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GROWTH AND YIELD OF EGGPLANT AND ITS PHSICAL AND CHEMICAL QUALITUS AS AFFECTED BY ORGANIC AND MINERAL FERTILIZER.

Shafeek, M. R.
Vegetable Depart., National Research Centre, Dokki, Cairo, Egypt.

ABSTRACT

Two field experiments were carried out at the Experimental Station of National Research Center to study the effect of some different sources of organic manure and chemical fertilizations on growth, yield and its physical and chemical properties of Egg plan. The important results revealed that:

1- The vigor plant growth and the heaviest fruits yield and that of the best physical and chemical properties were associated with the addition of NPK as mineral fertilization if compared with unfertilized plants.
2- Addition of chicken manure resulted the best vigor plant growth and the heaviest total (16.923 and 19.617 Ton/ fed in 1 *st* and 2 *nd* season respectively) and early (3.523 and 5.150 ton/ fed for the same respective under of fruits yield and the highest values of total protein, N, P, K, Fe, Mn, Zn and Cu in fruit tissues). If compared to the other sources of organic manure. Moreover, the statistical analysis of the obtained data revealed that, no great variations between the treatments of organic sources were found.
3- Supplying eggplant plants by organic manure (chicken manure) and mineral fertilizer as a chemical fertilizer resulted in the higher plant growth, and heaviest fruits yield and that of the best physical and chemical qualities of eggplant

INTREDUCTION

Eggplant (*solanum melongena* L.) is generally enlisted as classical commodity for both local consumption and exportation. As might be expected with crops of such promising potentiality efforts to improve its production should be carried out.

Increasing the productivity as well as the cultivated area, led to an increase in the used of chemical fertilizers, which increased environmental pollution.

Among the improvement possibilities, the nutritional requirements play a major role. Nitrogen, phosphorus and potassium major essential elements required for fertilizing eggplant to improve the growth characteristics (Sawan and Rizk, 1998 Singh and kohl, 1999, AbdEl-Naem *et al.* 2001 and Siviero *et al.* 2001) all of them demonstrated that applying NPK fertilizer increased the yield and quality of eggplant.

Organic manure contains higher levels of relatively available nutrient elements, which are essentially required for plant growth. Moreover it plays an important role for improving soil physical properties (Bhandari *et al.* 1989, AboEl- Defan 1990 and Fatma 2001).

The supplying vegetable crops with organic and inorganic fertilizers were proved to be very essential for the production of higher yield and for improving its quality (Mengel and Kirkby 1978, Edmoned *et al.* 1981, Borin *et al.* 1987, AbdAllah, *et al.*, 2001 and Fatma, 2001).

A combination of organic and inorganic fertilizations gave the best results in terms of growth: i. e. plant height, number of branches / plant, mean fruit weight and number of fruits / plant (Kumaran *et al.*. 1998 Batalha, *et al.*, 1995 and Fatma, 2002). Moreover, Organic manure + mineral fertilizations were the best treatment for producing early and total yields of tomato and eggplant (Ribiro *et al.*, 2000, AbdAllah, 2001 and Fatma, 2002). Many other investigators reported that the combination of organic and inorganic fertilizations increased the N and P uptake, total protein, K, Zn and Cu content as well as fruit total soluble solids (T S S) (Ogbadu and Easmon 1989, Fatma, 2002 and Hassan, 2002).

This present investigation was undertaken to study the effect of some different sources of organic manure and chemical fertilizations on eggplant growth, yield and its physical and chemical properties.

MATERIAL AND METHODS

Two field experiments were carried out during two successive growth seasons of 2001 and 2002 at the experimental station of National Research Center, at Shalakan (Kaluobia Governorate Egypt) to study the effect of different sources of organic nitrogen fertilization on the productivity and some chemical constituents of eggplant. The physical and chemical characteristics of the experimental soil sites are presented in Table (1). Table (2) shows the chemical analysis of the organic manures, which used in this study.

