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COMPARATIVE STUDIES ON MINERAL AND BIO-FERTILIZATION FOR SOME JUTE CULTIVAR IN SOME DIFFERENT SOILS.

El-Sweify, Amna H.H.*; Sh.M. AbdEl-Rasoul; A.M.A. El-Azzouni* and Haniat M.El-Nimr****

***Field Crops Res. Institute, Agric. Res. Center, Giza, Egypt.**

****Soils, Water and Environ. Res. Inst., Agric. Res. Center, Giza Egypt.**

ABSTRACT

Four field experiments were carried out at two location viz:: Saba Basha College of Agric.Farm, Alexandria Governorate and Ismailia Exp. Sta., Ismailia Governorate, during 2000/and 20001 seasons, to compared the effect of mineral and bio-fertilizers on the yield and its components of some Jute cultivars, in addition to the uptake of some elements in jute seeds.

Data indicated that DC9105cv. Ranked first in plant height and technical stem length in both of two tested locations, the highest mean values of green stalk per plant as well as per fed and fiber yield/fed produced by JRC7447 cv, recording (37.016g, 12.022 ton and 435.048 kg) and (30.631g, 9.353 ton and 393.537 kg) under clay loam and sandy soils, respectively. On other hand, PADMA cv. reached maximum values over the other tested cultivars for seed yield and related characters. It could be concluded, that mean values of yield and its components for jute which obtained by investigated cultivars at Saba Bash location were superior than those obtained from jute cultivars grown at Ismilia location.

Data illustrated that, either mineral fertilization with full recommended rates of NPK(control) or half rates combined with each of different sources bio-fertilizer(N_2-fixers and P.D.B.), caused significantly increases in jute yield and its components over half rates of mineral fertilization alone at both locations. All jute characters significantly affected by the interaction between fertilizers treatments and jute cultivars, except plant height, technical stem length and green stalk yield per plant in both two experimental sites. Green stalk and fiber yield (kg/fed) significantly affected by the interaction between JRC7447 cv.with addition of half of mineral fertilization + bio-fertilizer (N_2-fixers + P.D.B) and potassin as foliar spray while, no.of capsule, seed yield/plant and seed yield per faddan were significant with PADMA cv when applied the same treatments at both locations.

Nutrients uptake by seed jute was significantly affected by jute cultivars in all tested treatments under both sites. The PADMA > JRC7447 > DC9105 cv.

Data indicated that the N_2-fixes + phosphate dissolving bacteria combined with a pronounced more increase in nutrients uptake by seed of jut cultivars, the highest values of NPK uptake was obtained by PADMA cv with addition of half of mineral fertilization + bio-fertilizer (N_2-fixers + P.D.B) and potassin as foliar spray at two experimental sites.

It is concluded that mineral fertilization and bio-fertilization (N_2-fixers and P.D.B) have great importance in increasing jute productivity and seed nutrients content.

Keywords: Jute cultivars- Mineral fertilizers (NPK) - Bio-fertilization (N_2-fixers + phosphate dissolving bacteria) sand soils, clay loam soil.

INTRODUCTION

Jute, (*Corchorus capsularis*) belong to the bast fiber crops which extract from their stalks, by retting process. Internationally, jute ranks second after cotton in the cultivated area and the third after cotton and flax in fiber production. Recently, there was an interest for study the possibility of expanding jute cultivation in the newly reclaimed lands and aims to supply our national needs from jute products. Therefore, great efforts had been done to increase fiber quantity and quality of jute under Egyptian environmental conditions. Many investigators revealed that there is variability in jute characters [Lu *et al.*, 1983, Qi *et al.*, 1984, Chakraborty 1991, Bhunia *et al.*, 1997, El-Shimy and El-Sweify 2000. It is necessary to improve jute productivity; this could be achieved by growing more productive cultivars or by improvement of agricultural practices.

