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EFFECT OF ORGANIC FERTILIZATION AND THE METHOD AND DATE OF ADDING BIO MANURE IN THE GROWTH AND PRODUCTION OF CUCUMBER VARIS CATEGORY

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ABSTRACT

A study of the autumn season 2012 was carried out in a field of the Department of Horticulture and Garden Engineering, Faculty of Agriculture, Anbar University, as a simple experiment according to the design of the complete random sections to test the effect of two organic fertilizer sources. The results showed that the use of only 10% of the poultry wastes in the highest length of plant was 116.60 cm and the largest leaf area was 112.75 fat 2 compared with the comparison treatment, which gave a length of 64.77 cm and 62.06 cm2 for both lips, respectively. While the treatment treated 10% of poultry waste + bio-fertilization spraying on the plant, giving it the highest rate of the number of leaf amounted to 21.40 sheets/ plants. Compared to the comparison treatment, which recorded 14.0 leaf and gave the best dry weight of the total vegetative of 54.52 g compared to the comparison treatment gave 30.70 g. In chlorophyll content, the treatment of leaf bioremediation was higher with 40,60spad compared to the comparison treatment of 39.73 spad. On the other hand, the treatment of 10% of the poultry waste with 50% of the mineral fertilization according to the fertilizer recommendation increased the maximum number of fruits reached 420.00 fruit per experimental unit compared to the comparison treatment which gave 60.23 fruit to the experimental unit. While the treatment of the use of bio-fertilization gave a spray of two times the best length of the fruit was 15.59 cm compared to the comparison treatment, which gave a length of fruit of 8.92 cm. In total, 10% of poultry residues with soil biological fertilization before planting were recorded at a higher yield of 21.460 kg per experimental unit compared with the comparison treatment which gave 2.832 kg for experimental unit.

KEYWORDS: Cucumber, Organic Fertilizer, Bio Fertilizer.

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INTRODUCTION

Cucumber(Cucumissativus L.) is a cucurbitaceae cultivated for domestic consumption either in the form of small green fruits eaten fresh or in the form of pickled fruits(Zhu et al., 2016). 17 Organic fertilizers(animal residues) are of great benefit to the plant as a result of the slow release of mineral nutrients And their balance within the soil as well as their ability to retain large quantities of water needed by cucumber crop(4)(Berg et al., 2017). On the other hand, the use of bio-fertilization(pollination of soil and seeds with microorganisms) changes the biological content of the area surrounding plant roots and enriches them with their enzymatic secretions (Abd-Alhamid, Haggag, Hassan, Abdelhafez, & Hassan, 2015), which play an important role in the processing of nutrients in that area(Abdel-Hakim, Moustafa, & Nour, 2015). Yeast is one of the single-cell microorganisms that multiply vegetatively with sprouts and sometimes by simple division or both (Rawat, 2015). Yeast contains reduced substances such as calcium, fat and vitamins such as Vit B1, Vit B2, Vit B3, Niacin, Salts and Proteins (Pilát, Jonáš, Ježek, & Zemánek, 2017). Yeast is a bio- and reduce environmental pollution compared to chemical fertilizers as well as their high content of proteins, vitamins and natural hormones. (Navasardyan, Marutyan, Hovnanyan, & Trchounian, 2017) also explained that the use of municipal fertilizer treatment + the treatment of poultry manure + mineral fertilizer resulted in the highest vegetative growth of plant cucumber (length of plant and number of leaves) and increase the percentage of nitrogen, phosphorus and potassium elements in the leg and leaves. The effect of fertilization of sheep by 0, 10, 20 and 30 ton / ha -1 in the growth of cucumber plants found that the addition of 30 tons / ha -1 gave superiority in vegetative growth characteristics(plant height, number of leaves, dry weight of vegetative, root, leaf area and chlorophyll content) (Elouear, Bouhamed, Boujelben, & Bouzid, 2016). The addition of poultry waste and the level of 10 tons / e on the cucumber plant improved the growth of the fruit, which represents a significant increase in the number of fruits and diameter and plant yield, while did not show fertilizer effect significantly in the characteristics of the weight of the fruit and its length (Abobi et al., 2017). (Gerber, Lucia Jr, Correa, Neto, & Correa, 2017)He pointed out that the spraying of cucumber plants with four levels of Yeast 1, 2, 3 and 4 g / L -1 affected the growth, yield and concentration of the chemical compounds of the cucumber, and gave the highest yield and weight parameters for the fruit and the best yield at spraying level 4 g / L -1 for yeast With non-sprayed plants. So the study aimed at

