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# EFFECT OF SPRAYING ORGANIC FERTILIZER (VIGAMINO) AND LICORICE EXTRACT ON THE VEGETATIVE AND CHEMICAL TRAITS FOR APRICOT SEEDLINGS (*PRUNUS ARMENIACA* L.)

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### ABSTRACT

The experiment was conducted in the lath house of the Technical College / Musayyib during 2015 on the apricot seedlings and included two factors: - The first is the effect of adding four levels of organic fertilizer Vigamino (0, 10, 20, 30 ml / seedlings) in three batches, while the second factor is Spray the seedlings with liquorice extract in concentrations (0, 2, 4, 6) g / L and in three batches, and the interaction between them in the traits of vegetative growth and dry weight of the vegetative group and the leaf content of chlorophyll, N, P and K for the seedlings, a factorial experiment was conducted according to a completely randomized design (CRD). With three replicates and three seedlings for the experimental unit, and the averages were compared according to the test of Least Significant Difference (LSD) under the 0.05 probability level, The results showed that treatment with Fijamino was more than 30 ml. L<sup>-1</sup>, in terms of plant length, branch length, leaf area of seedlings, root length, chlorophyll amount, nitrogen and potassium levels, the average amounted to (87.45 cm, 18.61 cm, 57.45 cm, 14.10 mg. Chlorophyll, 1.63% nitrogen, 1.30% potassium) While the treatment of spraying excelled the concentration of 20 mg. Liters in the description of the average leaf area of the seedlings and the average weight of dry and phosphorus and gave 1282.3 cm<sup>2</sup> and 29.18% and 0.54% each, respectively, as the treatment of seedlings with liquorice extract 6 g. Liters and interaction between the factors were in it Significantly effect on all studied traits.

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**Keywords:** *Apricot seedlings, Concentrations, Liquorice extract, Organic fertilizer, Vgamino fertilizer.*

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### INTRODUCTION

Apricot (*Prunus armeniaca* L.) belonged to the Rosaceae family is one of the important deciduous fruit trees, which is characterized by being one of the first fruits to enter the market and its fruits have nutritional value, they are consumed either fresh or cooked, It also has the advantage of requiring a few cold hours, so it can be successful in the central regions of Iraq, especially local cultivars (Al-Jumaili et al, 1989). The apricot seedlings are important to use as rootstock them to stimulate the growth of seedlings and reach the appropriate size of the seedlings in the sustainable place. Scientific research has shown that 85% of the needs of the plant can be communicated through the leaves (Abdul, 1988). Recent studies have pointed to the importance of using organic fertilizers and natural plant extracts to stimulate the growth of horticultural crops and increase their

productivity (Al-Jizani, 2010), because it is a rich source with many It is an essential nutrient as well as an important micronutrient in plant growth (Schionning et al., 2004) The organic fertilizer type Vigaminino has an important role in stimulating the Biology activities of plants because it contains nutrients and amino acids that help in increasing the growth rates of the seedlings and raising the level of photosynthesis and thus increasing the efficiency of nutrient absorption (Hartmann and Kester,2003). Shial Al-Elm (2009) showed a significant increase in the amount of carbohydrates in the leaves and the number of new branches on trees and the main stem diameter when spraying Dexi Reed seedlings with Liquorices extract 2 g. L<sup>-1</sup>, Al-Aaraji and Beirut (2017) concluded that the use of organic fertilizer (Humi Max, Vit-Org and Nutri Green) on apricot trees Royal cultivar in one or two batches and in the same concentrations (15 and 30 ml.L<sup>-1</sup>) to increase the concentration of nitrogen and potassium in the leaves when using Nutri Green )) At a concentration of 30 ml. Liters while the use of (Humi Max) at a concentration of 30 ml gave an increase in the percentage of phosphorus in the leaves, To achieve this, we will conduct this research for the purpose of knowing the effect of each of Viagemino as organic fertilizer and Liquorices extract and their interactions to treat plant nutrition and to improve the vegetative traits of apricot seedlings.

### MATERIAL AND METHODS

The research was conducted at the Technical College - Al-Musayyib / Babylon province ,Iraq in the lath house during the 2015 growing season as a factorial experiment (4×2) according to a completely randomized design (CRD). With three replicates on apricot seeds, the experiment included two factors:

First Factor: Four levels of Vigamino fertilizer (24 organic materials, 20 free amino acids, 3.9 total nitrogen, 3.85 organic nitrogen and 0.03% ammonium nitrogen) (0, 10, 20, 30)%

The second factor: four levels of licorice extract. Glycyrrhizin glabra L As licorice powder was brought from the market and sifted, then the required concentrations were prepared (0, 2, 4, 6) g.L<sup>-1</sup> according to the method mentioned by the decree.

