Effect of organic and biofertilizers and magnesium sulphate on growth yield, chemical composition and fruit quality of "Le-Conte" pear trees.

M.I.F. Fawzi[1], .F.M. Shahin* [1], Elham, A.Daood[1] and E.A. Kandil[2]

1. Pomology Department, National, Research centre, Dokki, Giza, Egypt.

2. Horticulture Research Institute, Agriculture Research Centre, Giza; Egypt. Greenzone5@yahoo.com

Abstract: The present study was carried out during 2008 and 2009 seasons on 12 - year - old trees of "Le – Conte" pear grown in sandy soil in a private orchard at Cairo – Ismailia desert road, Egypt. The objective of this study was to investigate the effect of organic farmyard manure (FYM) 50 kg/tree, Nile compost (COM) 45kg/tree, biofertilizes (Bio) as combination between (phosphorene and nitrobeine), 20 g/tree and sprays of magnesium sulphate 1.5% single or combination with them. Beside the fertilization program adopted in the farm was used as control. The results showed that, the application of different of different aforementioned treatments increased significantly vegetative growth (shoot length and leaf area), leaf minerals Content (N, P, K and Mg), pigments Content (Ch1. A & B), yield as well as physical and chemical properties of the fruits compared to untreated trees. From the economic point of view, the best results with regard to nutritional stalus of the trees, yield and fruit quality were obtained when "Le- Conte" Pear trees treated with (COM) 45kg/tree + (Bio) 20g/tree + (Mg SO_4)1.5% .

[Fawzi, .F.M. Shahin, Elham, A.Daood and E.A. Kandil. **Effect of organic and biofertilizers and magnesium sulphate on growth yield, chemical composition and fruit quality of "Le-Conte" pear trees.** Nature and Science 2010;8(12):273-280]. (ISSN: 1545-0740). http://www.sciencepub.net.

Keywords: organic; biofertilizer; magnesium sulphate; growth yield; chemical composition; fruit

INTRODUCTION

Pear fruits are considered the third in important among other deciduous fruits and the fourth among all fruits in the world. Le-Conte pear is the most important pear cultivar in Egypt. Organic manures affect the physical, chemical and biological characteristics of the soil hence, adjusting soil pH, and increasing solubility and nutrients (P, K, Ca & Mg) availability to plant consequently, influence the growth and production and the plant **(Abdel-Nasser & Harhash, 2000).**

Compost is an organic fertilizer and soil amendment that providing plants with mineral nutrition and other benefits **(Kassem and Marzouk, 2002).** Meantime, compost organic manure enhances vegetative growth, fruit weight and N Content in olive trees **(Haggag, 1996).** Biofertilizers are microbial preparation containing primarily of sufficient numbers of potent strains of microorganisms and furnishing a beneficial rhizoshere for plant growth. Moreover, biofertilizers have a significant effect of deferent strain groups such as nitrogen fixers **(Abou El-Kashab, 2002 and Abou Taleb et al 2004)** and nutrient mobilizing microorganisms which help in the availability of metals and their forms in the composted materials and level of extractable nutrient elements **(El-Karamany et al 2000)**. Bio-application improves plant growth, fruit yield and chemical composition through the exertion of plant promoting substances mainly IAA, gibberellic acid and cytokinin like substances, vitamins and amino acid Content. **(Abd El-Mouty 2001)** "Le-Conte" pear trees growth under sandy soil suffer from nutrients deficiencies particularly magnesium due to high fixing rate beside the low soil fertility. The continuous exhaustion due to the growth of the development of fruit can also aggrevate magnesium deficiency symptom. As it is Known, the nutritional status of the trees has important role in controlling fruiting . Application of magnesium **Guo &XU, (1998) and Ahmed & Morsy, (2001).**

The objective of the present study was to detect the effect of the application of farmyard manure, Nile compost, biofertilization (Phosphorene + nitrobeine) and sprays of magnesium sulphate on vegetative growth, yield, leaf chemical constituents and fruit quality of "Le- Conte" pear trees.

