	70.9a	55.11a	1763.6a	14.2c	1.26bc
16	216.2ab	12.66ab	32.9a-d	13.62abc	126.7b	42.7c	19.84ab	9.51ab	18.5b	230.4de	65.9b	52.8de	41.00d	1312.0d	13.0d	1.06c
17	212.1ab	12.17ab	31.2d	11.98e	118.1cd	40.1e	16.89cd	7.80e	18.6bce	239.9bc	64.9c	62.4b	48.56b	1553.8b	12.8d	1.51abc
21	217.7a	11.81b	33.3abc	13.11b-e	125.9b	41.5d	19.17b	8.46cde	19.9a	236.7cd	63.8cd	44.4f	34.00f	1085.0f	14.0c	1.43bc
26	207.5bc	12.52ab	31.6cd	12.24de	120.6cd	40.6de	17.78c	7.97de	20.4a	239.2bc	63.1d	42.4f	33.00f	1056.0f	14.1c	1.67ab
28	208.3abc	13.10a	31.3cd	11.92e	117.9d	38.7f	16.44d	7.82e	16.4ef	226.8e	65.6b	51.1e	38.11e	1219.6e	14.5bc	1.81a
32	210.0ab	13.11a	31.8cd	12.56cde	124.7b	43.9ab	19.39ab	8.82bc	17.4cde	226.6e	74.1a	51.6e	40.33d	1290.7d	15.1a	1.39abc
43	191.5d	12.28ab	33.1a-d	13.50a-d	125.1b	44.2a	20.56a	10.01a	15.4f	236.4cd	66.0b	57.6c	44.22c	1415.1c	15.1b	1.25bc

* Not determined.

Table (4) : The average values of growth measurements and forage yield of sorghum as affected by interaction effect between cultivar Giza-1, mutant lines and N-fertilizer levels in 1992 and 1993 seasons.

Mutant lines No.	Plant height (cm) N-level 30	60	90	Stem diameter (cm) N-level 30	60	90	Leaf area (cm²) N-level 30	60	90	Leaves/stem ratio N-level 30	60	90
						1992 season						
Giza-1	135.3Aef	117.3ABcd	96.3Bc	10.33Aa	11.60Aa	11.67Aa	155Ac	152Acd	154Abc	20.33Aab	19.20Aab	19.40Aa
2	154.7Acde	134.7Bbc	115.0Bb	13.27Aa	12.70Aa	12.97Aa	189Aab	157Bcd	147Bc	21.40Aab	20.00Aab	19.33Aa
15	169.0Aa	158.7Ba	134.3Cbc	13.40Aa	14.57Aa	13.73Aa	186Aab	203Aa	139Bc	19.33Ab	16.87Ab	18.50Aa
16	141.0Ac-f	130.0ABbc	114.0Bbc	12.03Aa	14.47Aa	12.17Aa	189Aab	187Aab	181Aab	23.23Aab	21.30Aab	22.67Aa
17	159.0Abc	131.7Bbc	102.0Cbc	11.87Aa	12.43Aa	13.53Aa	154Ac	141Ad	146Ac	20.33Aab	19.73Aab	20.77Aa
21	174.7Aab	156.3ABa	140.3Ba	12.33Aa	12.90Aa	12.53Aa	175Abc	194Aa	195Aa	25.53Aa	22.43Aab	23.97Aa
26	156.0Acd	143.7Aab	105.3Bbc	13.73Aa	14.03Aa	11.87Aa	165Abc	178Aabc	185Aa	21.63Aab	23.67Aa	23.53Aa
28	129.0Af	122.3Ac	109.0Abc	11.53Aa	12.13Aa	11.80Aa	173Abc	163Abcd	182Aa	21.33Aab	17.83Ab	19.33Aa
32	109.0Ag	103.3Ad	99.0Ac	13.43Aa	13.93Aa	14.20Aa	212Aa	191Aab	206Aa	23.47Aab	22.27Aab	21.73Aa
43	139.7ABef	127.0ABbc	115.7Bbc	10.86Aa	11.53Aa	12.40Aa	173Abc	164Abcd	182Aa	24.07Aab	21.23Aab	20.90Aa
	15	30	45	15	30	45	15	30	45	15	30	45
						1993 season						
Giza-1	191.8Aa	200.9Aab	203.3Aab	10.50Bab	13.93Aabc	13.00Aabc	219Bbc	245Abc	240Abcd	16.99ABcd	18.92Aa	15.62Bde
2	189.3Ba	205.1ABab	226.3Aa	10.26Bb	14.10Aab	13.17Aabc	224Babc	259Aa	255Aa	15.48Bd	19.37Aa	16.61ABcd
15	208.3Aa	214.9Aab	205.6Aab	11.40Aab	11.93Ac	11.67Ac	233Ba	250Aab	250Aab	18.70ABbc	19.11Aa	16.04Bd
16	200.2Aa	226.8Aa	221.8Aa	12.47Aa	12.17Abc	13.33Aabc	220Bbc	235Acd	237Acd	16.69Bcd	19.92Aa	19.27ABbc
17	189.5Ba	221.5ABab	225.4Aa	12.10Aab	11.90Ac	12.50Aabc	231Bab	245Abc	244Aabc	17.20Acd	18.86Aa	19.56Ab
21	202.2Aa	228.9Aa	221.9Aa	10.40Bab	12.67Aabc	12.37Abc	223Babc	242Abc	245Aabc	22.00Aa	19.71ABa	18.11Bbcd
26	203.5Aa	216.5Aab	202.5Aab	11.40Bab	12.27ABabc	13.90Aab	230Babc	243Abc	245Aabc	21.19Aab	17.41Ba	22.67Aa
28	210.7Aa	213.0Aab	201.3Aab	11.50Bab	14.37Aa	13.43Aabc	218Bc	229Ad	233Acd	12.34Be	19.42Aa	17.38Abcd
32	210.3Aa	212.2Aab	207.5Aab	10.60Bab	14.17Aab	14.57Aa	218Bc	233Acd	229Ad	16.34Bcd	19.76Aa	16.18Bd
43	200.2Aa	191.9Ab	182.4Ab	12.07Aab	12.47Aabc	12.30Abc	223Babc	244Abc	242Abc	14.28Bde	19.04Aa	12.90Be