Table 1. components of liquorice extract based on dry weight (micrograms/gram)

Cu	Zn	Mn	Fe	Mg	P	Ca	Na	K	The content of the elements
0.07	3.5	5	35	230	520	500	700	1230	Concentration of elements (Mu/g)

Source musa and etal..(2002)

Then the treatment was sprayed on the leaves to the point of complete wetness in the early morning using a fifteen liter hand sprayer with the addition of the diffuser Tween-20 (0.01%) volume / volume and an average of three spraying between spraying and another thirty days the first spraying on 4/10 and the results were analyzed using The GEN STAT program then compared the mean differences using Least Significant Difference (LSD), With a 5% probability level (Al-Rawi and Khalaf Allah, 1980).

#### Studies traits

The traits below were studied on 15/11/2015:

- 1- Average seedling height (cm) Take the average of seedlings height at the end of the experiment using the metric tape and measure the height from the soil surface to the growing top.
- 2- Branch length: Using the metric measurement tape, the number of branches for each seedling was calculated according to the average for each experimental unit.
- 3-The leaf area (cm<sup>2</sup>) / seedlings It was measured by means of graphs by taking four full-width leaves from the middle branch on the main stem of each seedling and for each treatment. The total leaf area of the seedlings was calculated by the product of the leaf area multiplied by the number of leaves in the branch by the number of branches of that treatment/seedlings.
- 4- Root length: was done using the metric tape measure.
- 5- Total dry weight of vegetative total (g): The vegetative group was cut close to the soil surface and for a number of samples and transferred to the laboratory in paper bags on which each treatment number was written and entered into the electric oven (Oven) and at a temperature of 70 degrees Celsius for 48 hours and until the stability of weight (Al-Sahaf, 1989) was weighed and calculated The average total dry weight of seedlings per treatment.

Chlorophyll leaf rate: (SPAD unit)

The chlorophyll content was estimated by a Chlorophyll meter of the type SPAD-502 equipped by the Japanese company Minolta by taking the reading of a number of leaves per experimental unit (seedlings) and then taking the rate (Minnotti et al., 1994) and measured in units SPAD UNIT

7-Percentage of nutrients (K, P, N): The nitrogen element concentration in the leaves was estimated using a Mikrokjedhal device according to the method (Black, 1965), as the leaf samples were taken from each seedling and each replicate, then washed with distilled water and placed in perforated paper bags and then dried in an electric oven at a temperature of 65 C for 48 hours and until proven. Dry Weight (Al-Sahaf, 1989)

Then the samples were ground and 0.5 g of the crushed sample powder (dry leaves) were taken. According to Black, 1965, the nitrogen concentration was calculated using the Microkjedhal apparatus and it was digested by concentrated 96% sulfuric acid (15 ml and (3 g) of the mixture (copper sulfate 0.2 + potassium sulfate 0.8) with heating for an hour, then transfer the digestion solution to a volumetric flask with a capacity of 50 cm<sup>3</sup> and complete the volume with distilled water in the amount of (20) ml and then wiped using a standard hydrochloric acid 0.1 Then the nitrogen percentage was calculated according to equation. Phosphorous was also estimated by the method of soft digestion by using ammonium molybdate and ascorbic acid in the Spectrophotometer (John, 1970). Where (10) ml of the solution of the digested sample was taken and placed in a volumetric flask, then (0.1) g of ascorbic acid was added and (4) ml of ammonium molybdate solution for each sample, after which the contents of the beaker were heated on a hot plate for one minute, so the color of the solution became blue, then read along the wavelength of 620 nm. At the same time, the samples of standard prepared solutions were read at the same time and method of preparing the digested sample, then the ratio was calculated Percentage of phosphorous. The potassium component was also estimated by the Flame-Photometer according to the method mentioned (Haynes, 1980).