MATERIALS AND METHODS

This experimental was carried out in two seasons (2008 and 2009) on "Le –Conte" pear trees. The threes were 12-year –old, budding on pyrus communis rootstock and planted at 5 x 5m apart and grown on sandy soil under drip irrigation system in a private orchard located at Cairo – Ismailia desert road. Fourty – four trees, healthy and nearly uniform in growth vigor and fruiting were selected.

The objective of this study was to investigate the effect of organic fertilizers in the form of dried farmyard manure or compost (Nile compost), biofertilizers in the form of the mixture between Phosphorene and nitrobeine fertilizers and sprays of magnesium sulphate on vegetative growth, leaf composition, yield and fruit quality of "Le-Conte" pear trees. Soil analysis was carried out according to **(Wilde et al 1985)** and obtained data are shown in Table (1).

Data of chemical analysis of farmyard manure and Nile compost are presented in Table (2).

Organic manures were applied in the form of farmyard manure and compost at the rates of 50kg/tree, 45kg/tree, respectively, at November 15th. Whereas, Phosphorene + nitrobeine as a source of biofertilizers was applied at the rate of 20g/tree at January 15th.

Moreover, magnesium sulphate (9.6% Mg) at 1.5% as source of magnesium was added as foliar applications two times in the same trees in the mid-April and mid- June of each year, with the assigned solutions till the leaf surfaces become thoroughly met (about 8 liters / tree). Triton B was wetting agent was added at 0.2%.

Table (1): Soil physical and chemical analysis.

Character	Value
Sand %	83.30
Silt %	14.00
Clay %	2.70
Texture grade	Sandy
pH (1 : 2.5 extract)	7.50
EC (1 : 2.5 extract) mm hos/cm25^{o}C).	0.68
Total $CaCO_3$ %	5.6
O.M.%	0.73
Available macro- nutrients	
N %	0.038
P p.p.m	3.35
K p.p.m	185.3
Mg p.p.m	1.53
Available micro-nutrients	1.99
Fe ppm	3.11
Zn Ppm	1.16
Mn ppm	1.63

Table (2): Chemical analysis of the experimental organic manure.

Organic fertilizer	Farmyard manure (FYM)	Nile compost (COM)
Orgnaic carbon (%)	21.3	26.2
	16.3	23.10
Moisture content (%)	36.2	45.00
Organic matter %		
Macronutrients (%)	1.76	1.88
	0.80	0.65
N	1.29	1.1
P	2.33	1.19
K	0.75	0.33
Ca		
Mg	1100	1300
Micronutrients (%)	433	128
Fe	116	60
Mn		
Zn		

The treatments were arranged in a completely randomized block design with four replicate for each treatment and one trees per each replicate were investigated for each season as follows:

1. Control (sprayed with water).
2. Farmyard manure (FYM).
3. Compost (COM).
4. Biofertilizers (Bio).
5. Spraying magnesium sulphate at 1.5%.
6. FYM + Bio.
7. COM + Bio.
8. FYM + Mg.
9. COM + Mg.
10. FYM + Bio + Mg.
11. COM + Bio + Mg.

The treated trees were investigated for the following characteristics.

1. Vegetative growth: shoot length (cm) and leaf area (cm^2) the length of the terminal shoots on the 4 chosen branders of each tree was measured at the and of September in 2008 and 2009 seasons, the average of shoot length was calculated.
2. leaf chemical constitute: samples of twenty leaves from the middle part of shoots according to **Chuntonarb and Cummings, (1981),** were selected at random from each replicate (2^{nd} week of July) to measure their area (cm^2) according to **Ahmed and Morsy (2001)** and determined their Content of chlorophly (A & B according to **Brougham (1960)** and determined their content of N, P, K and Mg according to **Wilde et al (1985)** on dry weight basis.
3. Yield measurements: Yield expressed in weight (Kg) and number of fruit/tree was recorded at harvest time.
4. Fruit quality: samples consisting of ten fruits were randomly taken at harvest time from each tree for determining average fruit weight (g) fruit length (cm), fruit diameter (cm), total soluble solids %, total acidity %, (expressed as gram of malic acid/100mL juice) (A.O.A.C, 1985) and TSS / acidity ratio were tabulated. Total sugar percentage using the method described by **(A.O.A.C. 1985)**.