Recently, much interest is focused on using bio-fertilizers to minimize consumption of chemical fertilization, to decrease production cost and environmental pollution. Bio-fertilization with associative and symbiotic N_2-fixers (*Azospirillum* and *Azotobacter*) gave appreciable increase in plant growth and yield of different crops(Rai and Gaur, 1989; Bashan and Levanony., 1990; Mowad, and Abd El Maksoud, 1992; Kavimandan, 1992; El-Aggory *et al.*,2001 and Abd El-Rasoul *et al.*, 2002)

Some soil microorganisms could improve P-uptake by different field crops. Phosphate dissolving organisms play an important role in releasing P from difficult P forms through producing organic and inorganic acid as well as Co_2 (Curl and Truevove,1985 and El Sayed, 1999). Also, P.D.O. may produce growth promoting substances such as ouxine, gibberline and cytokines (Berea *et al.*, 1976 and Yahya and Al-Azowi, 1989), which may improve plant growth and sitmulate the microbial development (El-Sayed, 1999; Nassar *et al.*, 2000 and Abd El-Rasoul *et al.*, 2002).

Potassium is a constituent of all plant tissues and is found especially concentrated in younger parts, in flowers and in seeds. This element is particularly important in germination of seed and fruits. Potassium is essential for cell division and development of meristematic tissue (Mengl and Kirkby, 1987). Shalan *et al.*, (2001) found that potassin as a source of potassium caused highly significant increase in most character of rosell plants.

The objective of this study was evaluated the beneficial effect of using NPK bio-fertilizers or alternate or complementary source of mineral fertilization on yield and quality of three different jute cultivars under different soils.

MATERIALS AND METHODS

Four field trials were conducted at two Experimental Stations under different agricoclimatic conditions viz: Saba Basha College of Agric. Farm, Alexandria Governorate and Ismailia Exp. Sta. Ismailia Governorate during growing seasons 2000 and 2001 to compare the mineral fertilization (in recommended rates) versus co-fertilization with half recommended rates of

mineral fertilizer with specific bio-fertilizers(N_2- fixers, phosphate dissolving bacteria and potassin-p (foliar sprays) for cultivars of jute.

A split plot design with three replicates was used in every location, whereas, the three cultivars of jute (*c.capsularis*) namely JRC 7447, DC 9105 and PADMA were allocated for the main plots.. Plots were 3 m long and two in wide (1/700 fad.), while the following fertilizer treatments were allocated for sub plots as follows:-

1- Control (NPK as mineral recommended rates)
2- NPK as full recommended rates + Potassin-P (30%K_2O +10% P_2O_5/fed.) as foliar spray.
3- 1/2 NPK (half recommended rates)
4- 1/2 NPK as half recommended rates + Potassin-P (30%K_2O + 10 % P_2O_5/fed.) as foliar spray.
5- 1/2 NPK (half recommended rates) + Bio-fertilizers (N_2-fixers* + P.D.B**)
6- 1/2 NPK (half recommended rates) + Potassin-P + Bio-fertilizers (N2-fixers + P.D.B).

Some seeds of jute were mixed with N_2-fixers + phosphate dissolving bacteria (P.D.B) before planting at the rate of 500g / fed. Jute seeds of three cultivars were sown on 2 and 5 May in the two seasons, respectively. After that plants were fertilized with ammonium sulphate 20.5%N at the rate of 60kgN/fed., P as super phosphate 15.5%P_2O_5/fed. and K-as potassium sulphate .

*** N_2-fixers: Azospirillum ssp(10^9cells/g) and Azotobacter chroococcum**
**** P.D.B: Phosphate dissolving bacteria monoculture .**

All the recommended agronomic practices were done in suitable time. Soil samples of the experimental locations were analyses for estimated soil characteristics as listed in Table (1).

Table (1): Some physical and chemical properties of the sample taken from the experimental sites.

a- Chemical properties*

Location	pH 1:2.5	EC DS/m	Soluble cations (meq/L)				Soluble anions (meq/L)			
			Ca ++	Mg ++	Na +	K +	CO^-	HCO^-	Cl^-	SO_4
Saba Basha	8.2	1.9	6.00	4.00	7.46	1.54	--	3.00	8.80	7.20
Ismailia	8.14	1.4	4.56	2.00	3.07	0.36	--	6.60	2.83	1.16

b- Available nutrients (ppm)

	N**	P***	K***
Saba Basha	40.0	4.50	430
Ismailia	21.00	3.00	49

c- Particle size distribution

	Coarse sand %	Fine sand %	Silt %	Clay %	$CaCO_3$ %	Texture class
Saba Basha	9.0	24.9	28.20	37.90	21.40	Clay loam
Ismailia	76.18	15.17	2.35	6.30	0.90	Sandy

