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INFLUENCE OF SOME STIMULANTS AND NITROGEN SOURCES ON GROWTH AND YIELD OF CANTALOUPE PLANTS IN LOW PLASTIC TUNNELS UNDER SALINE CONDITIONS

BY

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ABSTRACT

This study was carried out at El- Arish (North Sinai Governorate) on sandy soil farm under low plastic tunnels conditions during the two successive seasons of 2004/2005 and 2005/2006 to investigate the influence of some stimulants and nitrogen sources on growth and yield of cantaloupe cv. Galia grown in low plastic tunnels under saline conditions. All used biostumlants treatments and 50% chicken manure of added dose increased all growth parameters such as plant height,number of main stems, fresh and dry weight of plant foliage and average fruit weight, diameter, length, shape index, flesh thickness and total soluble solid, early and total yield with significant differences in most cases. In addition, the different tested stimulants significa ntly increased leaf and fruit mineral contents. In this respect, the best results of all studied vegetative growth, yield and chemical traits in the two seasons vere obtained from the treatments of 50% chicken manure+ (EM) + (Ha) followed by 50% FYM manure + (EM)+ (Am)+ Ha).

INTRODUCTION

Organic manure play a direct role in plant growth as they are the source of all necessary macro and micro nutrients in available forms during mineralization. They also improve agrochemical, physical and physiochemical properties of the soil. They improve air and water regimes of the so l where heavy soils become less compact. While light soil acquire higher moisture and exchange capacities. Thus, growth of most vegetable crops improved by applying different forms of organic fertilizers. El- Desuki *et al.* (2001) found that plant height and leaves number of sweet pepper were significantly increased by ncreasing the level of organic fertilizers to 12 ton/ feddan. Also, Yousef *et al.* (2001) found that chicken manure had a favorable effect on tomato plant heigh. Ouda (2002) pointed out that adding chicken manure at a rate of 15 m^3/ feddan to tomato plants produced higher fruit yield. Also, El- Seify *et al.* (2004) and Hassan *et al.* (2006) reported that the biofrtilizers (rhizobacterin) application increased vegetative growth (plant height, number of leaves, leaf area and dry weight) in potato plants,

Organic production systems are based on specific and precise standards of production aiming to achieve socially and ecologically sustainable agro-ecosystems (FAO 2000). Also, Hellian *et al.* (2000) found that plant height and leaves number per plant were significantly increased with increasing chicken manure up to $30m^3$/feddan. Additionally, dry weight of leaves was significantly increased with increasing chicken manure up to $45m^3$/feddan in both growing seasons of potato plants. However, Midan (1998) indicated that increasing organic manure rates up to 45 m^3 farmyard manure/ feddan significantly increased TSS and yield components, of fruit pepper plants. Eissa (1996) reported that addition of organic manure (pigeon manure at a rate of $20m^3$/fed.) significantly increased fruit length, fruit diameter, fresh and dry yield of sweet pepper fruits.

Concerning, organic and mineral fertilizers, conversion to organic agricultural systems is triggered by different objectives such as securing a place on international markets export promotion economic self reliance finding alternatives to decrease access to agricultural inputs natural conservation, food self sufficiency and rural and social development Scialable (2000). However, Abd- Allah *et al.* (2001) found that the increase in fruit yield accompanied the high organic fertilizer rates i.e. 45 m^3 chicken manure/feddan might be due to the increase of the vegetative growth and dry matter of plant which consequently lead to a higher early and total yield of tomato plants. Also, Abdel- Kader (2002) indicated that using $30m^3$ chicken manure/fed. Significantly increased length, diameter of fruit, fresh and dry weight of cantaloupe plants. Hasanin (2007) indicated that using 10 tons of biogreen compost or 10 tons of chicken manure per feddan increased leaves content of NPK and some micro nutrients of strawberry plants.

Effective microorganisms (EM) have been shown to improve growth, yield and quality of crops over a wide range of agro- ecological conditions. Effective microorganisms (EM) is particularly effective in promoting plant growth and production under the stress conditions such as drought,heat, insects, diseases and when the greatest loss in crop yield and quality can occur. Daly and Stewart (1999)

Effective microorganisms (EM) also, enhanced protein activity Konoplay and Higa (2001) and photosynthesis Xu *et al.* (2001). Zarb *et al.* (2001) reported that the interaction between microbes and plants could significantly enhance the productivity of most farming systems.

Application of effective microorganisms (EM) improved not only the production of some crops, but also the physical and chemical properties of cultivated soil (Cho-Cho –Myint *et al.* 1999 and Salib *et al.* (2003) who found that using EM decreasing clay soil bulk density and increasing soil porosity.

