*Available online www.jsaer.com*

***Journal of Scientific and Engineering Research*, 2019, 6(9):199-205**

**Research Article**

**ISSN: 2394-2630**
**CODEN(USA): JSERBR**

# Influence Extracts of Bud Populous, Algae and Swamp Morning Glory on Vegetative and Fruiting Growth of Fig cv. Kadota

**Abbass Mhson Salman Al- Hmadawi**

College of Agriculture, University of Kufa

**Abstract** An experiment was conducted on private orchard at Al- Abbasyia / Najaf Governorate at 15 march and 15 May 2018 to investigate the effects of spraying with bud populous extracts at concentration 50%, algae extract 3% and swamp morning glory extracts at (30, 40 and 50%) on the local fig cv. Kadota in single way or in combination on the leaf aria, total chlorophyll, diameter of fruit, length of fruit, shape of fruit, weight of fruit, volume of fruit, specific gravity of fruit, humidity of fruit, dry matter of fruit, carotene pigment in fruit peel, percentage of acidity, percentage of total soluble sold (T.S.S.), vitamin C, antioxidant capacity of fruits, calcium pictate, Firmness, Total cracking and Total yield/ tree at maturity stage. Results showed that spraying with bud populous extracts, algae extract and swamp morning glory extracts in single way or in interactions caused a significant increase percentage of leaf area, total chlorophyll, characterizes of fruits and total yield of trees compared with control treatment. There was significant differences between above mentioned treatments. The combination of bud populous extracts, algae extract and hemorrhage cane vine gave the best results in the treatment (bud populous extracts + algae extract + swamp morning glory extract 50 %) for the season of experiment.

**Keywords** Bud populous extracts, algae extract, swamp morning glory extract, Fig.

## Introduction

The fig tree (*Ficus carica* L.), belonging to the family Moraceae, is one of the oldest cultivated plants in the world, where it believed that its origin is Arabian peninsula and Sproad to the subtropical regions [1]. Al-Shemmeryi *et al.*, [2] found that, treated fruit of local orange with Salix bark extracts at percentage of (20, 30 and 40%) gave a significant decries percentage of total soluble sold (T.S.S.), total acidity, vitamin C, carotene pigment in peels and percentage of juice. The new trend agriculture is using sea weed and extract of alga instated of chemical fertilizer in order to presenter the environment and increase the growth and producers of horticulture plant and lastly increase the activity of microorganisms in soil [3], and increase the nutrient absorption [4]. It encores the growth of plant under bad conditions of soil and atmosphere [5]. The quantity of alga material use estimated by 15 million tons which used in agriculture prospect and it stimulates plant growth with small concentration and it contents the micro and machro nutrients, the stimulated material are auxins, cytokinins, vitamins, amino acids, organic acids, semi auxins and cytokinins and multi sugars such as Laminaran, Fucoidan and Alginate [6]. Basak [7] mentioned that, spraying apple tress in the end of full bloom period with extract of alga Eckonia (Kelpak ) at conc. Of (0.5, 1 and 2 %) caused a significant increased the leaf area, content of leaves from total chlorophyll, hormones, IAA, $GA_3$, and quality of fruits compared to control treatment. Dell [8] showed that, sea weed and extract of alga's contenting high percentage of Salicylic acid, cytokinin, Fume acid, $GA^3$ and auxins that increasing root and shoot of plant, process of photosynthesis and activate plant growth which led to enhance hormones synthesis and delay of senescence of leaves. Bondok et al [9] found that spraying grape trees with extract of alga's (Acadian, Goemar and BM86) at conc. of (0.5, 1 and 2

