



STUDY OF THE EFFECT OF SPRAYING BY A NUTRIENT SOLUTION (EL-NEBRAS AND KING LIFE) ON THE GROWTH AND YIELD OF TWO VARIETIES OF EGGPLANT (LOCAL AND BLACK BEAUTY)

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Abstract

The experiment was carried out during the 2017-2017 season in the plastic house of a farmer in Sadat Al-Hindiya district, Al-Mahnawiyah area, north of Babylon Governorate. To study the effect of spraying with a nutrient solution (EL-nebras and king life) on the growth and yield of two varieties of eggplant (local and Black beauty) According to complete Randomized Design (C.R.D) arranging split split plots, the experiment included three factors: the first factor, the varieties (local and black beauty) occupied the main plates (main plot) and symbolized them with the symbol (A1, A2), the second factor represented two types of leaf nutrients (EL-nebras king leaf), and the secondary plates (sub plot) And symbolized by it (B1, B2), the third factor includes four spray concentrations (4,3,2,0) g.L⁻¹ For both nutrients, the sub sub plot is occupied by symbol (T4, T3, T2, T0). The results of the study showed that: A2 (Black beauty) surpassed all studied characteristics: plant height. Cm, number of branches. Plant, leaves number. Plant, leafy area. Cm², fruits number of fruits. Plant, fruit weight and yield plant. Kg (85.31 cm, 7.23 branches. Plant, 64.17 leaves. Plant, 4640.7 cm², 42.2 fruit. Plant, 164.86 g and 6.98 kg. Plant), Leaf nutrition EL-nebras (B2) showed significant superiority in all studied traits: plant height. Cm, number of branches. Plant, number of leaves. Plant, leafy area. Cm², the fruit number, fruit weight.plant and plant yield. Kg as it reached (84.39 cm, 6.40 branches. Plant, 64.57 Leaf. Plant, 5252.0 cm, 2.45.0 fruits. Plant, 163.88 gm and 7.36 kg). The concentrations also showed a significant effect on all traits, as concentration (T4) gave the highest mean average height for the plant. Cm, number of branches. Plant, number of leaves. Plant, leafy area. Cm², the number of fruits.plant , Fruit weight.plant yield. Kg reached (99.00 cm, 7.11 branches. Plant, 69.60 leaf. Plant, 4920.4 cm², 49.0 fruit. Plant, 167.5 gm and 8.18 kg). The results of the bilateral interaction between characteristics the variety and the nutrients showed a significant effect on all the, as the black beauty class A2 with the nutrient EL-nebras (B2) gave the highest mean height of the plant.Cm, number of branches. Plant, number of leaves. Plant, leafy area.Cm², the number of fruits.plant, fruits weight. Gm and yield plant.Kg reached (89.24 cm, 7.25 branches. Plant, 70.26 leaf. Plant, 5707.6 cm², 46.5 fruit. Plant, 166.17 gm and 7.70 kg). The bilateral interaction between variety (A2) Black beauty and concentration (T4) showed significant superiority in most studied characteristics, plant height. Cm, number of branches.Plant, number of leaves.Plant, leafy area.Cm², weight of fruits.gm and yield plant. Kg as the average quality (99.57 cm, 8.68 branch. plants, 75.03 leaf, plant, 5036.9 cm², 175.92 gm and 8.44 kg. Plant), while the local variety (A1) with concentration (T4) outperformed the number of fruits. It reached 50.0 fruit.plant. The results of the bilateral interaction between the nutrient and the concentrations of the studied characteristics indicated a significant superiority of the leaf nutrient EL-nebras (B2) and the concentration (T4) in most of the studied characteristics, number of branches. Plant, number of leaves.Plant, leafy area.Cm², weight of fruits.gm, as the average value of each trait was (8.16 branch.Plant, 71.20 leaf.Plant, 5582.8 cm²,173.03 gm). Whereas the nutrient king life (B1) and concentration (T4) gave the highest mean characteristic of plant height. Cm, the number of fruits.Plant and yield plant. Kg as it reached 99.75 cm and 52.3 fruit.Plant and 8.47 kg), the triple interaction between variety Black beauty (A2), nutrient EL-nebras (B2) and concentration (T4) showed significant superiority in most studied traits: number of branches, plant, number of leaves.Plant, leafy area.Cm², weight of fruits.gm as the average traits(8.73 branch. Plant, 76.13 leaf. Plant, 5858.4 cm² and 178.32gm).whereas, the black beauty (A2), nutrient (B1), king life and concentration (T4) gave the highest mean characteristic of plant height, name the number of fruits. Plant and the yield of the plant. kg (100.37 cm 52.7 fruit. Plant and 9.14 kg).