Effective microorganisms (EM) improved also, soil chemical properties as reported by Shao *et al.* (2001) who found that using EM decreased the soil electrical conductivity (EC), PH and increased the organic matter content.

Nguyen and Trinh (2003) reported that the use of EM positively affected the growth of cucumber compared with untreated plant .El-Sharkawy, *et al.* (2003) show that the highest values of plant height were recorded in the plants from plots inoculated with biofertilizers nitrobein.

Bio- fertilizers are microbial preparation containing primarily sufficient number of potent strains of microorganisms having definite role in furnishing a proper rhizosopher for plant growth. EM are microbial inoculants .Hassan, (2005) reported that application of EM with chemical fertilizers gave good yield under conditions of adequate irrigation .EM applied alone increased yield of tomatoes, phaseolus and capsicum . El- Banna and Tolba (2000) found that using biofertilizers increased plant height and number of leaves per plant in potato plants.

Humic acids have been found to have profound effect on the biological activity and soil properties Cheng *et al.* (1998). Humic acids had a simulative effect on plant growth reported by El- Fakhrani (1999) reported that the profound effect of HA on the plant growth and yield effect was due to its improve effect on the incensement of plant nutrients and their availability to the growing plants. Also, Nardi *et al.* (1999) attributed the beneficial effect of HA on plant growth to its acting as plant growth hormones .Markowiak (2001) related the positive role of HA on increasing the growth and nutrients uptake due its ability to improving soil physical properties.

Plants convert inorganic nitrogen to amino acids, the building blocks of proteins and a variety of out her functional compounds. However, when plants are under stress conditions, they unable to perform their normal physiological activities to synthesize their own amino acids. The exogenous application of amino acids reduces the energy requirements of plants and this saved energy can be used for vital processes, especially under extreme adverse conditions. Also, Sutha *et al.* (1998) reported an increases in protein content with significantly increases in the concentration of amino acids were noticed in tomato plants .Amino acid may be playing a synergistic role about 90% of the variation in color accounted for by variation in the sugars on potato plants.

In additionally, Ahmed *et al.* (2006) reported that application two amino acids i. e. proline and glycine at 100 ppm every seven days significantly increased plant height, leaf area and total yield in bean plants. However, Gaafer and Hasanin (2006) indicated that using amino acid at a rate of 200 ppm significantly increased NPK percent in the watermelon plant tissues, which led to an increase in the plant vegetative growth, average fruit weight and total yield.
The aim of the present study was to investigate the effect of some stimulants and nitrogen sources on some growth, physical properties of a sandy soil and yield of cantaloupe plants.

MATERIALS AND METHODS

Two field experiments were carried out at El- Arish (North Sinai Governorate) on sandy soil farm under low plastic tunnels conditions during the two successive winter seasons of 2004/2005 and 2005/2006 to investigate the influence of same stimulants and nitrogen sources on growth and yield of cantaloupe cv. Galia grown under low plastic tunnels and saline conditions. The soil of the experimental field was sandy in texture with PH 7.79, the chemical analysis of soil samples and used organic manure were carried out at laboratories of soil and water Research. Inst. Agric. Res. Center according to the methods described Jackson (1973) and the results of these analysis were presented in Tables (1 and 2).

Table (1): Physical and chemical properties of experimental soil.

2005/2006										
physical properties					Chemical properties					
Sand %	Silt %	Clay %	Texture	OM %	PH	EC (ds/m)	N% Total	available N ppm	Available P ppm	Available K ppm
97.76	2.36	1.88	Sandy	1.23	7.84	4.42	0.17	13.52	11.65	72.27
2006/2007										
94.56	3.37	1.87	Sandy	1.31	8.23	4.54	0.16	12.85	13.16	70.82

Table (2): Some chemical characteristics of the studied organic manure.

2005/2006										
Organic manure	PH	EC ds /m	C/N ratio	$CaCo_3$ %	OM %	humidity %	Organic C %	N %	P %	K %
Chicken	8.2	4.17	1:14	3.71	32.1	17.1	25.4	1,17	1.56	1.63
Farmyard	8.6	3.74	1:16	3.46	25.7	15.6	23.3	0.91	1.32	1.49
Olive	9.1	5.23	1:12	3.66	17.2	12.3	21.3	0.74	1.11	1.27
2006/2007										
Chicken	8.4	4.42	1:18	4.19	34.6	14.4	24.2	1.24	1.63	1.72
Farmyard	8.5	3.62	1:15	3.85	27.2	13.9	23.8	0.97	1.37	1.58
Olive	8.8	4.76	1:13	4.05	20.6	11.6	20.1	0.82	1.06	1.14

Cantaloupe seeds cv. Galia sowing was done in the second week of December in the two seasons. A complete randomized block design with three replicate was adopted .Each experimental plot included one row each 10 m length and 1m width with an area 10 m^2 .