*** Soil past.**
**** Extracted with 1% potassium sulphate described by Jackson, 1973.**
***** Extracted with 0.5M sodium bicarbonate according to Jackson, 1973.**
***** Extracted with 1N ammonium acetate Jackson, 1973.**

At maturity, ten random guarded plants from each plot were used for recording the following traits:0

1- Plant height (cm).
2- Technical stem length (cm),
3- Green stalk yield (g/plant),
4- No. of fruiting branches per plant,
5- No. of capsules per plant
6- Seed yield (g/plant),
7- Green stalk yield (ton/fed.)
8- Fiber yield (kg/fed.) after rotting process and extracting the fiber
9- Seed yield (kg/fed.)

Samples of seed were dried, ground where N, P and K content were determined according the standard methods described by Chapman and Pratt (1961).

Statistical analysis:

The crop yield data were statistically analyses according to Sndecor and Cochran (1982), means were compared by least significant differences (LSD) at 5% level. Combined analysis was performed for all previously mentioned characters over the two seasons according to LeClerg *et al.*, (1966).

RESULTS AND DISCUSSION

I- Yield and its components:

1- Effect of cultivars:

Mean values of yield and related characters of three evaluated jute cultivars in the two investigated locations [Saba Basha (clay loam soil) and Ismailia (sandy soil)] from the combined analysis over two seasons are present in Table (2).

Data indicated that jute cultivars significantly divered in all tested traits under the conditions of the two investigated locations. DC 9105 cv. ranked first in plant height and technical stem length with mean values of (247.789 and 196.018 cm)in Saba Basha location and (223.752 and 177.082 cm) in Ismailia location; while PADMA cv was the shorter cultivar in the two above mentioned measurements. The third cultivar (JRC 7447 cv.) recorded the moderate mean values for plant height and technical stem length by (243.429 cm and 189.086 cm for clay loam soil) and (217.424 cm and 170.345cm for sandy soil), respectively.

Green stalk yield (g/plant), green stalk yield (ton/fed.) and fiber yield kg/fed. produced by JRC 7447 cv. reached maximum values when compared with the other two tested cultivars, recording (37.016g, 12.022 ton and 435.048 kg)and (30.631 g, 9.353 ton and 393.537 kg) under clay loam soil and sandy soil conditions, respectively. PADMA cv. yielded the lowest mean values by 30.317 g, 11.266 ton and 385.13 kg at Saba Basha while it had the same trend in Ismsilia location recording 27.353 g, 8.612 ton and 348.839 kg for green stalk yield/plant, green stalk yield as well as fiber yield per fed., respectively.

Concerning seed yield and related characters, data illustrated that PADMA reached maximum values over the other two tested cultivars for number of capsules, seed yield g/plant and seed yield kg/fed whereas producing mean values of 82.453, 7.732 g and 374.547 kg from plants grown under clay loam soil, on the other hand, at sandy soil, the same previous cultivar " PADMA" recorded mean values of 74.004, 6.992 g and 336.842 kg for no.of capsules, seed yield per plant and seed yield per fed., respectively. The lowest mean values for three above mentioned traits were obtained from JRC 7447cv.at the two investigated locations. These above mentioned varietals deference's are due to variability in genetic constituents and potential which in turn affected growth habit as well as yield components can explain these findings. Many investigators recorded genetic differences in jute characters among cultivars (Chakraborty *et al.*, 1991, El-Shimy and El-Sweify 2000 and El-Sweify and Abd El-Rasoul 2002.

Table (2):The effect of jute cultivars on yield and its components at the two investigated locations, Saba Basha and Ismailia. (Combined analysis of 2001 and 2002 seasons).