%) caused increase in the vegetative growth and fruits quality with increase of concentration of extract of alga's. Bund and Norrie [10] observed that cherry trees when applied at (0.5, 1 and 2) Kg/ H seaweed increased length, diameter of fruit, total yield of trees, total soluble solids, total sugar, vitamin C and anthocyanine pigment in fruit. Al-Hameedawi and Al-Malikshah [11] found that, spraying fig tress cv. Asowd Diala with seaweed *Ascophyllum nodosum* at concentrations of 4% caused a significant increase percentage of leaf area, total chlorophyll, length of shoots, percentage of carbohydrate in branches, percentage of nitrogen in branches, percentage of carbohydrate / nitrogen in branches , percentage of nitrogen in leaves, percentage of phosphor in leaves, percentage of potassium in leaves, diameter of fruit, length of fruit, weight of fruit, percentage humidity of fruit, percentage dray matter of fruit, number of days to ripening, percentage of total soluble sold, fruit firmness and total yield of trees compared with control treatment. Al-Hameedawi *et al* [12] mentioned that, the extracts of leaves of plant swamp morning glory (based on % dry weight) showed the leaves contained 3% protein, 4.5% total carbohydrate, 0.3% lipids, 78% moisture, 1.6% ash, 1.4% fiber and gross energy value of 141.4 Kj/g. Leaves yielded high amounts of essential amino acids (per 100g) 4765 mg: leucine 1365 mg/100g, tyrosine+phenylalanine 1124 mg/100g, lysine 682 mg, and threonine 606 mg. Minerals (per 100 g) were potassium 444 mg, calcium 163, sodium 159.8 mg, phosphorus 86, magnesium 52 mg, copper 5.3 mg, zinc 4.1 mg, iron 3.2 mg, manganese 2.3 mg ,IAA26 mg/L , $GA_3$ 40 mg /L and CKs 35 mg/L. The main objective of this investigation is to study of the effect of spraying with bud populous extracts, algae extract and swamp morning glory extracts on vegetative growth, physical and chemical characterize of fig fruit cv. Kadota.

**Materials and Methods**

This study was conducted in a private farm at Abbasiya / Najaf governorate for the 2018 season on fig trees cv. Kadota, 48 at same size and growth trees were selected with 10 years of age, that planted on (5 x 5 m.), they watered every five days, and fertilized by Nitrogenous and phosphates in two periods in March and May of each year at a rate of 500 g. per tree, as well as by manure for the two years. The experiment included 16 treatments with three replicates. It is adopted according to Randomized Complete Block Design (RCBD), and the results were statistically analyzed according to Duncan test at the probability level of 5% [13]. Treatments were adopted at 15 march and 15 May 2018, spraying was done early morning until wetness was full addendum. Tween 20 was added at concentration of $1cm^3/L$ as spreader material. Treatments were as follows:

1- Bud populous extracts (Bpe) conc. of 50%
2- Algae extract (Ae) at conc. of 3%. It was natural Algae extract (oligo-x) obtained from Agas (Arabian group for agricultural service) company having the following composition: oligosaccharide (3%), algnic acid (5%), phytin (0.003%), menthol (0.001%), natural growth regulators (cytokinine, 0.001; indol acetic acid, 0.0002% and pepsin, 0.02%) and minerals (potassium oxide, 12%; phosphorus oxide, 0.5%; N, 1%; Zn, 0.3%; Fe, 0.2% and Mn, 0.1%)
3- Swamp morning glory extracts (Smge) at conc. of 30 %
4- Swamp morning glory extracts (Smge) at conc. of 40 %
5- Swamp morning glory extracts (Smge) at conc. of 50 %
6- Bpe + Ae.
7- Bpe + (Smge) 30 %
8- Bpe + (Smge) 40 %
9- Bpe + (Smge) 50 %
10- Ae + (Smge) 30 %
11- Ae + (Smge) 40 %
12- Ae + (Smge) 50 %
13- Bpe + Ae + (Smge) 30 %
14- Bpe + Ae + (Smge) 40 %
15- Bpe +Ae + (Smge) 50 %
16- Control

Leaf aria $m^2$/tree, total chlorophyll mg/1gm FW, number of shoot, length of shoot cm, diameter of fruit cm, length of fruit cm, length of fruit/ diameter of fruit, Volume of fruit $cm^3$, Specific gravity of fruit, percentage humidity of fruit, percentage dray matter of fruit, percentage of total cracking, total yield kg/tree according to Ibrahim [14]. Calcium pictate was determined according to Rouhani and Bassiri [15]. Firmness was measured on two sides of each fruit with an Effegi penetrometer (Model NI, McCormick Fruit Tech, Yakima, WA) Fitted with an 11.1mm tip. The total soluble solids were determined by hand refractometer. Carotene pigment in fruit peel mg/100g peel, total percentage of acidity, Vitamin C mg /100 ml Juice according to A.O.A.C. Antioxidant capacity (mmol TE/g FW ) was determined to previous work [16].