Keywords : Variety, Leafy nutrients, Eggplant and spray.

Introduction

Eggplant *Solanum melongena* L. is an important vegetable plant that belongs to the Solanaceae nightshade family (Al-katib, 2000). It has a high nutritional value as its fruits contain 14.34 protein, 2.82% fat, 12.85% fiber, 63.87% carbohydrates, in addition to many nutrients. Such as calcium, iron and potassium (Hussein *et al.*, 2010). It is also considered one of the important plants as the body provides many energy compounds that are important for building proteins, fats and vitamins (Gopalan, 2007). Leaf feeding has an effective role in plant nutrition because of the fast absorption of nutrients by plant parts equally and it also reduces the use of large quantities Fertilizers also excel leafy nutrition with several advantages compared to ground fertilization, as it is the fastest in addressing the shortage of elements that appear first on the leaves, as it works to add

nutrients directly to the deficiency areas as well as it provides a lot of effort and time to distinguish it by the possibility of mixing fertilizers and Growth regulators (Focus, 2003). In recent years, many researches have been conducted to study the effectiveness of leafy nutrients and their direct impact on improving crop growth and productivity. Mohammad (2013) found a significant increase in plant height, number of branches and leaves, number of fruits, weight of fruit and total yield of eggplant inside the greenhouse when overlapping the addition of 50 kg of K₂SO₄ with spraying with agro leaf at a concentration of 10 g. L⁻¹, as has been shown by many researches, foliar nutrients are considered a necessary and effective adjunct with fertilizers to increase production (Kostadinov and Kostadinova, 2014), Therefore, leaf fertilizer (EL-nebras) is considered an important fertilizer in the leafy nutrition because it contains a distinct combination of nutrients necessary for the plant in a parallel

manner and ready for absorption, as these elements are chelated and in a way that achieves the optimum benefit as a result of preventing sedimentation and antagonism between the nutrients, Because of its significant effect on increasing vegetative growth, improving fruit quality, strengthening root systems, and increasing production (Raziyeh *et al.*, 2013).

The study came with the aim of: comparing the growth and yield of the two eggplant varieties and identifying the best variety for cultivation in greenhouses, as well as studying the effect of spraying the nutrient solution on plant growth, the amount of yield and the appropriate concentration in this solution and knowing the response of the two eggplant varieties to the number of times spraying by leafy nutrition and its effect on some of the growth and yield characteristics And know the interference to determine the best combination of the three factors.

Materials and Methods

The experiment was carried out during the 2017-2017 season in the plastic house of a farmer in Sadat Al-Hindiya district, Al-Mahnawiyah area, north of Babylon Governorate. To study the effect of spraying with a nutritional solution (Nebras and king life) on the growth and yield of two varieties of eggplant (local and Black beauty) according to Complete Randomized Design (C.R.D) and in order split plots , The experiment included three factors, the first factor is the varieties (local and black beauty) occupied the main plates (main plot) and its symbol is symbol (A1, A2), the second factor represents two types of leafy nutrition (the king leaf) and occupied the secondary plates (sub plot) and a symbol It has the symbol (B1, B2), the third factor includes four spray concentrations (4,3,2,0) g. L⁻¹ for both nutrients, the sub sub plot was occupied and symbolized (T4, T3, T2,

T0). Samples were studied for the characteristics studied by (6) plants per experimental unit and randomly for the purpose of extracting the rate, statistical analysis of the studied characteristics was carried out according to a Completely Randomized Design using the Genstat program. The results were tested using the lowest LSD mean difference between the mean scores at 0.05 level (Torrie Steel, 1980).

After that, the green house soil was prepared from sterilization, tillage, smoothing and modification. Various samples were taken from the soil of the experiment for the purpose of conducting chemical and physical analyzes. The samples were examined in soil and water laboratories of the Technical Institute, Musaiib, Table (1).After that, the greenhouse was divided into a length of 30 m, between a mare and another 1.5 m, and between a plant and another 40 cm, the seeds of the two varieties were planted on 5/9/2017 in the middle of a component of river soil, decomposed animal fertilizer and peat moss with a ratio of (1: 1: 1). The seedlings were transported after Genesis 4-3 real leaves were transferred to the permanent place of the green house on 10/11/2017. All agricultural operations were carried out equally for all transactions, including weeding, control, irrigation and fertilization.