Saba Basha (clay loam soil)				
Traits	**JRC 7447**	**DC 9105**	**PADMA**	**L.S.D.at 5%**
Plant height (cm).	243.429	247.789	236.964	6.460
Technical stem length(cm)	189.089	196.018	181.089	1.663
Green stalk yield (g/p)	34.016	31.448	30.317	1.084
Green stalk yield (ton/fed)	12.002	11.659	11.266	0.051
No. of capsules / plant	63.066	79.619	82.453	0.516
Seed yield (g/plant)	5.169	5.870	7.732	0.182
Seed yield (kg/fed.)	224.185	253.856	374.547	1.331
Fiber yield (kg/fed.)	435.048	405.451	385.130	3.821
Ismailia (sandy soil)				
Plant height (cm).	217.424	223.752	213.968	0.297
Technical stem length(cm)	170.345	177.082	163.641	0.209
Green stalk yield (g/p)	30.631	28.376	27.353	0.869
Green stalk yield (ton/fed)	9.353	9.026	8.612	0.117
No. of capsules / plant	56.609	68.068	74.004	0.463
Seed yield (g/plant)	4.889	5.483	6.992	0.328
Seed yield (kg/fed.)	201.945	228.671	336.842	0.197
Fiber yield (kg/fed.)	393.537	364.217	348.839	3.436

It could be concluded, from the previous results, that mean values of yield and its components for jute which obtained by investigated cultivars at Saba Basha location were superior than those obtained from the same cultivars grown in Ismailia location; the increment ratios of mean values for yield and its components traits which recorded by data obtained from the first location when compared with the other location were, 10.03, 9.74, 9.83, 22.77, 11.75, 7.49, 9.99 and 9.71% for plant height, technical stem length, green stalk yield /plant, green stalk yield /fed., number of capsules/plant, seed yield/plant and seed as well as fiber yields/fed., respectively.

In thus respect Qi *et al.*, (1984) .obtained significantly differences between the productivity of jute cultivars as affected by sowing under the different locations.

b-Effect of mineral and bio-fertilization treatments:

Data in Table (3) clearly indicate that the positive effect of different tested bio-fertilizers on proving jute yield and its components and reducing mineral fertilizer requirement in the case of two investigated locations.

Data illustrated that, either mineral fertilization with full recommended rates of NPK or half rates combined with each bio-fertilizer caused significantly increased in jute yield and its components over half rates of NPK treatment alone.

Table (3): Mean values of yield and its components of jute as affected by mineral and bio-fertilizer treatments. (Combined analysis of 2001 and 2002 seasons).

Saba Basha (clay loam soil)							
Traits	**1**	**2**	**3**	**4**	**5**	**6**	**L.S.D.at5%**
Plant height (cm).	241.335	246.527	233.400	243.252	245.167	246.686	6.587
Technical stem length (cm)	188.050	192.076	180.078	187.757	191.066	193.361	1.197
Green stalk yield (g/p)	27.873	32.278	26.057	30.141	34.108	41.103	1.210
Green stalk yield (ton/fed)	11.294	11.858	10.453	11.186	12.254	12.849	0.062
No. of capsules / plant	74.266	74.990	70.956	71.907	76.543	81.613	0.350
Seed yield (g/plant)	5.688	6.376	5.171	5.311	7.226	7.770	0.088
Seed yield (kg/fed.)	280.447	285.308	275.234	278.574	288.447	297.164	1.202
Fiber yield (kg/fed.)	406.611	408.788	400.905	402.479	413.932	418.543	1.041
Ismailia (sandy soil)							
Plant height (cm).	217.245	220.665	210.187	217.079	220.905	224.208	0.342
Technical stem length (cm)	169.234	172.867	162.069	168.982	172.948	176.036	0.341
Green stalk yield (g/p)	24.988	30.697	23.443	27.139	29.260	37.193	1.116
Green stalk yield (ton/fed)	8.355	9.228	7.608	8.267	9.761	10.763	0.153
No. of capsules / plant	66.840	67.491	60.416	61.382	68.390	72.845	0.318
Seed yield (g/plant)	5.120	5.739	4.654	5.185	6.604	7.427	0.261
Seed yield (kg/fed.)	252.372	256.778	247.711	250.704	260.203	267.148	0.136
Fiber yield (kg/fed.)	365.950	371.628	360.803	357.763	374.353	382.689	0.937

1= NPK alon **2= NPK + Potassin-P**
3 = 1/2 NPK **4 = 1/2 NPK+Potassin-P**
5 = 1/2 NPK + N_2-fixers + P.D.B **6 = 1/2 NPK + Potassin-p + N_2-fixers + P.D.B**

