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# EVALUATION OF THE GROWTH OF TOMATO PLANTS (*LYCPERSICON ESCULENTUM* MILL.) CULTIVATED IN DIFFERENT TYPES OF GREENHOUSES ORGANIC FERTILIZERS

**Hala Jumaah Asree*[1], Ali Ahmed Hussein AL-Myali[2], Bahaa Ahmed Hasan[1] and Ahmed Adnan Kadhim AL-Maameri[3]**

[1]Department of Biotechnology, Faculty of Biotechnology, University of Al-Qassim Green, Iraq.
[2]Karbala University, Karbala, Iraq.
[3]Alfurat Alawsat Technical University, Babylon, Iraq.

## Abstract

A factorial experiment was carried out in one of the private greenhouses in the city of AL-Saouira for the season 2016-2017 to evaluate and compare two different types of organic fertilizers in growth , flowering ,and yield of tomato plants , represented the first factor, use three levels of domestic organic fertilizer (5, 7.5 and 10%), while the second factor used three levels of imported organic fertilizer (5, 7.5 and 10%). Follow the design (complete randomized design) in the research experiment , in three replicates per treatment . The addition of both types of fertilizer resulted in a significant increase in all Characteristics of vegetative growth , plant height 322.33 cm, number of leaves 53.67 leaf ,leaf area 285.96 cm², the content of chlorophyll leaves 49.43 SPAD, the dry weight of plant 320.73 gm and characteristics of yield (Number of floral clusters 13.33 cluster, number of flowers 13.93 flower, number the fruit is 71.33 fruit, the fruit weight is 94.76 g and the plant yield is 6.49 kg). The higher two levels of organic fertilizer distinction compared to the lower level of the two types of organic fertilizer that gave less Rates for all studied traits.

***Key words :*** Protected agriculture, organic fertilizer, plant yield.

## Introduction

*Lycpersion esculentum* Mill. dates back to the family of lactans , it is one of the most important nutritional crops in the world because it contains a lot of solanaceae, it rich in carbohydrates, proteins, fats and vitamins, especially vitamin A and C (AL-Khalil, 2011). The importance of this crop lies in its high nutritional value and variety consumed fresh or cooked, or in industrial products (AL-Shammari, 2005). Increase in the world's population led to an increase in demand for food, as a result of the negative effects resulting from Chemical additives that lead to environmental and health impacts and increase the proportion of oxides and nitrates so many countries around the world have moved to encourage the use of organic fertilizers Provide a clean ecosystem and maintain soil fertility, increase and improve its long-term properties nutrient supply and microbiological activity (Gregory, 2006 and Osman, 2007). AL-Tantawy (2009) indicates that organic manure has led to significant increase in characteristics of vegetative and root growth, yield and pigments of chlorophyll and carotene in tomato. AL-Amiri and Matloob (2012) that the addition of compost to plants tomato by 5% of soil weight led to a significant increase in all vegetative growth indices, yield and the percentage of nutrients in the leaves compared to chemically fertilized plants, consider importance and the high consumption of its fruits. The aim of this research is to compare the effect of two types of domestic and imported organic fertilizers in the growth and yield of tomato for organic fertilizer increase in production and economic return of the unit area.

***Author for correspondence :** E-mail : hala_halaali@yahoo.com

## Materials and Methods

This study was carried out in a private green house in the city of AL-Saouira for the agricultural season 2016/

**Table 1 :** Chemical properties of the local organic fertilizer used in the experiment.

| PH | E.C | Organic carbon Gm. $Kgm^{-1}$ | Total Nitrogen Gm. $Kgm^{-1}$ | Carbon to Nitrogen Ratio | Total Phosphor Gm. $Kgm^{-1}$ | Total Potassium Gm. $Kgm^{-1}$ |
|---|---|---|---|---|---|---|
| **7.6** | **1.6** | **3.6** | **29** | **12.8** | **20.1** | **24.4** |

