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EFFECT OF MAGNESIUM, FARMYERD MANURE AND MINERAL FERTILIZERS ON YIELD, YIELD COMPONANETS AND NUTRIENT CONTENTS OF SOME FLAX GENOTYPES ON SANDY SOILS.

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ABSTRACT

Two field experiments were conducted during 2000/2001 and 2001/2002 growing seasons on sandy soil at Ismalia Agric. Res. Station to study the effect of magnesium (0,100 and 200ppm) as a foliar spray, Farmyard manure and mineral fertilization on yield, yield components and nutrient contents of three flax genotypes (Sakha 1, S 402/7/17/3 and S3). The treatments were arranged in a split split-plot design with three replicates. Combined analysis overall the two years for all data were performed.

The obtained results could be summarized as follows:

1. Strain 402/7/14/3 gave the highest values of plant height, technical stem length, and straw yield per plant and per faddan, number of capsules per plant, seed yield per plant and per faddan followed by Sakha1 and S3.
2. Slight differences between farmyard manure (FYM) and mineral fertilizer (M.F) could be observed in all studied characters and these differences did not reach the level of significance.
3. Straw yield per fad., seed yield/fad. and their related characters were significantly increased by magnesium during both seasons
4. The differences between the effect of the two magnesium concentrations and untreated (control) treatment were significant and the highest values of all characters under study were obtained by 200 ppm of magnesium. Also, there are significant differences between 100 and 200 ppm of magnesium concentration.
5. The yield and yield components were not significantly respond to the triple interaction. The maximum values of both flax yields (seed and straw) were obtained with S2*FYM*200ppm Mg.
6. seed nitrogen, phosphorus and potassium contents were significantly increased with (strain1) flax genotypes and mineral fertilizer had significant effect on seed content of P and K and insignificant effect on N content.
7. Foliar spray significantly increased seed N,P and K content at the rate of 200 ppm Mg. It can also observed that the maximum values of both seed content of Nitrogen and phosphorus were obtained with S2*FYM*200ppm Mg. while, the highest value of seed content of potassium was obtained with S2*M.F* Mg (200ppm.)

Keywords: magnesium- FYM- mineral fertilization- flax- sandy soil.

INTRODUCTION

Flax (*Linum usitatissimum*) is widely grown for fiber and seed in Egypt. Several efforts were carried out to increase the fertility of the new lands to increase the yield of flax plants per faddan in order to minimize the great gab between productivity and consumption.

Previous studies recorded by many authors showed that the yield of various genotypes (promosing strains and local Varity) were studied differed significantly from each others (Momtaz *et al* (1989), El-Swiefy *et* al (1996) , Moawed (2001) and El-Deeb (2002).

Organic manures increase soil organic matter and hence improved their physical, chemical and biological properties of many soils. Consequently, the availability of nutrients for plant will be increased as well as the other soil characteristics. (FAO, 1977; Khalil, 2000 and Badran 2000)

Foliar application of plant nutrients proved to be useful for several plant species. Kene et al (1990) showed that foliar application of Mg increased yield and oil content of sunflower, while Negm *et al* (1997) found that foliar application of Mg at the high rate (4%) significantly increased the seed and straw yield. On other hand, Abd El-Mottalb et al (1998) found that seed yield and yield components of faba bean increased with Mg addition as foliar spray (100ppm Mg) but these were not significant.

MATERIALS AND METHODS

Two field experiments were conducted at Ismaelia Agric. Res. Station (sandy soil) during the two successive seasons of 2000/2001 and 2001/2002 to study the effect of magnesium as foliar spray, Farmyard manure and mineral fertilization on yield and yield components of some flax genotypes grown on sandy soil under sprinkler irrigation system.

A split- split design in four replications was used where flax genotype treatments (Local Varity Sakh1, S402/7/14/3 and S3) were in main plots, the two sources of fertilizer (Farmyard manure and Mineral fertilizer) treatments in sub-plots and foliar spray with Magnesium (100,200ppm and untreated control) in sub-sub plots. Plot size was 2x3m. Dates of cultivation were on November 15^{th} and 20^{th} during both seasons respectively.

Organic fertilization was done at the rate of 20 m^3 farmyard manure per faddan before planting.