Table (1): The physical and chemical characteristics of the experimental soil.

Soil properties		Value
Physical analysis:		
Organic matter	(%)	2.25
Fine sand	(%)	19.90
Silt	(%)	27.55
Clay		53.22
Soil texture		Clay loam
Chemical analysis:		
pH.	(1:2.5 H_2o)	7.8
EC	(m.mhos)	1.25
Total nitrogen	(mg/100g) soil)	135.0
Available P	(mg/100g) soil)	4.55
Available K	(mg/100g) soil)	0.65
Iron	(ppm)	35.90
Zinc	(ppm)	2.55
Manganese	(ppm)	65.40
Copper	(ppm)	5.50

Each experiment consisted of 10 treatments, which were: four sources of organic manure, i. e cattle, chicken, Nile compost and town refuse with or without chemical fertilizers (NPK). The experimental design used in the two growing seasons was a split plot with three replicates. The two levels of chemical fertilizer were arranged at random in the main plots, while the four different sources of organic nitrogen were distributed within the sub –plots.

Table (2): The chemical analysis of the used cattle, chicken manures, plants residue, compost and town refuse.

Characters	Cattle manure	Chicken manure	Plant compost	Town refuse compost
Ph	7.5	6.5	7	7.0
E.C.(m mhos)	14.1	5.7	5	4.0
Organic carbon %	7.9	32	41	12
Organic matter %	6.5	63.5	70	32
Total nitrogen %	0.42	2.95	2	1.0
C / N ratio	1:19	1:11	1:17	10.12
Total phosphorus %	0.41	1.14	0.6	0.4
Total potassium %	0.85	1.8	6.0	0.4
Fe mg / kg	650	168	7900	5
Manganese mg / kg	135	241	190	0.2
Copper mg / kg	11	92	20	0.3
Zinc mg / kg	105	110	4.75	1.0

The chemical fertilizer was added as ammonium sulfate (20.6 % N), calcium super phosphate (15.5 %P_2O_5) and potassium sulfate (48% K_2O) at two times: The first half before seedling plantation and the second one at 1.5 month late. Whereas, all organic manure treatments applied to the soil during preparing it for planting.

The seedlings of eggplant c.v. Balady were sown on one side of the ridge 20cm apart on June 20 and 26 in the two seasons 2001 and 2002 respectively. Each experimental plot consisted of 4 ridges, 3m in length and 80cm in width (plot area 9.6 m2). The normal cultural practices commonly used in growing and irrigation of eggplant was followed. Three months after transplanting, foliage samples were collected from every experimental plot and the following vegetative growth parameters were recorded: plant length (cm), number of shoots and leaves (No./ plant), fresh and dry weight g / plant of eggplant and its different organs (leaves and shoots).

Eggplant fruits were harvested weekly and the early (first 3 pickings) and total yield were counted as tons /fed. Samples of fruits at harvesting time were taken to determine physical quality measurements as follows: dimension of fruits (length, diameter as cm, size (cm3), average weight (g), as well as the number of fruits / plant. Nitrogen, phosphorus and potassium contents in eggplant fruits were analyzed according to the methods described by Pregl (1945), Troug and Meyer (1939) and Brown and Lilleland (1946), respectively. But, Fe, Mn, Zn and Cu concentrations, were determined using flame ionization of atomic absorption, spectrometer modal 1100B of perking

Elmer and according the method of Chapman and Pratt (1978). The protein percentage in fruits was accounted by multiplying nitrogen content by 6.25. Total soluble solids (TSS) of fruits was determined using hand refractmeter. All data values were subjected to the analysis of variance according to Gomez and Gomez (1984).