**Table 2 :** Physical and chemical properties of decomposed organic fertilizers.

| Adjective | EC | pH | Organic carbon | Total $NO_3$ | C/NO3ratio | Total PO4 | Total K | Ca | Fe | Zn |
|---|---|---|---|---|---|---|---|---|---|---|
| Unit | Desmenz | — | Gm/kgm | | — | Gm/kgm | | % | | |
| | **1.7** | **6.2** | **243** | **33** | **8.2** | **13.2** | **22.9** | **7.1** | **1.22** | **0.29** |

2017 to find out the effect of two types of organic fertilizers and their comparison in growth and fruiting For the plants were planted in greenhouses. Two organic fertilizers were used locally consisting of residues of organic waste of poultry added to the proportion of corn shelled with a type of organic fertilizers imported from the Spanish type which consisted of residues organic waste (table 1), organic fertilizer species were established in the soil of the village (table 2). After the inheritance, settlement and smooth by the agricultural tractor of the plastic houses, type (kabota) and processing for agriculture, as the fertilizer is placed at a depth of about (20 – 25 cm) for both types and spray the soil with water until full soak before starting the seedlings.

Seeds were planted for tomato hybrids (Wigdan), were an unlimited-growing hybrid and certified in Iraq, that were produced by the American company (Peto Seed) in the plastic canopy on 12th of September of the 2016 in the 209-toned flint dishes and used the bitumen in the center of the dough and covered the leaves seeds with a piece of cloth to prevent white fly that vector of viral diseases. The seedlings were produced inside a plastic canopy dedicated for this purpose before being planted at plastic home with. When the seedlings reach the appropriate size (3-4 true leaves) in higher 10-15 cm was transferred to the soil of the study on 16/11/2016 after spraying with fungicide Benlet to avoid infection with fungal diseases and planted directly in the soil, which were divided into 3 streams, each stream included four lines of cultivation with a length of 3 meters per line. The seedlings were planted on each side of each stream with 10 plants per line and the distance between plants 40 cm with a distance of 50 cm at the beginning and end of each stream. Three levels of organic fertilizers (5%, 7.5% and 10%) were added for each type of soil mix within each experimental unit during preparation of the soil before planting the seedlings with the study of overlap between them. The experiment was designed according to the complete randomized design (C.R.D.) with 9 treatments. Each treatment included 3 replicates containing each replicate on 10 plants and the mean of all was measured study results by least significant difference (L.S.D) at 0.05 probability level (Sahuki and Wahib, 1990).

**Study indicators**

**First: Characteristics of vegetative growth**

**1. Plant height (cm):** Measured after the end of the growing season from the leg contact area to the soil to the developing summit of the plant by the metric tape, noting that the plants were stuffed on the leg of one head.

**2. Number of leaves/plant:** According to the number of leaves on the main stem at the end of the growing season, including leaves removed during the period of growth.

**3. The leaf area ($dcm^2$) :** The leaf area in each transaction was measured by taking the area of 3 leaves from different areas of the plant at random and according to the average and multiplying the number of leaves of the plant and obtained a portable leaf area meter.

**4. Relative content of chlorophyll (SPAD Unit):** Chlorophyll has been estimated by using a Chlorophyll meter, type SPAD-502.

**5. Dry weight of the total vegetative (g):** Dried plants aerobic exposure to direct sunlight for 10 days and after weight stability by dry weight of the plant.

**Second: Indicators of flowers growth**

**1. The number of floral clusters per plant :** Calculated from 6 plants per experimental unit.

**2. Number of flowers in the single cluster :** Calculated from 6 plants per experimental unit

**Third : Indicators of the yield**

**1. Number of fruits/plant:** Count the number of fruits in the selected plants and then recorded the rate of one plant.

**2. Average weight of fruit/plant (g):** Weight in 6 plants of each experimental unit and a section on the number of fruits and record the rate.

**3. Plant yield (kg):** Plant yeidl was calculated by taking the product of 6 plants of each experimental unit and record rate.

