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EFFECT OF SPRAYING ORGANIC EMULSION (APPETIZER) AND NANO NPK WITH UREA ON SOME GROWTH CHARACTERISTICS OF THREE SYNTHETIC CULTIVARS OF MAIZE

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ABSTRACT

A field experiment was carried out at the research station of the College of Agriculture - Wasit University / Kut, during the fall season 2021 in soil with texture (sandy mixture) using the RCBD design in the arrangement of splintered plates and with three replications, to study the effect of spraying different combinations of organic emulsion (Appetizer) and NPK nano fertilizer with urea fertilizer on the growth of synthetic cultivars of yellow corn. The main panels included three synthetic varieties of yellow corn (Fajr1, Sumer and Baghdad3), which symbolized by (V1,V2,V3) in sequence, while the secondary panels included five fertilization treatments in which mineral fertilizer (urea) was used 46% nitrogen with the full recommendation (300 kg/ha^{-1}) (control treatment) symbolized by T1 and (adding urea according to the recommendation with the addition of the organic emulsion (Appetizer) in two batches before flowering and full flowering) and symbolized by T2 and (adding urea according to the recommendation with nano-NPK in two batches before flowering and full flowering) and symbolized by T3 and (reduction of the recommendation treatment in the first and second batches with the addition of the organic emulsion (Appetizer) in two batches before flowering and full flowering) and symbolized by T4 and (reduction of the recommendation treatment in the first and second batches with the addition of nano-NPK in two batches before flowering and full flowering) It is symbolized by T5. The results showed that there were significant differences between the different fertilization treatments, as the T5 nano fertilization treatment achieved the highest average in most of the growth and quality indicators, It gave the highest average number of days from planting up to 75% of male flowering amounted to 68.00 days and the highest average number of days from planting to 75% of female flowering amounted to 73.44 days and the highest plant height (172.96 cm) and ear height (70.01 cm), the number of leaves per plant (15.23) and the content of The chlorophyll of the leaf under the ear (60.09). The results also showed that the Baghdad3 variety excelled in most of the growth indicators and gave the highest average number of days from planting up to 75% of male flowering amounting to 66.07 days and the highest average number of days from planting up to 75% of female flowering amounted to 72.00 days and the highest plant height (170.04 cm) and ear height (67.11 cm), the number of leaves per plant (14.26), the chlorophyll content of the leaf under the ear (55.49). The interaction between fertilization treatments and cultivars was not significant for most of the growth characteristics.

Keywords: Yellow corn, synthetic items, appetizer emulsion, NPK nanoparticles.

أثير رش المستحلب العضوي (Appetizer) وNPK النانوي مع اليوريا في بعض صفات النمو لثلاث اصناف تركيبية من الذرة الصفراء

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الخلاصة

لدراسة تأثير الرش لتوليفات مختلفة من المستحلب العضوي (Appetizer) وسماد NPK النانوي مع سماد اليوريا في نمو وحاصل أصناف تركيبية من الذرة الصفراء، نفذت تجربة حقلية في محطة الابحاث التابعة لكلية الزراعة – جامعة واسط / الكوت، خلال الموسم الخريفي 2021 في تربة ذات نسجة (مزيجية رملية) باستعمال تصميم RCBD بترتيب الالواح المنشقة وبثلاثة مكررات، تضمنت الالواح الرئيسة ثلاثة أصناف تركيبية من الذرة الصفراء (فجر1وسومروبغداد3) والتي رمز لها (V1 ،V2 ،V3) بالتتابع، في حين تضمنت الالواح الثانوية خمسة معاملات للتسميد أستخدم فيها السماد المعدني (اليوريا) 46% نتروجين بكامل التوصية (300 كغم /هـ$^{-1}$) (معاملة المقارنة) ورمز لها بـ T1 و(إضافة اليوريا حسب التوصية مع اضافة المستحلب العضوي (الابيتايزر) على دفعتين قبل التزهير والتزهير الكامل) ورمز لها بـ T2 و(إضافة اليوريا حسب التوصية مع NPK النانوي على دفعتين قبل التزهير والتزهير الكامل) ورمز لها بـ T3 و(إختزال معاملة التوصية بالدفعتين الاولى والثانية مع إضافة المستحلب العضوي (الابيتايزر) على دفعتين قبل التزهير والتزهير الكامل) ورمز لها بالرمز بـ T4 و (اختزال معاملة التوصية بالدفعتين الاولى والثانية مع اضافة NPK النانوي على دفعتين قبل التزهير والتزهير الكامل) ورمز لها بـ T5. أظهرت النتائج وجود فروق معنوية بين معاملات التسميد المختلفة، اذ حققت معاملة التسميد النانوي T5 أعلى متوسط في اغلب مؤشرات النمو، وأعطت أعلى متوسط لعدد الايام من الزراعة حتى 75 % تزهير ذكري بلغ 68.00 يوماً وأعلى متوسط عدد ايام من الزراعة حتى 75 % تزهير انثوي بلغ 73.44يوماً وأعلى إرتفاع نبات (172.96سم) وإرتفاع العرنوص (70.01 سم) وعدد الاوراق في النبات (15.23) ومحتوى الكلوروفيل للورقة تحت العرنوص (60.09) . كما اظهرت النتائج ان الصنف بغداد3 قد تفوق في أغلب مؤشرات النمو وأعطى أعلى متوسط لعدد الايام من الزراعة حتى 75 % تزهير ذكري بلغ 66.07 يوماً وأعلى متوسط عدد ايام من الزراعة حتى 75 % تزهير انثوي بلغ 72.00 يوماً وأعلى إرتفاع نبات (170.04سم) وإرتفاع العرنوص (67.11 سم) وعدد الاوراق في النبات (14.26) ومحتوى الكلوروفيل للورقة تحت العرنوص (55.49) مقارنة بالأصناف الاخرى، وكان التداخل بين معملات التسميد والاصناف غير معنوي لمعظم صفات النمو.