The amount of organic manures were added before planting in the furrow and raked lightly with soil .Mineral nitrogen with 200 kg/ fed. added in the forms of ammonium sulphate (20.5% N) and ammonium nitrate (33.5% N) .Two thirds of the total nitrogen as ammonium sulphate were equally divided and applied before planting and complete plant emergence .The rest of N fertilizer was soil dressed in the form of ammonium nitrate at two weeks following complete plant a mergence stage.

Total phosphorus (P_2O_5) with 300 kg/ fed. applied during soil preparation in the form of calcium super phosphate (15.5% P_2O_5) while potassium fertilizer was applied in the form of potassium sulphate (48% K_2O) at a rate of 150 kg/ fed. with soil application twice at 45 and 60 days after planting (DAP).

All the experimental plots received the same amount of water from planting till harvest, using drip irrigation system. Culture practices were applied according to the recommendation of the Egyptian Ministry of Agriculture.

Humic acid (HA), Amino plus (AP) and Effective microorganisms (EM) were used in this experiment as biostimulants. Humic acid (HA) applied at the rates of 50 mg/ kg soil 15- days after transplanting.

Amino plus (AP) at the 200 ppm was applied after planting around plants. Also, the effective microorganisms (EM) stock solution that used in the study has been produced and a viable at Ministry of Agriculture, Egypt. EM content different of beneficial microorganisms about 80 species. The main species included in EM are as follows:-

(Lactic acid bacteria, Photosynthetic bacteria, Yeasts, Ray fungi .Fungi, Others)

The fertilization treatments of organic, inorganic and biofertilization either in a single form or in combination were conducted as follows:-

1- 100% of recommended NPK. (10 tons/ fed.) (NPK)
1- 100% of Chicken manure. (10 tons/ fed.) (CH)
2- 100% of Farmyard manure. (10 tons/ fed.) (FYM)
3- 100% of Olive manure. (10 tons/ fed.) (OL)
4- 50% Chicken manure (5 tons/ fed.) + Amino plus (200ppm) (AP). (CH+AP)
5- 50% Farmyard manure (5 tons/ fed.)+Amino plus (200ppm)(AP). (FYM+AP)
6- 50% Olive manure (5 tons/ fed.) +Amino plus (200ppm) (AP).(OL+AP)
7- 50% Chicken manure (5 tons/ fed.) + (EM) (2L/ fed.). (CH+EM)
8- 50% Farmyard manure (5 tons/ fed.) +(EM) (2L/ fed.) . (FYM+EM)
9- 50% Olive manure (5 tons/ fed.) + (EM) (2L/ fed.). (OL+EM)
10- 50%Chicken manure (5tons/fed.)+ Humic acid (HA) (50gm/kg soil). (CH+HA)
11- 50% Farmyard manure (5 tons/ fed.)+ Humic acid (HA) (50gm/kg soil. (FYM+HA)
12- 50% Olive manure (5 tons/ fed.) + Humic acid (HA) (50gm/kg soil (OL+HA)
13- 25% Chicken manure (2.5 tons/fed.)+25% Farmyard manure(2.5 tons/fed.)+ (AP)+(EM)+(HA) (MIX1)
14- 25% Chicken manure (2.5 tons/fed.)+25% Olive manure(2.5 tons/fed.)+ (AP)+(EM)+(HA) (MIX2)
15- 25% Farmyard manure (2.5 tons/fed.)+25% Olive manure(2.5 tons/fed.)+ (AP)+(EM)+(HA) (MIX3)

A random sample of three plants from each plot was used for the determination of growth and yield characters of the plant.

1- Vegetative growth characteristics:-

- Plant height (cm).
- Leaf area: the average leaf area (cm^2) was measured for the 5^{th} true leaf by using laser leaf area meter.
- Number of leaves per plant.
- Fresh and dry weight per plant.

2- Chemical composition:

Sample of the fourth top leaves were dried at 70 ° C till constant weight and wet digested to determine N,P and K contents.

- Total nitrogen (%) in leaves was determined by using the microkjeldahl by A. O. A. C. (1990).
- Phosphorus (%) was determined calorimetrically at 550 mm as described by Ranganna (1979).
- Potassium (%)was determined by flame photometer as described by Ranganna (1979).
- Micro nutrients Fe, Mn and Zn contents were determined for the above ground dried vegetative parts by using atomic spectrophotometer according to Chapman and Pratt (1961).
- Total Soluble Solid (T.S.S. %) of fruit was measured by hand refract meter.

3- Fruit physical characteristics:

- Fruit length and fruit diameter (cm).
- Fruit firmness were determined according to Hiataranta and Linna (1999).
- Flesh thickness (cm).