**Results and Discussion**

1- The leaf aria, total chlorophyll, number of shoot and length of shoot in fig trees cv. Kadota

Results indicated in table (1) that spraying trees with bud populous extracts, algae extract and swamp morning glory extracts led to a significant increase of leaf aria , total chlorophyll, number of shoot and length of shoot compared to control treatment . Control treatment recorded the lowest percentage as compared to the individual treatments (5.98 $m^2$/tree, 131.12 mg/1gm FW, 3.90 and 22.65cm), respectively. Treatment of (bud populous 50% + algae extracts 50% + swamp morning glory extracts 50 %) gave an excellent result which differed of the other treatments, that gave the highest percentages of leaf aria and total chlorophyll, they were (7.62 $m^2$/tree, 144.34 mg/1gm FW, 6.62 and 36.46 cm) on the year of study, respectively. The higher rates of leaf aria and total chlorophyll were due to the process of spraying of the bud populous extracts, algae extract and swamp morning glory extracts might be due to increase in photosynthesis, nutrient uptake which are essential elements for chlorophyll biosynthesis and biozyme contain different acids more over seaweed extracts contain natural plant growth regulators which control growth and structural development of plants [17]. The results are in consonance with those obtained by Malguti *et al*., [18] and Abed El- Hamied [19].

**Table 1:** Effect of spraying of spraying bud populous extracts, algae extract and swamp morning glory extracts on vegetative growth and physical characterize of fig fruit cv. Kadota for seasons 2018

| Treatments | Leaf aria / tree $m^2$ | Total chlorophyll mg/1gm FW | Number of shoot | Shoot length cm | Diameter of fruit cm | Length of fruit cm | Shape of fruit | Weight of fruit gm | Volume of fruit $cm^3$ | Specific gravity |
|---|---|---|---|---|---|---|---|---|---|---|
| Control | 5.98 k | 131.12 cd | 3.90 hijk | 22.65ijk | 3.70 i | 3.35 e | 0.90 a | 30.07 i | 26.01 i | 1.15 a |
| Bud populous extracts (Bpe) at conc. of 50% | 6.19 j | 135.75cbc | 4.80hij | 25.17fghi | 4.11 h | 3.48cd | 0.84a | 31.79 h | 28.16 h | 1.12 a |
| Algae extract (Ae ) at conc. of 3% | 6.25 ij | 139.83 bc | 5.05ghi | 25.91fgh | 4.24 fgh | 3.46d | 0.81a | 33.00 g | 29.16 fg | 1.13 a |
| Swamp morning glory extracts (Smge) at conc. of 30% | 6.31 ij | 132.19 cd | 5.20fgh | 25.83fgh | 4.30 efgh | 3.50 bcd | 0.82a | 34.18 f | 29.69 ef | 1.15 a |
| Swampmorning glory extracts (Smge) at conc. of 40% | ij 6.30 | 132.61bcd | 5.33efg | 26.00efgh | 4.14 gh | 3.56 bcd | 0.80a | 32.46 gh | 29.12 fg | 1.11a |
| Swamp morning glory extracts (Smge) at conc. of 50% | 6.45 g | 131.39 cd | 5.40def | 26.56def | 4.30 efgh | 3.49 cd | 0.81a | 34.26 f | 30.75 cd | 1.11 a |
| Bpe +Ae | 6.59 f | 141.80 bc | 5.69de | 26.19efg | 4.34 defg | 3.62 bcd | 0.83a | 35.51 f | 31.11bcd | 1.12 a |
| Bpe +( Smge ) 30% | 6.74 e | 136.35 bc | 5.70de | 26.75 def | 4.34 defg | 3.68abc | 0.88a | 34.12 f | 30.75 cd | 1.10 a |
| Bpe +( Smge ) 40% | 6.78 de | 139.23 bc | 6.00cd | 26.88 def | 4.37 cdefg | 3.71bc | 0.84a | 34.84f | 30.31 de | 1.14 a |
| Bpe +( Smge ) 50% | 6.90 c | 137.29 bc | 6.15cd | 29.27 cd | 4.47 bcdef | 3.73abc | 0.83a | 36.43 de | 31.29 abc | 1.16 a |
| Ae +( Smge ) 30% | 6.98 c | 140.18 bcd | 6.30bc | 28.90cde | 4.59 abcd | 3.71abc | 0.80a | 36.60 cde | 31.52 abc | 1.16 a |