### RESULTS AND DISCUSSION

The results shown in the table below indicate that the treatment of seedlings of apricot seedlings with organic fertilizer Vigamino significantly effect on increasing the rate (plant length, branch length, root length, chlorophyll amount, nitrogen and potassium ratio) as the treatment gave a concentration of 30 ml. L<sup>-1</sup> (87.45 cm, 18.61 cm), 57.5 cm, 14.10 mg. G, 1.63%, 1.30%), respectively, for the above traits, while untreated trees gave an average amounted to (74.42 cm, 16.07 cm, 50.8 cm, 10.28,1.52,1.24%), respectively, and shown from the table below to The treatment of seedlings with organic fertilizer at a concentration of 20 ml. Liters has a significant effect on the average leaf area, dry weight of the vegetative population and phosphorus ratio, It recorded an average of (1282.3 cm<sup>2</sup>, 29.18 g, 0.54%) respectively, compared to untreated trees that recorded the lowest average for both traits. The treatment of seedlings with liquorice extract at a concentration of 6 g. Liters gave the highest average in all studied traits (plant length, branch length, root length, foliar area, dry matter average for the vegetable total, amount of chlorophyll, the ratio of nitrogen, phosphorus and potassium) as it reached (88.08 cm), 19.73 cm, 57.8 cm, 32.28 g, g, 1430.3 cm<sup>2</sup>, 13,46 mg, 1.67%, 0.56%, 1.30%) for each of the traits respectively, As for the untreated trees, the averages were (73.67 cm, 16.07 cm, 49.9 cm, 14.49 cm, 23.44 g, 1430.3 cm<sup>2</sup>, 10.28 mg. G, 1.54%, 0.44%, 1.22%), respectively. The reason for the increase in the rate of vegetative growth is that these fertilizers contain the necessary elements and amino acids to carry out biological processes within the plant that lead to increased vegetative growth and leaf area (Mengel and Kirkby, 1982). The increased leaf content of chlorophyll is due to the liquorice extract containing manganese and copper, which have an important role in building and efficacy of chlorophyll and preventing its breakdown, as well as the role of copper in reducing the activity of the phenolase enzyme, which causes the accumulation of phenols as well as its important role in nitrogen fixation in the plant (Tisdale et al., 1997). Or it may be due to the elements (NPK) and their effect on the activation of enzymes and the formation of amino acids and protein, which have an important role in building chlorophyll (Marr et al., 1998). Also, the fertilizer and vegamino licorice extract contains the important nitrogen, phosphorous and potassium elements that enter it in many among the compounds, including chlorophyll, as nitrogen is included in the synthesis of amino acids and protein, which are involved in building vital parts, including chloroplasts (Taiz and Zeiger, 2006). Also, phosphorous has a role in increasing the growth of the root system, which increases the absorption of nutrients and increases its percentage (Gobara et al., 2002). The reason for the increase in potassium in the leaves is due to its catalytic and organizational role in the formation of plant members, as it works to regulate the osmotic effort and this is consistent with what has been reached The Mechanism (Shial Al-Elm, 2009, Al-Hadethi et al., 2012, Al-Aaraji and Beirut, 2017)

It is clear from the table below that the bi-interaction between the two factors of the experiment (organic fertilizer, vitamino and licorice extract) had a significant effect on the traits studied above.

Table 2. The effect of adding fertilizer, liquorice extract and their interactions on the vegetative and chemical traits of apricot seedlings

The levels of foliar spraying	Organic fertilization	Average seedlings length (cm)	Root length	Branch length	Dry weight	The leaf content of chlorophyll mg / cm <sup>2</sup>	Leaf area (cm <sup>2</sup> )	N	P	K
0	0	69.33	46.6	13.23	19.60	9.23	979.2	1.43	0.34	1.19
	2	72.67	47.7	15.47	21.11	10.07	1040.0	1.51	0.37	1.24
	4	76.33	52.8	17.58	27.27	11.87	1317.8	1.55	0.44	1.24
	6	79.33	56.1	18.00	31.15	12.10	1325.2	1.58	0.48	1.29
10	0	71.00	49.4	14.27	23.41	9.88	990.3	1.51	0.48	1.20
	2	73.67	52.3	17.21	25.47	11.23	1131.7	1.56	0.51	1.24
	4	80.67	53.5	17.82	29.46	12.62	1444.4	1.60	0.55	1.29
	6	78.67	53.3	19.33	31.36	14.62	1525.9	1.67	0.56	1.32
20	0	77.10	51.6	14.40	25.82	10.43	1061.3	1.48	0.45	1.23

	2	82.27	56.0	16.70	28.00	12.18	1194.0	1.54	0.55	1.27
	4	82.57	61.2	18.10	30.13	14.10	1435.0	1.63	0.55	1.33
	6	93.30	60.8	20.20	32.78	14.60	1439.0	1.70	0.60	1.33
30	0	77.24	52.0	16.07	24.92	11.59	1059.0	1.73	0.48	1.25
	2	84.93	57.3	18.10	26.87	12.78	1191.0	1.49	0.50	1.28
	4	86.63	59.7	18.89	30.53	14.43	1395.7	1.58	0.56	1.34
	6	101.00	60.8	21.37	33.82	15.03	1431.3	1.72	0.58	1.35
LSD <sub>0.05</sub>		5.52	3.0	1.13	2.04	0.60	20.00	0.04	0.01	0.02
The average of Vigamino	0	74.42	50.8	16.07	24.78	10.28	1165.5	1.52	0.41	1.24
	10	76.00	52.1	17.16	27.47	11.57	1273.1	1.59	0.53	1.26
	20	83.81	57.4	17.35	29.18	13.26	1282.3	1.59	0.54	1.29
	30	87.45	57.5	18.61	29.04	14.10	1269.2	1.63	0.53	1.30
LSD <sub>0.05</sub>		2.76	1.5	0.56	1.02	0.30	10.00	0.02	0.01	0.01
The average of organic fertilizer liquorice extract (g)	0	73.67	49.9	14.49	23.44	10.82	1022.5	1.54	0.44	1.22
	2	78.38	53.3	16.87	25.36	12.09	1139.2	1.53	0.49	1.26
	4	81.55	56.8	18.10	29.39	12.83	1398.2	1.59	0.53	1.29
	6	88.08	57.8	19.73	32.28	13.46	1430.3	1.67	0.56	1.30
LSD <sub>0.05</sub>		2.76	1.5	0.56	1.02	0.30	10.00	0.02	0.01	0.01

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