RESULTS AND DISCUSSION

A- Growth character:

1-Effect of mineral fertilization:

Table (3) show clearly that, addition of NPK as chemical mineral fertilization for eggplant resulted the vigor plant growth than that with no NPK addition, whereas, the higher plants which carried the outnumber of shoots and leaves, as well as the heavier fresh and dry weights of whole plant and its different organs, all of them were recorded with plants received nitrogen in the mineral form. These findings were similar in the two experimental seasons. The superiority in plant growth of eggplants with the application of NPK mineral fertilizer, which obtained here are in good accordance with that of Sawan and Rizk (1998), Singh and Kohl (1999) and AbdEl-Naem *et al.* (2001).

2- Effect of organic fertilization:

The presented data of Table (3) reveals that, addition of chicken manure for eggplant resulted the most vigor plant growth, where the highest number of shoots (1 st season), leaves (1 st and 2 nd seasons) , the heaviest fresh weight of whole plant and its leaves (1 st and 2 nd seasons) as well as the heaviest dry weight of whole plant and its leaves (1 st season), all of the previous criterias were registrated with plants supplied with chicken manure. However, the addition of compost (resulted from the fermintation of some agricultural residues) caused an increase in the values of plant growth characters, but its enhancment were less than that of using the chicken manure in many cases, but were more in other cases. It could be conducted that, applying either chicken or compost manure as organic fertilizer for eggplant resulted a similar effect. Where, the statistical analysis of the obtained data showed that, the differences within the two kinds of organic fertilizers failled to reach the 5% level of significant.

The resulted data of Table (3) also reveals that, the poorest plant growth was recorded with the unfertilized plants. These were true in first and second experimental seasons. With regard to the cattle and town refuse of organic fertilizer, the experimental data showed that, the variations between them were not great, but in most cases the application of cattle manure recorded some more vigor plant growth. The addition of organic manure for vegetable plant as an organic fertilizer were studied by many investigators such as Mengel and Kirkby (1976), Edmond *et al.* (1981), Borin *et al.* (1987), AbdAllah *et al.* (2001) and Fatma (2001), all of them obtained a similar finding which supported our results.

Table (3): Effect of organic manure and chemical fertilizers on the growth characters of eggplant during two Seasons.

A- First season (.2001).

Treatments		Plant length (cm)	No./plant		Fresh weight g/ plant			Dry weight g/plant		
Minerals	Organic		Shoots	Leaves	Shoots	Leaves	Whole plant	Shoots	Leaves	Whole plant
Without NPK	0	58.67	2.33	24.67	64.33	82.67	147.00	4.37	7.50	11.87
	Cattle	66.66	4.32	23.66	123.32	96.32	219.67	6.17	8.00	14.17
	Chicken	69.32	4.34	46.66	93.33	196.33	289.67	6.17	10.13	16.30
	Compost	75.00	4.33	38.32	93.00	102.43	195.33	7.33	10.17	17.50
	Town refuse	73.00	3.00	37.33	122.66	96.00	218.66	7.83	9.67	17.50
Mean		**68.53**	**3.67**	**34.13**	**99.33**	**114.73**	**214.07**	**6.37**	**9.09**	**15.47**
With NPK	0	72.00	5.00	45.67	135.00	160.32	295.32	7.17	11.73	18.90
	Cattle	74.00	7.33	59.33	196.67	216.33	413.00	11.40	13.73	25.13
	Chicken	98.34	7.67	81.66	164.66	240.33	405.00	7.90	19.00	26.90
	Compost	72.00	5.00	88.34	165.00	196.67	361.66	8.07	13.43	21.50
	Town refuse	74.32	5.67	78.33	156.00	178.33	334.33	7.66	12.13	19.80
Mean		**78.53**	**6.13**	**70.67**	**163.47**	**198.40**	**361.87**	**8.44**	**14.01**	**22.45**
Average	0	65.33	3.66	35.17	99.67	121.50	221.17	5.77	9.62	15.38
	Cattle	70.33	5.83	41.50	160.00	156.33	316.33	8.78	10.87	19.65
	Chicken	83.82	6.00	64.17	129.00	218.33	347.32	7.03	14.57	21.60
	Compost	74.50	4.67	63.33	129.00	149.50	278.50	7.70	11.80	19.50
	Town refuse	73.66	4.23	57.83	139.32	137.17	276.50	7.50	10.90	18.65
L.S.D.at 5% level	Nitrogen	**3.58**	**N.S.**	**26.58**	**24.15**	**4.87**	**22.75**	**1.94**	**1.34**	**0.60**
	Organic	**5.35**	**0.89**	**10.77**	**19.64**	**15.28**	**22.72**	**0.96**	**1.64**	**2.11**
	Interaction	**7.56**	**1.25**	**N.S.**	**N.S.**	**21.61**	**32.13**	**1.36**	**2.32**	**2.99**