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Ae +( Smge ) 40% | 7.13 bc | 139.87 ab | 6.20 | 31.54cd | 4.53abcde | 3.75abc | 0.82a | 36.97 cde | 31.43 abc | 1.17 a |
| Ae +( Smge ) 50% | 7.15bc | 143.42 ab | 6.33bc | 33.24bc | 4.64 abc | 3.77 ab | 0.81a | 36.37 bcd | 31.60 abc | 1.15 a |
| Bpe + Ae +( Smge ) 30% | 7.22 b | 144.08a b | 6.38ab | 32.31 bc | 4.70ab | 3.80 ab | 0.80a | 37.97 ab | 32.12 ab | 1.18 a |
| Bpe + Ae +(Smge ) 40% | 7.38ab | 146.60 a b | 6.45ab | 34.58b | 4.67ab | 3.78 ab | 0.80a | 37.49 bc | 33.18 ab | 1.12 a |
| Bpe+Ae+(Smge) 50% | 7.62 a | 148.34 a | 6.62a | 36.46 a | 4.80 a | 3.84 a | 0.80a | 38.45a | 34.01 a | 1.13 a |

2- Physical characterize of fruits and total yield of fig trees cv. Kadota

Concerning the results in Table (1 and 2), Diameter of fruit, length of fruit, weight of fruit, volume of fruit, humidity of fruit, dry matter of fruit firmness, percentage of total cracking and total yield of trees were significantly affected by all treatments. It is cleared that spraying bud populous extracts, algae extract and swamp morning glory extracts in single way or in combination to the fig trees increased physical characters of fruits compared with untreated trees. In addition, spraying this material in combination gave the highest parameters they were (4.80 cm, 3.84 cm, 38.45 gm, 34.01cm$^3$, 77.82%, 22.18%, 0.423kg/cm$^2$ and 31.75 kg/tree). On the other hand, untreated trees gave the lowest value they were (3.70 cm, 3.35 cm, 30.07 gm, 26.01cm$^3$, 76.48%, 23.52%, 0.302kg/cm$^2$ and 16.45 kg/tree ) respectively. In addition, the single and combination treatments led to a significant decreased in the percentage of total cracking of fruit and the lowest value 2.18% in the treatment (bud populous 50% + algae extracts 50% + swamp morning glory extracts 50%) comparison with the highest rates 18.56% in control treatment, while shape of fruit and specific gravity was not significant with the single way or in combination treatment spraying to the fig trees compared with untreated trees. Increased physical characters of fruits at harvest may be due to enhanced cell enlargement by growth regulators during developmental stages. The major plant growth regulators present in spraying material are auxins, cytokinins, indoles and hormones are a major factor applied to trees in promoting the growth of fruiting spurs and reduce premature dropping of fruit and improve the physical characters of the fruit and yield [20]. The increase in all parameter of fruits is ascribed to the increased of chlorophyll contents of leaves, which increased photosynthesis and ultimately overall health of fig and this increased total yield of trees.

**Table 2:** Effect of spraying of spraying bud populous extracts, algae extract and swamp morning glory extracts on chemical and physical characterize of fig fruit cv. Kadota for seasons 2018