## Results and Discussion

**First : Effect of organic fertilizers on characteristics of vegetative growth**

**1. Plant height (cm)**

The statistical analysis data in table 3 indicate that the imported organic fertilizer has a significant effect on the height of the tomato plants. The treatments of the levels 7.5% and 10% significantly exceeded the treatment of the level 5% they achieved the highest rate (314.33 and 308.22) cm respectively, where there were no significant differences between the two treatments. The lowest rate of resulted at the treatment was 5% of 303.44 cm without significantly different from the treatment 7.5%. As for the effect of local organic fertilizer, there were no clear differences between the treatments. The treatment of the level of 10% significantly exceeded the treatment of the level of 5% only , the rate of 316.55 cm did not differ significantly with the treatment of 7.5%, the 5% treatment gave the lowest rate of 301.44 cm which did not differ significantly from the 7.5% level treatment. As for the treatment of the interaction between the two types of organic fertilizer, there was no significant response between the two treatments. The treatment of interference (highest level of the two types of organic fertilizer) achieved the highest rate of 322.33 cm. While the treatment of the mixture (lower levels of the two types of organic fertilizer) gave the lowest rate of 297.66 cm.

**2. Number of leaves**

The results of table 4 shows significant differences between the treatments due to the addition of compost Imported organic fertilizer in terms of number of leaves, where the treatments of the levels of 7.5 and 10% were significantly higher than 5%. The highest rate was 51.55 and 51.77, respectively. There was no significant difference between them. The lowest was at the rate of 5% of 46.44 leaves. The results shows that the local organic fertilizer had a significant effect. The treatment treated 10% significantly with the treatment of level 5% only. It recorded 52.33 sheets without significantly different treatment with 7.5% while the treatment gave 5% the lowest rate of 46.33 sheets. As the results showed % that the local organic fertilizer had a significant effect, the treatment at 10% significantly on the treatment of level 5% Only 52.33 leaves were recorded, with no significant difference with 7.5%, treatment 5% lowest rate of 46.33 leaves. As for the effect of the overlap between the two types of organic fertilizer, there were no significant differences between the treatments. The treatment of the mixture (level 7.5% organic imported with 10% organic) gave the highest rate of 55.33 leaves. While the treatment of interference (lower levels of two types of organic fertilizer) gave the lowest rate of the mentioned recipe of 43.66 leaves.

**3. Leaf area ($cm^2$)**

The data in table 5 shows a significant effect between the treatments due to the addition of compost to the soil , on the leaf area, where the treatments of the levels 7.5 and 10% significantly exceeded the treatment by 5%, achieving the highest rate of (273.31 and 268.67) $cm^2$ respectively, there were no significant differences between them, and the lowest rate at the treatment of 5% of 256.16 $cm^2$. The results showed differences were significant among the treatments produced by the local organic fertilizer as the treatments were significantly higher by 10 and 7.5%. On the treatment 5% were registered (277.72 and 270.11) $cm^2$ while the treatment5% achieved lower rate 250.32 $cm^2$. The interaction of the two types of organic manure did not produce significant differences between the treatments. The treatment of interference (level 10% organic importer with 10% local organic) gave the highest rate 271.20 $cm^2$ and the interference treatment (lower levels of both types of organic fertilizer) was lower they was rate of 236.62$cm^2$.

**4. Content of chlorophyll leaves (SPAD)**

The results of table 6 indicated that the imported fertilizer had a significant effect on leaf content of chlorophyll the treatment of the 10% level significantly exceeded the rest of the treatments, achieving the highest rate of 48.35 SPAD, the lowest rate was recorded at the treatment of 5% SPAD 42.07. The results shows that the local fertilizer achieved a significant response, with the treatments 7.5% and 10% significantly higher than the treatment of 5% (47.73 and 46.72) SPAD, while the treatment recorded 5%, the lowest rate of 42.07 SPAD. The interaction between the two types of organic fertilizer showed significant differences. Interference treatment (level 10% imported with 10% local) recorded a significant increase over interference treatments (5% imported with 5, 7.5 and 10% domestic) and (7.5% imported with 5% domestic) only with the highest rate of 49.43 SPAD , Compared to the interference treatment (lower levels of the two types of organic fertilizer), which recorded the lowest rate of 37.73 SPAD.

