Indonesian Journal on Health Science and Medicine
Vol. 2 No. 1 (2025): January
ISSN 3063-8186. Published by Universitas Muhamamdiyah Sidoarjo

https://doi.org/10.21070/ijhsm.v2i1.68

The Effect of Foliar Feeding With University Fertilizer on The Growth and Yield of Green Onion Plants Allium Cepa, The Local White Variety, Planted in Southern Iraq

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Abstract. The experiment was conducted during the winter agricultural season 2023-2024 at the Agricultural Research Station of the Faculty of Agriculture, University of Basra, in the Kerma Ali area, with the aim of studying the impact of different concentrations of liquid sky (university fertilizer) on the growth and yield of green onions of the white local variety and four different sprays (0, 3, 6, 9) ml-1, so it was carried out according to the design of the complete random sectors with three repetitions and the arithmetic averages of the transactions were compared according to the test of the lowest moral difference LSD and it has a significance level of 0.05. The results showed that the concentration of spraying exceeded 6 ml liters-1 Significantly in the height of the plant, the number of tubular leaves, the soft weight of the vegetative total, the diameter and weight of the onion, the total onion yield and the total green yield. The values were as follows (75.3 cm, 13.3 leaves, 141.6g, 4.2 cm, 64.5 g, 3.783 tons, -1 0.307 tons, -1) respectively.

Highlights:

1. Evaluate liquid sky fertilizer effects on green onion growth, yield.
2. Tested 0, 3, 6, 9 ml/L on green onions, LSD 0.05.
3. 6 ml/L improved plant height, leaves, weight, yield significantly.

Keywords: green onion, university fertilizer, leaf spray, growth, yield

Introduction

Oneon(Allium Cepa L.) one of the most important winter vegetables of the garlic family Aitiaceae. Its fresh onions with high nutritional value are eaten. Each 100 g of it contains 8.2 kg of dry matter, 1.3 g protein, 0.2 g fat - 4.2 g carbohydrates, 1.5 g fiber, 0.6 g mineral salts, vitamin B1 0.05 mg , B20.05 mg and vitamin C 30 mg [1] as well as its medical value, as it contains kerosene, It is due to the flavonoids that act as antioxidants and the active substance Allicin, which is responsible for most of the therapeutic properties possessed by the plant [2]. Despite the importance of the economic, food and medical crop, the area planted with onions is still few, as it reached

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in 2020 about 13,300 dunums and a total productivity of 41,000 tons with a low production rate of 1.926 tons Dotm-1. In order to promote production, it is necessary to use health scientific methods, including paper fertilizers, as it is one of the techniques contributing to the rapid nutrition of the plant, as it facilitates the arrival of elements to their places of representation by the plant [3] The best plant growth is achieved when the availability of macro and micro nutrients at optimal levels of growth and productivity is good for the plant, as it participates and helps in the metabolic processes in the plant and performs many functions. Its deficiency causes a physiological imbalance, including the element of nitrogen, which is involved in the composition of amino acids, which is the basic unit for building proteins and enters into the composition of chlorophyll, proteoplasm and enzymes. Phosphorus also enters into the construction of many organic compounds such as phospholipids, phosphoproteins, amino acids and as a component in energy compounds and its role in increasing carbohydrates in the plant. It is also a necessary element in plant nutrition for its important physiological cycles. It activates the work of enzymes and works to increase sugars and in the manufacture of starch inside the plant and in many vitamins [4] and[5]got it when spraying onions with compound fertilizer NPK 20:20:20 in a mineral or nanoparticle formula at a rate of 480 liters ha -1 twice, the first after 30 days of planting and the second after 30days after the first spray at a rate of 1g l-1 in addition to the comparison treatment, spraying with the substance led to a significant increase in the height of the plant, its soft weight and total yield. Nanofertilizer showed a greater impact than mineral fertilizer .Expain [6] that spraying the onion plant class Giza6 with compound fertilizer N. P. K. 20:20:20 with a nanoparticle with three levels(2, 4, 6) liters acres in addition to the comparison treatment, the level of 6liters acres led to a significant increase in the height of the plant, the weight of the onion and the total yield of both the experimental season [7]. Spraying onion plants Class 6 Giza four times with NPK compound fertilizer in two concentrations (500, 2000) mg L-1 and humic acid with a concentration of 200 mgL-1 and a mixture of N.P.K. 200- mgL-1 + 200 mgL-1 Humic acid in addition to the comparison treatment, all feather coefficients resulted in a significant increase in the weight of the onion and the total yield, while the treatment of the mixture N.P.K. 200- mg L-1 + 200 mgL-1 Humic acid gave a significant increase in the diameter of the onion and for both seasons the experiment compared to the comparison treatment and found [8] When spraying

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onion plants with potassium thapocrystalline fertilizer kts Container S (17%) and 25% (K) Container with concentrations of (0, 1, 2) liters of acres the first three times after 30 days of seedling and etc. in an interval of 15days, the high concentration of 2 liters of acres-1 led to a significant increase in the height of the plant, the number of leaves, their soft weight, the weight and diameter of the onion, and the total result of both seasons compared to the comparison treatment.