| **Treatments** | **% Humidity of fruit** | **% Dry matter of fruit** | **Anthocyanine pigment in fruit peel mg/100 g peel** | **% Acidty** | **% Total soluble solids** | **Vitamin C mg / 100 ml Juice** | **Antioxidant capacity (mmol TE/g FW** | **% calcium pictate** | **Firmness Kg/cm$^2$** | **% Total cracking** | **Total yield Kg/ tree** |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Control | 76.48 i | 23.52 a | 564.11 j | 0.240 b | 15.07 b | 6.80k | 1.40j | 1.87i | 0.302 j | 18.56 a | 16.45 j |
| Bud populous extracts (Bpe) at conc. of 50% | 77.36 defgh | 22.64 ab | 570.71 ij | 0.261a | 15.35 ab | 7.09ijk | 1.55ghi | 2.19efg | 0.312 ghij | 15.90b | 17.68 ij |
| Algae extract (Ae ) at conc. of 3% | 76.83ki | 22.98 ab | 581.62 ghij | 0.269 | 15.50 ab | 7.16hij | 1.69fgh | 2.13fgh | 0.328 fghi | 14.47bc | 18.00 hij |
| Swamp morning glory extracts (Smge) at conc. of 30% | 77.02 ijk | 23.01 ab | 577.42 hij | 0.277 cd | 15.50 ab | 7.35fg h | 1.67fgh | 2.35def | 0.319 ghij | 16.86b | 18.40 hij |
| Swampmorning glory extracts (Smge) at conc. of 40% | 76.89 jk | 23.11 ab | 590.22 fghi | 0.265 cd | 15.66 ab | 7.61efg | 1.81def | 2.29efg | 0.341 efgh | 12.77c | 19.11 hij |
| Swamp morning glory extracts (Smge) at conc. of 50% | 77.11 hijk | 22.89 ab | 593.10 efghi | 0.281d | 16.06 ab | 7.86def | 1.80def | 2.46def | 0.338 efg | 11.81 cd | 19.83 ghi |
| Bpe +Ae | 77.16g hij | 22.84 ab | 594.51 efghij | 0.289 cd | 16.15b a | 7.79ef | 2.00cde | 2.66cd | 0.350 ef | 9.13 de | 20.97 fgh |
| Bpe +( Smge ) 30% | 77.26 | 22.74 | 599.49 | 0.285 | 16.11 | 7.91def | 1.83de | 2.59cde | 0.358 | 9.35de | 22.15 |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | fgh | ab | efghi | de | ab | | | | de | | efg |
| Bpe +( Smge ) 40% | 77.22 | 22.78 | 608.46 | 0.293 | 16.19 | 7.75ef | 2.00cde | 2.70cd | 0.379 | 8.75ef | 23.45 |
| | fghi | ab | defgh | de | ab | | | | cd | | def |
| Bpe +( Smge ) 50% | 77.41 | 22.59 | 613.60 | 0.289 | 16.22ab | 8.13de | 1.99cde | 2.77bcd | 0.382 | 6.12fg | 24.33de |
| | cdef | ab | defgh | cd | | | | | de | | |
| Ae +( Smge ) 30% | 77.59 | 22.41 | 618.09 | 0.296cd | 16.28 | 8.22cd | 1.74 | 2.48cde | 0.380 | 6.36efg | 25.65 |
| | bcd | ab | cdef | | ab | e | fg | | cd | | cd |
| Ae +( Smge ) 40% | 77.45 | 22.55 | 620.52 | 0.305bc | 16.27 | 8.37cd | 2.00cde | 2.65cd | 0.393 | 8.01e | 26.17 |
| | cde | ab | cdef | | ab | | | | bc | | Bcd |
| Ae +( Smge ) 50% | 77.53 | 22.47 | 640.35 | 0.307 | 16.39 | 8.15de | 2.09cd | 2.80bc | 0.399 | 6.86ef | 29.49 |
| | bcd | ab | bcd | ab | ab | | | | bc | | ab |
| Bpe + Ae +( Smge ) 30% | 77.61a | 22.39 | 649.70 | 0.312 | 16.55 | 8.48bc | 2.34bc | 2.97bc | 0.405 | 4.55fgh | 29.50 |
| | bc | Ab | bc | bc | ab | | | | ab | | ab |
| Bpe + Ae +(Smge ) 40% | 77.72 | 22.28 | 658.55 | 0.316ab | 16.58 | 8.62 b | 2.59b | 3.18ab | 0.409 | 3.37fgh | 28.37 |
| | ab | ab | b | | ab | | | | ab | | cd |
| Bpe+Ae+(Smge)50% | 77.82 a | 22.18 b | 669.15 | 0.327 a | 16.82 a | 8.83a | 2.88a | 3.36a | 0.423 a | 2.18 h | 31.75 a |
| | | | a | | | | | | | | |

