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Effect of Sources of organic fertilizers on the growth of three types of young palm trees(*Phoenix dactylifera* L.).

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ABSTRACT

A global experiment was carried out at the Agricultural Research and Experiments Station in the Al-Sayadah area of the College of Agriculture - University of Kirkuk, Iraq, for the period from March 2023 until December 2023, to study the effect of sources of organic fertilizers on the growth of three varieties of young palm trees (Shwaithi Yellow, green, and green) The organic fertilization was at four levels (poultry waste 2 kg tree-1, poultry waste 4 kg tree-1, sheep waste 4 kg tree-1, sheep waste 8 kg tree-1) as well as the comparison treatment. The experiment was conducted on 45 young trees that were as homogeneous in vegetative growth as possible, four years old, and planted with dimensions of 8 x 8 m. The experiment was carried out according to a random plot design with a split plot design system. Varieties were counted within the main plot and organic fertilization treatments were included within the secondary plots (sup plot). The experimental unit was represented by one tree.The results can be summarized as follows:

In organic fertilization treatments, it is noted that poultry waste is superior to sheep waste when these two fertilizers are added, with an average of 4 kg tree-1, but sheep waste at a level of (8) kg tree-1 gives superiority to all, increasing plant height by 21.88 cm and increasing frond length by 24.54 cm. 10.04 palm fronds-1, the increase in frond length is 4.75 cm, the increase in frond width is 9.51 cm, and the percentage of dry matter is 51.43%. Varieties differed in their response to treatments. The Khadrawi variety excelled in increasing plant height and the concentration of nitrogen and protein in the fronds, with an average of 16.60 cm, 1.59%, and 9.93%, respectively. The Khastawi variety gave significant superiority in the characteristics of increase in frond length, increase in frond length, and increase in width. The average thickness of fronds was 21.48 cm, 3.76 cm, and 7.54 cm, and the percentage of dry matter was 49.03%..

***Keywords*:** Organic Fertilizers,Yellow shwaithi, khadrawi, khastawi, ,*Phoenix dactylifera* L.

INTRODUCTION

Date palm (*Phoenix dactylifera* L.) belong to the order Palmae palms, where it is considered one, of the most important plant orders known to man, which belong to the family Arecaceae, which include about, (2600) species, and about (220) genera, Allah has singled her out for many virtues, as mentioned in many Qur'anic verses[i]. There are a large number of different palm varieties, and there, are more than, 600, varietie in Iraq, and the diversity in botanic terms included, all agricultural and wild varieties[ii].The numbes of palm trees in Iraq, is estimated at about 17,348,741 palm trees, with a total productivity of about 735,353 thousand tons, with a production rate of 68.2 kg per palm, Baghdad province occupies the first place in terms of productivity, with productivity reaching 126.23 thousand tons of Iraq's total productivity, Babil province comes in second place, followed by Diyala province in third place[iii]. Iraq, is considered one of the most important, countries produced dates in, the world as the production of dates in Iraq in particular and the Arab countries in general began to decline, this is due to the inefficiency of the use of modern agricultural techniques in palm production using old production methods and the slow reliance on advanced modern technologies, the lack of agricultural service operations is one of the most important processes that affect the success of palm cultivation[iv]. The additions of organic fertilizers makes the soile acidic because the remnants of, organic fertilizers release organic acids when decomposed, this helps make nutrients in the soil more accessible to plants[v]. Palm trees need to add organic fertilizers, they are essential for their growth because they contain many important nutrients, they also increase soil fertility and improve its physical and chemical properties, they also reduce pollution from an environmental point of view, as they do not pollute water, soil and air[vi]. Organic fertilizers, which consist of plant or animal waste, provide plant with nutrient from, natural sources, reducing their dependence on various chemical. elements, organic fertilizers help the plant speed up vital processes such as respiration, absorption and nutrient conversion into an available form that the plant can easily represent[vii]. Organics matter is an important source that increases the availability of elements in the soil, it is also a source of many elements, especially nitrogen, and must be added as a fertilizer for poor soils because its content of organic matter is of particular importance to plants[viii]. Organic fertilizers are valued not only for their nutrients, but also for their ability to increase the readiness of elements and also dissolve some insoluble compounds[ix Saadi et -]. Al[x]،

al. found [11] in the study they conducted on three varieties of palm trees, showed that adding organic fertilizer (humus) at a concentration of 1% led to a significant increase in the content of chlorophyll A and chlorophyll B in the leaves compared to the control treatment. Due to the lack of studies on the effect, of adding sources of organic fertilizers, on the growth of three varieties of palm trees, the objective of the study is:

Work to improve the growth, qualities of three varieties of young palm trees and know the effect of organic fertilizers on varieties. Find the best levels for each type of organic fertilizer (poultry waste - sheep waste) strengthen the offshoots by improving the vegetative growth, and chemical content, of the shoot.

Materials and Working Methods

Experiment Site:

The study was conductes in the fields of the Agric Research, and Experiment Stations in Al-Sayada area, which is located at latitudes 35.33 N and 44.34 East longitude of the Department of Horticulture, and Garden Engineering, College of Agriculture – University, of Kirkuk, Iraq, for the periods from March (2023) to December (2023) to study the effect, of sources of organic fertilize on the growth of three varieties of date palm. Field configuration and service operations: All growing bushes were removed and the field was cleaned, after that, the ponds surrounding the trees were maintained, a drip irrigation system was installed, and bush growth was monitored and cleaned whenever necessary, varieties were selected (Yellow Shwaithi, Khadrawi, and Khastawi), from each variety, 15 seedlings were selected that are as homogeneous, as possible in their vegetative, growth planted as of September 2019, planted in the quadruple method (8 × 8 m). Soil analysis: Several sample were taken from, the experiment site randomly from the experimental field with a depths of (0-60 cm), then I mixed all of them to form a single model representative of the field, after I dried it pneumatically and grinded with a wooden hammer for the purpose of smashing large blocks and passed through, a sieve with a hole diameter, of (2) mm, then they were placed in plastic containers and many chemical and physical tests were carried out as shown in Table (1).

Table 1. Some chemical, and physical qualities of the experiment soil.

Adjective	Unit	Total
Ready nitrogen (N)	mg kg-1	19.02
Ready Finished Phosphorus (P)		8.92
Ready-made potassium (K)		131.12
EC electric conductivity	DS-1	0.95
soil reaction PH	--------	7.39
Soil texture	----------	Mixed Sandy
Clay	%	11
I liquidated		39
Support		50

Study factors: The study included two factors:

Organic fertilization: It included five treatments: Organic fertilizers were added once in mid-March 2023

1. Comparison treatment (without fertilization). and its symbol.
2. First treatment: adding poultry waste with an average of (2) kg tree^{-1}.
3. Second treatment: adding poultry waste with an average of (4) kg tree^{-1}.
4. Third treatment: adding sheep waste with an average of (4) kg tree^{-1}.
5. Fourth treatment: adding sheep waste with an average of (8) kg tree^{-1}.

Variety: included three varieties (Yellow Shwaithi, Khadrawi and Khastawi) symbolized:

Yellow Shwaithi, Khadrawi, Khastawi.

Collection and Preparation of Organic Waste:

Poultry waste was collected from one of the fields of the Faculty of Agriculture - University, of Kirkuk , sheep waste was brought from one of the fields from the village of Ahmed Al-Danouk located in Riyadh district / Kirkuk Governorate, a sample of sheep and poultry waste was taken and passeds through a sieve with a diameter of ,2,mm and then drieds in an electric oven at a temperature, of 65 °C , then kept in plastic cans for the purposes of conducting some chemical, analysis on them, as proven in Table (2).

2.6-

Table 2. Some chemical propertie of organic fertilizers used in the study.