الكلمات المفتاحية: الذرة الصفراء، اصناف تركيبية، مستحلب الابيتايزر، NPK النانوي.

INTRODUCTION

Yellow corn (*Zea mays* L.) is considered one of the crops with an important strategic and economic aspect in most countries of the world, as it comes in third place after wheat and rice crops in terms of cultivated area and productivity, given the importance and diversity and uses of yellow corn in human food directly or in industry and preparing diets Poultry and animal feed, both dry or soft, as well as its use in bio-fuel and various medical fields for caloric until it was called the queen of grain crops **(Bukhsh *et al*., 2010)**. Yellow maize is cultivated in Iraq on a large scale, as the cultivated area for the year 2016 amounted to an estimated 76000 thousand hectares, with an average production of 3.415 tons/ha^{-1} **(Directorate of Agricultural Statistics, 2017)**. Despite this importance, the production rate is still low compared to global production and does not meet the needs of Iraq. The yellow corn crop is among the crops that stress the soil and need many quantities of fertilizers, as it is a four-carbon plant and is responsive to fertilizers. These fertilizers may significantly pollute the environment through their impact on the air as a result of their emission in the form of ammonia and nitrogen oxides, which negatively affects human health. Therefore, specialists in the field of modern agriculture had to use modern techniques to increase production, and the most important of these techniques is the foliar spray method using nanotechnology to fertilize crops and the use of nano-fertilizers that contain the main nutrients for the plant (NPK), as well as the use of emulsion foliar fertilizers containing a number of the micro-nutrients (Mn, Zn and marine algae), which is known as Nutrition Foliar, as the addition of foliar fertilizers may be to treat the lack of nutrients as a result of chemical and physical soil problems and may be added to encourage the growth and increase the accumulation of dry matter for the plant by spraying it on the vegetative parts of the plant, which It is more effective than the ground fertilization method **(EL-Ahmar،2003)**. in addition to reducing the amount of compost used **(Al-bayrouti *et al*., 2008)**. The foliar fertilization method may not replace the fertilizer additions from chemical and organic fertilizers, but rather it is a supplement to them **(Bahia, 2001)**. Yellow corn varieties differ in their response to different service operations, including their response to ground or foliar fertilization according to the genetic nature of the variety, and therefore choosing the appropriate variety and the most responsive to service operations, including fertilization, may increase the productivity of the crop and improve its quality.

MATERIALS AND METHODS

A field experiment was carried out during the autumn agricultural season of 2021 at the agricultural research station, college of agriculture, Wasit university. Three random samples were taken from each depth of the field soil (0-30 cm) and they were dried aerobically, then ground and sieved with a sieve whose holes diameter is 2 mm and a homogeneous sample was taken from it for analysis in the laboratories of the department of soil and water resources, college of agriculture, Wasit university to know some physical and chemical properties as shown in (Table 1) The experiment included two factors, the first includes three approved synthetic varieties of maize (Fajr1,Sumer and Baghdad3) It comes from the Ministry of Agriculture, department of agricultural research, Maize department and is symbolized by (V3,V2,V1) sequentially and the second is five fertilization combinations that include the control treatment and four treatments, which are symbolized by (T5, T4, T3, T2, T1) in sequence. It contains the following fertilizers:

1- Urea fertilizer at a rate of 300 kg/ha and according to the recommendation.