4- Yield and its components:

- Early yield ton/ feddan.
- Total yield ton/ feddan.
- Average fruit weight (g).

Statistical analysis:

The data were exposed to proper statistical analysis of variance of randomized complete block design by Snedecor and Cochran (1980).

RESULTS AND DISCUSSION

1- Vegetative growth parameters of cantaloupe plant.

a- Plant height.

Results of the effect of some stimulants and nitrogen sources on cantaloupe vegetative growth (plant height, leaf area, number of leaves and fresh, as well as dry weight plant) were recorded in Table (3) . Data show that greater plant height was obtained by using NPK (100%) than any other treatments used in both years. In other words applying CH(100%) gave the highest values of plant height 215.6 cm. While adding NPK100% treatment resulted in 219.4 cm,FYM 100% treatment gave 211.1 with significant difference between the treatments. Similar results were obtained by Konoplay and Higa (2001), Shao *et al.* (2001), El- Sharkawy *et al.* (2003) Nguyen and Trinh (2003) and Salib *et al.* (2003)

The lowest values were 157.0 and 165.5 cm receptivity under (50% OL+AP) treatment (control) with significant effect during the first and second seasons. This effect might be due to that EM increased the microorganisms in the soil which convert the ability of mobilizing the unavailable forms of nutrient elements to available forms .Moreover, the microorganisms produce growth promoting substances, which increase the plant growth characters. Also, EM improved the soil physical and chemical properties .The data agreed with Scialable (2000), Abd- Allah *et al.* (2001), El- Desuki *et al.* (2001),Yousef *et al.* (2001),El- Seify *et al.* (2004) and Hassan *et al.* (2006).

Table (3): Effect of some stimulants and nitrogen sources on different parameters of cantaloupe plants.

Treatments	Plant height (cm)		Leaf area (cm^2)		No. of leaves/plant		fresh weight/plant		dry weight/plant	
	2005/ 2006	2006/ 2007	2005/ 2006	2006/ 2007	2005/ 2006	2006/ 2007	2005/ 2006	2006/ 2007	2005/ 2006	2006/ 2007
100%NPK	219.4	223.6	175.3	168.8	77	79	732	719	168	162
100% CH	215.6	220.3	172.1	165.4	74	76	721	706	163	158
100%FYM	211.1	217.0	167.3	161.2	71	75	715	694	157	154
100%OL	168.8	174.5	137.1	131.1	51	55	642	629	125	119
50%CH+AP	185.0	190.9	148.2	143.1	63	64	667	659	144	140
50%CH+H.M	191.1	196.7	151.1	145.0	65	67	674	666	147	143
50%CH+EM	201.0	207.6	159.2	153.6	67	70	691	681	151	146
50%FYM+AP	179.1	183.5	144.4	139.2	58	61	657	643	137	135
50%FYM+H.M	181.6	188.8	146.2	141.0	61	64	661	652	141	138
50%FYM+EM	196.4	202.2	153.1	147.2	66	69	683	672	148	143
50%OL+AP	157.0	165.5	130.0	122.2	44	47	626	593	116	113
50%OL+H.M	160.2	169.4	133.2	125.4	46	50	631	607	118	114
50%OL+EM	164.3	172.4	136.2	128.3	49	53	637	615	121	117
MIX(1)	206.6	213.7	162.5	157.3	59	72	706	686	153	149
MIX(2)	174.9	178.6	142.6	137.1	57	59	631	639	132	129
MIX(3)	171.1	176.3	138.2	133.6	55	58	647	634	128	121
L.S.D. at 0.05	2.7	3.2	6.1	8.4	2.7	1.9	13.7	9.4	4.6	5.3

Mix (1) = 25% CH+ 25% FYM+AP+H.M+EM.
Mix (2) = 25% CH+ 25%OL+ AP+H.M+EM.
Mix (3) = 25% FYM+ 25% OL+ AP+H.M+EM.

b- Leaf area.

Leaf area lowest for plant grown in (50% OL+AP) in the first and second season whereas plant grown in 100% NPK, 100% CH or 100% FYM produced the greatest leaf area in both years of work Table (3) .The increase in leaf area for plant grown in available substrates may be attributed to several advantages i.e. reducing EC and PH values in the soil and increasing nutrient uptake. Similar results were obtained by Xu *et al.* (2001), Zarb *et al.* (2001), Ahmed *et al.* (2006) and Hassan *et al.* (2006).

c- Number of leaves.

Superiority of 100% NPK or 100% CH on number of leaves per plant was observed in Table (3) Both 100% form NPK,CH and FYM treatments gave higher number of leaves compared with control plant in both seasons of study.