All the obtained data were, tabulated and statistically analyzed according to **Mead et al (1993)**. For comparing the significant difference among various treatments, new L.S.D test was used.

RESULTS AND DISCUSSION

1- Growth measurement.

The effect of organic fertilizers as farmyard manure (FYM) and compost (COM) manure, biofertilizers (Bio), (Phosphorene + nitrobeine) and magnesium sulphate on growth measurements of "Le-Conte" pear cv. are presented in Table (3). It is obvious that shoot length and leaf area were significantly increased by different fertilization treatments compart to the control in both seasons. Hence, combined application of COM at 45 kg/tree + Bio at 20g/tree + Mg SO_4 at 1.5%, gave the highest shoot length and leaf area. These results are in harmony with those found by **Villasudra & Baluyut, (1990)** on guava and **El-Morshedy (1997)** on sour orange concluded that, organic manure (Farmyard manure and compost) increased vegetative and nutrition status. Furthermore, **Abd El-Moez et al (1999)** mentioned that the significant positive effect of compost fertilizers on vegetative growth characters may be due to the improvement in soil physical and biological properties and also, the chemical properties resulting in more release of available nutrient elements to be absorbed by plant root and its effect on the physiological process such as the photosynthesis activity as well as the utilization of carbohydrates, in addition to water use efficiency by different plants. Moreover, recently works **Mahmoud & Mahmoud (1999)** on peach as affected by biofertilizers, they proved that biofertilizers improved the plant vigor and growth. The increase in plant growth may be attributed to be capability of microorganisms in biofertilizers to produce growth regulators such as auxins, cytokinins and gibberellins which affect growth and nutrient up take **(Soliman 2001)**. The favorable effect of the combination between organic manure and biofertilizers may be explained the beneficial effects on physical and chemical soil structure, water up take and nutrient availability resulting in improving plant growth and productivity **(Bashan et al 1989)**.

On the other hand, foliar application of magnesium sulphate at 1.5%, either single or in combination with FYM or COM significantly stimulated the shoot length and leaf area compared to the control. These result are in agreement with obtained by **Ahmed & Morsy (2001)** who worked on magnesium.

2. Leaf chemical constituents:

2.1. Leaf pigments Content.

Data presented in Table (3) disclosed that all treatments significantly increased chlorophyll (A) and (B) and total chlorophyll Contents during two seasons. Yet, combined application of COM + Bio + Mg gave a more pronounced effect in this respect, followed by FYM + Bio + Mg treatment. These results are similar with those **Abou El-Kashab (2002)**, on olive seedling. The increase in leaf pigments might be result of balanced nutritional environment in the soil and thus

kept iron physiologically active for chlorophyll synthesis in certain plants **(El-Morshedy 1997)**.

2.2. Leaf minerals Content.

The response of leaf nutrient Contents (N, P, K and Mg) of "Le-Conte" pear cv. as affected by organic manure, bio fertilizers and magnesium sulphate shown in Table (4). In this connection, all treatments used significantly increased percentage of N, P, K and Mg in the leaves of Le-Conte" pear trees as compared to the control. Moreover, Le-Conte" pear trees treated with COM + Bio + Mg gave significant increase than all other treatments. On the other hand, control gave the lowest values. These effects could be due to that a set of soil microorganism processing the ability and mobilizing the unavailable forms of nutrient elements to be available for absorption by roots. These results are in line with those of **Fernandez – Falcon et al (1998), Soliman, (2001); Magda Mostafa (2002) and Radwan & Awad (2003).** Who worked on biofertilizers and **Ahmed & Morsy (2001) and Elham Daood & Shahin (2006)** who worked on magnesium.

