**The Role of** **Biofertilizer and Licorice Extract in Improving (Citrus Maxima L.) seedlings growth**

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**shatinya (ذات لحم أبيض)**

**First- Three doses of** **Biofertilizer**

1. **Zero**
2. **2gm Biofertilizer**
3. **4gm Biofertilizer**

**Second- Tree concentration Licorice Extract**

1. **Zero**
2. **3gm.L-**

 **3-6gm.L-**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  **Bio****Li** | **0.0** | **2 gm** | **4gm** |  |
| **0.0** | **L0B0** | **L0B2** | **L0B4** |  |
| **3gm.L-** | **L3B0** | **L3B2** | **L3B2** |  |
| **6 gm.L-** | **L0B6** | **L6B2** | **L6B4** |  |
|  |  |  |  |  |

**No. of treatments =3x3 =9**

**No. of seedlings in treatment = 5**

**No. of replications =4**

**Total No. of Seedlings =9x5x4=190**

**Stem length cm, Stem diameter cm, Number of leaves/seedling, Shoot fresh weight g, Shoot dry weight g, Root fresh weight g, Root dry weight g, Chlorophyll A and B , Carbohydrate**

Stem length cm

Stem length cm

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**Response of Local Sour Orange (Citrus aurantium L.) Seedlings**

**to two Bio Stimulators**

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the pomelo (Citrus maxima or Citrus grandis) is the largest citrus fruit from the Rutaceae family.

1. [VOL. 4 NO. 4 (2022): SAMARRA JOURNAL OF PURE AND APPLIED SCIENCE](http://www.sjpas.com/index.php/sjpas/issue/view/12) /

1. Biology

**The effect of spraying with growth regulator Kinetin and addition of Humic acid and the interaction between them on the chemical content of grapefruit and shaddock seedlings.**

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**DOI:**

<https://doi.org/10.54153/sjpas.2022.v4i4.207>

**Keywords:**

spray, kinetin growth regulator, humic acid, grapefruit, shaddock.

**ABSTRACT**

The experiment was conducted at the Lath house of the collage of Agriculture/ Tikrit University for the growing season 3/15/2019 to 2/15/2020. Seedlings were brought from Balad district and 108 seedlings , grafted on *Citrus aurantium*, to see the effect of spraying with kinetin growth regulator and addition of Humic acid on the characteristics of vegetative and root growth and the chemical content of two types of citrus fruits (shaddock and grapefruit), When shaddock and grapefruit seedlings were sprayed with three concentrations of the growth regulator kinetin (0, 75 and 150 mg. L-1.) And three levels of Humic acid were added (0, 5 and 10 ml.L-1), the addition and spraying were done on three dates of the appointment. The first date was 3/15/2019 and the second appointment 21 days after the first appointment, and so on for the third appointment. This study was carried out according to the Randomized Complete Block Design (R.C.B.D). The results were analyzed using a table of variance analysis, factors and their interactions were tested using the ready-made statistical program SAS and the lowest significant difference LSD was calculated at a probability level of 0.05. The results of the study are summarized as follows: -

The variety had a significant effect on the studied traits, as the grapefruit variety exceeded the rate of increase in leaves content of chlorophyll , nitrogen ,phosphor, potassium in leaves as it reached 12.22 mg.g-1 soft weight, 1.15%, 0.225% , 1.03% and 7.18% , while the shaddock variety gave the high rate for the carbohydrate / nitrogen as it reached 3.79 .

The spraying with the growth regulator kinetin, especially the concentration of 150 mg / L-1, gave to a significant increase in the studied characteristics represented in the leaves content of chlorophyll , ,phosphor, potassium, carbohydrate and carbohydrate/ nitrogen in leaves as it reached 12.93 mg.g-1 soft weight,0.252%, 1.08%, 4.52% and 4.05% , while the comparison treatment gave the lowest average for the aforementioned traits. Fertilization with humic acid, especially at the level of 10 ml. L-1, resulted in a significant increase in the rate of the leaves content of chlorophyll , nitrogen , ,phosphor, potassium, protein , carbohydrate and carbohydrate/ nitrogen in leaves as it reached 13.17 mg.g-1 soft weight,1.14% , 0.278%, 1.07%, 7.10%, 4.31% and 3.82, while the comparison treatment gave the lowest average for the aforementioned traits.

. The two and three interactions of the research factors showed significant differences for all the studied traits.