Generally, the lowest number of leaves obtained for plants grown with (50% OL +AP) treatment. The data were in harmony with Nardi *et al.* (1999), El- Banna and Tolba (2000) and Hellian *et al.* (2000).

d- Fresh and dry weight per plant.

Responses of the fresh and dry weight of cantaloupe plants to some stimulants and nitrogen sources are illustrated in Table (3) .The results indicate that applying 100%NPK or 100% CH and 100% FYM treatments added to the soil had a significant effect on fresh and dry weight of plant compared with other treatments at sampling data. The highest values of fresh and dry weight were obtained under 100%NPK and100% CH and reached 732,721,719 and 706 gm respectively. The lowest values were 626 and 593 gm respectively under (50%OL+AP) treatment (control). The data were in harmony with Cheng *et al.* (1998) and Markowiak (2001)

Using organic fertilizer such as chicken manure and farmyard manure in sandy soil improves the soil texture. The structural improvement can encourage the plant to have a good root development through the soil fertility which leads to a higher plant vegetative growth.

2- Chemical analysis of cantaloupe plants.

Cantaloupe plant analysis for N, P and K (%) with some micro elements Fe, Mn, and Zn (ppm) were recorded in Table (4).

Table (4): Effect of some stimulants and nitrogen sources on macro and micro nutrients of cantaloupe plants.

Treatments	N (%)		P (%)		K (%)		Fe (ppm)		Mn (ppm)		Zn (ppm)	
	2005/ 2006	2006/ 2007	2005/ 2006	2006/ 2007	2005/ 2006	2006/ 2007	2005/ 2006	2006/ 2007	2005/ 2006	2006/ 2007	2005/ 2006	2006/ 2007
100%NPK	4.3	4.1	0.89	0.87	5.89	5.77	374	362	46	43	37	35
100% CH	4.1	3.8	0.87	0.86	5.62	5.55	356	345	42	41	34	34
100%FYM	4.0	3.8	0.85	0.84	5.55	5.34	346	336	40	39	31	32
100%OL	3.0	2.9	0.68	0.67	4.36	4.17	252	243	28	27	25	28
50%CH+AP	3.7	3.5	0.75	0.72	5.06	4.72	302	294	36	37	28	27
50%CH+H.M	3.8	3.6	0.77	0.74	5.17	4.83	314	307	37	35	27	26
50%CH+EM	3.9	3.8	0.81	0.80	5.32	5.19	332	322	38	36	27	29
50%FYM+AP	3.4	3.3	0.65	0.64	4.72	4.51	286	277	33	32	29	30
50%FYM+H.M	3.6	3.4	0.63	0.62	4.92	4.63	294	283	35	34	30	30
50%FYM+EM	3.8	3.7	0.79	0.78	5.26	5.07	325	313	38	36	28	31
50%OL+AP	2.6	2.4	0.96	0.92	3.71	3.67	215	207	24	21	18	17
50%OL+H.M	2.7	2.5	0.94	0.90	3.98	3.86	232	222	25	24	20	19
50%OL+EM	2.9	2.8	0.91	0.89	4.16	4.06	241	236	27	26	19	18
MIX(1)	3.9	3.7	0.83	0.82	5.46	5.39	341	327	39	37	26	24
MIX(2)	3.3	3.2	0.73	0.70	4.53	4.42	272	265	32	31	25	23
MIX(3)	3.2	3.0	0.71	0.69	4.41	4.27	263	253	30	29	24	22
L.S.D. at 0.05	0.2	0.1	0.04	0.03	0.3	0.5	11.2	9.7	N.S	N.S	1.7	1.1

Mix (1) = 25% CH+ 25% FYM+ AP+H.M+EM.
Mix (2) = 25% CH+ 25%OL+ AP+H.M+EM.
Mix (3) = 25% FYM+ 25% OL+ AP+H.M+EM.

Results show that application of 100% NPK treatment gave the highest values of N and K in cantaloupe plants with significant effect compared with the control and other treatments. The values of N and K percentage under 100% NPK,CH and FYM (4.3,4.1 and 4.0) and (5.89,5.62 and 5.55) in the first season, respectively. The MIX(1) treatment gave (3.9,0.83 and 5.46) in the first season, respectively The lowest concentration of N and K were observed under applying (50%OL+AP) (control). Nitrogen known essential plant nutrient and plays a major role in nucleic acids and protein synthesis chlorophyll synthesis, cell division and consequently enhanced vegetative growth of plants.

As micro nutrients i.e. Fe, Mn and Zn concentration the results showed that there were significant differences between all treatments during the two seasons of study. Meanwhile, (50%OL+AP) control gave the lowest values of macro and micro elements. The results agree with those obtained by Hasanin (2007)

3- Chemical analysis of cantaloupe fruits.