Study of cucumber responsiveness to the use of degraded plant residues with the ground addition of yeast or leaf spray compared with the use of organic fertilizer for poultry waste and its impact on increasing production in quantity and quantity under open farming conditions.

MATERIALS AND METHODS

The research was conducted during the autumn season 2012 in the vegetable field of the Department of Horticulture and Garden Engineering Faculty of Agriculture, Anbar University. The cucumber seeds were selected as a certified cultivar cultivar species that proved to be successful in Iraq, especially in the central regions. The seeds were planted in cork plates on 25/8/2012. The field was divided into three sectors, the distance between which is 1 m. Each sector was divided into a width of 1.5 m and a length of 8 m. Provide the field with a drip irrigation system. The coefficients were distributed within each sector randomly and were transferred to the field after the

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emergence of the first real leaf on 8/9/2012 at the rate of 20 plants for experimental unit. After the transaction included the experiment:

- T1 - Comparative treatment of soil without organic and mineral fertilization
- T2 -Soil without organic fertilization + 100% mineral fertilization according to the recommendation of the fertilizer(8)
- T3 -Soil without organic fertilization + soil biological fertilization before planting 2 weeks(yeast dry bread 6 g / plant),(12).
- T4-Soil without organic fertilization + bio-fertilization leaf(spraying for the first two times after planting two weeks and the second after two weeks)
- T5-Soil deposited with 10% dissolved organic waste + 0% mineral fertilizer
- T6-Soil deposited with 10% dissolved organic waste + 50% mineral fertilization
- T7-Soil deposited with 10% decomposed organic waste + soil biological fertilization before planting.
- T8-Soil deposited with 10% decomposed organic waste + biochemical fertilization sprayed twice.
- T9-Soil deposited with 10% decomposed poultry residues + 0% mineral fertilization
- T10-Soil deposited with 10% decomposed poultry residues + 50% mineral fertilization
- T11-Soil deposited with 10% decomposed poultry residues + soil biological fertilization before planting
- T12-Soil deposited with 10% decomposed poultry residues + biochemical fertilization spraying for two times.

CHARACTERISTICS OF STUDIED

1. **Plant height ratio (plant size -1):** The length of the plant was measured using the measuring tape on 29/11/2012. The measurement was carried out at the end of the growth season from the leg contact area to the developing top of all the plants in the experimental unit.
2. **Number of leaf:** The number of leaf at the end of the season were calculated for five plants taken randomly at each repeater on 29/11/2012
3. **Leaf area:** The leaf area was calculated at the seventh Fairy in five plants taken random from each repeater, according to what(24)
4. **Chlorophyll content:** Chlorophyll meter(SPAD-502) was evaluated in five plants taken randomly from each replicator
5. **Average number of fruits per plant.(Fruit of plant -1):** The number of fruits in the experimental unit was calculated from the beginning of the harvest till the last growth season divided by the number of experimental unit plants according to the following equation

$$\text{Average number of fruits per plant} = \frac{\text{Total fruits}}{\text{Number of plants}}$$

6. **Average length of fruit (cm):** The length of the fruit was measured by the ruler in five plants taken randomly from each repeater.
7. **Plant yield:** The cumulative score was recorded from the beginning of the harvest until the last one and each plant in the experimental unit and extracted the average.
8. **Dry weight of the total vegetative(g):** dry weight was taken to the total vegetative by the extraction of five plants at random and removed roots and fruits, and dried at a temperature of 65 m and for 72 hours and took weight and extracted the rate.(5)

RESULTS AND DISCUSSION

FIRST: CHARACTERISTICS OF VEGETATIVE GROWTH

Plant height is one of the indicators of

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vegetative growth, which depends on the division and elongation of the cells, which in turn is affected by the quantity and quality of nutrients absorbed by the plant. The differing environmental conditions can also affect this characteristic.