**Table 3**

| Treatments | leaf aria $cm^2$ | Total chlorophyll mg / 100g | Shoot length cm | Number of shoot | % humidity of fruit | % Total soluble sold | Vitamin C mg / 100 ml Juice | Anthocyanine pigment in fruit peel mg / 100g peel | Firmness $Kg/cm^2$ |
|---|---|---|---|---|---|---|---|---|---|
| Control | 128.81 | 115.63 | 22.65 | 3.00 | 76.50 | 12.93 | 7.17 | 413.25 | 0.293 |
| Ca | 132.90 | 118.25 | 25.17 | 4.75 | 77.34 | 12.75 | 7.01 | 402.68 | 0.330 |
| Kelpak (Ke ) | 135.41 | 118.97 | 27.91 | 5.50 | 76.87 | 12.61 | 6.90 | 400.41 | 0.339 |
| Irrigation after 3 days | 130.65 | 117.12 | 24.83 | 3.33 | 76.99 | 12.79 | 7.05 | 409.36 | 0.346 |
| Irrigation after 6 days | 131.97 | 117.85 | 25.00 | 4.70 | 76.95 | 12.72 | 6.98 | 401.70 | 0.337 |
| Ca+Ke | 133.72 | 118.45 | 25.56 | 5.15 | 77.07 | 12.70 | 7.08 | 408.96 | 0.344 |
| Ca+Irrigation after 3 days | 134.88 | 119.33 | 26.19 | 5.70 | 77.14 | 12.68 | 6.96 | 399.83 | 0.370 |
| Ca+Irrigation after 6 days | 136.48 | 119.13 | 26.81 | 6.00 | 77.24 | 12.71 | 6.90 | 398.69 | 0.373 |
| Ke+Irrigation after 3days | 133.94 | 118.31 | 26.43 | 6.15 | 77.20 | 12.55 | 6.86 | 398.57 | 0.382 |
| Ke+Irrigation after 6days | 135.73 | 119.46 | 29.27 | 6.30 | 77.40 | 12.34 | 6.85 | 397.18 | 0.386 |
| Ca + Ke + Irrigation after 3days | 133.18 | 118.00 | 29.90 | 6.13 | 78.25 | 12.30 | 6.70 | 387.29 | 0.395 |
| Ca + Ke + Irrigation after 6days | 134.89 | 119.35 | 31.54 | 6.33 | 78.87 | 12.08 | 6.47 | 366.85 | 0.405 |
| L . S. D. 0.05 | 2.95 | 0.89 | 36.24 | 0.62 | 0.49 | 0.20 | 0.11 | 0.73 | 0.014 |

3- Chemical characterize of fruits of fig trees cv. Kadota

Data in Table (2) show the effect of spraying bud populous extracts, algae extract and swamp morning glory extracts in single way or in combination on carotene pigment in fruit peel, percentage of acidity, percentage of total soluble solids, Vitamin C, Antioxidant capacity and percentage of calcium pictate of fig trees cv. Kadota during 2018 season. Results clear that the all estimated characters were significantly increased and the highest averages (669.15 mg/100g peel, 0.327%, 16.82%, 8.83 mg/100 ml Juice, 2.88 (mmol TE/g FW) and 3.36%), respectively in the treatment (bud populous 50% + algae extracts 50% + swamp morning glory extracts 50 %) compared to the lowest rates (564.11 mg/100g peel, 0.240%, 15.07%, 6.80 mg/100 ml Juice, 1.40 (mmol TE/g FW) and 1.87%), respectively in control treatment. The increase in Chemical characterize of fruits from carotene pigment in fruit peel, percentage of acidity, percentage of total soluble solids, Vitamin C, Antioxidant capacity and percentage of calcium pictate which results through spraying bud populous extracts, algae extract

and swamp morning glory extracts due to the fact that this compound increase vegetative growth and thus encourages the accumulation of carbohydrate materials in fruits leading to increased content of these materials [21].

**Conclusion**

It could be concluded from this experiment that, spraying bud populous extracts, algae extract and swamp morning glory extracts a single or combination has led to an increase in the physical and chemical characterize of fruits and total yield of fig trees cv. Kadota with significant differences between treatments for growing season.

**References**


[1]. Gerber, H.J. (2010). Tree Training and Managing Complexity and Yield in Fig (*Ficus carica* L.). Thesis. Dep. Hort. Agric. Univ. of Stellenbosch. Florida USA.

[2]. Al- Shemmeryi, W.H., Al-Malikshah, Z.R. and Zena, H.C. (2010). Effect of wax sprays of Vapor–Gard and bark extracts of Salix on the storability of local orange (*Citrus sinensis* L.). J .Orak. 3 (3): 1-8.