Table (3): Continue:

B- Second season (2002).

Treatments		Plant length (cm)	No./plant		Fresh weight (g)/ plant			Dry weight (g)/ plant		
Minerals	Organic		Shoots	Leaves	Shoots	Leaves	Whole plant	Shoots	Leaves	Whole plant
Without NPK	0	54.67	4.63	99.27	42.13	28.39	70.52	13.11	9.63	22.74
	Cattle	70.07	5.07	133.00	62.99	40.98	103.98	17.84	12.28	30.13
	Chicken	76.50	4.90	168.37	55.84	59.49	115.33	16.29	16.20	32.49
	Compost	80.17	5.03	155.73	58.09	42.59	100.68	16.95	16.17	33.12
	Town refuse	84.33	4.87	122.37	46.26	42.55	88.81	18.39	15.29	33.69
Mean		**73.15**	**4.90**	**135.75**	**53.06**	**42.80**	**95.86**	**16.52**	**13.91**	**30.43**
Witht NPK	0	91.00	5.90	171.77	60.38	42.20	102.58	19.78	16.00	35.78
	Cattle	94.33	7.33	172.30	80.77	59.27	140.04	28.80	21.10	49.90
	Chicken	98.67	6.63	181.33	87.24	82.30	169.54	21.70	19.58	41.28
	Compost	102.67	7.07	189.10	61.56	62.77	124.32	30.27	19.85	50.12
	Town refuse	100.13	6.60	193.07	75.53	69.20	144.73	26.48	19.72	46.20
Mean		**97.36**	**6.71**	**181.51**	**73.10**	**63.15**	**136.24**	**25.41**	**19.25**	**44.66**
Average	0	72.83	5.27	135.52	51.26	35.29	86.55	16.45	12.82	29.26
	Cattle	82.20	6.20	152.65	71.88	50.13	122.01	23.32	16.69	40.01
	Chicken	87.58	5.77	174.85	71.54	70.90	142.44	19.00	17.89	36.89
	Compost	91.42	6.05	172.42	59.82	52.68	112.50	23.61	18.01	41.62
	Town refuse	92.23	5.73	157.72	60.90	55.87	116.77	22.44	17.51	39.95
L.S.D.at 5 % level	Nitrogen	5.24	0.10	11.04	9.04	18.57	17.56	4.54	5.29	9.55
	Organic	3.73	0.35	16.68	7.49	18.92	19.68	2.73	N.S.	5.39
	Interaction	5.27	N.S	23.59	10.59	N.S.	N.S	3.86	N.S.	N.S.

3- Effect of the interaction:

The effect of interaction between addition of organic fertilizers (cattle, chicken and town refuse) with or without minerals (as NPK) on the vegetative growth values of eggpiant in two experiments of 2001 and 2002 are presented in Table (3). However, the obtained data demonstrated that, addition of chemical nitrogen with organic manures gave superiority in all plant growth parameters if compared of those without chemical nitrogen addition. These findings were true in two seasons of 2001 and 2002.