The results of Table(1) indicate that the use of only 10% of poultry wastes in the highest plant yield was 116.60 cm, compared with the comparison of 64.77 cm. T10), which used 10% poultry residues + bio-fertilization leaf, giving the highest rate of number of leaf amounted to 21.40 sheets. Plants -1 compared to the average number of leaves of 14.0 sheets. Plants -1 In the comparison treatment, the treatment of T10, which used 10% 50% mineral fertilizer at the second rank when it achieved a number of leaves of 20 sheets. Plants -1 (Table 2). In terms of leaf area, the T9 treatment was only 10% higher than that of poultry with a leaf area of 112.75d2 compared with 62.06d2 in the comparison treatment (Table 2). The results of the same table indicate that the treatment of T4 Of chlorophyll was 40.60 SPAD compared to the comparison of 39.73 SPAD.

Table 2.Effect of organic and bio-fertilization on plant length(cm), average number of leaves and leaf area(fat 2) and chlorophyll(SPAD) for cucumber plant for autumn season 2012

Transactions	Content of chlorophyll SPAD module	Leaf area(creamy^2)	Average number of leaves per plant	The rate of plant height
T1	39.73	62.06	14.0	64.77
T2	73.10	55.86	18.5	84.40
T3	38.27	79.20	12.5	91.07
T4	40.60	73.23	18.3	89.73
T5	37.50	63.46	16.6	111.07
T6	37.87	64.59	16.8	63.18
T7	39.13	89.99	18.2	80.62
T8	39.59	86.65	14.5	91.13
T9	36.00	112.75	18.4	116.60
T10	37.67	86.09	20.0	92.13
T11	39.80	101.35	18.3	108.13
T12	39.93	104.54	21.4	94.92
L.S.D. 0.05	**2.30**	**63.284**	**8.17**	**35.017**

The results of improved vegetative growth of the cucumber plant can be explained by the role of organic fertilizers in increasing soil fertility and nutrient availability, as well as improving chemical and physical soil properties such as reciprocal capacitance, reservoir energy for water and the release of catalysts from amino acids(9) and(11). It may be attributed to the superiority of poultry waste to give the highest rate of the length of the plant to the content of this type of organic fertilizers of the elements of nutrients, such as nitrogen and phosphorus higher than containing high organic waste decomposed as well as containing the element of potassium(Cao, Gao, Qi, & Li, 2018). On the other hand, the decomposition of organic matter enriches the soil with organic acids such as humic acid, which plays an important role in increasing vegetative growth, as the elements become ready for absorption after soil mineralization by microorganisms that improve the properties of chemical and physical soil and increase the proportion of organic matter, This may be due the role of organic matter in the processing of plant nutrients, especially nitrogen in a balanced

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manner and to achieve the growth and development of the total vegetative by building the important proteins to increasing the division and expansion of cells and the reflection in the leaf area (Maragal, Singh, Behera, Munshi, & Dash, 2018).

The increase in the relative content of chlorophyll may be due to the effect of organic matter on the uptake of the N and Mg molecules, which have an important effect by being present at the center of the chlorophyll molecule or the effect may be due to the role of *Tirchodrma.harzinum*L., which is used to accelerate the decomposition of plant waste and to increase iron readiness of Fe2O3 by its ability to convert from Fe Fe 3 to Fez 2 ready-made Fez 2 which is a catalyst for absorption by the plant that enters the chlorophyll synthesis (Senbayram, Gransee, Wahle, & Thiel, 2016).