Mineral fertilization was carried out at the levels of 60, 15 and 48kg N, P_2O_5 and K_2O per faddan respectively. Phosphorus (as super phosphate 15% P_2O_5) and potassium (as potassium sulphate 48%K_2O) were added before planting while; nitrogen fertilizer (ammonium sulphate 20.5%N) was added in five equal doses, during growth stage and before flowring.

Magnesium fertilizer doses were 0,100 and 200ppm as $MgSO_4$ and they added foliarly at 30 and 70 days after planting.

All agricultural practices were carried out as recommended in this district. At harvest time ten guarded plants were taken randomly from each plot to record the following character:

1- Plant height (cm).
2- Technical stem length (cm).
3- Straw yield (g / plant)
4- Straw yield(ton/ fad.) from the whole plot area yield basis.
5- Number of fruiting branches/plant.

6- Number of capsules/plant
7- Number of seeds/capsules.
8- Seed yield (g / plant).
9- Seed yield (kg. / fad.).
10- Samples of seeds were oven dried, and ground. Seed N, P and K content were determined according to methods by Chapman and Pratt (1961) and Jackson (1973).

All obtained data were subjected to statistically analysis according to Snedecor and Cochran (1989).

Similar trend of the data was obtained for 2000/2001 and 2001/2002 seasons. Therefore, combined analysis was carried out for each character over two growing season as described by Cochran and Cox (1957), where means value were compared using L.S.D. at 5%level.

Some properties of experimental site are listed in Table (1). It is clearer that the soil is a sandy soils, poor in organic matter, available nitrogen, phosphorus and potassium and have a slightly salinity (EC = 1.40 dS/m).

Table (1): Some soil properties of investigated soil and the added farmyard manure.

Soil character	Value	Soil character	Value
pH	8.14	Organic matter %	0.10
EC dS/m in past	1.40	Coarse sand %	76.20
Soluble cations (meq/L)*		Fine sand %	15.17
Ca^{+2}	4.56	Silt %	2.35
Mg^{+2}	2.60	Clay %	6.30
Na^{+}	3.07	$CaCO_3$ %	2.50
K^{+}	0.36		
Soluble anions (meq/L)		Textural class	Sandy
CO_3^{-}	--	FYM :	
$HCO_3^{=}$	6.60	C%	5.6
Cl^{-}	2.83	Total N%	0.3
$SO_4^{=}$	1.16	C/N	18.6
		Total P%	0.15
Available nutrients(ppm)		Total K%	0.5
**N	21	pH(1:5)	7.3
***P	7	EC dS/m(1:5)	3.5
***K	49		

* Soil: water (1:5) extract
**Extracted with 1% potassium sulphate as described by Jackson (1973)
***Extracted with 0.5M sodium bicarbonate according to Jackson (1973)
***Extracted with 1N ammonium acetate (Jackson, 1973)

RESULTS AND DISCUSSION

I-Effect of genotypes, source of fertilizer and magnesium on flax yield and its components:

1- Genotype effects:

Data represented in Table 2 reveal differences among the flax genotypes and local variety in yield and its components but this differences did not reach the level of significance except characters of technical stem length, straw yield (g / plant) and straw yield (ton /fad.) where the differences reached the level of significance.

The means of technical stem length, straw yield/plant and straw yield/fad., ranged from 63.53 to66.39 cm, 0.911 to 1.221 g and 2.928 to 3.911 ton; respectively. S2(402/7/14/3) gave the highest technical length, and straw yield/fad. whereas, S3 gave the lowest. These results are in agreement with those obtained by El-Shimy *et al* (1985), Hella *et al* (1989) and Moawed *et al* (2001).

Table 2: Effect of genotype on flax yield and its components. (Combined analysis of 2000/2001 and 2001/2002seasons)

Genotype	Plant height (cm)	Techn. stem L.(cm)	Straw yield. g/plant	Straw yield ton/fad.	No.of fruting /branch plant	No.of capsoules /plant	No.of seeds/ capsoule	Seed yield g/plant	Seed yield kg/fad.
S1	69.275	64.33	0.994	3.911	4.610	6.808	6.222	0.436	636.36
S2	71.973	66.39	1.221	3.155	4.342	7.573	6.285	0.602	709.530
S3	69.242	63.53	0.911	2.928	4.133	6.703	5.977	0.431	686.020
L.S.D at 5%	n.s	2.642	0.284	0.210	n.s	n.s	n.s	n.s	n.s

S1= Sakh 1   S2= S402/7/14/3   S3= I. 2384xHera

2 Source of fertilizer effects:

Analysis of variance data in Table 3 show slightly differences in all studied characters and those differences did not reach the level of significance. These results mean that farmyard manure and nitrogen mineral fertilizer could produce the same effects on all flax characters (yield and its components). Thus farmyard manure may could save about 90 kg N/fad as a source of N mineral fertilizer. Similar results were obtained by Mitkess et al (1989) and El Azzouni *et al.* (2002).