**5. Dry weight of plants (gm)**

Table 7 shows that there is a significant effect

**Table 3 :** Effect of local and imported fertilizers and their overlap in the height of the tomato plants (cm).

| Concentration of imported fertilizer (%) | Local fertilizer concentration (%) | | | Effect of imported fertilizer |
|---|---|---|---|---|
| | 5.00 | 7.50 | 10.00 | |
| 5.00 | 297.66 | 301.00 | 311.66 | 303.44 |
| 7.50 | 300.66 | 308.33 | 315.66 | 308.22 |
| 10.00 | 306.00 | 314.66 | 322.33 | 314.33 |
| Effect of Local fertilizer | 301.44 | 308.00 | 316.55 | |
| L.S.D5.00 | Imported 9.55 | Local 9.55 | Interference N.S | |

**Table 4 :** The Effect of local and imported fertilizer and their Interaction in the number of oats of the tomato plants.

| Concentration of imported fertilizer (%) | Local fertilizer concentration (%) | | | Effect of imported fertilizer |
|---|---|---|---|---|
| | 5.00 | 7.50 | 10.00 | |
| 5.00 | 43.66 | 47.66 | 48.00 | 46.44 |
| 7.50 | 47.00 | 52.33 | 55.33 | 51.55 |
| 10.00 | 48.33 | 53.33 | 53.66 | 51.77 |
| Effect of Local fertilizer | 46.33 | 51.11 | 52.33 | |
| L.S.D 5.00 | Imported 3.17 | Local 3.17 | Interference N.S | |

**Table 5 :** Effect of local and imported fertilizer and their overlap in the leaf area of tomato plants ($cm^2$).

| Concentration of imported fertilizer (%) | Local fertilizer concentration (%) | | | Effect of imported fertilizer |
|---|---|---|---|---|
| | 5.00 | 7.50 | 10.00 | |
| **5.00** | 236.62 | 261.03 | 271.20 | **256.16** |
| **7.50** | 252.33 | 277.70 | 276.00 | **268.67** |
| **10.00** | 262.36 | 271.60 | 285.96 | **273.31** |
| Effect of Local fertilizer | 250.32 | 270.11 | 277.72 | |
| L.S.D 5.00 | Imported 11.82 | Local 11.82 | Interference N.S | |

between the treatments due to the addition of imported compost to the soil , on the dry plant weight, where the treatments of the levels of 7.5 and 10% significantly exceeded the treatment of 5% with an average of 311.57 and 301.82 gm respectively, as there were no differences between them. The lowest rate was recorded at 5% of 285.02 gm. these results showed that the local fertilizer achieved a significant increase and the treatment treated

**Table 6 :** The effect of local and imported fertilizer and their interaction in the content of chlorophyll origins (SPAD) for the plants of the tomato.

| Concentration of imported fertilizer (%) | Local fertilizer concentration (%) | | | Effect of imported fertilizer |
|---|---|---|---|---|
| | 5.00 | 7.50 | 10.00 | |
| **5.00** | 73.73 | 43.13 | 45.36 | **42.07** |
| **7.50** | 44.00 | 46.96 | 48.40 | **46.45** |
| **10.00** | 46.90 | 48.73 | 49.43 | **48.35** |
| Effect of Local fertilizer | 42.87 | 46.72 | 47.73 | |
| L.S.D 5.00 | Imported 1.66 | Local 1.66 | Interference 2.87 | |

**Table 7 :** Effect of local and imported fertilizers and their overlap in the dry weight of the tomato plants.

| Concentration of imported fertilizer (%) | Local fertilizer concentration (%) | | | Effect of imported fertilizer |
|---|---|---|---|---|
| | 5.00 | 7.50 | 10.00 | |
| **5.00** | 263.00 | 289.00 | 303.06 | **285.02** |
| **7.50** | 288.16 | 302.43 | 314.86 | **301.82** |
| **10.00** | 308.46 | 305.53 | 320.73 | **311.57** |
| Effect of Local fertilizer | 286. 54 | 298.98 | 312.88 | |
| L.S.D 5.00 | Imported 10.29 | Local 10.29 | Interference 17.83 | |

10% significantly on the rest of the treatments. The highest rate of 312.88 gm was recorded against 286.54 g for the 5% treatment that achieved the lowest rate of this characteristic. The interaction between the two types of organic fertilizer showed significant differences between the treatments. The interference treatment (level 10% imported with 10% local) showed significant superiority over the interference treatments (5% imported with 5 and 7.5% local) and (7.5% imported with 5 and 7.5% local) only, the highest rate of 320.73 gm was recorded with respect to the interference treatment (lowest levels of organic manure) which recorded the lowest rate of 263.00 gm.