The experiment included the effect of spraying the two nutritional solutions (Nebras and King leaf) at four concentrations (4,2,2,0 gm.L⁻¹) the first spray approximately 45 days after transferring the seedlings to the permanent place at a rate of 4 sprinkles per leafy nutrition for both varieties of the vegetative total of the plant, and spraying until complete wetness was carried out spraying in the early morning with a sprinkler of 10 liters and was between one sprinkle to another 15 days.

Table 1 : Some chemical and physical properties of greenhouse soil

Degree of soil interaction pH	Degree of electrical conductivity ds/m	Calcium carbonate (g.kg ⁻¹) caco3	Total nitrogen mg.g ⁻¹	Organic matter g. Kg ⁻¹	Volumetric distribution of soil separators			Soil texture
					Clay ratio%	Silt ratio%	Sand ratio%	
7.5	3.4	25	32	12	345	375	280	

Paper feeder (AL-NEBRAS) produced by Jordan Caravan Company. Its components:

Element	Ratio
Nitrogen	%10
Phosphorus	%8 (P.O)
Potassium	%6 (K.O)
Chelated iron	PPM 200
Chelated Zinc	PPM 200
Boron	PPM 10
Chelated Manganese	PPM 150
Chelated magnesium	PPM 160
Chelated copper	PPM 25

Nutritious fertilizer (King Leaf) produced by (GREENHAS ITALIA .S.P.A), its ingredients:

Major elements: N.P.K 20:20:20 Small elements: Fe. Mn. Zn. Cu. B. Mo

Studied traits:

1. Plant height.cm: The averages were recorded from the position of the plant contact with the soil surface to the developing top.

2. Branches number.Plant: Calculated at the end of Season 3-number of leaves. Plant: The number of leaves was calculated for each plant.

3. Leaves number.Plant: The number of leaves was calculated for each plant.

4. Leafy area.Cm²: the Leafy area was calculated according to (Lu *et al.*, 2004) stated using the modern laser device(Digital).

5. Fruits number. Plant: According to the number of fruits from the beginning of the first reap after 4 months from the date of planting until the last reap at the end of the season, dividing the sum of the fruits in the experimental unit by the number of their plants by all the reaps.

6-Fruit Weight.gm: This attribute was calculated at the end of the season by dividing the quotient of the experimental unit by the number of fruits obtained in it.

7-Plant yield.Kg: The product of one plant was calculated by multiplying the number of fruits by the average weight of the fruit for each plant.

Results and Discussion

Plant height. Cm

The results shown in Table (3) indicate that there were significant differences between the two varieties (A1 and A2) in the height of the plant, as the variety A2 gave the highest average of 85.31 cm, while the variety A1 gave the lowest average of 79.93cm, nutrients showed significant superiority, as leafy nutrient B2 gave the highest average height of plant to 84.39 cm over leafy nutrient B1 which gave the lowest rate reached 80.85 cm. It is clear from the same table that there was a significant effect of different concentrations of nutrients and gave the concentration T4 g. Liters 1 - the highest rate reached 99.00 cm while T0 gave the lowest rate of 62.87 cm. Perhaps it is due to the role of foliar nutrients and their effect on plant growth and increase of yield, and this in turn leads to the superiority of the treatments used in this study. The reason may be due to the rapid absorption of nutrients by the plant and thus its effect on the development of the vegetative total of the crop. On the other hand, the contents of foliar nutrients used in their quality from In terms of containing the nutrients necessary for growth, such as nitrogen, phosphorous, etc. It is considered one of the most important requirements for the development and growth of the plant and its effect on productivity, as the presence of potassium is also a major relationship in increasing

vegetative growth and thus its effect on the vegetative total of the plant (Sanders, 2001 and Torres *et al.*, 2004).

