The role of foliar spraying of banana peel extract and the addition of bio-fertilizer in the qualitative traits and total yield of carrot plants

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Abstract

The field experiment was conducted at the training extension farm in Al-Mahanawiya / Al-Musayyab district, 25 km northwest of Hilla city center / Babylon provainc. The seeds of the Samen carrot hybrid were planted during the autumn season on October 3, 2021.To study the role of foliar spraying of banana peel extract and the addition of bio-fertilizer on the qualitative traits and total yield of carrot plants. The experiment was designed according to a split plot-system using a randomized complete block design with three replicates. The results of the experiment were statistically analyzed according to the method of analysis of variance and according to the significant differences between the treatments at the probability level of 0.05 using the least significant difference LSD. The results indicated that the bio-fertilization (Biohealth) had a significant effect on (the percentage of nitrogen and potassium in carrots and the percentage of protein in the roots of the carrot plant for wet weight), and (Fulzyme) scored significantly in (the percentage of phosphorous in carrots, the total yield, the ratio of wood to bark and the root content of beta-carotene and ascorbic acid).Treatment with the organic extract of banana peels showed significantly excelled at the concentration of 40 ml. L^{-1} in (percentage of soluble solids T.S.S., carrot content of ascorbic acid, and carrot root carbohydrate content) and at a concentration of 20 ml. L^{-1} in (percentage of potassium in carrots and total yield).The bi- interaction of the bio-fertilization treatment and the organic extract indicated significant differences, as the interaction between Fulzyme and the concentration 40 ml.L^{-1} in carrot content of ascorbic acid was significantly excelled to (2.83 mg.100gm-1 fresh weight), The interaction between Biohealth and the concentration of 40 ml.L^{-1} recorded the highest content of carrots of beta-carotene (2.55 mg.100gm^{-1} fresh weight) respectively, and the interaction between Biohealth and the concentration20ml.L^{-1} recorded the highest total yield of (12.73 tons.ha^{-1}).Whereas, the lowest rate of all studied traits was reached when the control treatment was given for both biofertilization and banana peel extract.

Key word: carrot- Bio fertilizer - Banana peel extract- Quality& yield total parameters.

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Introduction

The carrot plant *Daucus carota* L. var. sativa is an important winter vegetable crop belonging to the Apiaceae family, which includes more than 3700 species and 434 genera (David, 2008).Asia ranks first in terms of cultivated area, according to the Food and Agriculture Organization of the United Nations, with 66,245,278 tons of carrots produced worldwide for human consumption from a cultivated area of 1,544,303 hectares (FAO, 2019).In Iraq, the area planted with carrots amounted to about 2431.3 hectares for the year 2020, and the production amounted to 3404 tons (Central Statistics Organization, 2020). The orange color of carrots is due to the presence of B_Carotene, some of which are converted to vitamin A inside the human body. The high content of fiber and sugar in the roots made it a good source of iron, calcium, phosphorous and vitamin B (Yawalkar and Ram, 2004). Carrots are especially rich in carotene, vitamin B1, C and essential oil, rich in vitamin E and a large amount of carbohydrates and little protein and fat, it is consumed either fresh or as a salad crop or cooked and in large quantities also after processing enters into canning, freezing or drying (Ozcan and Chalchat , 2007).The increase in people's awareness about the importance of vegetables on the one hand and the increase in the population, on the other hand, has increased the interest of specialists in the production of these crops and working to improve them .However, the excessive use of chemical fertilizers has great harm to human health and the toxic effects it