In this respect, the positive active of the FYM and COM increasing the uptake of N, P, K and Mg was in agreement with the results of **Krajne (2000)**.

1- Yield Measurements:

It is obvious from Table (5) that all studied treatments significantly enhanced pear fruit yield /tree, number of fruit / tree and fruit weight compared to the control. However, combined application of COM + Bio + Mg and FYM + Bio + Mg were significantly superior to the other while FYM treatment was the least effective over the control, There results were true in both seasons, (2008 and 2009). The improving effect of FYM and COM on yield /tree and fruit weight was supported by the results of **Ahmed et al (1996)** on organic manure **Mansour (1998)**, who worked on nitrobeine emphasized, the positive action of them, on yield and fruit weight. The various positive effect of biofertilizers on yield and fruit weight could be due to they activate the photosynthesis process and both cell division enlargement. It is evident from the data in the same table that yield expressed in weight and number of fruit /tree was positively affected by spraying Le-Conte" pear trees with magnesium sulphate at 1.5% either single or combined with FYM or COM. Similar results were obtained by **Ahmed & Morsy (2001)** who worked in magnesium.

2- Fruit quality:

It is clear from the data in Table (6 and 7) that single or combined application of FYM, COM , Bio and Mg was significantly effective in improving fruit quality in terms of increasing fruit weight, fruit length, fruit diameter, T.S.S., T.S.S/acidity ratio and total sugar percentage and reducing total acidity compared to the control. The best results with regard to fruit quality were obtained due to application COM + Bio + Mg. similar trend was observed in two seasons. The effect of FYM, COM fertilizer and biofertilizers on increasing the T.S.S., T.S.S/acidity ratio and total sugars and decreasing of acidity could be due to their beneficial effect on the total leaf area of the plant which reflected in more carbohydrates production through photosynthesis process. From the physiological view, the obtained results could be explained in the light of the role of the biofertilizers as a constituent of pyridines which are in turn constituents of chlorophyll and cytecromes. **Mansour (1998); Joo et al (1999) and Magda Mostafa (2002).**

Moreover, the improvement occurred in the fruit quality due to supplying the trees via leaves with Mg could be attributed to their effect on enhancing the biosynthesis and translocation of carbohydrates and advancing fruit maturity **Nijjar (1985).** These results were supported by the results of **Ahmed and Morsy (2001)** who worked on magnesium.

From the present study we can recommend the combination between organic manure (in form of FYM or COM) with either biofertilizers in the form (Phosphorene + nitrobeine) or foliar application of magnesium sulphate for improving "Le-Conte" pear trees growth, productivity and fruit quality under the same condition of our study.

Table (3). Vegetative growth and leaf chlorophyll A & B, and total chlorophyll content of "Le-Conte" pear trees as influenced by different studied treatments during 2008 & 2009 seasons.

Treatments	Shoot length (cm)		Leaf area (cm^2)		Chlorophyll (A)		Chlorophyll (B)		Total chlorophyll (A+B)	
	2008	2009	2008	2009	2008	2009	2008	2009	2008	2009
1. Control	35.16	37.11	22.36	25.16	55.16	57.30	36.11	37.10	91.27	94.40
2. FYM.	38.31	41.32	26.11	27.03	57.01	59.14	36.33	37.50	93.34	96.64
3. COM.	41.01	43.10	27.16	27.50	58.11	60.31	36.36	37.66	94.47	97.97
4. Bio	36.18	37.00	25.33	26.30	56.33	58.11	36.50	38.33	92.83	96.44
5. Mg	37.16	39.12	26.11	26.11	59.31	61.03	37.06	39.16	96.37	100.19
6. FYM +Bio	47.11	49.16	28.16	29.14	61.33	60.32	37.88	38.36	99.21	98.68
7.COM + Bio	53.21	55.53	29.11	29.18	6230	63.33	38.16	387.89	100.46	102.22
8. FYM + Mg	37.30	38.11	30.01	31.32	66.11	66.26	39.16	39.16	105.27	105.42
9. COM + Mg	47.11	50.16	31.66	32.31	66.36	66.99	41.03	41.11	107.34	108.10
10. FYM + Bio + Mg	58.43	60.31	32.14	33.06	68.00	68.11	42.11	42.36	110.11	110.47
11. COM + Bio + Mg	63.30	66.32	33.06	35.18	68.30	68.89	42.50	42.76	110.85	111.65
New L.S. Dat5%	1.02	1.18	0.98	1.11	3.11	3.66	2.10	2.03	6.03	5.11