The positive effect of FYM on flax yield and its components may be due to the beneficial effect of organic matter on soil properties. Also, due to its contribution to some plant needs from both macro and micronutrients and finally to its effect on raising the availability of nutrients in roots media (Gati 1982).

Table 3: Effect of Mineral and organic fertilizer on flax and its components. (Combined analysis of 2000/2001 and 2001/2002seasons)

Source of fertilizer	Plant height (cm)	Techn. stem L.(cm)	Straw yield g/plant	Straw yield ton/ fad.	No.of fruting /branch plant	No.of capsoules /plant	No.of seeds/ capsoule (g)	Seed yield g/plant	Seed yield kg/ fad.
FYM	68.59	63.881	1.006	3.126	4.374	6.770	6.166	0.495	664.15
M.F	71.74	65.615	1.078	3.001	4.350	7.287	6.157	0.484	690.47
L.S.D at 5%	n.s	n.s	n.s	n.s	n.s	n.s	n.s	n.s	n.s

3- Magnesium effects:

Data in Table 4 show that flax yield and its components were significantly affected by increasing level of Mg application as foliar spray. The highest values of straw and seed yield and yield components were obtained with 200 ppm Mg application. Theses results may be attributed to the major role of Mg as co-factor in almost enzymes activating phosphorylation processes and biochemical functions (Mengel and Kirby, 1987). Also, it could be attributed to the vital role of Magnesium in chlorophyll structure especially in sandy soil. These findings are in agreement with those obtained by Samuel *et al* (1985), Walker *et al* (1989), Sagare et al (1990), Darwish *et al* (1997) and Abd El Motalb *et al* (1998).

Table 4: Effect of magnesium on flax and its components. (Combined analysis of 2000/2001 and 2001/2002seasons)

Mg (ppm)	Plant height (cm)	Techn. stem L.(cm)	Straw yield g/plant	Straw yield ton/fad.	No.of fruting /branch plant	No.of capsoules /plant	No.of seeds/ capsoule (g)	Seed yield g/plant	Seed yield kg/fad
0	64.058	56.407	0.727	2.510	3.471	5.519	4.968	0.334	496.655
100	72.521	67.053	1.057	3.087	4.370	7.027	6.214	0.431	718.147
200	73.931	70.783	1.342	3.597	5.244	8.538	7.302	0.704	817.113
L.S.D at 5%	3.262	2.3682	0.128	0.162	0.159	0.430	0.277	0.130	42.589

Interaction effects:

The interaction between flax genotype and source of fertilizer (FYM &mineral fertilizer) had a significant effect on plant height, technical stem length, number of seeds/capsule, seed yield/faddan and straw yield/faddan (Table 5).

These results mean that the response of flax genotype to fertilizer source was not similar. However, it could be noticed that significant effect of interaction on most of the studied traits means that flax genotype and N-fertilization may had success fully interacted

Table 5: Effect of the interaction between flax genotypes and source of fertilizers on flax yield and its components. (Combined analysis of 2000/2001 and 2001/2002seasons)

G* Fer: G	G* Fer: Fert	Plant height (cm)	Techn. stem L.(cm)	Straw yield g/plant	Straw yield ton/fad.	No.of fruting /branch plant	No.of capsoules /plant	No.of seeds/ capsule (g)	Seed yield g/plant	Seed yield kg/fad
S1	FYM	64.47	59.02	0.76	2.750	4.22	6.01	5.85	0.39	551.52
	M.F	75.07	69.63	1.34	3.110	4.99	7.60	6.59	0.48	432.82
S2	FYM	71.98	66.24	1.22	3.510	4.51	7.57	6.36	0.61	723.24
	M.F	72.11	66.54	1.22	2.810	4.18	7.57	6.21	0.54	695.82
S3	FYM	72.57	66.38	1.03	3.110	4.39	6.72	6.43	0.43	717.68
	M.F	66.49	60.67	0.79	3.100	3.87	6.69	5.52	0.43	654.35
L.S.D at 5%		3.05	3.815	n.s	0.323	n.s	n.s	0.36	n.s	48.72