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produces on the part of the plant, as well as the deterioration of the physical and chemical properties of the soil, as well as the increase in the material cost of those fertilizers (Othman, 2007). As a result, many researchers have tended to encourage and support organic production, which is characterized by its low percentage of nitrates and oxalates so that it does not exceed healthy limits, as well as high economic production, especially in developed countries (Abu Rayan, 2010). Recent studies have tended to reduce the added quantities of mineral fertilizers by using strategies that increase their readiness in the soil and their absorption by plants easily, and one of the most important strategies is biofertilization (Suhag, 2016). It is one of the methods that aimed to reduce the excessive use of mineral fertilizers, reduce sources of environmental pollution and production costs, increase soil fertility and increase the quality of crops. If biological fertilizers increase the availability of nutrients by fixing nitrogen, dissolving phosphate compounds and facilitating potassium (Jha and Soni, 2008) . Kiraci (2018) studied conventional and organic production systems on yield, quality and determination of the botanical traits of the carrot cultivar(Nantindo). Using organic manure, sheep and poultry manure and seaweed extract, the average yield when seaweed was added as a biostimulant was (4.27 tons. ha-^{1})While the control application (without addition) was the lowest (3.79 tons.ha-^{1}) and total dissolved solids content (10.55%), total sugar content (6.24 g.100g-^{1}), phenol (165.62 g.10-^{2}.g.) -^{1}), b-carotene (159.98 mg. g-^{1}) Among Kwiatkowski et al. (2013) the effect of growth stimulants (Asahi SL, Bio-algeen, and Tytanit) on carrot yield in cultivar (Laguna F1) and the accumulation of chemical components in the root that determine root quality,The results indicated that all growth stimulants, the most significant of which is (Bio-algeen S 90), had a positive effect on the total and qualitative yield and on growth indicators, including carotenoids (17.41. mg. 100 g-^{1} fresh weight), ascorbic acid (7.76. mg. 100 g. -1 fresh weight), total sugars amounted to (5.22 mg. 100 g-1 fresh weight) and the total yield (68.2 tons. ha^{-1}). Elsayed et al. (2020) reported on the effect of biofertilizers and organic fertilizers on growth, nutrient contents and fresh yield of dill (Anethum Gravolens) to determine the response of two dill cultivars (Balady and Dukat) to seven fertilizer treatments (no fertilization, 100% mineral fertilizer, 100% biofertilizer). , 100% organic fertilizer, 50% organic fertilizer, organic fertilizer with 100% bio-fertilizer, and 50% organic fertilizer with 100% bio-fertilizer) ,The results showed the best fertilization treatment was 100% organic fertilizer with biofertilizer and 100% mineral fertilizer with carotene content of 0.90 mg.100 gm-1, carbohydrate content 80%, nitrogen content 2.50% and phosphorous 0.60% for two genetic types of dill. On the other hand, 50% organic fertilization with bio was recorded as the best treatment for the accumulation of nitrates at 40% and potassium 5.0% with two dill cultivars. Modern trends work to improve plant growth and productivity through the use of organic extracts, which are concentrated natural preparations with a liquid, solid or viscous consistency. It contains amino acids, auxins, gibberellins and cytokines that stimulate root growth and vegetative growth and improve yield characteristics of many plants and increase their resistance to water stress, freezing and insect resistance (Thomas and Li, 2004). One of these plant extracts is the banana peel extract, which contains minerals, antioxidants, proteins, fibers and carbohydrates (Anhwange et al., 2009). Nikmatullah et al. (2021) showed the response of growth and production in carrot to organic foliar spraying (NASA FOF with 1 ml. L of Hormonik) with 6 concentrations of foliar organic fertilizer, where the concentration (25 ml. L-1) significantly excelled and recorded the highest percentage of beta Carotene (19.9 mg.gm-1 fresh weight) and sugar contents amounted to (11.4 Birx°) and the total yield (36.35 tons.ha-1). Taha and Abdelaziz (2015) presented a study on the effect of commercial seaweed extract “Actiwave®” on the growth, yield and quality of two cultivars of orange (Chantenay) and purple (Purple Sun), Actiwave extract was applied to the leaves directly and at concentrations (0, 2.5, 5 and 10 gm. Liter). -1)The results indicated that the concentrations of N, P and K were (31.7, 5.0, and 31.5 mg.g dry weight) respectively in the leaves of both cultivars. The highest productivity of each of Chantenay and Purple Sun cultivars was (17.3 and 18.2 tons. feddans) respectively, T.S.S (9.9%) and total sugars (5.7%), and the content of carotenes, anthocyanins and total antioxidants tended to increase with the highest level of concentrations. extract compared to lower concentrations. Zekeria et al. (2020) mentioned a study on the production of organic

liquid fertilizer from coffee beans and banana peels. The results indicated that phosphorous (P), potassium (K), calcium (Ca), magnesium (Mg) and sodium (Na) found significant differences between organic liquid fertilizers and compost. Compost tea (comparator treatment) amounted to (2.51, 3.74, 14.15, 2.35, 2.67%) respectively, and the same values for comparison treatment (tea compost) (1.44, 2.11, 2.72, 1.01, 1.19%(Hariyono et al. (2021) reported on the effectiveness of using liquid organic fertilizer based on banana peels as a source of potassium for the growth and yield of eggplant (Solanum melongena L.). The results showed that the use of liquid organic fertilizer based on banana peels (LOF-BP) as a source of potassium Potassium can be a substitute for inorganic KCl fertilizer, and this was indicated by the plant's response in terms of growth and yield, as it was noted that there were no clear significant differences between the characteristics of vegetative and fruitful growth and production between the application of organic fertilizer and inorganic KCL fertilizer.