B- Total fruits yield and its components:

1- **Effect of mineral fertilization:**

The presented data of Table (4) demonstrated that, the highest total (16.88 and 20.187respectively for 1 *st* and 2 *nd* seasons) and early yield (3.846 and 5.844 for the same respective) of eggplant were harvested from the applied plants supplied with mineral fertilization as NPK. These results were true in both seasons of 2001 and 2002. The physical properties of eggplant fruits, i.e. length, diameter, size and average weight of fruit as well as the average fruits number/ plant, all of them registered the same order of change like that of total and early yield in two seasons. It could be stated that the heaviest fruits yield and that of the best physical properties were associated with the addition of mineral nitrogen if compared with no mineral fertilizer application. The findings which obtained by Sawan and Rizk (1998), Siviero *et al.* (2001), AbdEl-Naem *et al.* (2001) and Fatma, 2002 are in good accordance with the data recorded in this study.

2- Effect of the organic fertilizers:

Data of Table (4) clearly showed that plants received chicken manure as organic manure gained the heaviest total (16.923 and 19.617 ton/ fed in 1 *st* and 2 *nd* seasons respectively), and early (3.523 and 5.150 ton/ fed. for the same respective) fruits yield comparing with the other studied organic kinds of manure. On the contrary,the lowest yield was recorded with the plants did not received organic fertilizers. Moreover,application of compost resulted a less yied than that resulted when using chicken manure, but was more than using either of cattle or town refuse manures. These effects were similar in the two experimental seasons.

Concerning to the physical properties of fruits, i.e. fruit dimensions (length, diameters and size) and average fruit weight as well as average fruits number/ plant, all of them recorded the same trend of change like that, above mentioned for total and early fruits yield.

Generally, it could be concluded that, the heaviest fruits yield and that of the best physical quality of eggplant were associated with using chicken manure as organic fertilizer followed in descending order by using compost, but the lowest values of yield and its components were recorded with plants fertilized with NPK only. These results were in accordance with those of Bhandari *et al.* (1989), AboEl-Defan (1990) Fatma (2001) and Hassan 2002

3- Effect of the interactions:

The effect of the interaction treatments of mineral and organic fertilization for eggplant on fruits yield and its some physical properties during 2001 and 2002 seasons are tabulated in Table (4).

Table (4): Effect of organic manure and chemical fertilizers on total fruit yield and its components of eggplant during two seasons.

A. First season (2001).

Treatments		Fruits					Yield (ton/ fed.)	
Minerals	Organic	Length	Diameter	Size	No./plant	Average wt.	Early	Total
Without NPK	0	9.83	2.93	27.32	27.87	24.365	2.423	9.957
	Cattle	10.50	2.87	73.67	44.67	39.877	2.823	14.263
	Chicken	13.00	3.33	42.83	53.07	41.647	2.860	14.593
	Compost	11.83	2.87	34.66	44.70	36.480	2.657	12.407
	Town refuse	13.50	2.90	27.83	35.87	31.692	2.450	12.183
Mean		**11.73**	**2.98**	**41.27**	**41.23**	**34.812**	**2.643**	**12.681**
With NPK	0	11.83	2.77	39.50	41.90	33.597	3.370	14.530
	Cattle	14.17	3.20	40.03	59.87	46.982	4.140	18.013
	Chicken	14.67	3.37	52.83	60.00	48.065	4.187	19.253
	Compost	12.00	3.43	43.50	49.67	38.432	4.090	17.220
	Town refuse	12.33	2.93	43.17	55.80	33.627	3.443	15.417
Mean		**13.00**	**3.14**	**43.81**	**53.45**	**40.140**	**3.846**	**16.887**
Averages	0	10.83	2.85	33.42	34.88	28.981	2.897	12.243
	Cattle	12.32	3.03	56.58	52.27	43.429	3.482	16.138
	Chicken	13.83	3.35	47.83	56.53	44.856	3.523	16.923
	Compost	11.92	3.15	39.08	47.18	37.456	3.373	14.813
	Town refuse	12.92	2.92	35.50	45.83	32.659	2.947	13.800
L.S.D.at 5% level	Nitrogen	0.62	N.S.	0.37	10.24	4.802	1.025	2.183
	Organic	N.S.	N.S.	N.S	14.38	6.142	0.406	1.308
	Interaction	N.S.	N.S.	7.61	N.S.	N.S.	N.S.	N.S.