Data recorded in Table 6 indicate that the interaction between magnesium and source of fertilizer (FYM and M.F) insignificantly affected flax yield and its component except the number of capsules/plant and number of seed/ capsules where interaction gave significant effect. The highest mean values of number of capsules / plant and number of seed / capsules were 9.01 and 7.47 respectively which obtained with 200 ppm Mg and the lowest values were 5.16 and 4.90 which obtained with the control.

Table 6: Effect of interaction between magnesium and source of fertilizers on flax and its components. (Combined analysis of 2000/2001 and 2001/2002seasons)

Mg* Fer Mg	Fert	Plant height (cm)	Techn. stem L.(cm)	Straw yield/p (g)	Straw yield ton/fad.)	No.of fruting /branch plant	No.of capsoules /plant (g)	No.of seeds/ capsule (g)	Seed yield g/plant	Seed yield kg/fad
0	FYM	61.38	55.40	0.73	2.650	3.55	5.16	4.90	0.27	476.11
	F.M	63.14	57.41	0.72	2.360	3.39	5.87	5.03	0.28	517.20
100	FYM	71.60	65.87	1.00	3.090	4.27	7.08	6.27	0.44	716.98
	F.M	73.46	68.24	1.23	3.090	4.47	6.18	6.16	0.42	719.27
200	FYM	70.04	70.38	1.28	3.630	4.97	8.07	7.47	0.72	799.35
	F.M	77.08	71.19	1.40	3.560	5.18	9.01	7.13	0.75	854.87
L.S.D At 5%		n.s	n.s	n.s	n.s	n.s	1.30	0.95	n.s	n.s

Table 7 shows that the interaction between magnesium and flax genotype had insignificant effect on all studies characters, except number of fruiting branches which had significant effect with the interaction. This result suggests that the effect of magnesium under three genotype was the same with respect to the previous exceptive traits and each of these factors acted independently on these characters.

Table 7: Effect of interaction between magnesium and flax genotype on flax and its components. (Combined analysis of 2000/2001 and 2001/2002seasons)

Mg* G Mg	G	Plant height (cm)	Techn. stem L.(cm)	Straw yield g/plant	Straw yield ton/fad.	No.of fruting /branch plant	No.of capsoules /plant	No.of seeds/ capsoule (g)	Seed yield g/plant	Seed yield kg/fad
0	S1	62.22	56.79	0.63	2.32	3.51	5.08	4.91	0.24	493.57
	S2	63.70	57.43	0.87	2.66	3.55	5.94	5.10	0.33	522.01
	S3	60.85	54.99	0.69	2.54	3.37	4.88	4.88	0.25	474.38
100	S1	71.32	65.85	1.24	2.98	4.63	6.79	6.25	0.40	635.88
	S2	73.66	68.64	1.25	3.20	4.31	7.49	6.33	0.57	749.69
	S3	72.62	66.67	0.86	3.09	4.18	6.07	6.07	0.32	768.82
200	S1	75.00	70.33	1.29	3.49	5.69	8.55	7.50	0.66	779.65
	S2	78.77	73.09	1.55	3.61	5.19	9.28	7.42	0.82	856.89
	S3	75.12	68.92	1.19	3.67	4.86	6.98	6.98	0.72	814.29
L.S.D At 5%		n.s	n.s	n.s	n.s	0.532	n.s	n.s	n.s	n.s

The effects of interaction between flax genotype (G), magnesium (MG) and source of fertilizer (FYM & F.M) are presented in Table (8). As shown, the yield and yield components were not significantly responded by triple interaction. It can also observed that the maximum values of both flax yields (seed and straw) were obtained with S2*FYM*200ppm Mg.