Al-Lami (2015) mentioned the presence of a significant effect of leafy nutrients on increasing plant height when sprayed on eggplant plants at high levels compared to most other treatments. The results also indicated a significant overlap between the varieties and nutrients, as the category A2 and the nutrient B2 outperformed the highest mean of 89.24 cm, and the variety A1 and nutrient B1 gave the lowest mean of 79.54 cm. As for the interference between the varieties and concentrations, it was superior to variety A2 with a concentration of T4 g.L⁻¹ gave the highest height of 99.57 cm, while the interference treatment between variety A1 and T0 gave the lowest rate of 57.60 cm.

At the same time, the results indicated the bilateral interference between the nutrients and the concentrations, as the nutrient gave B1 with a concentration of T4 g.L⁻¹ the highest average reached 99.75 cm, while the nutrient gave B1 with the control treatment the lowest average of 60.25 cm. variety A2, leafy nutrition B1 and concentration T4 g.L⁻¹ gave the highest average rate of 100 cm, the highest average value was 100.37 cm, while the variety A1 and leafy nutrition B1 and T0 gave the lowest average plant height of 57.57 cm.

Table 3 : Effect of variety, nutrient solution, spraying stages, and their interactions on characteristic (plant height. Cm)

Varieties	Nutrients	Concentrations.gm.L ⁻¹				A*B
		T0	T2	T3	T4	
A1	B1	57.57	88.90	75.70	99.13	80.32
	B2	57.63	75.00	87.80	97.73	79.54
A2	B1	62.93	71.97	90.23	100.37	81.38
	B2	73.33	86.70	98.17	98.77	89.24
LSD0.05		1.91				0.87
A*T						
A1		57.60	81.95	81.75	98.43	79.93
A2		68.13	79.33	94.20	99.57	85.31
LSD0.05		1.28				0.24
B*T						
B1		60.25	80.43	82.97	99.75	80.85
B2		65.48	80.85	92.98	98.25	84.39
LSD 0.05		1.43				0.88
Average		62.87	80.64	87.97	99.00	
LSD0.05		1.04				

Leaves number. Plant

The results of Table (5) indicated that there were significant differences for the effect of varieties, nutrients and concentrations on the number of leaves, variety A2 outperformed variety A1 by giving it the highest average number of leaves reached 64.17. leaf, while variety A1 gave the lowest rate of 55.91 leaf. The reason for the variation between the varieties is due to the genetic difference between the varieties and the result of the different genetic factors that control the vegetative buds responsible for the formation of the leaves and thus control the number of leaves formed on the plant for each variety (Dovrnac, 1965). The nutrients had a significant effect, as the B2 nutrient gave the highest rate of 64.57 leaf, while the B1 nutrient gave the lowest rate of 55.51 leaf. The increase is due to the role of foliar nutrient B2 in stimulating plants and increasing their growth because it is rich in amino acids and very important in increasing the

concentration of chlorophyll in the leaves, which increases the products of carbon representation, causing an increase in the formation of vegetative tissues and the accumulation of carbohydrates and proteins in them, which increased the area of absorption of nutrients in the leafy fertilization (Abu Dahi and Muayyad, 1988), Concentrations of nutrient spray showed significant superiority, as that of T4 gm.L⁻¹ gave the highest average of 69.60 leaf, while T0 gave the lowest rate of 16,053 leaf. The reason for the superiority of spraying treatments with the nutrient solution is due to the role of the necessary elements involved in the synthesis of the nutrient solution, especially nitrogen, which leads to an increase in the number of branches of the plant and vegetative growth that was reflected in the increase in the number of leaves, and zinc also plays an important role in the process of cell division and thus formation of the principles of leaves ((Leaf Primordial and thus an increase in the number of leaves as

well as the role of sprayed elements in photosynthesis in the leaves and composition of nutrients important in plant growth and increase of its branches and then its reflection on the increase in the number of leaves (Al-Sahaf, 1989).

The same table also indicated the existence of significant interaction between the nutrients and varieties, as spraying nutrient B2 for variety A2 gave the highest rate of 70.26 leaf, while nutrient B1 and variety A1 gave the lowest prepared amount of 52.94 leaf. The results indicated that there was a significant interaction between the varieties and

concentrations, as variety A2 spray was given at a concentration of T4 g.L⁻¹ the highest rate was 75.03 leaf, while the comparison treatment (T0) with variety A1 gave the lowest rate of 50.77 leaf the highest rate was 71.20 leaf, while T0 g.L⁻¹ with variety A1 gave the lowest rate of 50.77leaf. The triple interference in this trait showed a significant effect, as variety A2, leaf nutrient B2 and concentration T4 g.L⁻¹ the highest rate reached 76.13 leaf, while the combination between variety A2 and nutrient B1 and T0 gave the lowest average of 42.73.