Adjective Manure	pH	EC (Deci Siemens M-1)	Phosphorus %	Nitrogen %	Potassium %	Carbon %	N/C	C/P
Sheep waste	7.54	5.71	0.677	2.85	0.85	45.07	66.57	15.81
Poultry waste	7.02	5.77	0.713	3.23	0.91	40.33	56.56	12.49

Experiments Design, Statistical Analysis:

The experimen was designed accordings to the split plot ,design system, within the design of the complete, random sectors, where the varieties in the main plot are Main plot and fertilization coefficients in the secondary pieces, by three replicates, each shoot represents an experimental unit, and each class includes 15 seedlings, thus, the total number of shoots is (45 shoots). The results averages were analyzes statistically using the statistical program (SAS), the Dunkin' test was also useds to compare, averages at a probability, level of 0.05[xi].

2.7 Studied Qualities:

All measurements were taken at the beginning of the experiments and at the end of the experiment on 2023/12/15

1- Rate of increase in tree height (cm): The height of the palm tree was measured from the soil level to the last summit of the palm using a tape measure, the rate was calculated according to the following equation:

Increasing the height of the palm = the height of the palm at the end of the experiment - the height of the palm at the beginning of the experiment.

2- Rate of increase in frond length (cm): The lengths of the fronds from the area where the fronds, connect to the trunk to the end of the frondsw was measured using a tape measure 3 fronds were taken from each tree, the rate was calculated according to the following formula:

Increase in ringworm length = ringworm length at the end of the experiment – ringworm length at the beginning of the experiment.

3- Rate of increase in the number of fronds (frond follicle -1): the number of fronds in each shoot was calculated, the rate was calculats according to the following equation:

Increase in the number of fronds = number of fronds at the end, of the experiment – the number of fronds at the beginning of the experiment.

4- Rate of increase in wicker length (cm): the length of the wicker was measured by means of a tape, measure, and take from each tree 6 wicker different directions. The rate was calculated according to the following formula:

Increase in wicker length = wicker length at the end of the experiment – wicker length at the beginning of the experiment.

5- Rate of increase in frond width (cm): the width of the frond was measured by tape measure and taken from each tree (3 fronds) the rate was calculated according to the following equation:

Increase in frond width = frond width at the end of the experiment – frond width at the beginning of the experiment.

6- Percentage of dry matter in wicker (%): Samples were taken from the third-grade postcardiac wicker of the growing shoot[xii].the wicker was placed in perforated paper bags for each experimental unit after washing it thoroughly, it was weighed with a sensitive scale, then drieds in an electric oven, at a temperature of 65 °C + 5 ° C, until the weight, stabilized, it was weighed with a sensitive balance and calculated as in the following equation:

Dry matter ratio = dry weight / wet weight × 100.

3. Results and Discussion:

3.1- Rate of increase in tree height (cm):

It is not from the results of Table, (3) that the treatment of sheep for level (8) kg of sapling-1 is superior to all transactions with an average height of (21.88) cm, in general, the addition, of organic waste gave an increase in the height of trees with an average of ([14].22, 18.44, 16.55) cm for fertilization treatments (poultry waste 2 kg, poultry waste 4 kg, sheep waste 4 kg, and a significant superiority compared to the comparisond treatment, which recorded the lowest averages of (6.44) cm respectively, as for the effect of varieties, the Khadrawi variety excelled in the characteristic of the increase in the height of

trees with an average of (16.60) cm, While for the two varieties, yellow Shwaithi and Al-Khastawi, an average of (14.26 and 15.66) cm, respectively, the bilateral overlap between, the two factors of the study showed significant differences, as the treatment (Khadrawi variety + sheep waste 8 kg) recorded the highest average of (23.33) cm and a significant superiority over all transactions, while the comparison, treatmente for the yellow Shwaithi variety recorded the lowest average of (5.33) cm.

Table 3. The effects of the source, and level of organic fertilizer and the overlap between them in increasing the height of young trees for three varieties of palm (cm)

Varieties Treatment	Yellow Shwaithi	Khadrawi	Khastawi	Average treatment
Control treatment	5.33j	7.66 i	6.33 ij	6.44 e
Poultry waste (2) kg Fsila^{-1}	13.66 h	14.66 gh	14.33 g	14.22 d
Poultry waste (4) kg Fsila^{-1}	16.66 ef	20.00 cb	18.66 cd	18.44 b
Sheep waste (4) kg Fsila^{-1}	15.33 fg	17.33 de	E 17.00	16.55 c
Sheep waste (8) kg, Fsila^{-1}	20.33 b	23.33 a	22.00 a	21.88 a
Average items	14.26 c	16.60 a	15.66 b	

- Averages with similar letters have no significant difference according to the Dunkin' test at 5%.