Table (4): Continue:

B-Second season (2002).

Treatments		Fruit					Yield (ton / fed)	
Minerals	Organic	Length	Diameter	Size	No. /plant	Average wt.	Early	Total
Without NPK	0	11.23	2.77	85.53	16.67	59.560	2.710	10.243
	Cattle	12.50	3.00	91.97	19.00	68.793	3.393	15.927
	Chicken	14.67	3.43	96.73	20.33	84.803	4.090	17.057
	Compost	12.32	3.13	100.27	18.67	76.692	3.383	14.483
	Town refuse	13.00	2.97	103.57	18.00	73.178	3.000	14.033
Mean		**12.75**	**3.06**	**95.61**	**18.53**	**72.605**	**3.315**	**14.349**
With NPK	0	12.50	2.90	100.27	21.33	76.257	5.527	18.627
	Cattle	13.83	3.03	103.20	24.00	82.318	5.867	20.933
	Chicken	12.66	3.03	107.73	28.33	99.195	6.210	22.177
	Compost	12.83	3.20	109.20	23.33	89.048	5.813	20.147
	Town refuse	13.00	3.33	102.97	22.33	88.768	5.803	19.037
Mean		**12.97**	**3.10**	**104.67**	**23.87**	**87.117**	**5.844**	**20.184**
Averages	0	11.87	2.83	92.90	19.00	67.908	4.118	14.435
	Cattle	13.17	3.02	97.58	21.50	75.556	3.630	18.430
	Chicken	13.67	3.23	102.23	24.33	91.999	5.150	19.617
	Compost	12.58	3.17	104.73	21.00	82.870	4.598	17.315
	Town refuse	13.00	3.15	103.27	20.17	80.973	4.402	16.535
L.S.D.at 5% level	Nitrogen	N.S.	N.S.	7.19	2.82	13.552	1.345	1.427
	Organic	N.S.	N.S.	N.S	3.09	12.354	N.S.	1.356
	Interaction	N.S.	N.S.	N.S.	N.S.	N.S.	N.S.	N.S.

Whereas, the statistical analysis of the obtained data clearly demonstrated that the differences within the different interaction treatments were not significant. These were similar in both experimental seasons except of size of fruit in 1 *st* season. It means that each factor of the experiment acting individually, i.e. independently.

Generally, the obtained data (Table 4) showed that, the heaviest fruits yield of total and early as well as its best physical quality, all of them were associated with that plants applied each of chicken as organic manure and NPK as mineral fertilization.

C- Fruit nutritional values:

1-Effect of mineral fertilization:

Table (5) shows the response of eggplant fruits to the application of nitrogen as mineral fertilizer in 2001 and 2002 seasons. However, the obtained data reveals that, the highest values of total soluble solids (TSS), protein content, N, P, K, as major elements; and Fe, Mn, Zn and Cu as microelements, all of them recorded higher results than that of plants which supplied with NPK as mineral fertilization if compared with the unfertilized plants. These were true in both seasons. These results might be attributed to the enough N, P and K in rooting zone, which caused a promotion in plant growth and its metabolic synthesis and minerals accumulations. Many other investigators studied the role of mineral fertilizer on the nutritional values of vegetable fruits and supported our findings for the obtained data (Sawan and Rizk1998, Ribiro *et al.* 2000, AbdAllah *et al.* (2001) and Fatma, 2002).