2- Emulsion appetizer (Mn, Zn and marine algae) is added at a rate of (150 mL/100 L of water) added as a spray in two batches before flowering and full flowering (instructions of the producing company). 3- NPK fertilizer (20-20-20) nano chelating is added at a rate (2g

dissolved in 1 L of water) and added as a spray in two batches before flowering and full flowering. The experiment was carried out according to the arrangement of the split panels in the design of randomized complete sectors RCBD and with three replications that included the main panels (Main-Plot) and the synthetic varieties (Fajr1,Sumer and Baghdad3) while the secondary panels (Sub-Plot) occupied the aforementioned fertilizer treatments, the field was prepared by plowing the land Two orthogonal plows using the inverted plow, smoothed by disc harrows and leveled with the leveling machine, the field is divided into three sectors, then each sector is divided into three main experimental units representing the varieties, each of which includes five secondary experimental units representing fertilizer treatments, the area of each experimental unit is $9m^2$ with 3×3m, spacers were left between the experimental units about 0.5m to ensure that the spray of the (Appetizer) and nano-NPK fertilizer did not fly out. 1/8/2021 In the upper third of the rice to avoid possible damage from the accumulation of salt, as 2-3 seeds were placed in each hole, and after the emergence of seedlings was completed, the bushes failed to germinate and the process of thinning was carried out to one plant in the field After 14 d of planting (the height of the plants reached 15-20 cm), the experiment field was irrigated immediately after planting, and all the experimental units were irrigated equally to ensure a good germination rate. The following measurements were taken: number of days from planting up to 75% male flowering, number of days from planting up to 75% female flowering, plant height (cm) and ear height (cm) and number of leaves (leaf.plant^{-1}) and leaf content of chlorophyll SPAD (mg^{-1}/100 g weight soft) and plant dry weight (gm plant^{-1}). The results were statistically analyzed using the statistical program Gen Stat Release 10.3DE. The arithmetic averages of the labs were compared using the least significant difference L.S.D at the 0.01 and 0.05 probability levels.

Table (1): Some physical and chemical properties of field soil before planting.

Adjective measurement		the value	Unit	
Soil tissue components	The sand	544	G. kg^{-1}	Mineral Sandy
	Green	277	G. kg^{-1}	
	Clay	179	G. kg^{-1}	
Ready nitrogen		29	Mg.kg^{-1}soil	
Ready phosphorus P		3.8	Mg.kg^{-1} soil	
Ready potassium K		127.24	Mg.kg^{-1}soil	
Organic matter OM		1.80	G. kg^{-1}	
CaCo3 carbonate		152.3	G. kg^{-1}	
Ca ++		26.64	L^{-1} mL	
Solid sodium Na+		11.21	L^{-1} mL	
Mg ++ melodic magnesium		12.33	L^{-1} mL	
CI chlorine		28.85	L^{-1} mL	
Solving potassium		9.78	L^{-1} mL	
HCO3 dissolved bicarbonate		1.4	L^{-1} mL	
EC		9.97	Desmond M^{-1}	
pH		7.29	---	

RESULTS AND DISCUSSION

Number of days from planting to 75% male flowering

The characteristic of early or late flowering affects the length and shortness of the vegetative growth period of the plant and also affects the stage of filling the bean, as this characteristic affects the efficiency of the source and the efficiency of the downstream or both together and then reflecting on the growth characteristic **(Issa, 1990)**. The results of (Table 2)