### Second : Effect of organic fertilizers on the characteristics flower growth and yield

### 1. Number of floral clusters

The results of the statistical analysis in table 8 showed that the imported fertilizer had a significant effect on the number of flowers, which exceeded the treatment level of 10% significantly on the treatments 5% and 7.5%. Achieved the highest rate of 13.11 cluster and the lowest

rate was at the treatment 5% of 11.77 cluster. The results of the table showed significant differences due to the addition of local fertilizer. The treatment exceeded 10% significantly on the treatment 5% as it achieved 12.77 cluster without significant difference with the treatment level 7.5% while the treatment gave 5% the lowest rate of 1.22 cluster, without any significant differences with the treatment of 7.5%.

Effect of overlap between the two types of organic fertilizer there were no significant differences between the treatments, the interference treatment (level 10% imported with 10% local) gave the highest rate of 13.33 clusters, the interference treatment (lower levels of the two types of organic fertilizer) achieved the lowest rate of 11.33 cluster.

**2. Number of flowers**

The results of table 9 indicates that the imported organic fertilizer has a significant effect on the number of flowers , were the treatments of the levels of 7.5 and 10% significantly exceeded the treatment at 5%, achieving the highest rate (13.61 and 13.33) flowers, respectively. There were no significant differences between them. The lowest rate was at the treatment 5% (11.33) flowers. The results showed that the local fertilizer had a significant effect, with the treatments 7.5% and 10% significantly higher than the 5% level, which recorded (13.20 and 12.87) flowers respectively, showing no significant difference. The treatment 5% gave the lowest rate of 12.28 flowers.

As for the effect of the overlap between the two types of organic fertilizer there were no significant differences between the treatments, the interaction treatment (level 10% organic importer with 10% organic) gave the highest rate of 13.93 flower, while the overlap treatment was achieved (the lowest levels were qualitative organic fertilizer) the lowest rate of 10.66 flowers.

**3. Number of fruits**

The results of table 10 shows significant differences due to imported fertilizer in the number of fruits , the treatments of the levels of 7.5 and 10% significantly exceeded the treatment by 5% achieving the highest rate (68.11 and 65.33) fruits respectively, with no significant differences between the two treatments. The treatment is 5% recorded lowest rate (59.11) fruits. The results of the table show that the local fertilizer has a significant effect as it has exceeded the treatment of 10% significantly on the treatments of 5% and 7.5% and recorded 68.88 fruit, while the treatment of 5% was gave the lowest rate of (60.66) fruits, without significantly different with treatment 7.5% has not been the interaction between the two types of fertilizer had significant differences between the treatments, giving the interference treatment (level 10% imported with 10% domestic), the highest rate of (71.33) fruits, while the treatment of overlap (Lower levels of organic manure) had the lowest rate of (54.00) fruits.

**Table 8 :** Effect of local and imported fertilizers and their overlap in the number of clusters of tomato plants.

| Concentration of imported fertilizer (%) | Local fertilizer concentration (%) | | | Effect of imported fertilizer |
|---|---|---|---|---|
| | 5.00 | 7.50 | 10.00 | |
| **5.00** | 11.33 | 12 | 12 | **11.77** |
| **7.50** | 12.33 | 12 | 13 | **12.44** |
| **10.00** | 13 | 13 | 13.33 | **13.11** |
| Effect of Local fertilizer | 12.22 | 12.33 | 12.77 | |
| L.S.D 5.00 | Imported 0.48 | Local0.48 | Interference N.S. | |

**Table 9 :** Effect of local and imported fertilizers and their overlap in the number of flowers of the plants of the tomato.