Table (4). Leaf mineral content of "Le-Conte" pear trees as influenced by different studied treatments during 2008 & 2009 seasons.

Treatments	N(%)		P(%)		K(%)		Mg(%)	
	2008	2009	2008	2009	2008	2009	2008	2009
1. Control	1.96	2.03	0.23	0.25	1.73	1.78	0.27	0.29
2. FYM.	2.33	2.39	0.31	0.33	1.81	1.85	0.31	0.33
3. COM.	2.54	2.61	0.38	0.37	1.96	1.96	0.33	0.35
4. Bio	2.03	2.18	0.36	0.38	2.11	1.98	0.30	0.33
5. Mg	2.55	2.43	0.38	0.39	2.12	2.23	0.41	0.42
6. FYM +Bio	2.41	2.49	0.45	0.46	2.18	2.36	0.35	0.36
7.COM + Bio	2.61	2.68	0.49	0.51	2.26	2.41	0.37	0.38
8. FYM + Mg	2.65	2.70	0.51	0.53	2.01	2.45	0.41	0.42
9. COM + Mg	2.70	2.73	0.53	0.54	2.11	2.50	0.42	0.43
10. FYM + Bio + Mg	2.73	2.75	0.54	0.55	2.33	2.53	0.44	0.45
11. COM + Bio + Mg	2.75	2.81	0.55	0.57	2.53	2.58	0.45	0.46
New L.S. Dat5%	0.05	0.04	0.02	0.03	0.04	0.05	0.02	0.03

Table (5). Yield per tree, number of fruit per tree and fruit weight of "Le-conte" pear trees as influenced by different studied treatments during 2008 & 2009 seasons.

Treatments	Yield /tree (kg)		No. of fruit /tree		fruit weight (g)	
	2008	2009	2008	2009	2008	2009
1. Control	13.33	15.03	119.74	128.10	111.30	117.3
2. FYM.	16.33	18.34	135.74	145.14	120.30	126.36
3. COM.	18.11	21.06	144.76	160.32	125.10	131.36
4. Bio	14.33	16.51	121.33	13282	118.11	124.30
5. Mg	16.88	18.32	129.55	134.48	130.30	136.23
6. FYM +Bio	20.03	23.16	147.17	163.06	136.10	142.03
7.COM + Bio	23.33	26.34	156.45	169.57	149.12	155.33
8. FYM + Mg	27.10	29.12	174.71	179.72	155.11	162.03
9. COM + Mg	29.16	31.33	178.56	185.06	163.30	169.30
10. FYM + Bio + Mg	33.33	35.45	191.96	197.68	173.11	179.23
11. COM + Bio + Mg	36.18	38.33	202.92	203.53	178.30	188.33
New L.S. Dat5%	3.98	3.33	10.31	10.78	8.16	9.88

Table (6). Physical characteristics of "Le – Conte" pear trees as influenced by different studied treatments during 2008 & 2009 seasons.