Concerning the effect of using potassin-P, data show that the co-fertilization of full recommended rate of NPK in combination with potassin seemed to be superior, followed by half recommended rates of NPK plus potassin as compared to mineral fertilizer alone; with maximum increments of 5.32, 6.25, 19.277, 11.85, 5.86, 18.91, 3.53 and 1.93% for plant height, technical stem length, green stalk yield per plant, green stalk yield/fed., no. of capsules, seed yield per plant, seed yield/ fed and fiber yield/fed., respectively; when compared with applying only the half recommended rates of NPK to clay loam soil; while the lowest values of increases which obtained by added potassin to full recommended NPK were 2.11, 2.09, 13.65, 4.76, 0.97, 10.79, 1.70 and 0.53% for the above mentioned characters,

respectively under the same previous soil. These results were agreed with El Gazzar and El-Kady, (2000) and Shalan *et al.*, (2001).

Regarding to the effect of other bio-fertilizers (N_2-fixers bacteria + phosphate dissolved bacteria (PDB), data indicate that last fertilizer treatment used in this study (half recommended rates of NPK plus potassin plus (N_2-fixers +PDB), was more effective than the other treatment which containing the same kinds of fertilizer without potassin-p; in this case, the increases value in tested characters of about 1.519 cm, 2.295 cm, 6.995 g, 0.595 ton, 5.07, 0.544g, 8.717kg and 4.611 kg for plant height, technical stem length, green stalk yield/plant, green stalk yield/fed. no. of capsules, seed yield per plant, seed yield/ fed and fiber yield/fed., respectively, this finding was obtained from data of Saba Basha location.

It be must concluded that significantly increase were recorded for the main important jute yield characters when the last fertilizer treatment [1/2 recommended rates of mineral fertilizer + potassin-P as foliar spray + Biofertilizers (N_2fixers +phosphate dissolving bacteria)], was used in the clay loam soil and comparing to the fertilizer treatment of only full recommended rates of mineral fertilization, these increase are 1.555 ton,16.717 kg and 11.932 kg for green yield, seed yield and fiber yield per fed. traits, respectively. On other hand, data obtained from the second investigated station (sandy soil) indicated that adding bio-fertilizer (N_2-fixers +phosphate dissolving bacteria) + potassin-P as foliar spray to the half recommended mineral fertilization significantly increased the mean values of most important traits of jute such as green stalk yield/fed, seed yield/fed and fiber yield/fed by 2.408 ton, 14.77 kg and 16.739 kg, respectively, these increases produced over the mean values which obtained by using the full recommended rates of mineral fertilizer only.

From the previous results, it worth be mentioned that green stalk as well as fiber yields/fed traits were more responded by applying the bio-fertilizer to sandy soil than clay loam soil. This may be due to low fertility of sandy soil (Table 1). The same variation in the location effect on crops productivity when used bio-fertilizers were recorded by El-Aggory *et al.*, (2001).

C-Interaction effects:

It is clear from the data presented in Table (4) that all jute characters significantly affected by the interaction between fertilizers treatments and jute cultivars, except plant height, technical stem length and green stalk yield per plant in both two experimental sites.

Regarding green stalk and fiber yield (kg/fed) significantly affected by the interaction between JRC 1447 cv. with addition of half of mineral fertilization + bio-fertilizer (N_2-fixers + phosphate dissolving bacteria) and potassin as foliar spray, recording the highest value for the two above mentioned characters (13.223 ton/fed and 445.23kg/fed) in clay loam soil and (11.10 ton/fed and 406.767 kg/fed) in sandy soils, respectively.

As for no. of capsule, seed yield/plant and seed yield per faddan were recording the highest values with PADMA c.v when applied half of mineral fertilization +bio-fertilizers (N_2-fixers + P.D.B) and potassin-P as foliar spray in both experimental locations.

Table (4): Effect of interaction between fertilizers treatments and jute cultivars on some jute characters. (Combined analysis of 2001 and 2002 seasons).