Table 5 : Effect of variety, nutrient solution, spraying stages and their interactions with each trait (leaves number. Plant)

Varieties	Nutrients	Concentrations.gm.L ⁻¹				A*B
		T0	T2	T3	T4	
A1	B1	43.05	54.30	52.03	62.07	52.94
	B2	58.17	56.70	54.37	66.27	58.88
A2	B1	42.73	53.47	62.17	73.93	58.08
	B2	68.37	68.43	68.10	76.13	70.26
LSD0.05		1.74				0.84
A*T						
A1		50.77	55.50	53.20	64.17	55.91
A2		55.55	60.95	65.13	75.03	64.17
LSD0.05		1.25				1.04
B*T						
B1		43.05	53.88	57.10	68.00	55.51
B2		63.27	62.57	61.23	71.20	64.57
LSD 0.05		1.23				0.62
Average		53.16	58.23	59.17	69.60	
LSD0.05		0.93				

Branches number.plant

Table (4) shows the superiority of variety A2 significantly over variety A1 in the number of branches. The plant gave the highest average of 8.68 branch. Concerning the nutrients, the B2 gave the highest mean for this trait of 8.16 branch, while the leafy nutrient B1 gave the lowest value of 6.06 branch. The concentrations showed a significant superiority, as the concentration gave T4 g.L⁻¹ by giving him the highest average number of branches, it reached 7.11 branch, and the control treatment gave the lowest average of 5.04 branch, the increase in this characteristic and the rest of the traits when spraying with the B2 nutrient solution may be due to the role of nutrients and organic materials present in this solution and their effect on photosynthesis, respiration and protoplasmic construction, as some of them, such as nitrogen, are involved in the synthesis of a large number of organic compounds important in biological processes In the plant, it is involved in the synthesis of nucleic amino acids such as RNA and DNA and enters into the synthesis of the chlorophyll molecule and cytochrome enzymes that are important in the synthesis of many compounds including nucleic acids and ATP and helps in the process of forming and dividing cells and stimulating growth and development of roots and plant maturity, this result is consistent with Al-Amri (2011) who found that spraying tomato plants with foliar nutrients has led to a significant increase in the vegetative traits and that the lack of these elements may cause the emergence of many symptoms that negatively affect the nature of plant growth, The interference between B A, had a significant effect in this

trait if nutrient B2 with variety A2 gave the highest mean average of 7.25 branch, while the interference between variety A1 with nutrient B1 gave the lowest value of 3.67 branch, the bilateral interference between A and T showed a significant effect, as variety A2 exceeded by giving it the highest average of 8.68 branch, while the interference between the local variety and control treatment gave the lowest average of 4.10 branch. The results of the same table showed a significant effect of the bilateral interference between B and T, as the concentration gave T4 g.L⁻¹ and nutrient B2 have the highest mean of 8.16 branches for this trait, while the interference between T0 and nutrient B1 gave the lowest average of 4.90 branch, as for the effect of nutrients in this study, it found a significant effect of triple interference between A, B and T, as variety A2 and leaf nutrient B2 were given with concentration T4 g.L⁻¹ the highest mean was 8.73 branch, while the triple interference between variety A1 and nutrient B1 with a concentration of T4 g.L⁻¹ the lowest average was 3.50 branch. The reason may be due to the role of the important active compounds contained in the leafy nutrients used and to the various biological processes and its reflection on increasing the efficiency and development of plant growth (Gopalan *et al.*, 2007), also, it may be due to the positive effect of the use of foliar nutrients in the processing of plants with nutrients and their positive role in the growth and development of the vegetative system and an increase in the number of airy stems, which consequently leads to an increase in the number of branches of the plant (Abdel- Mouty *et al.*, 2011).