Materials and Methods

The experiment was conducted in one of the training extension farms in Saddat Al Hindiya (Al-Mahnawiya) / Al-Musayyib District, 25 km northwest of the city of Al-Hilla, within longitude 42"16°44E and latitude 56"42°32N. Samples of field soil were collected from different areas before the start of the experiment, with a depth of (0-30 cm) from the surface layer, then air-dried, crushed and passed through a sieve with holes diameter of 2 mm and analyzed to find out some chemical and physical properties of field soil (Table No. 1). Then the soil for the experiment was prepared and tillage. The experiment was designed according to a split-plot system using a randomized complete block design with two factors (3×2).The biofertilizers were represented in the main plots and the organic extract in the subplots. The land was divided into three terraces. Each terrace was a repeater and a width of 60 cm. Each terrace was divided into 9 experimental units. The length of the experimental unit was 2.5 m, leaving a distance of 0.50 cm between the unit and the other, leaving 1.5 m between the replicate and another. The seeds of the hybrid carrot stinger cultivar, carrot stinger, were sown from the American company Quantum on 3/10/2021 directly in the open field. The planting was conducted by 50 plants for each experimental unit and on two landscaping lines. The distance between one line and another was 20 cm, and the distance between one plant and another was 10 cm. More than one seed was planted in each hole, and on 10/12/2021 germination was completed, and after germination and growth of plants, it was reduced to one plant per pit.All agricultural operations were conducted from irrigation, control and removal of weeds and the irrigation system was drip irrigation. The experiment included a study of two factors: the first included the addition of biofertilizers of two types, the control treatment (without addition), the addition of Bio health fertilizer and the addition of Fulzyme plus biofertilizer. On 10/13/2021, the bio fertilizer was added to the soil for each fertilizer type at an average of 2.5 $g.L^{-1}$ of water The recommendation of the producing company) by adding 2 liters in one experimental unit, and the addition process was repeated on 10/20/2021. Table (2) shows the specifications of the biofertilizers used, and the second factor is the organic extracts .It includes three levels of organic banana peel extract. Control treatment (without addition) and banana peel extract at a concentration of 20 ml. L^{-1} and banana peel extract at a concentration of 40 ml. L^{-1} Banana peels were collected. It is air-dried for 72 hours and then dried inside an electric oven at a temperature of 45 °C until the weight of the dry substance is stable. It is crushed to obtain a powder from which 500 g is taken and mixed with 2 liters of pure water and soaked for 24 hours and extracted by squeezing using a cloth (ml) to obtain On the crude extract (Anhwange et al., 2009), from which the two concentrations used in the study were taken 20 and 40 ml in a liter of distilled water.The plants were sprayed with extract at the two concentrations mentioned under study until complete wetness, where the first spray was 30 days after sowing the seeds on 3/11/2021 and the spraying process was repeated six times during the growing season between one spray and another week. Table (3) shows the components of the banana peel extract. All vegetative growth indicators were taken 7 days after the last spraying and for five plants from each experimental unit, and yield measurements were randomly recorded on 8 carrots from each experimental unit. The results of the experiment were statistically analyzed according to the method of analysis of variance and according to the

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significant differences between the treatments at the probability level of 0.05 using the least significant difference LSD (Al-Sahoki and Waheeb, 1990). The Genstat program was used in the statistical analysis and the characteristics were as follows:The percentage of nitrogen, phosphorous and potassium elements in the carrot plant (%), the percentage of Phloem / Xylem in the roots (%), the total yield (ton. H-1), the percentage of soluble solids % (T.S.S ,(Carrot content of β-carotene (mg.100gm $^{-1}$ fresh weight), Ascorbic acid content of carrots (mg.100gm $^{-1}$ of fresh weight(, Carbohydrate content of carrot root (mg.100 g^{-1}), percentage of protein in carrot root wet weight (%).