Treatments	Fruit length(cm)		Fruit diameter (cm)		Shape index. (L/D)	
	2008	2009	2008	2009	2008	2009
1. Control	7.83	8.10	6.90	7.23	1.13	1.12
2. FYM.	8.13	8.23	7.23	7.11	1.12	1.16
3. COM.	8.32	8.43	7.22	7.33	1.15	1.15
4. Bio	8.21	8.33	7.31	7.43	1.12	1.12
5. Mg	8.43	8.51	7.53	7.53	1.11	1.13
6. FYM +Bio	8.53	8.63	7.56	7.61	1.13	1.15
7.COM + Bio	8.73	8.62	7.63	7.66	1.14	1.13
8. FYM + Mg	8.92	8.71	7.93	7.73	1.12	1.13
9. COM + Mg	9.21	9.30	8.11	8.18	1.14	1.14
10. FYM + Bio + Mg	9.51	9.73	8.23	8.53	1.16	1.14
11. COM + Bio + Mg	9.63	9.92	8.53	8.73	1.13	1.14
New L.S. Dat5%	0.3	0.2	2.4	2.5	N.S	N.S

Table (7). Chemical characteristics of "Le – Conte" pear trees as influenced by different studied treatments during 2008 & 2009 seasons.

Treatments	T.S.S. (%0		Total acidity (%)		T.S.S/acidity ratio		Total sugars (%)	
	2008	2009	2008	2009	2008	2009	2008	2009
1. Control	10.30	10.83	0.63	0.58	16.34	18.67	5.23	5.73
2. FYM.	11.33	11.50	0.60	0.56	18.88	20.56	6.63	5.23
3. COM.	11.56	11.86	0.58	0.55	19.93	21.56	6.06	6.76
4. Bio	10.93	11.03	0.62	0.57	17.62	19.35	5.53	5.83
5. Mg	11.53	11.76	0.57	0.56	20.23	21.00	6.23	6.56
6. FYM +Bio	12.03	12.36	0.56	0.54	21.48	22.89	6.83	7.26
7.COM + Bio	12.63	12.73	0.54	0.51	23.39	24.96	7.43	7.53
8. FYM + Mg	12.86	13.01	0.53	0.48	24.26	27.10	7.76	7.91
9. COM + Mg	13.11	13.53	0.48	0.45	27.31	30.07	7.81	8.43
10. FYM + Bio + Mg	13.96	14.03	0.41	0.39	34.05	35.97	8.66	8.83
11. COM + Bio + Mg	14.10	14.33	0.38	0.36	37.1	39.81	8.70	9.03
New L.S. Dat5%	0.38	0.45	0.06	0.05	3.30	3.16	1.12	1.33

REFERENCES

A.O.A.C. (1985). Association of Official Agriculture Chemistis. Official Methods of Analysis, pp, 490-494-510, Washington DC. U.S.A.

Abd El-Moez, M. R.; A.L. Saleh and SH. A. H. Wanas (1999). Influences of some organic compost on yield, nutrients uptake and consumptive use of fennel and coriander plants and some soil properties. J. Agric Farming Bangkok, pp:151-156.Sci. Mansoura Univ., Egypt. 24 (6): 3157-3165.

Abd El-Mouty, M. Mona; A. Aisha and A.R. Fatma (2001). Potato yield as affected by the interaction between bio and organic fertilizers, Egypt, J. Appl. Sci. 16 (6), 267.

Abdel – Nasser, G. and M.M. Harhash (2002). The effect of organic manure in combination with elemental sulfur on soil physical and chemical characters, yield, fruit quality, leaf water Contents and nutritional status contents and nutritional status of Flame seedless grapevines. 1-Soil physical and chemical characteristics. J. Agric. Sci. Mansoura Univ., Egypt 25 (6): 3541-3558.

Abou – Taleb, A. Sabia, A.M. Abou El-Khashab and S.T. Wafaa (2004). Growth and productivity of olive trees as affected by some bio and mineral nitrogen fertilizers. Minufiya J. Agric. Res. Egypt. 29(4): 933-963.