Table (5) show that NPK (%) and Fe, Mn and Zn (ppm) contents in cantaloupe fruits. In these respect (50% FYM) plus microorganisms (EM) significantly increased nitrogen, phosphorus and potassium contents over the control and most other tested treatments in cantaloupe fruits tissues in the first and second seasons Data were in harmony with those of Gaafer and Hasanin (2006).

Table (5): Effect of some stimulants and nitrogen sources on macro and micro nutrients of cantaloupe fruits.

Treatments	N (%)		P (%)		K (%)		Fe (ppm)		Mn (ppm)		Zn (ppm)	
	2005/ 2006	2006/ 2007	2005/ 2006	2006/ 2007	2005/ 2006	2006/ 2007	2005/ 2006	2006/ 2007	2005/ 2006	2006/ 2007	2005/ 2006	2006/ 2007
100%NPK	3.2	3.1	0.66	0.53	3.96	4.12	211	229	34	31	27	25
100% CH	3.0	3.0	0.62	0.50	4.17	4.42	208	225	32	30	26	25
100%FYM	2.9	2.8	0.60	0.49	4.32	4.61	200	217	31	30	25	25
100%OL	2.0	1.9	0.39	0.32	3.22	3.33	132	141	20	20	19	19
50%CH+AP	2.4	2.5	0.51	0.40	3.66	3.79	156	169	25	24	18	18
50%CH+H.M	2.6	2.5	0.53	0.43	3.71	3.84	163	174	26	26	20	17
50%CH+EM	2.8	2.6	0.57	0.46	3.87	4.02	186	197	28	27	23	22
50%FYM+AP	2.3	2.2	0.47	0.37	3.43	3.65	147	153	23	22	23	21
50%FYM+H.M	2.4	2.3	0.49	0.38	3.51	3.72	151	163	24	23	21	20
50%FYM+EM	3.3	3.2	0.76	0.57	4.42	4.71	216	234	37	33	28	26
50%OL+AP	1.7	1.5	0.76	0.62	2.95	3.09	120	126	17	18	17	16
50%OL+H.M	1.8	1.7	0.71	0.58	3.04	3.17	125	131	19	18	16	15
50%OL+EM	2.0	1.9	0.68	0.55	3.16	3.26	129	137	20	19	18	17
MIX(1)	2.8	2.7	0.59	0.47	4.06	4.25	193	204	29	28	24	23
MIX(2)	2.2	2.1	0.45	0.36	3.36	3.54	142	149	22	21	23	20
MIX(3)	2.1	2.0	0.42	0.34	3.27	3.41	138	145	21	20	22	19
L.S.D. at 0.05	0.2	0.1	0.02	0.04	0.4	0.3	2.7	1.9	N.S	N.S	N.S	N.S

Mix (1) = 25% CH+ 25% FYM+ AP+H.M+EM.
Mix (2) = 25% CH+ 25%OL+ AP+H.M+EM.
Mix (3) = 25% FYM+ 25% OL+ AP+H.M+EM

The margin curve of Fe, Mn and Zn in cantaloupe fruits (50% FYM) plus microorganisms (EM) were reached to the significant point in the two seasons.

These enhancing effects of the different bio fertilizers may be due to the efficiency of the different bacterial strains, on N2 fixation dissolving non soluble P and producing appropriate a mounts of phytohormones necessary for activating plant growth parameters.

4- fruit physical characteristics.

Fruit quality of cantaloupe average fruit weight, diameter, length, shape index, fresh thickness and Total Soluble Solid (TSS) as affected by different fertilization with biostimulants in two seasons in presented in Table (6). Results indicated that the highest average fruit weight, diameter, length, shape index, fresh thickness and Total Soluble Solid (SSC) were obtained by mineral fertilization and half rate of organic manure+ biostimulants treatments, while the lowest values were significant values were obtained by OL (10 tons/feddan) treatment only meanwhile other treatments were intermediate with significant differences.

Table (6): Effect of some stimulants and nitrogen sources on physical and chemical characteristics of cantaloupe fruits.