Table (4): Cont.

Mutant lines No.	Leaves weight (g/plant)						Stem weight (g/plant)					
	Fresh			Dry			Fresh			Dry		
	N-level			N-level			N-level			N-level		
	30	60	90	30	60	90	30	60	90	30	60	90
					1992 season							
Giza-1	19.70Ab	16.90Aa	16.53Aa	10.03Aab	8.73Aa	8.23Aa	35.50Aab	32.33Aa	29.20Aa	35.50Abc	32.33Aabc	29.20Aabc
2	21.90Aab	19.00ABa	17.77Ba	11.23Aab	9.90Aa	9.03Aa	36.13Aab	32.50Aa	31.13Aa	36.13Abc	32.50Aabc	31.13Aabc
15	20.77Aab	16.57ABa	17.53Aa	10.27Aab	8.73Aa	9.07Aa	42.77Aa	34.83Aa	33.33Aa	42.77Aa	34.83Ba	33.33Ba
16	22.67Aab	20.33Aa	20.00Aa	12.03Aa	9.93Aa	9.50Aa	33.10Aab	30.73Aa	28.63Aa	33.10Abcd	30.73Aabc	28.63Aabc
17	20.80Aab	18.77Aa	18.63Aa	11.33Aab	9.97Aa	9.03Aa	36.27Aab	34.30Aa	30.77Aa	36.27Abc	43.30Aab	30.77Aabc
21	21.13Aab	19.67Aa	18.87Aa	10.07Aab	9.83Aa	9.03Aa	28.20Ab	27.97Aa	25.77Aa	28.20Ad	27.97Abc	25.77Abc
26	18.87Ab	18.43Aa	18.20Aa	9.17Ab	9.03Aa	9.40Aa	29.83Ab	26.63Aa	25.00Aa	29.83Acd	26.63Ac	25.00Ac
28	20.37Aab	16.47Ba	16.67Ba	9.53Aab	8.77Aa	8.77Aa	32.90Aab	32.43Aa	29.40Aa	32.90Abcd	32.43Aabc	29.40Aabc
32	23.67Aab	20.77ABa	20.00Ba	11.20Aab	10.00Aa	9.57Aa	39.07Aab	34.17Aa	32.27Aa	39.07Aab	34.17Aab	32.27Aab
43	24.70Aa	20.57Ba	19.23Ba	11.67Aab	9.93Aa	9.47Aa	39.57Aab	36.53Aa	33.03Aa	39.57Aab	36.53Aa	33.03Aa
	15	30	45	15	30	45	15	30	45	15	30	45
					1993 season							
Giza-1	31.50Aabc	33.57Aa	33.40Aa	12.60Aabc	13.70Aab	13.40Aa	41.50Aab	44.40Aab	42.67Aa	41.50Abcd	44.40Abc	42.67Abc
2	34.30Aab	35.57Aa	33.77Aa	14.50Aa -	15.30Aa	14.50Aa	45.20ABa	48.30Aa	41.00Ba	45.20Ba	48.30Aa	41.00Ccd
15	34.50Aab	35.57Aa	34.70Aa	14.00Aab	14.77Aab	14.30Aa	42.10Aab	45.97Aab	42.20Aa	42.10Bbcd	45.97Aab	42.20Bbcd
16	35.70Aa	32.30ABa	30.57Ba	14.87Aa	13.50ABab	12.50Ba	42.70Aab	43.47Aab	41.90Aa	42.70Aabc	43.47Abc	41.90Abcd
17	29.77Ac	32.17Aa	31.67Aa	10.89Ac	12.77Aab	12.27Aa	39.70Aab	40.47Ab	40.00Aa	39.70Ad	40.47Ad	40.00Acd
21	31.47Aabc	34.37Aa	34.07Aa	11.77Bbc	14.00Aab	13.57ABa	40.40Aab	43.27Aab	40.80Aa	40.40Acd	43.27Abc	40.80Acd
26	30.50Abc	32.27Aa	31.97Aa	11.07Ac	13.00Aab	12.67Aa	39.87Aab	41.77Aab	40.17Aa	39.87Ad	41.77Acd	40.17Acd
28	29.37Ac	32.27Aa	32.17Aa	11.07Ac	12.40Ab	12.30Aa	36.77Ab	39.60Ab	39.50Aa	36.77Be	39.60Ad	39.50ABd
32	28.80Bc	33.40Aa	33.30Aa	11.00Bc	13.40Aab	13.27Aa	41.50Aab	44.50Aab	45.67Aa	41.50Bbcd	44.50Abc	45.67Aa
43	32.87ABabc	35.27Aa	31.27Ba	12.87Babc	15.37Aa	12.27Ba	43.47Aab	45.20Aab	44.07Aa	43.47Aab	45.20Ab	44.07Aab