SECOND: THE CHARACTERISTICS OF PRODUCT

The results of Table (3) indicate that the treatment of T10 is 10% higher than that of poultry + 50% of the mineral fertilization. The maximum number of fruits was 420.0 in the experimental unit (12 m 2), while the lowest number was 60.23. The T9 treatment exceeded 10% of the poultry waste only by giving the best rate of fruit length of 14.07 cm. Fruit -1 compared with the lowest rate of 8.92 cm. Fruit -1 in the comparison treatment (Table 3) 10% poultry residues + soil biomass before planting were used to give the highest total yield of 21.460 kg for the experimental unit while the lowest total was recorded at the comparison treatment of 2.832 kg for the experimental unit.(Table3).

On the other hand, dry weight of the plant is one of the indicators indicating the strength or weakness of plant growth, which in turn depends on increasing the ability of the plant to metabolism by increasing the photosynthesis products and accumulation in the plant tissue with the nutrients to form dry matter and increase the dry weight of the plant has indicated Results Table(3) to the superiority of treatment of T2 recommended mineral fertilization in giving the highest dry weight rate of 54.52 g. Plants -1, compared to the comparison in the treatment of 30.70 g.

Table 3.Effect of organic and biological fertilization on the number of fruits, the length of the fruit and the total dry weight of the cucumber plant for the autumn season 2012

Transactions	The dry weight of the vegetative total(g)	Total unit of experimental unit(12.0 m 2)(kg)	Fruit length(cm)	The average number of fruits of experimental unit
T1	30.70	2.832	8.92	60.23
T2	42.75	6.298	10.58	193.20
T3	35.96	6.240	11.13	60.87
T4	39.94	9.563	15.59	100.00
T5	46.45	10.920	11.47	166.60
T6	32.08	3.594	9.29	80.30
T7	25.96	6.930	10.83	186.60
T8	36.46	4.472	10.21	104.60
T9	31.72	13.808	14.07	313.20
T10	43.14	18.134	11.08	420.00
T11	45.46	21.460	10.89	306.60
T12	54.52	13.792	11.43	208.30
L.S.D. $_{0.05}$	26.433	0.015	4.662	7.056

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The results of tables(3) indicate that there is an effect on the use of organic fertilizer supported by bio fertilization in the number of fruits per plant and the length of fruit, which may be attributed to the addition of organic matter in the soil leads to an increase in the number of microorganisms and activity, which increases the activity of enzymes that work on the decomposition of compounds Organicization and the release of hydroxide and hydroxide acid have an active role in increasing plant growth.

On the other hand, the release of elements from organic fertilizers increases the plant's readiness and contributes to the improvement of physical, chemical and fertility properties of soil. Resulting in an increase in the growth force of the root and vegetative sum of the plants, which was positively reflected in the increase in the number of fruits and thus increase the plant yield. These results are consistent with the results of(Corrêa et al., 2018). It is also consistent with what found (Zhang et al., 2015) that the addition of the organic matter leads to an increase in the components of the yield from the number of fruits and the yield of each plant in proportion to the percentage increase of organic matter added.

The effect of organic matter on the characteristics of the effect may be due to the role of the trachoderma used in the decomposition of plant and animal waste, which has led to the increase of sasilink acid, which stimulates vegetative and root growth and the number of branches, which in turn increases the yield(Chang, Wang, Gan, & Li, 2017).

The reason for the dry weight increase of vegetative growth may be due to the role of microorganisms containing organic fertilizers, which increase the mineral elements ready for absorption(van Dam-Bates, Curtis, Cowen, Cross, & Pearce, 2016), and these elements of the role of being involved in many biological and physiological processes or stimulate cell division and expansion and the formation of cellular membranes that lead to increase vegetative growth, leaf area and then the dry weight of the plant, or may be due to the role of these fertilizers and the nutrients that are available in large quantities gives the opportunity to accumulate these elements and materials manufactured process photosynthesis, such as carbohydrates and proteins in the plant tissue, which is a component of dry matter in the plant, increasing its concentration leading to dry weight increase (Namukose, Msuya, Ferse, Slater, & Kunzmann, 2016).

CONCLUSION

The results of the study indicate the superiority of the plants treated with organic fertilizer, which gave the highest rate of all the studied traits. The results also showed that there was a correlation between cucumber varieties and organic fertilizer. We recommend that organic fertilizer be used widely for the purpose of obtaining the highest output of the cucumber.

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