Table 1: The physical and chemical properties of the soil of the experimental field before planting *

Values	Units	Traits
7.14	....	PH
3	DS.m^{-3}	EC . electrical conduction
0.53	mg/kg	Nitrate NO3
0.89	mg/kg	Ammonia NH3
9.52	Ppm	phosphorous
31.7	Ppm	potassium
176	g/kg	sand
484	g/kg	silt
3.40	g/kg	clay
Sandy silt loam	Soil texture	

***Soil analysis was conducted in the laboratory of the Directorate of Agriculture of Babylon - El-Moradia**

Table 2: Shows the physical and chemical properties of Bio health and Fulzyme

values	units	Bio health content
10	%	Trichoderma maharzinum basilius spotless
75	%	humic lion
5	%	seaweed
20-10	%	Humidity
65	%	Organic materials
11	%	water soluble potassium (k2O)
ketone exchange capacity < 100g⁄meq 400		
Boron 15 mg⁄kg, the percentage of insoluble substances in water with alkaline properties > 0.1%		
values	units	Fulzyme plus
2×10^{10}	gram	& Pseudomonas putida Bacillus subtilis
0.3	%	Gibberellin&Cytokinin Activities
-	-	Protease,Amylase,Chitinase& Lipase

Table 3: shows the minerals components of banana peel extract.

values	Content	element concentration)mg-g(	Element

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6.70	% Humidity	78.10	potassium
8.50	% ash	19.20	Calcium
91.5	% organic matter	18.04	magnesium
0.90	% protein	0.61	Iron
1.70	% crude fat	76.20	manganese
59.0	% Carbohydrates	24.30	Sodium
31.70	% raw fiber	0.51	oxalates
		0.28	vitamins

Results and discussion:

total yield

The results in Table 4 indicate that there were significant differences when treated with bio-fertilization in the total yield, where Fulzyme excelled in the percentage of phosphorous, the percentage of Xylem to Phloem and the total yield of carrot plant in values (0.14%, 93.1%, 11.64 tons. ha^{-1}) respectively and Biohealth achieved a significant difference in the percentage of nitrogen and potassium in carrots (1.67%, 1.27%). Treatment with the organic extract of banana peels showed significant differences, where the concentration of 20 ml. L^{-1} recorded the highest average for the total yield of 11.13 tons. hectare-1 and the highest percentage of potassium in carrots was 1.27%. As for the bi-interactions of the bio-fertilization treatment and the organic extract, it showed significant differences through the interaction of Fulzyme and the treatment without spraying of the organic extract in the percentage of phosphorous in carrots (0.16%). The interaction between the control treatment with the concentration was 20 mL^{-1} in the percentage of potassium in carrots (1.35%). As for the total yield, the highest average was recorded at 12.73 tons.ha^{-1} through the interaction between Biohealth and the concentration 20ml.L^{-1}, and the lowest rate for the above characteristics was when the two interactions of the control treatment for both biofertilizer and banana peel extract.

Table 4: The effect of foliar spraying of banana peel extract and the addition of bio-fertilizer and the interaction between them on the total yield of carrot plant

Total yield ton.ha-1	**Xylem /Phloem in carrots%**	**potassium percentage in carrots%**	**Phosphorous percentage in carrots%**	**nitrogen percentage % in carrots**	treatments Bio Fertilization
79.7	82.7	1.18	0.11	1.20	control A0
11.07	90.4	1.27	0.13	1.67	A1 Biohealth
11.64	93.1	1.20	0.14	1.48	A2 Fulzyme
2.39	**10**	**0.08**	**0.02**	**0.45**	L.S.D.0.05
Banana peel extract					
8.43	92.4	1.10	0.12	1.49	control B0
11.13	84.0	1.27	0.13	1.49	B1 20 ml.L^{-1}
10.93	89.8	1.26	0.12	1.37	B2 40 ml.L^{-1}

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1.86	**NS**	**0.12**	**NS**	**NS**	**L.S.D.0.05**
Bio-interaction X Extract					
6.83	89.9	0.85	0.07	0.99	A0B0
7.78	91.7	1.35	0.13	1.32	A0B1
10.60	95.7	1.34	0.12	1.30	A0B2
8.17	77.9	1.19	0.13	1.82	A1B0
12.73	82.1	1.34	0.14	1.57	A1B1
12.50	92.1	1.27	0.13	1.60	A1B2
8.37	80.4	1.27	0.16	1.67	A2B0
12.60	97.4	1.13	0.13	1.58	A2B1
11.83	91.6	1.19	0.12	1.20	A2B2
3.36	**NS**	**0.19**	**0.04**	**NS**	**L.S.D.0.05**