Treatments	fruit length (cm)		Fruit diameter (cm)		Shape index		flesh thickness (cm)		TSS (%)	
	2005/ 2006	2006/ 2007	2005/ 2006	2006/ 2007	2005/ 2006	2006/ 2007	2005/ 2006	2006/ 2007	2005/ 2006	2006/ 2007
100%NPK	8.5	9.0	12.7	12.4	1.441	1.330	3.8	3.7	14.0	13.9
100% CH	9.0	9.4	13.1	12.7	1.456	1.351	4.1	4.0	14.4	14.3
100%FYM	8.9	9.3	12.9	12.6	1.449	1.370	3.9	3.8	14.2	14.1
100%OL	7.2	7.4	10.2	9.8	1.327	1.271	2.7	2.6	11.8	11.5
50%CH+AP	8.0	8.5	12.2	11.6	1.525	1.364	3.5	3.4	13.5	13.4
50%CH+H.M	8.3	8.6	12.3	11.8	1.482	1.372	3.6	3.6	13.6	13.5
50%CH+EM	8.5	8.9	12.6	12.2	1.482	1.371	3.8	3.6	13.9	13.7
50%FYM+AP	7.7	8.1	11.7	11.3	1.520	1.395	3.3	3.2	13.4	13.1
50%FYM+H.M	7.9	8.3	12.0	11.4	1.519	1.373	3.4	3.4	13.5	13.3
50%FYM+EM	9.3	9.7	13.4	12.9	1.459	1.364	4.3	4.2	14.7	14.5
50%OL+AP	7.3	7.4	10.7	10.1	1.466	1.365	2.9	2.9	12.0	11.6
50%OL+H.M	7.3	7.6	10.8	10.3	1.479	1.355	3.0	2.9	12.3	12.0
50%OL+EM	7.4	7.7	11.0	10.6	1.487	1.377	3.1	3.0	12.6	12.3
MIX(1)	8.7	9.0	12.8	12.4	1.471	1.378	3.8	3.7	14.0	13.9
MIX(2)	7.6	8.0	11.6	11.0	1.526	1.375	3.3	3.2	13.2	12.9
MIX(3)	7.5	7.8	11.4	10.8	1.520	1.385	3.2	3.2	13.0	12.8
L.S.D. at 0.05	0.5	0.4	1.1	0.8	0.023	0.017	N.S	N.S	0.2	0.3

Mix (1) = 25% CH+ 25% FYM+ AP+H.M+EM.
Mix (2) = 25% CH+ 25%OL+ AP+H.M+EM.
Mix (3) = 25% FYM+ 25% OL+ AP+H.M+EM.

Such data confirmed with the recorded by Midan (1998), Eissa (1996),Sutha *et al.* (1998), Cho-Cho- Myint *et al.* (1999), Abdel- Kader (2002) and Gaafer and Hasanin(2006).

5- Yield and its components.

Results illustrated in Table (7) indicated that early, total yield and average fruit weight were significantly greater with FYM at a rate of 5 tons/feddan plus EM than any other treatments used in this experiment in both years of study.

The average increments of total yield were significantly increased compared with the control in both years. Besides 100% FYM. 50% FYM plus (EM) and 100% CH gave the highest values of early, total yield and average fruit weight compared with other used treatments in the two years of study . EM had significantly the highest early and total yield compared with either 100% OL or 50% OL plus EM. Regarding average fruit weight results of Table (7) revealed that 50% FYM plus (EM) produced significantly highest fruit compared with that of other treatments. Data confirmed with the recorded by El- Fakhrani (1999).

Table (7): Effect of some stimulants and nitrogen sources on yield productivity of cantaloupe fruits.

Treatments	Early yield (ton/fed.)		Total yield (ton/fed.)		Average fruit weight (gm)	
	2005/ 2006	2006/ 2007	2005/ 2006	2006/ 2007	2005/ 2006	2006/ 2007
100%NPK	3.23	3.06	12.71	12.53	810	817
100% CH	3.49	3.37	13.00	12.74	827	843
100%FYM	3.55	3.41	13.16	12.94	833	852
100%OL	2.37	2.33	11.83	11.62	684	695
50%CH+AP	2.75	2.62	12.39	12,16	743	756
50%CH+H.M	2.84	2.76	12.46	12.22	753	769
50%CH+EM	3.12	2.96	12.62	12.43	795	805
50%FYM+AP	2.63	2.51	12.26	11.94	729	739
50%FYM+H.M	2.71	2.56	12.31	12.06	736	748
50%FYM+EM	3.72	3.56	13.28	13.11	854	867
50%OL+AP	2.11	2.06	11.27	11.12	525	647
50%OL+H.M	2.31	2.21	11.42	11.36	553	666
50%OL+EM	2.36	2.29	11.74	11.51	674	685
MIX(1)	3.34	3.15	12.86	12.66	815	822
MIX(2)	2.53	2.47	12.16	11.85	711	728
MIX(3)	2.43	2.39	12.11	11.75	705	716
L.S.D. at 0.05	0.3	0.2	0.09	0.08	11.2	13.9