3.2 Increase in Ringworm Length (Cm)

The results of Table, (4) indicate the effect of adding organic fertilizers significantly in increasing the length of ringworm, as the length of the frond increase with the increase in the rate of additions of these fertilizers, with an average of (19.00, 21.39, 20.38, 24.54) cm for the transactions (poultry waste 2 kg, poultry waste 4 kg, sheep waste 4 kg, sheep waste 8 kg) respectively, the comparisond treatment, gave the lowest average for this trait of (12.96) cm. As for the varieties, there are significants differences between, the varieties for the characteristic of the increase in the length of the frond, as the Khastawi variety recorded the highest average of (21.48) cm, follow by the Khadrawi variety with an average of (19.59) cm and finally the yellow variety Shwaithi with the lowest average of (17.89) cm. The bilateral overlap between the two factors, of the study affecteds significantly the characteristic of the increase in the length of ringworm, the superiority was in favor of the treatment (Khastawi variety + sheep waste 8 kg) cm, while the comparison, treatment for the yellow Shwaithi variety recorded the lowest average of (11.77) cm.

Table 4. The effects of the source and level of organic fertilizer, and the overlap between them in the increase in the length of fronds for young trees of three varieties of palm (cm)

Varieties Treatment	Yellow Shwaithi	Khadrawi	Khastawi	Average treatment
Control treatment	14.23 j	12.87 k	11.77 L	12.96 e
Poultry waste (2) kg Fsila^{-1}	20.69 ef	19.00 gh	17.32 i	19.00 d
Poultry waste (4) kg Fsila^{-1}	23.09 bc	21.29 de	19.78 fg	21.39 b
Sheep waste (4) kg Fsila^{-1}	21.91 d	20.77 ef	18.45 h	20.38 c
Sheep waste (8) kg, Fsila^{-1}	27.46 a	24.03 b	22.12 cd	24.54 a
Average items	21.48 a	19.59 b	17.89 c	

- Averages with similar letters have no significant difference according to the Dunkin' test at the level of 5%.

3.3 Increase in the Number of Fronds (Frond of A Tree^{-1})

The results of Table (5) shows that the addition of organic fertilizers has a significant impact on the percentage of increase in the number of fronds, the treatment (sheep waste 8 kg) recorded the highest average of (10.04) tree fronds^{-1}, while the transactions recorded (poultry waste 2 kg, poultry waste 4 kg, sheep waste 4 kg) average record (7.48, 8.36, 7.63) frond tree $^{-1}$ respectively, the comparison treatment gave the lowest, averaged of (3.95) frond tree $^{-1}$. As for the varieties, there are no significant difference, in the increase in the number of fronds between the studied varieties, the effect of bilateral overlap between the study coefficients was the highest average of (11.14) in favor of the treatment (yellow Shwaithi+ sheep waste 8 kg) which significantly outperformed all the coefficients in these interactions, while the treatment (Khastawi variety + comparison treatment

Table 5. Effect of Source and Level of Organic, Fertilizer and the Overlap between Them in Increasing the Number of Fronds for Young Palm Trees for Three Varieties (Palm Frond-1)

Varieties Treatment	Yellow Shwaithi	Khadrawi	Khastawi	Average treatment
Control treatment	4.33 j	4.20 k	3.33 L	3.95 d
Poultry waste (2) kg Fsila^{-1}	7.66 g	7.20 i	7.57 g	7.48 c
Poultry waste (4) kg Fsila^{-1}	8.44 d	8.36 de	8.29 e	8.36 b
Sheep waste (4) kg Fsila^{-1}	7.89 f	7.37h	7.63 g	7.63 c
Sheep waste (8) kg, Fsila^{-1}	11.14 a	8.66c	10.33 b	10.04 a
Average items	7.89 a	7.16 a	7.43 a	

Averages with similar letters have no significant difference according to the Dunkin' test at 5%. recorded the lowests average of (3.33) frond tree -1.