[3]. Chen, S.K., Subler, S. and Edwards, C.A. (2002). Effects of agricultural biostmulants on soil microbial activity and nitrogen dynamics. Applied soil ecology. 19: 249-259.

[4]. Estken, A. and Pirlak, L. (2002). The effects of biostmulantor applications on nutrient Composition of strawberries. Acta Agrobotanica. 55(2): 51-55.

[5]. Dabrowski, Z.T. (2008). Biostmulants in modern agricultural .Vegetable Crops, Warsaw. 5: 6-10.

[6]. Spinelli, F., Fiori, G., Noferini, M., Sprocatti, M. and Costa, G. (2009). Perspectives on the Use of a seaweed extract on apple trees. J. Hort. Sci. and Biotech. Special Issue. 131–137.

[7]. Basak, A. (2008). Effect of preharvest treatment with seaweed products, Kelpak and Gonemar (BM86) on fruit quality in apple. International Journal of fruit Sc. (1-2): 1-14.

[8]. Dell, O.C. (2013). Natural plant hormones are biostmulants helping plants develop Hight antioxidant activity for multiple benefits. Virginia, vegetable, small Fruit and specially crops. 2(6):1-3.

[9]. Bondok, S.K., Omaran,Y.A.M. and Abdel-Hamid, H.M. (2013). Enhanced productivity and quality of flame seedless grapevines treated with seaweed extract. J. Plant. Prod. 1 (12): 1625-1635.

[10]. Bund, S. and Norre, J. (2011). Seaweed extract improve cherry fruit quality. Aphc. Aushs. Nziash. Joint. Con. 18-22 September. 2011. Lorne, Victoria.

[11]. Al-Hamdawi, A.M.S and Al-Malikshah, Z.R.J. (2017). Influence of amino acids, bleed grape and seaweed extract on vegetative growth, yield and its quality of fig. 2017. International Journal of Environmental & Agriculture Research (IJOEAR). 3(4): 1-5.

[12]. Al- Hamdawi, A. M., R. A. Al-Taie, Z. R. Al- Malikshah and A. A. Ibrahim. (2019). The morphological characters of growth swamp morning glory with distant from level water and effect on growth common reed. Plant Archives. Vol. 19, Supplement 1, pp. 392-396.

[13]. Al– Rawi, K. M. and A. M. Khalf Allah (2000). Design and Analysis of Agricultural Experiments. College of Agric. Univ. Mosel. Iraq.

[14]. Ibrahim, H.M. (2010). Analysis of plant samples. Al-MeniaUnui. Dar AL-Fajar for printing and publishing, Egypt

[15]. Rouhani, I. and A. Bassiri (1976). Changes in the physical and chemical characteristics of Shahani dates during development and maturity. Hort. Sci. 15: 480–498.

[16]. Crisosto, C.H. and G.M. Crisosto, Understanding consumer acceptance of early harvested 'Hayward' kiwifruit. Postharvest Biol. Technol. 22:205–213(2001).

[17]. Jundi, H. M. (2003). Physiology of tree fruits. Arabic home for publishing, Cairo.

[18]. Malguti, D., Rombola, M., Gerin, G., Simeni, M., Tagianvini, M. and Margangoni, B. 2002. Effect of seaweed extracts-based leaf sprays on the mineral status, yield and fruit quality of apple. *Acta Hort.*, 594: 357-359.

[19]. Abed El- Hamied, S.A. (2014). Improving Growth and Productivity of "Sukkary" Mango Trees Grown in North Sinai Using Extracts of Some Brown Marine Algae, Yeast and Effective Microorganisms 1-

Mineral content of leaves and fruit growth aspects. Middle East Journal of Agriculture Research, 3(2): 318-329.

[20]. Stover, E., M. Aradhya, C. Crisosto, and L. Ferguson. 2007. Overview of the California fig industry and new interest in varieties for fresh fruit. Proc. California Plant and Soil Conference: Opportunities for California agriculture, Sacramento, Calif. p. 169–175.

[21]. Devlin, R. and F., Witham. (2001). Plant Physiology, 4th Ed., C.B.S Publishers and distributors, Daragani, New Delhi, India.