Mix (1) = 25% CH+ 25% FYM+ AP+H.M+EM.
Mix (2) = 25% CH+ 25%OL+ AP+H.M+EM.
Mix (3) = 25% FYM+ 25% OL+ AP+H.M+EM

The increase of fruit yield due to applying the suitable organic fertilizer rate might be due to the increase of the vegetative growth and dry matter and nutrient elements content of plants which consequently led to higher early and total yield. Such data confirmed with the recorded by Midan (1998), Eissa(1996), Daly and Stewart (1999), Ouda (2002), Hassan (2005), Gaafer and Hasanin (2005) and Hassan *et al.* (2006)

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تاثير المخصبات الحيوية ومصادر النتروجين على نمو وانتاجية نباتات الكنتالوب النامية تحت الانفاق البلاستيكية المنخفضة تحت ظروف الاراضى الملحية

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أجريت الدراسة فى منطقة العريش محافظة شمال سيناء تحت الانفاق البلاستيكية المنخفضة لمحصول الكنتالوب خلال موسمى ٢٠٠٥/٢٠٠٦ و ٢٠٠٦/٢٠٠٧ بهدف معرفة تاثير المخصبات الحيوية ومصادر النتروجين على جودة ثمار الكنتالوب وكانت المعاملات كالاتى:–

١– الاسمدة NPK بمعدل كامل .

٢– سماد الدواجن بمعدل ١٠ طن/فدان.

٣– سماد Farmyard بمعدل ١٠ طن/فدان.

٤– سماد مخلفات الزيتون بمعدل ١٠ طن/فدان.

٥– سماد الدواجن بمعدل ٥ طن/فدان + الحامض الامينى AP.بمعدل ٢٠٠ PPm.

٦– سماد Farmyard بمعدل ٥ طن/فدان + الحامض الامينى AP.بمعدل ٢٠٠ PPm.

٧– سماد مخلفات الزيتون بمعدل ٥ طن/فدان + الحامض الامينى AP.بمعدل ٢٠٠ PPm.

٨– سماد الدواجن بمعدل ٥ طن/فدان + EM.بمعدل ٤ لتر/ فدان.

٩– سماد Farmyard بمعدل ٥ طن/فدان +EM .بمعدل ٤ لتر/ فدان.

١٠- سماد مخلفات الزيتون بمعدل ٥ طن/فدان + EM.بمعدل ٤ لتر/ فدان
١١- سماد الدواجن بمعدل ٥ طن/فدان + حمض الهيومبك .بمعدل٥٠جم/ كجم تربة.
١٢- سماد Farmyard بمعدل ٥ طن/فدان + حمض الهيومبك .بمعدل٥٠جم/ كجم تربة.
١٣- سماد مخلفات الزيتون بمعدل ٥ طن/فدان + حمض الهيومبك .بمعدل٥٠جم/ كجم تربة
١٤- سماد الدواجن بمعدل ٢,٥ طن/فدان+ سماد Farmyard بمعدل ٢,٥ طن/فدان+ خليط من (AP+EM+HA).
١٥- سماد الدواجن بمعدل ٢,٥ طن/فدان+ سماد Farmyard بمعدل ٢,٥ طن/فدان+ خليط من (AP+EM+HA).
١٦- سماد الدواجن بمعدل ٢,٥ طن/فدان+ سماد Farmyard بمعدل ٢,٥ طن/فدان+ خليط من (AP+EM+HA). **وكانت اهم النتائج المتحصل عليها:-**

١- ادى استخدام الاسمدة NPK بمعدل كامل و سماد الدواجن بمعدل ١٠ طن/فدان و سماد Farmyard بمعدل ١٠ طن/فدان الى زيادة طول النبات ومساحة الورقة وعدد الاوراق على النبات والوزن الطازج والجاف بينما ادى استخدام سماد مخلفات الزيتون بمعدل ٥ طن/فدان + الحامض الامينى AP.بمعدل ٢٠٠ PPm الى قلة صفات النمو الخضرى.
٢- ادى استخدام الاسمدة NPK بمعدل كامل الى زيادة النسبة المئوية للعناصر الكبرى NPK والعناصر الصغرى Fe, Mn, Zn فى بناتات وثمار الكنتالوب مقارنة بالمعاملات الاخرى والكنترول.
٣- ادى استخدام سماد Farmyard بمعدل ٥ طن/فدان +EM .بمعدل ٤ لتر/ فدان الى زيادة المحصول المبكر والكلى ووزن الثمرة معنويا على باقى المعاملات والكنترول.
٤- ادى استخدام سماد Farmyard بمعدل ٥ طن/فدان +EM .بمعدل ٤ لتر/ فدان الى زيادة الصفات الطبيعية للثمار (طول و قطر الثمرة وسمك اللحم) والصفات الكيماوية مثل المواد الصلبة الزائبة حيث تفوقت معنويا على باقى المعاملات.