4Increase in Length of the Waist (Cm)

The results of Table (6) showed that the addition of fertilizer coefficients has a significant effect in increasing the length of the property, it gave an average record of (3.05, 3.69, 3.62, 4.75) cm for the transactions (poultry waste 2 kg, poultry waste 4 kg, sheep waste 4 kg, sheep waste 8 kg) respectively, and with a significant superiority compared to the comparisond treatment , which recorded, the lowest averages of (2.09) cm, as for the studied varieties, it affected significantly the increase in the length of the specialty, and Khastawi variety recorded the highest average of (3.76) cm, which surpassed the Khadrawi variety (3.57), while yellow Shwaithi variety recorded the lowest average of (2.98) cm.The resulte of the same tabled indicate that the bilateral, overlap between the two factors of the study significantly affected the characteristic of the increase in the length of the wicker, the treatment (Khastawi variety + 8 kg sheep waste) recorded the highest average record (5.21) cm, while the comparison treatment for the yellow variety gave the lowest average of (1.92) cm.

Table 6. Effect of Source and Level of Organic, Fertilizer, and the Overlap between Them on the Increase in Wicker Length of Young Trees of Three Varieties of Palm (cm)

Varieties Treatmente	Yellow Shwaithi	Khadrawi	Khastawi	Average treatment
Control treatment	1.92 g	2.25 f	2.09 fg	2.09 d
Poultry waste (2) kg Fsila^{-1}	2.77 e	3.02 e	3.35 d	3.05 c
Poultry waste (4) kg Fsila^{-1}	3.08 de	3.89 bc	4.11 bc	3.69 b

Sheep waste (4) kg Fsila^{-1}	3.02 e	3.79 c	4.05 bc	3.62 b
Sheep waste (8) kg, Fsila^{-1}	4.12 b	4.91 a	5.21 a	4.75 a
Average items	2.98 c	3.57 b	3.76 a	

- Averages with similar letters have no significant difference according to the Dunkin' test at 5%.

3.5 Increase in Ringworm Width (Cm)

It is noted from the results of Table (7) that the addition of organic fertilizers has an effect on the characteristic of increasing the width of the ringworm and gave the treatment (sheep waste 8 kg) a significant superiority with an average of (9.51) cm, as it is noted that the supply increased by increasing the level of organic fertilizer addition, as it gave an average of (6.05, 7.41, 7.26) cm for fertilizer treatments (poultry waste 2 kg, poultry waste 4 kg, sheep waste 4 kg) respectively, in general, a significant superiority is observed for all fertilizer treatments compared to the comparison treatment, which gave the lowest average for this trait and amounted to (4.19) cm, as for the studied varieties, there is a significant difference between them, as the variety recorded an average of (7.54) cm, outperforming the Khadrawi variety (7.17), both of which are superior to the yellow Shwaithi variety, who gave the lowest average of (5.94) cm. The bilateral interactions between the two factors of the study showed a clear significant difference between the coefficients as the treatment (Khastawi + sheep waste 8 kg) recorded the highest average of (10.45) cm. In contrast, the comparison treatment for the yellow Shwaithi variety gave the lowest average for this trait (3.85) cm.

Table 7. The effect of source and level of organic fertilizer and the overlap between them in increasing the frond width of young palm trees for three varieties (cm)

Varieties Treatment	Yellow Shwaithi	Khadrawi	Khastawi	Average treatment
Control treatment	3.85 j	4.52 h	4.19 i	4.19 e
Poultry waste (2) kg Fsila^{-1}	5.35 g	6.07 f	6.72 e	6.05 d
Poultry waste (4) kg Fsila^{-1}	6.18 f	7.80 d	8.24 c	7.41 b
Sheep waste (4) kg Fsila^{-1}	6.06 f	7.60 d	8.12 c	7.26 c
Sheep waste (8) kg, Fsila^{-1}	8.25 c	9.84 b	10.45 a	9.51 a
Average items	5.94 c	7.17 b	7.54 a	

- Averages with similar letters have no significant difference according to the Dunkin' test at 5%.