Abou El-khashab, A.M. (2002). Growth and chemical constituents of some olive cultivars as affected by biofertilizers and different water regime. Egypt. J. Agric., NRC.1 (2) : 243-265.

Ahmed, F. F.; Ragab, M. A and, A. E.M. Mansour, (1996). Comparative study on the effect of farmyard manure and filter mud for Red Roomy grapevines (Vitis vinifera L.), 1st Egypt- Hung. Hort. Conf. Vol. 2:232-238.

Ahmed, F.F. and M.H. Morsy (2001). Response of "Canino" apricot trees grown in the new reclaimed land to application of some nutrients and ascorbic acid. The fifth Arabian Hort. Conf. Ismailia, Egypt, pp. 27-34.

Bashan Y. Y.; Ream, H. Levanony, and A. Sade (1989). Nonspecific. Responses in plant growth, yield and root colonization or noncerial crop plant to inoculation with Azospirillcem brazilense. Can. J. Bot 67:1317-132.

Brougham, R.W. (1960). The relation between critical leaf area, total chlorophyll and maximum growth rate of some pastures and crop plant. Annl. Bot. (24): 463-510.

Chuntonaparab, N. and G. Cummings (1981). Seasonal trends in concentration of nitrogen, phosphorus, potassium, calcium and magnesium in leaf portion of apple, blueberry, grape and peach, J. Am. Soc. Horb, Sci. 105 (6): 933.

El- Morshedy, F.A. (1997). Organic manure and sulphur interaction influence vegetative growth and element concentration of sour orange seedlings. J. Agric. Sci. Mansoura Univ. Egypt 22(12): 4599-4616.

Elham, Z.A. and M. F. M. Shahin (2006). Effect of spraing magnesium, boron, ascorbic acid and vitamin B complex on yield and fruit quality of "Canino" apricot. Arab. Univ., J. Agric. Sci., Ain Shams Univ. Cairo, Egypt. 14 (1), 337-347.

El-Karamany, M.F.; M.K. Ahmed, A.A. Bahr and M.O. Kabesh (2000). Utilization of biofertilizers in field crop production. Egypt. J. Appl. Sci. 15 (11): 137-155.

Fernandez, Falcon, M.; c. Enrique- Alvarez, A. Borgessperez and A. Borges Rodiguez (1998). Bacteria enriched inoculant enhances Banana development and influence nutrition. Fruits (Paris). 53(2): 79-87. (C.f. Hort. Abst., 68 (9): 8089.

GUO, M. and H. XU (1998). Cultural techniques for high quality, high production and high profits in apricot orchards in the aird loess plateau. China Fruits, 4: 34-36.

Haggag, F. Laila (1996). Response of picual olive trees in sandy soil to various forms of N fertilization (organic and chemical) Annals. Agric. Sci. Ain Shams Univ. Cairo. 41 (1): 313-319.

Joo, Y. H.; Y. D.A. Senanayake and U.R. Sangakkara (1999). Effect of EM on the production of crops and waste treatment in Korea. Fifth International Conference on Kyusei Naturre.

Kassem H. A. and H. A. Marzouk (2002). Effect of organic and /or mineral nitrogen fertilization on the nutritional status, yield and fruit quality of Flame seedless grapevines grown in calcareous soil. J. Adv. Agric. Res. 7 (1): 117-125.

Krajne, M. (2000). The effect of various organic manures on the growth and development of graft of the first year of planting of Laski Riesling, PSAD, Revija-Ze- Sadja-Rstvo Vinogradnistvo-in- Vinarstvo 11: 3, 30-31.

Magda, H.Mostafa (2002). Studies on feitilization of washington navel orange trees. Ph.D. Thesis. Fac. Of Agric., Moshtohor, Zagazig Univ., Egypt. Pp. 61-68.