2-Effect of organic fertilizers:

The highest values of N, P and K and protein in eggplant fruit tissues were recorded when supplied with chicken manure if compared to the other types of organic manure. These results were more clearly in 1 st season. With concern to the other elements, the obtained data showed that, Fe (1 st season), Mn (both season), Zn (2 nd season) and Cu (2 nd season) were recorded their highest values with the addition of chicken manure as organic fertilizer for eggplant. Whereas, the statistical analysis of the obtained data demonstrated that the differences were not great within different organic sources as their effects on minor elements with some little exception. it could be concluded that, the superiority of some major and minor elements in fruits tissues of eggplant might be attributed to the high levels of these elements in chicken manure over than other organic manures (Table 2). Similar results were reported by Ogbadu and Easmon (1989), AbdAllah *et al.* (2001), Fatma (2001) and Hassan 2002).

1- **Effect the interactions:**

The effect of the interaction treatments of mineral and organic fertilization on the nutritional values of eggplant fruits in seasons of 2001 and 2002 are presented in Table (5). Generally supplying eggplant by organic manure and mineral nitrogen as a chemical fertilizer resulted in the higher nutritional values in eggplant fruits. Moreover, the responses of the major and minor elements as well as protein and TSS values to the interaction treatments were not statistically significant. These were true in the two experimental seasons except of protein, N, Mn and Zn values of 1 st season.

Table (5): Effect of organic manure and chemical fertilizers on the nutritional values of eggplant during two seasons.

A- First season (2001).

Treatments		TSS	Protein	%			ppm			
Minerals	Organic			N	P	K	Fe	Mn	Zn	Cu
Without NPK	0	4.23	17.73	2.84	0.68	2.797	6.80	0.175	0.177	0.184
	Cattle	5.33	20.54	3.29	0.74	3.530	7.07	0.180	0.185	0.186
	Chicken	4.30	23.94	3.83	0.87	3.057	7.17	0.182	0.190	0.187
	Compost	4.13	22.85	3.66	0.77	3.463	6.87	0.196	0.191	0.190
	Town refuse	4.00	22.27	3.56	0.86	2.983	7.10	0.188	0.219	0.186
Mean		**4.40**	**21.47**	**3.43**	**0.78**	**3.166**	**7.00**	**0.184**	**0.192**	**0.187**
With NPK	0	4.17	24.81	3.97	0.82	3.347	9.33	0.222	0.216	0.201
	Cattle	6.13	26.81	4.29	0.85	3.917	10.20	0.262	0.227	0.202
	Chicken	5.13	25.33	4.05	0.92	3.750	9.67	0.264	0.235	0.205
	Compost	4.33	25.29	4.05	0.87	3.803	10.23	0.246	0.229	0.213
	Town refuse	4.43	24.90	3.98	0.91	3.533	9.47	0.248	0.223	0.203
Mean		**4.84**	**25.43**	**4.07**	**0.87**	**3.670**	**9.78**	**0.248**	**0.226**	**0.205**
Averages	0	4.20	21.27	3.40	0.75	3.072	8.07	0.198	0.197	0.192
	Cattle	5.73	23.68	3.79	0.80	3.723	8.63	0.221	0.206	0.194
	Chicken	4.72	24.64	3.94	0.90	3.403	8.42	0.223	0.213	0.196
	Compost	4.23	24.07	3.85	0.82	3.633	8.55	0.221	0.210	0.202
	Town refuse	4.22	23.58	3.77	0.88	3.258	8.28	0.218	0.221	0.195
L.S.D.at 5 % levels	Nitrogen	0.40	1.28	0.21	0.05	0.402	1.07	0.043	0.008	0.010
	Organic	0.64	1.22	0.19	0.06	0.411	N.S.	0.015	N.S	N.S
	Interaction	N.S.	1.72	0.28	N.S.	N.S.	N.S.	0.021	0.011	N.S.

Table (5): Continue:

B-Second season (2002).