3.6 Percentage of Dry Matter in the Pot (%)

The results in Table (8) showed that fertilizer coefficients are significantly superior, with an average of (46.33, 50.17, 48.51, 51.43) % for fertilizer treatments (poultry waste 2 kg, poultry waste 4 kg, sheep waste 4 kg, sheep waste 8 kg) respectively, while the comparison treatment recorded the lowest average of (43.33)%, with regard to the varieties, there are significant differences between the studied varieties, as the variety gave a yellow Shwaithi, the highest average of 49.03%, which differs significantly from the variety Khastawi, while the vegetable variety recorded the lowest value of 46.74%, the bilateral overlap between the two factors of the study showed clear significant differences, as the transaction (yellow Shwaithi variety + sheep waste 8 kg) recorded the highest average of (53.06)% and a significant superiority over all transactions, while the comparative treatment for the vegetable variety gave the lowest average of (42.83)%.

Table 8. The effect of the source and level of organic fertilizer and the overlap between them in increasing the dry matter percentage of young palm trees for three varieties (cm)

Varieties Treatment	Yellow Shwaithi	Khadrawi	Khastawi	Average treatment
Control treatment	43.60 g	42.83 h	43.56 g	43.33 e

Poultry waste (2) kg Fsila^{-1}	47.14 e	45.09 f	46.77 e	46.33 d
Poultry waste (4) kg Fsila^{-1}	51.81 b	49.11 d	49.60 c	50.17 b
Sheep waste (4) kg Fsila^{-1}	49.56 c	47.09 e	48.88 d	48.51 c
Sheep waste (8) kg, Fsila^{-1}	53.06 a	49.6 c	51.63 b	51.43 a
Average items	49.03 a	46.74 c	48.09 b	

- Averages with similar letters have no significant difference according to the Dunkin' test at 5%.

With regard to organic fertilization treatments, they have significantly affected the vegetative qualities regardless of the source of these fertilizers as shown in Table (3-3-6-7-8) for young palm shoots, the reason for this is perhaps due to the role of organic fertilizer in improving the physical and chemical properties of the soil and increasing the readiness of many nutrients in it for a longer period even to the late stages of plant growth and the entry of these nutrients into the process of photosynthesis, as well as increasing the division and elongation of cells that increase the leaf area and the percentage of dry matter in the leaves and increase the content of the leaves of chlorophyll, which was reflected in the height of the plant, the number of fronds, the width of the ringworm, the width of the khosa and others[xiii]. As the organic fertilizer has a direct and indirect role in increasing the qualities of growth, and the direct effect is through the liberation of nutrients such as nitrogen, phosphorus, potassium and some growth-stimulating substances, this leads to the formation of a strong and active root system and increases the absorption of ready-made nutrients[xiv]. The indirect effect of the role of humic substances in improving the fertile, physical and chemical properties of the soil leads to increased soil moisture conservation[xv]. It also increases the activity and effectiveness of microorganisms that secrete growth regulators, which help improve vegetative growth qualities[xvi]. It is also noted through the results that the source of organic fertilizer affected the vegetative growth qualities of the palm, it is noted that poultry waste outperformed sheep waste when added at the same level, this is because poultry waste contains more nutrients than sheep waste, on the other hand, organic acids are secreted more than sheep waste, and these acids work to reduce the pH and increase the readiness of nutrients, this is reflected in the increase in the carbon metabolism in the plant and thus reflected in the growth and division of cells[xvii, xviii].

As for the variety, it is clear from the tables shown earlier (3-3-6-7-8) that the difference in varieties, organic fertilization treatments and theird overlaps significantly increased the vegetative, qualities of young palm trees, the influence of varieties on vegetative, growth qualities, it is believed, that its cause is due to the phenotypic difference of these, varieties result from their genetic structures that led, to the difference between them to benefit from the coefficients of the experiment, this may be due to differences in genetic makeup between taxa, and the different nature of theird growth, which leads to phenotypic, difference in the shape of the vegetative system, its size, and its interacti with the conditions prevailing in the grow season , differences can be attribut to physiological influences as well as difference between varieties in terms of their ability, to absorb water and nutrient from soils that directly, affects increased vegetative growth[xix]. These are consistent with the findings of (12) when studying two varieties of palm, as well as these results are consistent with what I found[1] when studying three varieties of palm.