Table 4 : Effect of variety, nutrient solution, spraying stages and their interactions with each trait (branches number. Plant)

		Concentrations.gm.L ⁻¹				
Varieties	nutrients	T0	T2	T3	T4	A*B
A1	B1	3.60	3.83	3.76	3.50	3.67
	B2	4.60	4.40	5.60	7.60	5.55
A2	B1	6.20	6.40	7.60	8.63	7.20
	B2	5.76	6.86	7.66	8.73	7.25
LSD0.05		0.43				0.16
A*T						
A1		4.10	4.11	4.68	5.55	4.61
A2		5.98	6.63	7.63	8.68	7.23
LSD0.05		0.30				0.18
B*T						
B1		4.90	5.11	5.68	6.06	5.44
B2		5.18	5.63	6.633	8.16	6.40
LSD 0.05		0.31				0.14
Average		5.04	5.37	6.15	7.11	
LSD0.05		0.23				

Leafy area.cm²

Table (6) shows the superiority of variety A2 in the characteristic leafy area.Cm which gave the highest average was 4,640.7 cm compared to the variety A1 which gave the lowest average was 4,143.5 cm. The reason may be attributed to the response of the varieties to the used paper-fed nutrients that exhibit positive behavior for both varieties, also, the reason for the increase in the relative content of chlorophyll may be due to the effect of the organic matter in increasing the readiness of the nitrogen and magnesium elements, which have a significant effect during their presence in the center of the chlorophyll molecule and consequently its effect on the leafy area of the plant (Peter and Carl, 2005).

As for the nutrients from the results of the same table, the leafy nutrient B2 gave the highest average characteristic of the leaf area reached 5252.0 cm². Compared to the nutrient B1, which gave the lowest average amount reached 3532.2 cm², as for T, it gave the concentration T4 g.L⁻¹ the highest average was 4,920.4 cm² compared to the concentration T2 g.L⁻¹ which gave the lowest average was 4,094.3 cm². The reason is because the superiority of spraying with the nutrient solution is that it contains the necessary nutrients in the process of dividing and expanding the cells, especially the important zinc in the manufacture of

the amino acid tryptophan, which is necessary for the synthesis of IAA, which is important in cell division and then increasing the leafy area, and nitrogen has a role in increasing vegetative growth in the number of leaves and thus increasing The leafy area (Abu Dahi and Yunus, 1988 and Al-Sahaf, 1989). The results of the same table show that there was a significant effect of bilateral interaction between A and B, as variety A2 with nutrient B2 gave the highest average of 5707.6 cm² compared to variety A1 with nutrient B1, which gave a minimum average of 3490.6 cm². As for the interaction of the two between A and T, variety A2 was given with concentration T4.gmThe highest average liter was 5036.9 cm2, with the bilateral interference between class A1, the concentration T2, the lowest average, reaching 3682.4 cm². The results of the interference between B and T indicated the superiority of the nutrient B2 with the concentration T4 g.L⁻¹ gave the highest average of 5582.8 cm² while nutrient B1 with T0 gave the lowest average of 3220.5 cm². The interference data of the three studied factors showed a significant effect on the leaf area. Variety A2 with nutrient B2 and concentration T4 g.L⁻¹ was given average top of the leafy area was 5858.4 cm² compared to varietyA1 with the nutrient B1 and T0 as it gave the lowest average of 3195.6 cm².

Table 6 : Effect of variety, nutrient solution, spraying stages, and their interactions with each characteristic (leaf area. Cm²)

		Concentrations.gm.L ⁻¹				
Varieties	Nutrients	T0	T2	T3	T4	A*B
A1	B1	3195.6	3210.9	3255.2	4300.6	3490.6
	B2	4459.1	4154.0	5265.3	5307.2	4796.4
A2	B1	3245.4	3357.9	3476.3	4215.4	3573.7
	B2	5548.6	5654.3	5769.2	5858.4	5707.6
LSD0.05		28.83				22.75
A*T						
A1		3827.3	3682.4	4260.2	4803.9	4143.5
A2		4397.0	4506.1	4622.8	5036.9	4640.7
LSD0.05		19.54				22.91
B*T						
B1		3220.5	3284.4	3365.7	4258.0	3532.2
B2		5003.9	4904.1	5517.3	5582.8	5252.0
LSD 0.05		22.82				21.17
Average		4112.2	4094.3	4441.5	4920.4	
LSD0.05		12.29				