Table 8: Effect of the interaction between flax genotypes (G), magnesium (Mg) and Source of fertilizer (FYM&FM) on flax yield and its components.
(Combined analysis of 2000/2001 and 2001/2002seasons)

Treatments			Plant height (cm)	Techn. stem L.(cm)	Straw yield g/plant (g)	Straw yield ton/f	No.of fruting /branch plant	No.of capsoules /plant	No.of seeds/ capsule	Seed yield g/plant	Seed yield kg/fad
G	Fert.	Mg									
Sakha1	FYM	0	57.30	51.79	0.53	2.38	3.45	4.73	4.20	0.21	365.48
		100	65.40	59.80	0.75	2.64	4.08	6.12	5.94	0.32	594.97
		200	70.70	65.48	1.00	3.24	5.13	7.13	7.42	0.65	694.12
	M.F	0	67.13	61.80	0.73	2.26	3.56	5.43	5.63	0.27	621.66
		100	77.23	71.90	1.73	3.32	5.18	7.41	6.55	0.48	676.79
		200	80.86	75.19	1.57	3.74	6.25	9.97	7.59	0.68	865.19
S 402/7/14/3	FYM	0	63.50	56.94	0.88	3.08	3.62	5.60	5.31	0.34	546.67
		100	73.90	68.87	1.32	3.44	4.44	7.92	6.38	0.62	761.95
		200	78.53	72.91	1.46	4.00	5.47	9.20	7.39	0.86	861.11
	M.F	0	63.90	57.92	0.85	2.24	3.47	6.28	4.89	0.33	497.35
		100	73.42	68.42	1.18	2.96	4.17	7.07	6.28	0.52	737.43
		200	79.02	73.28	1.64	3.22	4.90	9.37	7.45	0.78	852.68
S3	FYM	0	63.33	57.47	0.79	2.50	3.58	5.16	5.20	0.25	516.17
		100	75.50	68.93	0.94	3.18	4.29	7.13	6.49	0.39	794.03
		200	78.88	72.76	1.37	3.65	5.32	7.87	7.61	0.65	842.83
	M.F	0	58.38	52.52	0.59	2.58	3.15	5.91	4.56	0.25	432.60
		100	69.74	64.41	0.77	3.00	4.07	6.45	5.64	0.25	743.68
		200	71.36	65.09	1.00	3.73	4.40	7.70	6.35	0.79	786.76
L.S.D at 5%			n.s	n.s	n.s	n.s	n.s	n.s	n.s	n.s	n.s

II-Effect of flax genotype, source of fertilizer and magnesium on some nutrients contents of seed flax (kg/fed)

Effect of genotypes on seed was presented in Table 9. Data indicate that seed nitrogen, phosphorus and potassium contents were significantly increased with S2 (S 402/7/14/3) flax genotypes except K content gave the highest value with S3.

Table 9: Effect of flax genotype on seed content of NPK.
(Combined analysis of 2000/2001 and 2001/2002seasons)

Flax Genotype	Nutrients content (kg/fad.)		
	N	P	K
S1	22.48	2.24	5.36
S2	24.86	2.73	6.42
S3	20.30	2.49	6.97
L.S.D at 0.05	2.04	0.35	0.92

S1 = Sakha 1 **S2 = S402/7/14/3** **S3 = I. 2384 x Hera**

With respect the effect of mineral and organic fertilizer on seed content of NPK, data in Table 10 show that mineral fertilization had significant effect on seed content of phosphorus and potassium, but no significant effect on seed content of nitrogen. in this respect El-Sayed et al (1998), El-Bana et al (2000) and Nassar *et al* (2001) demonstrated the beneficial effect of chemical fertilization on yield and nutrient content in several crops(soybean, fababean and flax)

Table 10: Effect of source of fertilizer on seed content of NPK. (Combined analysis of 2000/2001 and 2001/2002seasons)

Source of fertilizer	Nutrients content (kg/fad.)		
	N	P	K
FYM	22.45	2.32	5.70
M.F	22.57	2.65	6.81
L.S.D at 0.05	N.S	0.250	0.629

FYM = farm yard manure
M.F = mineral fertilizer.

Concerning the effect of Mg application on seed nutrient content of NPK it is clear that Mg application as foliar spray significantly increased seed nitrogen, phosphorus and potassium content where the application of 200 ppm Mg produced the highest values of N,P and K (Table 11). These results may attributed to the important role of Mg which is considered as regulates the uptake of other plant nutrients, especially phosphorus, and is involved in the translocation and metabolism of carbohydrates. It acts as a carrier for phosphorus, particularly into the seeds.(Mengel and Kriby 1987).