| Concentration of imported fertilizer (%) | Local fertilizer concentration (%) | | | Effect of imported fertilizer |
|---|---|---|---|---|
| | 5.00 | 7.50 | 10.00 | |
| **5.00** | 10.66 | 11.33 | 12.00 | **11.33** |
| **7.50** | 13.00 | 13.33 | 13.66 | **13.33** |
| **10.00** | 13.20 | 13.70 | 13.93 | **13.61** |
| Effect of Local fertilizer | 12.28 | 12.78 | 13.20 | |
| L.S.D 5.00 | Imported 0.70 | Local 0.70 | Interference N.S | |

**Table 10 :** Effect of local and imported fertilizers and their overlap in the number of fruits of the tomato plants.

| Concentration of imported fertilizer (%) | Local fertilizer concentration (%) | | | Effect of imported fertilizer |
|---|---|---|---|---|
| | 5.00 | 7.50 | 10.00 | |
| **5.00** | 54.00 | 58.33 | 65.00 | **59.11** |
| **7.50** | 62.00 | 63.66 | 70.33 | **65.33** |
| **10.00** | 66.00 | 67.00 | 71.33 | **68.11** |
| Effect of Local fertilizer | 60.66 | 63.00 | 68.88 | |
| L.S.D 5.00 | Imported 3.51 | Local 3.51 | Interference N.S. | |

**Table 11 :** Effect of local and imported fertilizers and their overlap in the weight of the fruit of the tomato plants.

| Concentration of imported fertilizer (%) | Local fertilizer concentration (%) | | | Effect of imported fertilizer |
|---|---|---|---|---|
| | 5.00 | 7.50 | 10.00 | |
| **5.00** | 86.60 | 89.66 | 91.36 | **89.12** |
| **7.50** | 90.40 | 92.33 | 93.23 | **91.98** |
| **10.00** | 91.20 | 93.03 | 94.76 | **93.00** |
| Effect of Local fertilizer | 89.40 | 91.67 | 93.12 | |
| L.S.D 5.00 | Imported 1.42 | Local 1.42 | Interference N.S. | |

**Table 12 :** Effect of local and imported fertilizers and their overlap in plant yield of plants tomato (kg).

| Concentration of imported fertilizer (%) | Local fertilizer concentration (%) | | | Effect of imported fertilizer |
|---|---|---|---|---|
| | 5.00 | 7.50 | 10.00 | |
| **5.00** | 5.20 | 5.78 | 6.06 | **5.68** |
| **7.50** | 5.89 | 5.99 | 6.27 | **6.05** |
| **10.00** | 6.08 | 6.20 | 6.49 | **6.26** |
| Effect of Local fertilizer | 5.72 | 5.99 | 6.27 | |
| L.S.D 5.00 | Imported 0.17 | Local 0.17 | Interference N.S. | |

**4. Fruit weight (gm)**

The results of table 11 indicates significant differences in the treatment of imported fertilizers in the weight of fruits ,the treatments of the levels of 7.5% and 10% significantly exceeded the treatment by 5%, achieving the highest rate (93.00 and 91.98 g), respectively. The lowest rate of treatment 5% of 89.12 g. The results of the table showed that the local fertilizer had a significant effect, as the treatment was superior 10% significantly on the treatments 5% and 7.5%, when they recorded 93.12 g, while the treatment gave 5% the lowest rate of 89.40 g. There was no significant effect between the treatments produced by the interaction between the two types of fertilizer used were treated with the highest overlap of the two types of fertilizer of 94.76 g. In contrast, interference treatment (lower levels of organic manure) the lowest rate of 86.60 g.