Fruits number.plant

The results of Table (7) showed that there were no significant differences between A for the number of fruits. The nutrients showed a significant effect, as B2 gave the highest average of 45.0 fruit. Plant, while the nutrient gave B1 the lowest average of 38.6 fruit. The increase in the quantitative traits is due to the number of fruits, the length of the fruit, and the total yield of plants due to the role of foliar nutrients in increasing the outputs of carbonic representation as a result of improving the indicators of vegetative growth associated with that by stimulating their transition to the fruits as a result of increasing the absorbed quantities of nutrients, especially potassium, thus increasing the hormones in the fruits. Newly contracted, such as oxinate, as a result of increased concentrations of nutrients, especially nitrogen and zinc, as well as increased carbohydrates from the carbon metabolism (Al-Lami, 2015). This result is consistent with the results of Jaafar (2012) when spraying eggplant plants with potassium fertilizer (For max) at a concentration of 6 g.L⁻¹ has resulted in a significant increase in the number of fruits and the yield of one plant. The concentrations of foliar

spray showed significant superiority, as the concentration T4 gave an average mean of 49.0 fruit.Plant while T0 gave the lowest average of 34.4 fruit. Plant. The results of the same table indicated a significant effect of bilateral interference between B and A, as variety A2 with nutrient B2 gave the highest average of 46.5 fruit. Plant, and gave the variety A1 with the nutrient B1 the lowest average of 39.3 fruit.Plant. Results of bilateral interference between A and T showed significant differences, as class A1 with concentration T4 gave an average mean of 50.0 fruit.Plant and gave the same variety with T0 the lowest average was 33.1 fruit. The bilateral interaction between B and T had a significant effect, as nutrient B1 with concentration T4 gave the highest mean of 52.3 fruit, while the same nutrient with T0 gave the lowest average of 26.2 fruit.Plant. The results of the triple interference in this trait indicated significant differences, as variety A2 and nutrient B1 with concentration T4 g.L⁻¹ were given highest average was 52.7, while variety A1 and nutrient B1 with T0 gave the lowest mean average of 28.7 fruit.Plant.

Table 7 : Effect of variety, nutrient solution, spraying stages and their interactions with trait (fruits number. Plant)

		Concentrations.gm.L ⁻¹				
Varieties	Nutrients	T0	T2	T3	T4	A*B
A1	B1	28.7	30.5	46.0	52.0	39.3
	B2	37.4	42.6	45.8	48.0	43.5
A2	B1	23.7	32.7	42.9	52.7	38.0
	B2	47.8	48.6	46.2	43.3	46.5
LSD0.05		0.75				0.56
		A*T				
A1		33.1	36.6	45.9	50.0	41.4
A2		35.7	40.7	44.5	48.0	42.2
LSD0.05		0.45				N.S
		B*T				
B1		26.2	31.6	44.4	52.3	38.6
B2		42.6	45.6	46.0	45.6	45.0
LSD 0.05		0.62				0.57
Average		34.4	38.6	45.2	49.0	
LSD0.05		0.34				

Fruit weight.gm

It is evident from Table (8) that there is a significant effect of the varieties on the fruit weight characteristic. gm, as variety A2 gave the highest rate of 164.86 gm, while variety A1 gave the lowest average of 153.33 gm. Perhaps the reason for variety A2 superiority over the local variety is due to the genetic differences and the suitability of the variety for the prevailing environmental conditions in the region (Al Hayani, 2000). The addition of foliar nutrients led to a significant increase in this trait, as treatment of nutrient B2 gave the highest average of 163.88g, while nutrient B1 gave the lowest average of 154.31g. The reason may be that the leafy nutrients used are rich in essential nutrients that contribute to increasing cell division and building and stimulating plant biological activities leading to increased vegetative growth and thus an increase in production, and these results were agreed with (Basavarajeshwari *et al.*, 2008) those who pointed out the role played by leafy nutrients when sprayed on the vegetative system of the plant, which contributed effectively to increasing the efficiency of photosynthesis by supplying plants with the nutrients needed

during the growth stages that led to an increase in the accumulation of solubles as well as their role in stimulating plant hormones For tomato plant. Concentrations of nutrient spray showed significant differences, as the concentration gave T4 g.L⁻¹ highest average was 167.50 g compared to T0 which gave the lowest average of 150.57 g. The bilateral interaction between B and A showed a significant difference, as variety A2 and nutrient B2 gave the highest average of 166.17 g compared to nutrient A1 which gave the lowest mean with nutrient B1 to 145.06 g. Binary interference between A and T was found to have a significant effect, as variety A2 with concentration T4 gave the highest average of 175.92 g compared to variety A1 with T0, it gave the lowest average of 143.86 g. Interference between nutrients and concentrations had a significant effect in this characteristic. nutrient B2 and concentration T4 gave the highest average of 173.03, while the interference between nutrient B1 and T0 gave the lowest average of 144.91 gm. Interference between the three studied factors had a significant effect, as variety A2 with nutrient B2 and concentration T4 gave an average mean of 178.32 g while variety A1 with nutrient B1 and T0 gave the lowest average score of 132.19 g.