Table 11: Effect of magnesium application on seed content of NPK. (Combined analysis of 2000/2001 and 2001/2002seasons)

Mg application (ppm)	Nutrients content (kg/fad.)		
	N	P	K
0	12.52	1.715	4.08
100	22.53	2.490	6.58
200	29.31	3.245	8.11
L.S.D at 0.05	1.307	0.141	0.393

Interaction effects:

Effects of the interactions between genotype; source of fertilizer and magnesium are presented in Tables 12, 13, 14 and 15.

As indicated in Table 12, significant differences were recorded for the interaction between genotypes and source of fertilizer on seed nitrogen and phosphorus content, while seed potassium content respond insignificantly.

Table 12: Effect of interaction between flax genotype and source of fertilizer on seed content of NPK. (Combined analysis of 2000/2001 and 2001/2002seasons)

Flax genotype	Source of fertilizer	Nutrients content (kg/fad.)		
		N	P	K
S1	FYM	20.82	1.65	4.52
	M.F	24.13	2.83	6.20
S2	FYM	27.40	2.63	5.70
	M.F	22.30	2.83	7.14
S3	FYM	19.13	2.69	6.87
	M.F	21.26	2.28	7.07
l.S.D at 0.05		4.290	0.7807	n.s

With regard the effects of the interactions between magnesium and flax genotypes on seed nutrient content. Data in Table 13 show that nitrogen and phosphorus content significantly increased with the application of 200 ppm Mg and strain 2 (S2) while, potassium content was insignificantly affected.

Table 13: Effect of interaction between magnesium and flax genotype on seed content of NPK.
(Combined analysis of 2000/2001 and 2001/2002seasons)

Mg application (ppm)	Flax genotype	Nutrients content (kg/fad.)		
		N	P	K
0	S1	15.42	1.71	3.43
	S2	18.94	1.67	4.42
	S3	12.68	1.77	4.38
100	S1	23.78	2.29	5.43
	S2	23.26	2.92	6.70
	S3	20.25	3.60	7.60
200	S1	28.25	2.72	7.24
	S2	32.37	3.60	8.15
	S3	27.33	3.42	8.94
I.S.D at 0.05		2.953	0.496	n.s

As shown in Table 14 seed nitrogen and potassium content were significantly increased with the magnesium spray (200 ppm) and FYM while the highest value of phosphorus content was produced with magnesium spray(200ppm) and mineral fertilization but insignificantly. These results are in line with those reported by Negm et al (1997) who found that foliar application of Mg at the high rate significantly increased the seed and straw yield of lentil plants.

Table 14: Effect of interaction between magnesium and source of fertilizer on seed content of NPK.

Mg application (ppm)	Source of fertilizer	Nutrients content (kg/fad.)		
		N	P	K
0	FYM	14.47	1.43	3.00
	M.F	16.89	1.81	4.32
100	FYM	23.36	2.46	6.08
	M.F	21.70	2.53	7.07
200	FYM	29.52	3.07	7.19
	M.F	29.10	3.42	9.02
I.S.D at 0.05		3.618	n.s	1.863

The effects of interaction between Flax genotype, magnesium and source of fertilizer on seed nutrient content are presented in Table (15). As shown, the nitrogen and phosphorus content were significantly increased by the triple interaction. While the potassium content was affected insignificantly. It can also observed that the maximum values of both seed content of nitrogen and phosphorus were obtained with S2*FYM*200ppm Mg. while, the highest value of seed content of potassium was obtained with S2*M.F* Mg (200ppm.)

Table 15: Effect of interaction between flax genotype and source of fertilizer on seed content of NPK. (Combined analysis of 2000/2001 and 2001/2002seasons)

Flax Genotype	Source of fertilizer	Mg application (ppm)	Nutrients content (kg/fad.)		
			N	P	K
S1	FYM	0	11.88	0.80	2.56
		100	23.49	2.08	4.76
		200	27.08	2.06	6.25
	M.F	0	18.96	2.61	4.29
		100	24.03	2.51	6.09
		200	29.41	3.37	8.22
S2	FYM	0	19.13	1.59	4.26
		100	24.77	2.67	5.95
		200	38.31	3.62	6.89
	M.F	0	18.75	1.74	4.58
		100	21.74	3.17	7.45
		200	26.43	3.58	9.40
S3	FYM	0	12.39	1.91	4.65
		100	21.82	2.62	7.53
		200	23.18	3.54	8.43
	M.F	0	12.97	1.64	4.11
		100	19.34	1.91	7.67
		200	31.47	3.30	9.44
I.S.D at 0.05			2.871	0.158	n.s