	Saba Basha (clay loam soil)														
	Green stalk (ton/fed)			No.of capsul			Seed yield g/plant			Seed yield Kg/fed			Fiber yield kg/fed		
	S_1	S_2	S_3	S_1	S_2	S_3	S_1	S_2	S_3	S_1	S_2	S_3	S_1	S_2	S_3
1	11.6	11.3	10.8	61.8	80.8	80.7	4.48	5.24	7.34	220.7	250.2	370.3	431.8	386.5	401.4
2	12.5	12.2	11.9	63.7	82.7	78.4	5.39	6.01	7.73	225.2	255.2	375.4	440.7	390.5	410.5
3	10.8	10.4	10.0	59.2	78.8	74.7	4.10	4.75	6.66	215.4	245.1	365.1	425.6	380.5	396.5
4	11.5	11.1	10.8	60.4	79.7	75.5	4.24	4.92	6.77	218.6	248.6	368.4	430.5	375.7	401.1
5	12.2	11.9	11.3	64.8	84.4	80.3	6.19	6.89	8.58	228.4	258.0	378.8	436.3	382.8	407.2
6	13.2	12.8	12.5	68.8	80.1	87.9	6.60	7.41	9.30	236.6	265.8	388.9	445.2	394.7	415.7
L.S.D at 5%	0.108			0.749			0.227			0.467			4.133		
	Ismailia (sandy soil)														
	Green stalk (ton/fed)			No.of capsul			Seed yield g/plant			Seed yield Kg/fed			Fiber yield kg/fed		
	S_1	S_2	S_3	S_1	S_2	S_3	S_1	S_2	S_3	S_1	S_2	S_3	S_1	S_2	S_3
1	8.7	8.4	7.9	55.1	72.7	72.6	4.04	4.72	6.61	198.7	225.1	333.3	388.6	347.9	361.3
2	9.4	9.2	8.9	55.4	74.5	70.6	4.85	5.41	6.96	202.7	229.6	337.9	396.6	351.4	369.9
3	8.0	7.6	7.2	53.3	70.9	67.3	3.69	4.28	5.99	193.8	220.6	328.6	383.0	342.4	359.9
4	8.6	8.2	7.9	54.4	71.7	67.9	3.82	4.43	6.09	196.7	223.8	331.5	387.5	338.1	360.9
5	10.2	9.9	9.1	58.1	75.4	71.7	5.67	6.31	7.83	206.2	232.8	341.5	398.7	350.5	372.5
6	11.1	10.7	10.4	61.3	78.6	78.5	6.04	7.77	8.47	213.6	239.8	347.9	406.7	361.2	380.1
L.S.D at 5%	0.098			0.676			0.5226			0.2888			3.716		

S_1= JRC7447cv. S_2 = DC9105cv. S_3= PADMA cv.

II- Effect of mineral and bio-fertilizer on seed nutrients contents of jute cultivars and their interaction:-

Effect of cultivars:-

It is quite clear from the data reported in table (5) that nutrients uptake by seed of jute was significantly affected by jute cultivars in all tested treatments under both sites. The highest values of seed nutrients contents were obtained with PADM c.v., (5.189, 2.680 and 1.518kg/fed) for N,P and K uptake respectively at Ismailia site while, the main values was (8.211,4.487 and 2.446 kg/fed) in saba Basha site.

The lowest mean values were obtained from DC 9105 c.v at two sites. It may be due to variability in genetic constituents and potential El-Shimy and El-Sweify 2000, and El-Sweify and Abd-El Rasoul 2002.

Effect of mineral and bio-fertilizers:

Estimation of N, P and K amounts taken by jute as affected by mineral and bio-fertilizer, data in Table 5 confirmed the beneficial effect of performing mineral or mineral +bio-fertilization. The highest NPK uptake was obtained with full mineral fertilizer recommended rates + Potassin-Paa(as foliar spray) compared with full fertilizer recommended rates alone in both two experimental sits. While, the lowest values was obtained with half mineral recommended rates alone.

Table (5): Effect of mineral and bio-fertilizer on seed nutrients contents of jute cultivars and their interaction. (Combined analysis of 2001 and 2002 seasons).