**5. Plant yield (kg)**

The results of table 12 shows that there are significant differences in the treatment of imported fertilizers in the plant yield, where the treatment exceeded 10% significantly on the treatments 5% and 7.5% which recorded the highest rate of 6.26 kg and the lowest rate of treatment recorded 5% of 5.68 kg. The results of the table showed that the local fertilizer had a significant effect, which exceeded the treatment by 10% significantly on treatments 5% and 7.5% when it gave 6.27 Kg while the treatment 5% gave the lowest rate of 5.72 kg. As for the overlap between the two types of organic fertilizer used. The results of the table showed significant differences between the treatments, with the highest treatment of the two types of fertilizer, the highest level of 6.49 kg, which significantly exceeded all treatments except for the two overlap treatments (7.5% imported with 10% local) and (10% imported with 7.5% local). In contrast, the interference treatment (lower levels of two types of organic fertilizer) achieved the lowest rate of 5.20 kg.

## Discussion

It was noted that the increase in the vegetative growth characteristics was positive by increasing the level of organic fertilizer used in this research experiment, although differences between the highest levels 7.5% and 10% were not significant in vegetative growth indicators except for the chlorophyll paper content for imported organic fertilizer and dry plant weight for domestic organic fertilizer. This gives an indication that 7.5% should be used to reduce the economic cost. As for the reason for exceeded the higher levels of compost, this may be due to the role of organic fertilizer added to the soil of agriculture in increasing the proportion of organic matter and this is reflected positively in increasing the proportion of microorganisms , and increase its activity and this helps improve soil conditions and increase moisture content and improve the ventilation as microorganisms increase their porosity and at the same time to increase the effectiveness of enzymes that work on the decomposition of organic compounds, which increases the rate of release of nutrients which the plant needs to feed and develop in both smaller and larger species and thus increase plant growth rates (Nur *et al*., 2006). In addition, organic fertilizer has a significant role in improving physical and chemical soil properties, increasing the absorption of water and nutrients and increasing the temperature of the growth medium, which provides ideal conditions for the growth of the root mass. All these factors are positively reflected in the increase in vegetative growth indicators (Agbede *et al*., 2008). In terms of plant height, the high fertilizer content of nitrogen (tables 1 and 2) can be an important reason for increasing the rate of high. This element plays an important role in stimulating the plant to produce internal hormones and manufacture proteins, which stimulates cell division and

elongation (Taiz and Zeiger, 2006). In addition, manure contains a good percentage of phosphorus which plays an important role in increasing vegetative growth by increasing the composition of nucleic acids and building the necessary protoplasm to divide the cell and increase breathing rates and carbon representation and provide energy for all the vital processes carried out by the plant during the stages of growth, This is a clear indicator of the increase in the number of leaves and leaf area (Sahaf, 1989; Ghosh *et al*., 2004 and Shaheen *et al*., 2007). Achieved organic fertilizer significantly increased at the highest level locat in the experiment and this is probably due to higher fertilizer nitrogen that enters directly in the formation chlorophylls content as well as its role in building amino acids involved in the formation of chloroplasts and this increases the leaves content of chlorophyll (Gutierrez-Micelli *et al*., 2007) and this is what confirm it both (Myint *et al*., 2005; Peter and Rosen, 2010) that chlorophyll is closely linked to the content of the plant of nitrogen. It may be to increase the growth indicators tables 1, 2, 3 and 4 a natural reflection of an increase in the rate of plant dry weight at the top-level of the two types of organic fertilizer used. The obtained results are consistent with both (Al-Ajeel, 1998; Ali and Raja, 2004; Al-Ameri, 2011 and Al-Amri and Matloob, 2012), who obtained a significant increase in vegetative growth indicators of the tomato plants as a result of organic fertilizer treatment. As for the increase plant yield and the indicators of flowers growth, it is clear that the increase in the characteristics of vegetative growth is a direct reflection of the increase in plant yield, the strength of vegetative growth has an effective role in improving flowers growth, especially the leaves content of chlorophyll and the leaf area, which increase the carbonate-induced products that increase the plant's output of carbohydrates and proteins in the plant's stored parts (Fawzy *et al*., 2007). The reason for exceeded can also be explained by the processing of balanced organic manure of nutrients and improved physical and chemical soil properties, which are prominent in increasing flowers growth and plant yield (Jahan, 2007). Abed Al-Kader *et al.* (2010) also pointed out that continuous organic manure processing of nutrients until later stages of plant life can be an effective factor in increasing plant yield.

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