Due to the lack of studies on the impact of leaf fertilizer on the growth and yield of the white local variety, this experiment was carried out under the conditions of the city of Basra during the winter season 2023-2024.

Methods

The experiment was conducted during the winter agricultural season 2023-2024 at the agricultural research station of the Faculty of Agriculture, University of Basra, at the site of Karma, with the aim of studying the paper spraying in the of the university fertilizer, the components of which are shown in Table (1) and three concentrations (3, 6, 9) liters-1 in addition to the comparison treatment of spraying with distilled water only in growth and the green yield of the onion plant of the white local variety. Table 2 puts the physical and chemical characteristics of the field soil that is prepared by its plowing, smoothing, levelling and dividing it into three marozes with a length of 12 m and a distance of 0.75cm . Each time, one sector was counted, divided into four experimental units with a length of 3meters, and the transactions were distributed to it randomly. According to the design of the complete random sectors, slut was planted on 30/10/2023 on both sides of the tree and with a distance of 10 cm from one another, so that the vegetation density was 58666 plants. -1 All agricultural service operations followed to produce the crop were carried out from weeding, hoeing, irrigation, fattening and combating similarly for all experimental units. Then the plants were sprayed with university fertilizer and according to the transactions after adding drops of bright substance as a diffuser and by three sprays, the first after three weeks in agriculture and the other between two weeks. Mature plants were taken away at the end of the season on 12/19/2024, including a random sample of each experimental unit by 6 plants : then taking the following readings: plant height (cm) , number of tubular leaves, soft weight of the vegetative and root total (g) , onion diameter (cm) , weight of the onion(g)

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, total yield of onions (ton dunum-1) and total yield (ton dunum-1). Then analyzing the statistical data according to the design followed and comparing the arithmetic averages of the transactions, LSD test the lowest moral difference and at a significance level of 0.05 [9]

Table (1) Chemical components of university fertilizer *

Element	Quantity%
Nitrogen	7
Phosphorus	5
Potassium	7
MAGNESIUM	0.5
Potassium Humate and Microelements	0.5

* Produced by the Consulting Office, Faculty of Agriculture, University of Basra

Table(2) Chemical and physical characteristics of the field soil

Capacity	Unit	Value
Ph	-	7.29
Electrical Conductivity Grade (E.C) (Decisimensm^{-1})		6.64
total nitrogen	g kg $^{-1}$	1.73
Ready phosphorus	g kg $^{-1}$	.023
Ready Potassium	g kg $^{-1}$	45.5
soil separates		
Sand		60.3%
Silt		29.8%
lute, point, earth, daub		2.10%
Soil texture		silty sand

Result and Discussion

It is clear from Table (3) that the coefficients of spraying with liquid fertilizer have a significant impact on all the characteristics of the study, as the concentrations exceeded 6, 9 mlL-1 significantly in increasing the height of the plant compared to the comparative coefficient and by an increase of (21.09-13.68) %, respectively. The

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treatment of spraying with a concentration of 3 mlL-1 significantly differed from the treatment of comparison and concentration of 9 mlL-1. The spraying with a concentration of 6 mlL-1 significantly increased the number of tube leaves compared to the treatment of comparison and concentrations 3 and 9 mlL-1 and by an increase of (60.24, 29.12 , 20.90) % respectively, as for the soft weight of the vegetative total, both concentrations exceeded 6, 9 ml liters-1 significantly compared to the comparison treatment by an increase of (24.97 , 22.50) yen, respectively, and in turn the concentration exceeded 3 ml liters-1 significantly compared to the comparison treatment by an increase of 47.91%. As for the dry weight of the vegetative total, the high concentration exceeded 9 ml liters-1 significantly compared to the comparison treatment and concentrations 3 , 6 ml liters-1, with an increase of 92.98, 69.23, 35.80%, respectively, and the concentration exceeded 6 ml liters-1 significantly compared to the comparison With a treatment and concentration of 3 mlL-1 and an increase of (24.10, 24.61)