Treatments		TSS	Protein	%			ppm			
Minerals	Organic			N	P	K	Fe	Mn	Zn	Cu
Without NPK	0	3.67	20.17	3.23	0.67	3.060	4.30	0.171	0.163	0.174
	Cattle	5.00	22.48	3.60	0.73	3.583	6.27	0.171	0.168	0.183
	Chicken	4.90	25.48	4.08	0.69	3.750	6.23	0.173	0.174	0.187
	Compost	4.40	24.17	3.87	0.72	3.667	6.40	0.182	0.176	0.185
	Townrefuse	3.83	22.94	3.67	0.67	3.870	7.17	0.186	0.171	0.183
Mean		**4.36**	**23.05**	**3.69**	**0.70**	**3.588**	**6.07**	**0.177**	**0.170**	**0.182**
Without NPK	0	3.57	28.02	4.48	0.86	4.057	7.43	2.530	0.216	0.179
	Cattle	6.07	28.13	4.50	0.96	4.230	8.40	2.737	0.234	0.187
	Chicken	5.40	32.60	5.22	0.87	4.260	8.27	2.777	0.244	0.182
	Compost	4.00	31.48	5.04	0.93	3.833	11.07	2.647	0.240	0.183
	Townrefuse	3.83	28.44	4.55	0.91	4.200	10.23	2.517	0.236	0.180
Mean		**4.57**	**29.73**	**4.76**	**0.90**	**4.116**	**9.08**	**2.641**	**0.234**	**0.182**
Averages	0	3.62	24.09	3.86	0.76	3.558	5.87	1.350	0.190	0.177
	Cattle	5.53	25.30	4.05	0.84	3.907	7.33	1.454	0.201	0.185
	Chicken	5.15	29.04	4.65	0.78	4.005	7.25	1.475	0.209	0.184
	Compost	4.20	27.82	4.45	0.83	3.755	8.73	1.415	0.208	0.184
	Townrefuse	3.83	25.69	4.11	0.79	4.035	8.70	1.351	0.204	0.181
L.S.D.at 5% levels	Nitrogen	N.S.	3.69	0.59	0.05	N.S.	0.97	0.162	0.011	N.S.
	Organic	N.S.	1.84	0.29	N.S.	N.S.	1.53	N.S.	N.S	0.004
	Interaction	N.S.	N.S.	N.S.	N.S.	N.S.	N.S.	N.S.	N.S.	N.S

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تا ثير التسميد العضوى و المعدنى على النمو و المحصول و الصفات الطبيعية و الكيماوية لنبات البا ذ نجان

محمد رضا شفيق

قسم بحوث الخضر- المركز القومى للبحوث- الدقى- مصر

اجرى هذا البحث لدراسة ناثير المصادر المختلفة من التسميد العضوى و الكيماوى على النمو و المحصول و الصفات الطبيعية و الكيماوية لثمارالبا ذنجان و قد تضمنت اهم النتائج ما يلى:-

١- سجل افضل نمو خضرى و اعلى محصول و افضل جودة للثمار عند اضافة الاسمدة الكيماويه مقارنة بالنباتات الغير المسمدة بهذة الاسمدة.

٢-اعطت اضافة سماد الدواجن اكبر نمو خضرى للنباتات و اعلى محصول من الثمار (١٦,٩٢٣ طن/ فدان فى الموسم الاول و ١٩,٦١٧ طن/ فدان فى الموسم الثانى) و كذلك المحصول المبكر (٣,٥٢٣ طن / فدان فى الموسم الاول و ٥,١٥٠ طن / فدان فى الموسم الثانى) كما ادت نفس المعاملة الى الحصول على احسن صفات طبيعيه للثمار و اعلى محتوى من النتروجين و الفوسفور و البوتاسيوم و البروتين و كذلك بعض العناصر الصغرى و ذلك مقارنة بالمصادر الاخرى من الاسمدة العضوية.

٣-اعطى تسميد نبات البا ذنجان بالاسمدة العضوية و على الاخص سماد الدواجن مع السماد الكيماوى افضل نمو خضرى للنباتات واعلى محصول و احسن صفات طبيعية و كيماوية للثمار.