Table 8 : Effect of variety, nutrient solution, spraying stages, and their interactions with each attribute (fruit weight.g)

		Concentrations.gm.L ⁻¹				
Varieties	Nutrients	T0	T2	T3	T4	A*B
A1	B1	132.19	148.31	149.32	150.43	145.06
	B2	155.52	159.31	163.78	167.74	161.59
A2	B1	157.63	158.91	164.13	173.52	163.55
	B2	156.95	164.26	165.14	178.32	166.17
LSD0.05		0.55				0.38
A*T						
A1		143.86	153.81	156.55	159.08	153.33
A2		157.29	161.59	164.63	175.92	164.86
LSD0.05		0.33				0.12
B*T						
B1		144.91	153.61	156.73	161.97	154.31
B2		156.24	161.79	164.46	173.03	163.88
LSD 0.05		0.44				0.38
Average		150.57	157.70	160.59	167.50	
LSD0.05		0.27				

Plant yield.Kg

The results of Table (9) showed that there were significant differences between the two varieties for the yield of plants, kg. Plant, as it gave the variety A2 the highest average of 6.98 kg. Plant while variety A1 was given the lowest average of 6.38 kg. Plant. The nutrients were found to have a significant effect, as B2 gave the highest yield of 7.36 kg. A plant compared to the B1 nutrient which gave the lowest yield reached 6.01 kg. Plant. Because of the role of foliar nutrient B2 in stimulating plants and increasing their growth because it is rich in organic acids and amino acids, it is also very important in the process of photosynthesis and carbohydrates, as well as its role in the carbon representation in which (potassium contributes to the activating role) and the production of energy necessary for the division and elongation of cells, and containing diffuse substances Increases the plant's ability to utilize nutrients (Taiz and zeiger, 2010), These results are consistent with the findings of (Al-Tahafi *et al.*, 2009) who obtained a significant increase in the weight of fruits and the total yield of the plant.

Kg when spraying with leafy nutrient (15 micronite) on the Newton variety tomato plant. The concentrations of the leafy nutrient spray showed significant differences, as the concentration gave T4 g.L⁻¹, the highest yield was 8.18 kg. Plant compared to the lowest yield at concentration T0 g. L⁻¹ which amounted to 5.20 kg. The results of the same table showed that there were significant differences for the binary interference between B and A, noting that the superiority of class A2 with feeder B2 gave the highest yield of 7.70 kg compared to class A1 and feeder B1 which gave the lowest score of 5.74 kg. The results of the binary interference between A and T indicated that variety A2 with a concentration of T4 g.L⁻¹ the highest yield of 8.44 kg for this trait was compared to the lowest of variety A1 and T0 g.L⁻¹ concentration. which amounted to 4.76 kg. The results of the triple interference between A, B and T showed significant differences, as variety A2, nutrient B1 and concentration T4g.L⁻¹ were given the highest yield was 9.14 kg, while the same variety interference with nutrient B1 and concentration T0g.L⁻¹ was given the lowest yield of 3.73 kg.

Table 9 : Effect of variety , nutrient solution, spraying stages, and their interactions on the characteristic (plant yield. Kg)

		Concentrations.gm.L ⁻¹				
Varieties	Nutrients	T0	T2	T3	T4	A*B
A1	B1	3.79	4.52	6.86	7.82	5.74
	B2	5.81	6.78	7.50	8.05	7.03
A2	B1	3.73	5.19	7.04	9.14	6.27
	B2	7.59	7.98	7.62	7.72	7.70
LSD0.05		0.22				0.11
A*T						
A1		4.76	5.63	7.18	7.95	6.38
A2		5.61	6.57	7.32	8.44	6.98
LSD0.05		0.15				0.05
B*T						
B1		3.79	4.85	6.95	8.47	6.01
B2		6.65	7.37	7.56	7.89	7.36
LSD 0.05		0.16				0.10
Average		5.20	6.10	7.25	8.18	
LSD0.05		0.14				

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