Saba Basha (clay loam soil)												
	0Nutrients uptake (kg/fed)											
	N				P				K			
	S_1	S_2	S_3	Means	S_1	S_2	S_3	Means	S_1	S_2	S_3	Means
1	2.865	4.729	7.881	5.158	2.987	2.373	4.00	3.120	1.093	1.614	2.278	1.662
2	2.940	4.810	8.448	5.399	3.716	3.179	4.788	3.894	1.189	1.875	2.535	1.866
3	2.414	3.181	5.784	3.793	1.303	1.483	2.585	1.790	0.924	1.147	1.708	1.259
4	2.938	4.317	8.842	5.366	3.751	3.245	4.476	3.807	1.421	1.902	2.817	2.047
5	4.455	5.275	9.035	6.255	4.544	3.522	5.455	4.507	1.336	1.742	2.330	1.803
6	4.799	5.880	9.277	6.652	4.768	3.948	5.669	4.795	1.782	2.114	3.066	2.301
Means	3.402	4.699	8.211		3.512	2.958	4.487		1.291	1.732	2.446	
L.S.D at 5%	Cultivars: 0.0325				0.0019				0.0008			
	Treatments: 0.0286				0.0032				0.0014			
	Interaction: 0.0554				0.0054				0.0023			
Ismailia (sandy soil)												
1	2.346	3.153	5.067	3.522	2.443	1.643	2.400	2.162	0.894	0.968	1.366	1.073
2	2.412	3.330	5.069	3.603	3.040	2.044	2.702	2.595	0.973	1.125	1.521	1.206
3	1.977	2.603	4.733	3.104	1.008	1.213	1.939	1.387	0.756	0.794	1.282	0.944
4	2.203	2.775	5.305	3.428	2.596	1.947	2.686	2.409	0.984	1.140	1.692	1.272
5	3.093	3.399	5.431	3.974	3.155	2.119	2.945	2.739	0.928	1.048	1.400	1.125
6	3.332	3.857	5.533	4.240	3.310	2.375	3.410	3.032	1.175	1.271	1.844	1.430
Means	2.561	3.186	5.189		2.592	1.890	2.680		0.952	1.057	1.518	
L.S.D at 5%	Cultivars: 0.0444				0.0020				0.0012			
	Treatments: 0.0544				0.0021				0.0008			
	Interaction 0.1340				0.0039				0.0008			

1= NPK alon **2= NPK + Potassin-P**
3 = 1/2 NPK **4 = 1/2 NPK+Potassin-P**
5 = 1/2 NPK + N_2-fixers + P.D.B **6 = 1/2 NPK + Potassin-p + N_2-fixers + P.D.B**
S_1= S_1= JRC7447cv. S_2 = DC9105cv. S_3= PADMA cv.

Concerning the effect of bio-fertilizers, data indicated that the N_2-fixers + phosphate dissolving bacteria combined with a pronounced more increase in nutrients uptake by seed of jute cultivars. These finding are in hormone with those of Nassar *et al.*, (2000); Sobh *et al.*, 2000 and Abd El-Rasoul *et al.*, (2002 and 2003). Also, the nutrients uptakes by seed of jute cultivars in Saba Basha (clay loam soil) were superior to Ismailia site (sandy soil).

The interaction effect:

The effect of the interaction between fertilization and jute cultivars on seed nutrients uptake was significantly (Table 5).

The highest values of NPK uptake was obtained by PADMA c.v with addition of half of mineral fertilizer recommend rates + bio-fertilizers (N_2-fixers + phosphate dissolving bacteria) + potassin-P as foliar spray in the two experimental sites.

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دراسات مقارنة على التسميد المعدنى بالتسميد الحيوى وتأثيرة علـــى المحصـــول ومكوناتة لبعض أصناف من الجوت فى بعض أنواع الاراضى.

آمـنة حـافظ حـسن السـويفى* ، شـعبان مـحـمـد عـــبد الـرســـول** ، على محمد على العزونى*، هنيات محمد النمر**

* معهد بحوث المحاصيل الحقلية- مركز البحوث الزراعية- الجيزة

** معهد بحوث الاراضى والمياه والبيئة- مركز البحوث الزراعية – الجيزة.

أقيمت أربعة تجارب حقلية فى موقعين مختلفين مزرعة كلية الزراعـــة بســابا باشــا بمحافظـــة الاسكندرية (أرض طينية طمية) والاخرى محطة البحوث الزراعية بمحافظة الاسماعلية(ارض رملية) وذلـك خلال الموسمين الزراعيين ٢٠٠١ ، ٢٠٠٢.