Table(3) Effect of liquid fertilizer spraying concentrations (collector) in some vegetative and root growth indicators of green onion plant

Liquid Fertilizer Spray Concentrations ml-1	Plant height (cm)	Number of tubular leaves	Vegetative Total Soft Weight (g)	Radical Total Mild Weight (g)
0	62.1	8.3	76.6	1.14
3	68	10.3	113.3	1.30
6	75.2	13.3	141.6	1.62
9	70.6	11.0	138.8	2.20
LSD Value = 0.05	6.7	0.7	21.4	0.29

Table (4) shows that the coefficients of spraying with liquid fertilizer have been significantly affected in all the characteristics of the studied product, as the concentration of spraying with liquid fertilizer exceeds 6 ml liters-1 significantly in the increase in the diameter of the onion compared to its comparison coefficient and concentrations 3 and 9 ml liters-1, with an increase of (27.27 ,23.52 ,23.52) %, respectively. The concentrations also exceeded 3, 6 ml liters-1 significantly in the increase in the weight of one onion and the total bulb yield compared to the comparison treatment, with an

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increase of (28.50 , 27. 48)), respectively, in turn, the concentration exceeded the concentration of 6 ml-l-1 significantly compared to the concentration of 9 ml-l-1 and an increase of 27.47%. The concentration did not differ from 9 ml-l-1 compared to the comparison treatment for both attributes. As for the total green quotient of plants, they exceeded both concentrations 6 and 9 ml-l-1 significantly compared to the comparison treatment and by an increase of (84.64, 80.97) %respectively and compared to the concentration of 3 ml-l-1 and by an increase of (24.99, 22.50) %) In turn, the concentration exceeded 39 ml-1 significantly compared to the comparison treatment, with an increase of 47.72%.

Table(4) The effect of concentrations of liquid fertilizer spraying (the university) on some components of the crop of green onion plants

Liquid Fertilizer Spray Concentrations ml-1	Onion Diameter (cm)	Onion Weight (g)	Total yield of onions (ton/ dunum^{-1})	Total green onion yield (ton/ dunum^{-1})
0	**3.3**	**43.5**	**2.552**	**4.499**
3	**3.4**	**55.9**	**3.279**	**6.646**
6	**4.2**	**64.5**	**3.783**	**8.307**
9	**3.4**	**50.6**	**2.974**	**8,142**
LSD Value = 0.05	**6.7**	**0.7**	**21.4**	**0.29**

Discussion

respectively, the moral superiority when spraying with liquid fertilizer in vegetative growth

indicators because it contains a group of macro and micro nutrients important to most vital activities in the plant, including the process of cell division and elongation, especially the element of nitrogen, which is involved in the process of building chlorophyll, protein and nucleic acids, and then increase the ability of the plant to carry out the process of photosynthesis and the manufacture of nutrients such as starch and sugars, and thus led to increased vegetative growth [10]) and the role of the element potassium by activating the process of cell division and its participation in the synthesis

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of nucleic acids DNA-RNA and the energy transfer compound ATP [11]and to the element potassium in the process of protein formation of nucleic acids, photosynthesis and cell diviion [12] which was reflected positively in the increase in urban growth indicators and these results are consistent with what [6,5, 9]

The moral superiority of the product and its components when sprayed with liquid fertilizer may be attributed to the fertilizer content of the nutrients (Table 1) that are important for the plant and added to the leaves that are the center of many vital activities [13] especially nitrogen and phosphorus. The tasks include the synthesis of propane, enzymatic conjugates, RNA and DNA that stimulate the formation of cytokines, which in turn encourages the rapid division of cells and their construction, which is reflected in the improvement of vegetative growth varieties (Table 3), as well as containing the element potassium, which, after the isomeric regulator, has an influential role in The process of opening and closing the gaps, which is reflected in the increase in the absorption of water and nutrients that activate the process of photovoltaic and increase their outputs and speed up the process of moving all manufactured materials to storage sites in the bulbs [14] It also contains potassium humate, which has a physiological action similar to that of cytokines, which affects the promotion of plant growth and increase potency [15] These results are consistent with what he got [6,7,8,14,16]

Conclusion

We conclude from this study that in order to increase the yield of green onions, the local white variety, the plant must be sprayed with liquid fertilizer (the university) three times. The first is after three weeks from the hatchery and the other is the joints of two weeks when visited under the conditions of the city of Basra

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