Conclusions

From the results of the study we can conclude the following:

Poultry waste was superior to sheep waste in all the studied traits when they were added at the same level, but sheep waste with a level of (8) kg tree-1 was superior to poultry waste with a level of (4) kg tree-1 for all the studied traits. Varieties differed among themselves, as the Khadrawi variety excelled in increasing plant height and the Khastawi variety gave a significant superiority in the characteristics of increase in frond length and increase in frond length and frond width. The yellow Shwaithi also excelled in increasing the percentage of dry matter. With regard to the bilateral interaction between the two factors of the study, the varieties differed in the extent of their response to organic fertilization with poultry and sheep waste, and the best results were at high levels of these two fertilizers with the three varieties.

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تأثير مصادر من الاسمدة العضوية في نمو ثلاثة اصناف من اشجار النخيل الفتية (*Phoenix dactylifera* L.).

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الخلاصة

نفذت تجربة عامليه في محطة البحوث والتجارب الزراعية في منطقة الصيادة (تقع على خطي عرض 35.33 شمالاً وطول 44.34 شرقاً) التابعة لقسم البستنة وهندسة الحدائق، لكلية الزراعة - جامعة كركوك، العراق للفترة من شهر آذار (2023) ولغاية شهر كانون الاول (2023) ، لدراسة تأثير مصادر من الاسمدة العضوية في نمو ثلاثة أصناف من أشجار النخيل الفتية (شويثي أصفر ، خستاوي، خضراوي) كان التسميد العضوي بأربعة مستويات (مخلفات دواجن 2 كغم شجرة$^{-1}$ ، مخلفات دواجن 4 كغم شجرة-1، مخلفات اغنام 4 كغم شجرة$^{-1}$ ، مخلفات اغنام 8 كغم شجرة) فضلا عن معاملة المقارنة. اجريت التجربة على 45 شجرة فتية متجانسة في النمو الخضري قدر الامكان وبعمر اربع سنوات ومزروعة بأبعاد 8×8 م. تم تنفيذ التجربة وفق تصميم القطاعات العشوائية بنظام القطع المنشقة ***Split plot Desing*** وعدت الاصناف ضمن الألواح الرئيسية ***Main plot*** ومعاملات التسميد العضوي ضمن القطع الثانوية ***Sup plot*** وتمثلت الوحدة التجريبية بشجرة واحدة. ويمكن تلخيص النتائج بمايلي:

1-في معاملات التسميد العضوي يلاحظ تفوق مخلفات الدواجن على مخلفات الاغنام عند اضافة هذين السمادين بمتوسط 4 كغم شجرة$^{-1}$ ، لكن اعطت مخلفات الاغنام عند مستوى (8) كغم شجرة$^{-1}$ تفوق لجميع لزيادة ارتفاع النبات ***21.88*** سم و الزيادة في طول السعف 24.54 سم و ***10.04*** سعفة نخلة$^{-1}$ و الزيادة في طول الخوصة 4.75 سم و الزيادة في عرض السعفة 9.51 سم ونسبة المادة الجافة 51.43%.

2-اختلاف الأصناف في مدى استجابتها للمعاملات، اذ تفوق الصنف الخضراوي في زيادة ارتفاع النبات و تركيز النتروجين والبروتين في الخوص وبمتوسط بلغ 16.60 سم و 1.59 % و 9.93% بالتتابع ، واعطى الصنف خستاوي تفوق معنوي لصفات الزيادة في طول السعف والزيادة في طول الخوص والزيادة في عرض السعف وبمتوسط بلغ ***21.48*** سم و 3.76 سم و 7.54 سم وبلغت نسبة المادة الجافة 49.03%.

الكلمات المفتاحية **:**تسميد عضوي،شوائي أصفر،خضراوي،خستاوي*Phoenix dactylifera* L**.**