qualitative traits

The results in Table 5 indicate that there are significant differences when treated with bio-fertilization in the traits of the specific yield, except for the percentage of soluble solids and the root content of carbohydrates, which did not show any significant difference.The Fulzyme excelled in carrot content of beta-carotene and ascorbic acid by the values (1.52 mg.100 g-1 fresh weight, 2.45 mg.100 g^{-1} fresh weight), respectively, and Biohealth recorded a significant difference in the percentage of protein in carrot plant roots for fresh weight amounted to 1.26% ,Treatment with the organic extract of banana peels showed a significantly excelled in the percentage of soluble solids, ascorbic acid content of carrots and carbohydrate content of carrot root, where the concentration of 40 ml. L^{-1} achieved the highest values in the above traits (19.94%, 2.65 mg. 100 gm^{-1} fresh weight, 20.47). (mg.100gm-1) and for the two interactions of biofertilizer and organic extract , It showed significant differences through the interaction of the control treatment and concentration of 20 ml.L^{-1} in the percentage of soluble solids and percentage of protein in carrot roots for wet weight (20.67%, 1.33%). The interaction between Biohealth and the concentration 40ml.l^{-1} made a significant difference in the carrot content of beta-carotene (2.55 mg.100g-1 fresh weight) and the interaction between Fulzyme and the concentration 40ml.l^{-1} was the highest in the carrot content of ascorbic acid (2.83). 100gm-1 fresh weight). As for the carrot content of carbohydrates, the highest percentage was recorded at 21.40 mg.100 g^{-1} through the interaction between Fulzyme and the control treatment of the organic extract.

Table 5: The effect of foliar spraying of banana peel extract and the addition of bio-fertilizer and the interaction between them on the qualitative traits of the yield of carrot plant

Carbohydrate content of carrot root (mg.100g-1)	**Ascorbic acid content of carrots (mg .100 g–¹ fresh weight)**	**Carrot content of β-carotene (mg.100gm-1 fresh weight)**	**Percentage of protein in the roots of carrots fresh weight %**	**soluble solids percentage % (T.S.S)**	treatments Bio Fertilization
18.50	2.11	0.90	0.79	18.06	control A0
19.60	2.44	0.94	1.26	19.67	A1 Biohealth

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18.88	2.45	1.52	1.14	19.89	A2 Fulzyme
NS	**0.30**	**0.60**	**0.38**	**NS**	L.S.D.0.05
Banana peel extract					
17.91	1.96	0.84	1.05	18.67	control B0
18.61	2.39	1.20	1.11	19.00	B1 20 ml.L^{-1}
20.47	2.65	1.32	1.04	19.94	B2 40 ml.L^{-1}
1.88	**0.34**	**NS**	**NS**	**1.16**	**L.S.D.0.05**
Bio-interaction X Extract					
15.50	1.66	1.54	0.62	14.83	A0B0
19.88	2.05	0.71	1.33	20.67	A0B1
18.34	2.17	.270	1.20	20.50	A0B2
18.61	2.31	0.37	0.89	19.50	A1B0
17.80	2.51	0. 69	1.20	18.33	A1B1
19.42	2.34	2.55	1.24	19.17	A1B2
21.40	2.36	0.80	0.86	19.83	A2B0
21.12	2.76	1.44	1.27	20.00	A2B1
18.88	2.83	1.73	0.98	20.00	A2B2
4.02	**0.67**	**2.22**	**0.48**	**2.53**	**L.S.D.0.05**

Discussion:

The bio-fertilization treatment excelled on the control treatment in traits of the total yield. This may be due to the role of the biofertilizer, which contains beneficial bacteria, complex enzymatic systems and bio-stimulants.The efficiency of biofertilization may be due to humic acid, which is the largest percentage in the bio health synthesis by 75% (Table . 3) as a growth regulator that has many biochemical effects, both at the level of cell wall membrane permeability or cytoplasm, including increased rates of respiration and photosynthesis in plants leading to enhanced absorption of nutrients by stimulating microbiological activity, Thus, increasing the plant's content of nitrogen, phosphorous and potassium elements, as well as the distinctive effect of biofertilization on the readiness of nutrients through transformations and processes coundected by living organisms, which are closely related to the fertile status of the soil and nutrients, especially nitrogen, which is a synthetic part of many plant materials and compounds such as amino acids. And proteins, as well as nitrogen enters all processes and interactions associated with protoplasm and enzymatic reactions, which increases the size and growth of the plant and ultimately increases the amount of the root crop.The significant results in the percentage of Xylem/Phloem and carrot content of beta-carotene and ascorbic acid can be due to the positive effect of biofertilizer by Bacillus bacteria, which plays an important role in the secretion of important biochemical compounds such as vitamins and plant hormones such as auxins, cytokinins and gibberellins that are of great importance in regulating and stimulating growth. Glick, 2014) Therefore, changes that occur in the levels of these hormones are likely to play an important role in regulating the development of growing plants, Auxins play an important role in cell elongation and cellular expansion, and this effect is caused by auxin stimulating enzymes that degrade some components of the cell wall, in addition to the role of cytokinin in stimulating cell division at the