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تأثير الماغنسيوم والسماد البلدى والسماد المعدنى علــى المحصــول ومكوناتــة ومحتوى العناصر الغذائية فى بعض سلالات الكتان بالاراضى الرملية

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أجريت تجربتان حقليتان خلال الموسمين الزراعيين ٢٠٠٠/٢٠٠١ , ٢٠٠١/٢٠٠٢م بأرض رملية بمحطة البحوث الزراعية بالاسماعلية لدراسة تأثير اضافة الماغنسيوم رشا على النبات بتركيزات صفر ، ١٠٠ ، ٢٠٠ جزء فى المليون مع السماد البلدى مقارنة بالسماد المعدنى وذلك على سلالات الكتان ٤٠٢/٧/١٤/٣ ، الصنف المحلى سخا (١) والسلالة ٣ .

تم تصميم التجربة فى قطع منشقة مرتين فى أربع مكررات وتم عمل تحليل تجميعى للموسمين.

تتلخص النتائج المتحصل عليها فيما يلى:

١. أعطت السلالة ٤٠٢/٧/١٤/٣ أعلى قيم فى كل من الطول الكلى للنبات، الطول الفعال، محصــول القش للنبات/جم ومحصول القش للفدان بالطن ، عدد كبسولات النبات ، محصول البــذرة للنبــات بالجرام ومحصول البذرة للفدان بالكيلوجرام وتبعها فى ذلك السلالة (٣).

٢. لم يكن هناك فروق معنوية واضحة بين السماد البلدى والسماد المعدنى باستخدامه للنباتــات وذلــك فى جميع صفات المحصول التى تم تقديرها.

٣. أدى استخدام الماغنسيوم رشا على النبات الى زيادة معنوية فى كل من محصول القــش والبــذرة /فدان والصفات المتعلقة بها فى كلا الموسمين.

٤. كان لاستخدام الماغنسيوم بتركيز ١٠٠، ٢٠٠ جزء فى المليون مقارنة بالكنترول (عدم الاضافــة) تأثير معنوى وكانت أعلى قيم للصفات المدروسة تم الحصول عليها عند تركيز ٢٠٠ جــزء فــى المليون من الماغنسيوم رشا على النباتات. كانت هناك فروق معنوية واضحة بين التركيزين (١٠٠ ، ٢٠٠ جزء فى المليون).

٥. لم يتأثر المحصول ومكوناتة بالتفاعل الثلاثى ما بين الماغنسيوم والسماد والاصناف تأثيرا معنويــا يذكر. تم الحصول على اعلى محصول للبذرة والقش باستخدام السلالة ٤٠٢/٧/١٤/٣ مع اضافــة السماد البلدى للتربة واضافة الماغنسيوم رشا على النباتات بتركيز ٢٠٠ جزء فى المليون.

٦. محتوى البذرة من النتروجين والفوسفور والبوتاسيوم يزيد معنويا مع سلالات الكتان وأن الســلالة ٤٠٢/٧/١٤/٣ أعطت اعلى قيم عن السلالات الاخرى. كما ان هناك تأثير معنوى على محتــوى البذرة من الفوسفور والبوتاسيوم باستخدام السماد المعدنى.

٧. وجد ان اضافة الماغنسيوم رشا على النباتات ادى الى زيادة معنوية فــى محتــوى البــذرة مــن النتروجين والفوسفور والبوتاسيوم وذلك عند تركيز ٢٠٠ جزء فى المليون ماغنسيوم. كما لوحــظ ايضا ان اقصى قيم لكل من النتروجين والفوسفور فى البذرة كــانت مــع الســلالة ٤٠٢/٧/١٤/٣ والسماد البلدى وتركيز ٢٠٠ جزء فى المليون ماغنسيوم رشا بينما كان أعل قيم للبوتاســيوم مــع نفس السلالة والسماد المعدنى وتركيز ٢٠٠ جزء فى المليون ماغنسيوم.