تأثر النمو والمحصول الخضرى والحبوب والتركيب الكيماوى لبعض سلالات السورجم بالتسميد الأزوتى تحت ظروف الملوحة

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أقيمت تجربتان حقليتان بمحطة تجارب مركز بحوث الصحراء بوادى سدر بمحافظة جنوب سيناء خلال موسمى ١٩٩٢ ، ١٩٩٣ بهدف دراسة تأثير مستويات التسميد الأزوتى ٣٠ ، ٦٠ ، ٩٠ كيلوجرام أزوت / فدان فى الموسم ١٩٩٢ و ١٥ ، ٣٠ ، ٤٥ كيلوجرام أزوت /فدان على نمو والمحصول الخضرى والحبوب والتركيب الكيماوى فى موسم ١٩٩٣ لتسع طفرات سورجم مقارنة بالصنف جيزة ١ والتفاعل بينهم .

تشير النتائج الى أن زيادة التسميد الأزوتى من ٣٠ كيلوجرام نتروجين الى ٩٠ كيلوجرام نتروجين للفدان فى الموسم الأول يؤدى الى نقص طول النبات والوزن الغض والجاف للساق والمحصول الخضرى ومحصول الحبوب ولكن زيادة التسميد الأزوتى من ٣٠ كيلوجرام نتروجين للفدان الى ٦٠ كيلوجرام نتروجين للفدان يؤدى الى زيادة نسبة البروتين ونسبة الكربوهيدرات الكلية فى الأوراق والسيقان والحبوب. أعطى التسميد الأزوتى ٣٠ كيلوجرام نتروجين للفدان فى الموسم الثانى أطول نباتات وأسمك سيقان وزيادة المادة الغضة والمادة الجافة للأوراق والسيقان وزيادة وزن الحبوب.

أعطت الطفرة ١٥ فى كلا الموسمين أسمك قطر للساق وأعلى وزن غض وجاف للأوراق والسيقان وأكبر مساحة أوراق وأعلى محصول ونسبة كربوهيدرات كلية ورماد.