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meristem apex of plant roots and thus leads to an increase in cell division of cambium cells.This is done by stimulating the activity and activity of the vascular cambium cells, as it stimulates the secondary xylem and phloem tissues to adapt and differentiate, and the occurrence of transverse growth and the formation of secondary Xylem from the inner side and secondary phloem to the outside (Al-Khafaji, 2014).This is reflected positively on the proportion of wood and bark in the plant. The reason for the excelled of vitamin C (ascorbic acid) may be due to the increase in the number of leaves and their relative content of chlorophyll, which works to polarize light during the day and the activity of the carbonic metabolism process, and since sugars are the main product of photosynthesis, it is expected that the root content of ascorbic acid will increase, because the initial initiator of its formation is L-Galactose with the help of the enzyme L-Galactose dehydrogenase (Mario et al., 2019). As for the reason for the increase of β-Carotene dye as a result of biofertilization and the effect of microorganisms from Bacillus and Trichoderma bacteria in improving the architectural structure of the roots in terms of increasing length, diameter and weight in addition to the increase in the activity of these organisms as a result of the plant's secretion of many useful compounds, including sugars, to the rhizosphere area and by increasing biological activity For these organisms, the supply of nutrients, including nitrogen, phosphorous and potassium, increases, and thus the hormonal activity within the plant increases, especially with regard to plant growth and the manufacture of carotenoids (Ordookhani and Zare, 2011)In addition to the role of these organisms in causing a change in the level of hormones inside the plant represented by Abscisic acid, Auxin and Ethylene, which are involved in the maturation of the plant and the accumulation of carotenoid pigments (Su et al., 2015) and the increase in the proportion of protein may be due to the abundance of organic nitrogen found in amino acids, which is the basic building blocks of proteins (Davies, 1982). The superiority of the organic extract in the percentage of potassium in carrots and the total yield, due to the fact that banana peel extract is an organic substance of natural origin that is added to the soil or sprayed on the plant in order to provide one or more plant nutrients necessary for growth. Banana peels contain potassium, which is absorbed and transported to the plant at a high rate and effective means. It has the first role in activating respiratory enzymes, producing adenosine triphosphate (ATP), regulating the rate of photosynthesis, absorbing carbon dioxide and maintaining the balance of electric charge (Rattan, 2015). We find that this is positively reflected on the plant's biomass from the root growth of the total yield of the plant. The foliar application of banana peel extract significantly improved the soluble solids in carrot roots, and the percentage varies according to the degree of maturity, agricultural service processes and environmental conditions (Table 2) and (Dudas et al., 2017). The reason is likely to increase the percentage of total soluble solids as a result of the treatment with the organic extract, which gave the best results in the nutritional contents of the leaves, especially potassium, which allowed to receive a greater amount of incoming rays needed for the carbon metabolism process and then increase the products of this process, some of which are transmitted from the sites of manufacture in the leaves To storage places in the plant (Di Cesare et al., 2010).The content of carrots of ascorbic acid (vitamin C) varies according to many factors, the most important of which are the degree of maturity and climatic conditions (Table 2) and agricultural processes of irrigation and fertilization (Reuther, 1967). We find that spraying with the organic extract had a significant effect on the content of ascorbic acid because it provided the plant with the main nutrients, especially nitrogen, which contributed to the formation of processed food compounds and the metabolic compounds that enter the biosynthesis of ascorbic acid (Smirnoff and Wheeler, 2000). Also, its manufacture depends on carbohydrates, especially the sugars that enter into the construction of this acid. It is possible that the increase in the total carbohydrate content in the plant related to the effect of the organic extract is due to the photosynthetic activity, which directly affects the physiological processes, thus increasing the activities of carbohydrate metabolism and moving its products to the storage places in the root, which leads to an increase in the production of carbohydrates (Fouda, 2021).The reason for the increase of carbohydrates when increasing the concentrations of the organic extract can be due to the chemical structure of this extract (Table No. 4).

It consists of nutrients and amino acids, and as a result, these materials are ready for direct absorption from the leaves by spraying.

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