وذلك لمقارنة تأثير استخدام مصادر معدنية وأخـرى حيويـة للعنـاصر السـمادية النـتروجين والفوسفور والبوتاسيوم على انتاجية بعض الاصناف من الجوت وذلك فى كلا من الاراضى الطينية والرمليـة والتى تمثلها كل من المحطتين السابقتين.

أوضحت النتائج تفوق الصنف DC9105 على الاصناف الاخرى فى صفتـــى الطـــول الفعـــال والطول الكلى فى كلا الموقعين تحت الدراسة. فى حين أن الصنف JRC7447 أنتج أعلى القيـــم بالنســـبة لصفات محصول العيدان الاخضر/نبات وكذلك للفدان بالاضافة الـــى صفـــة محصـــول الالـيـاف مسـجلا (٣٧,٠١٦جم، ١٢,٠٢٢ طن، ٤٣٥,٠٤٨كجم)) تحت ظروف الارض الطينية (سابا باشا) فى حين أعطـــى (٣٠,٦٣١جم، ٩,٣٥٣طن، ٣٩٣,٥٣٧كجم) تحت ظروف الارض الرملية (الاســماعلية) وذلـك للصفـات السابقة على التوالى.

يجدر الاشارة الى أن النتائج المتحصل عليها دلـت علـى أن متوسـطات الصفـات المدروسـة للمحصول ومكوناتة تحت ظروف الارض الطينية الطمية أعلى من تلك المتحصـل عليـها تحـت ظـروف الارض الرملية.

أظهرت النتائج أن استخدام المعدل الموصى بة من التســميد المعدنـــى (نـتروجين-فوســفور – بوتاسيوم)كمعاملة مقارنة أو نصف هذا المعدل مضافا الية التسميد الحيـوى(البكتيريـا المثبتـة للنـتروجين والبكتيريا المذيبة للفوسفات) أدى الى الحصول على زيادة معنوية فى كل الصفـــات المدروســة لمحصـــول الجوت وذلك عند المقارنة باستخدام نصف المعدل الموصى بة من تلك العناصر منفردا.

كما أظهر تأثير التفاعل بين التسميد والاصناف المختبرة للجوت تأثيرا معنويا على كل الصفـــات المدروســة ماعد طول النبات، الطول الفعال ومحصول العيدان لكل نبات فى كلا من الارضين.

ارتبطت القيم العالية لمحصول العيدان ومحصول الالياف بتأير التفاعل بين الصنف JRC7447 عند اضافة نصف المعدل من التسميد المعدنى + التسميد الحيوى (البكتيريـــا المثبتـــة للنـــتروجين والبكتيريـــا المذيبـــة للفوسفات) + اضافة البوتاسين رشا .

بينما ارتبطت القيم العالية لعد الكبسولات لكل نبات ومحصو ل البذرة لكل نبات وذلك لكل فـدان و بتاثير التفاعل بين الصنف PADMA وذلك عند اضافة نصف المعدل مـــن التســـميد المعدنـــى + التســـميد الحيوى (البكتيريا المثبتة للنتروجين والبكتيريا المذيبة للفوسفات) + اضافة البوتاسين رشا .

تاثر امتصاص بذور الجوت لكل من النتروجين والفوسفور والبوتاسيوم تأثرا معنويـــا بـــاختلاف الاصناف وكذلك باختلاف معاملات التسميد المختلفة وذلك فى كلا الارضين.

ارتبطت القيم العالية لامتصاص العناصر بالصنف PADMA عن الاصناف الاخرى وكانت الارض الطينية اعلى من الارض الرملية وذلك مع اضافة نصف المعدل من التسميد المعدنى + التسميد الحيـــوى (البكتيريـــا المثبتة للنتروجين والبكتيريا المذيبة للفوسفات) + اضافة البوتاسين رشا .

توصى الدراسة باهمية التسميد الحيوى بالبكتريا المثبتة للنروجين +البكتريـــا المذيـــة للفوســـفات لزيادة انتاجية محصول الجوت ومكوناتة.