Mahmoud, Fatma and Mahmoud, A. Amera (1999). Resonse of tomato biological and mineral fertilizers under calcareous soil conditions. Bull. Fac. Agric., Cairo Univ. Egypt. 51:151-171.

Mansour, A. E. M. (1998). Response of Anna apples to some biofertilizers. Egypt. J. Hort: 25, No 2, pp. 241-251.

Mead, R.; R.N. Currnow, and A.M. Harted (193). Statistical Methods in Agricultural and Experimental Biology. 2nd Ed. Champan Hall, London, pp. 10-44.

Nijjar, G.S. (1985). Nutrition of Fruit Trees. Mrs. Msha Raj Kumar for kalyani publishers, New Delhi, pp. 10-52.

Radwan, S.M.A. and M. Awad (2002). Effect of soil amendments with various organic wastes with multi-biofertilizers on peanut plants in sandy soil. J. Agric. Mansoura Univ. 27(5): 3485-3494. Egypt.

Soliman, M.G.A. (2001). Response of Banana and Guava plants to some Biological and mineral fertilizers. M. Sc. Thesis Fac. Agric. Alex. Univ. Egypt. Pp. 49-61.

Villasudra, P. J. and N.M. Baluyut (1990). Growth and yield of guava psiddium guava L.) as affected by different levels and sources of organic and inorganic fertilizers. Colleague of Agric. Res. J. (1): 18-33. Hort. Abst. (1991) Vol. 61: 4444.

Wilde, S.A.; R.B.Corey, J. G. Lyer and G.K. Voigt (1985). Soil and plant Analysis for Tree culture 3rd Ed. Pp. 89-100. Oxford IBLT publishing Co., New Delhi.

الملخص العربي

تأثير التسميد العضوى والحيوي وسلفات الماغنسيوم على النمو ، المحصول ؛ التركيب الكيماوى وجودة ثمار اشجار "الكمثرى الليكونت"

محمد إيهاب فؤاد فوزى [1] ، محمد فتحي شاهين[1]، الهام زغلام عبد المعطي داوود[1] ، إيمان عبد الرحمن فنديل[2]

3- قسم بحوث الفاكهة – المركز القومي للبحوث – الدقي – جيزة – مصر.

4- معهد بحوث البساتين - مركز البحوث الزراعية – الدقي – جيزة – مصر.

أجريت هذه الدراسة خلال موسمي 2008 و 2009 على أشجار كمثرى صنف "الليكونت" عمرها 9 سنوات نامية فى تربة رملية فى مزرعة خاصة على طريق القاهرة – الإسماعيلية الصحراوى – جمهورية مصر العربية. وذلك لدراسة تأثير الأسمدة العضوية فى صورتين السماد البلدي 50كجم/ شجرة وكمبوست النيل 45كجم/شجرة والاسمدة الحيوية فى صورة خليط من الفوسفورين والنتروبين 20جرام/ شجرة. وكذلك الرش الورقي بسلفات الماغنسيوم 1.5% بمفرده أو تواليا بينهم . اضافة إلى برنامج التسميد المتبع بالمزرعة كمقارنة – وقد أوضحت النتائج أن المعاملات المختلفة تحت الدراسة أدت إلى تحسين صفات النمو (طول الفرع ومساحة الورقة) ومحتوى الورقة من العناصر (النتروجين ، الفوسفور ، البوتاسيوم و الماغنسيوم) والكلوروفيل أ ، ب ، المحصول والصفات الطبيعية والكيمائية للثمار وذلك مقارنة بعدم الاستخدام.

ومن الناحية الاقتصادية فإن أفضل النتائج من حيث الحالة الغذائية للأشجار والمحصول وجودة الثمار أمكن الحصول عليها فى أشجار الكمثرى الليكونت التي تم تسميدها بسماد كمبوست النيل 45 كجم / شجرة + السماد الحيوى (فوسفورين + نتروبين) 20 جرام/ شجرة + الرش بسلفات الماغنسيوم 1.5%.

11/4/2010