show that there is a significant effect of fertilizer treatments during the period from planting up to 75% of male flowering during the planting season. Where it is noted that the T5 fertilizer treatment was superior to the rest of the fertilizer plants with an average of 68.00 d during the growing season, followed by the T4 treatment with an average of 65.33 d, while the control treatment T1 recorded the lowest average for that trait amounting to 61.00 d during the growing season, the reason may be due to the superiority of the nano-NPK fertilization treatment To the role of the major elements nourishing the plant, especially the role of the nano-nitrogen element, by increasing the period from planting up to 75% of male flowering, as the high addition of nitrogen element delays the period of flowering and maturation, and about 39% of the nitrogen absorbed from the maize plant works on the formation of male organs And the female, in addition to the work of the nano fertilizer by reducing the stomata resistance and increasing the stomata conductivity and this in turn leads to providing the maize plant with a sufficient amount of CO_2 and water, which helps in the continuity of the carbonic metabolism process, in addition to withdrawing the nutrients from the soil into the plant and thus leads to increased growth of the vegetative group, and that containing NPK nano fertilizer on the major elements will work to create a nutritional balance within the plant and in the early stages of plant growth, which improves the metabolism Nutritional and metabolic activity, which leads to an increase in the total metabolic activities responsible for cell division and elongation **(Kamiab & Zamanibahramabadi, 2016)**, Which in turn works to shorten the flowering period and this effect is reflected in improving the growth and development characteristics of the plant and the transition from the stage of its vegetative growth to the stage of its reproductive growth, and the significance of the fertilization treatment with organic emulsion (Appetizer) T4 may be due to its components of the micro-nano elements zinc, manganese and marine algae extract that It has a role in the activity of the vital systems of the plant, stimulating vegetative growth, inducing flowering and raising its efficiency **(Nabti & Hartman, 2016)**. The results of (Table 2) indicate that the cultivars under study may differ significantly among themselves in this trait, as the cultivar Baghdad3 took the longest period to reach 75% male flowering, with an average of 66.07 d, while the cultivar Fajr1 recorded the shortest period to reach 75% male flowering with an average of 62.94 One day, and the reason for this union may be due to the fact that these varieties differ in the length of their season, and these results are consistent with what was reached **(Al-Nouri & al-Abadi, 2013; Jader *et al*., 2017)**. As for the overlap, the results indicate that there is no significant difference between the combinations of cultivars and the fertilizer treatments in that trait, as the effect of the two factors under study was singular and the differences were apparent.

Table (2): The effect of spraying organic emulsion (Appetizer) and NPK nano fertilizer with urea on cultivars and the interaction between them on the number of days from planting up to 75% of male flowering.

Fertilization transactions	Varieties			Average transactions
	Fajr1	Sumer	Baghdad3	
T1	59.67	61.33	62.00	61.00
T2	61.67	62.33	64.67	62.89
T3	64.00	63.33	65.67	64.33
T4	63.67	65.00	67.33	65.33
T5	65.67	67.67	70.67	68.00
L.S.D 0.05		N.S		0.992
Average varieties	62.94	63.93	66.07	
L.S.D 0.05		1.393		

Number of days from planting to 75% female flowering

The results of (Table, 3) indicate that there are significant differences between the different fertilizer treatments among the cultivars during the planting season. Whereas the T5 fertilization treatment gave the highest average number of days up to 75% of female flowering amounted to 73.44 d, followed by the T4 nanofertilization treatment with an average of 70.67 d, while the control treatment T1 recorded the lowest average for this trait amounting to 66.11 d, and the results of the analysis showed that all fertilizer treatments had It excelled with higher results than the control treatment, as the abundance of nitrogen leads to an increase in the size and speed of cell division and this leads to an increase in growth and its continuity, which in turn causes an increase in the activity of the work of auxins and cytokinins, which makes the plant's behavior towards increased vegetative growth **(Duete *et al*., 2008)**. The results showed that there was a significant difference in the planting season between the cultivars for this trait, as the Baghdad3 variety took the longest period to reach 75% of female flowering, with an average of 72.00 d., while the Fajr1 variety took the shortest period to reach that stage with an average of 67.00 d. for the planting season. The result is consistent with his findings **(Asaduzzaman, *et al*., 2014; Kazem & Arak, 2016)**. As for the interaction, the results indicate that there is no significant difference between the combinations of cultivars and fertilizer treatments in that trait, as the effect of the two factors under study was single and the differences were apparent, which in turn leads to an increase in the enzymes of cell divisions, and this in turn leads to an increase in the vegetative growth of the plant.

Table (3): Effect of spraying organic emulsion (Appetizer) and NPK nano fertilizer with urea on cultivars and the interaction between them on the number of days from planting up to 75% female flowering.

Fertilization transactions	Varieties			Average transactions
	Fajr1	Sumer	Baghdad3	
T1	63.67	66.33	68.33	66.11
T2	65.00	68.67	69.67	67.78
T3	67.67	69.33	72.33	69.78
T4	68.00	70.67	73.33	70.67
T5	70.67	73.33	76.33	73.44
L.S.D 0.05		N.S		1.205
Average varieties	67.00	69.67	72.00	
L.S.D 0.05		1.477		

Plant Height

It is clear from the results of (Table, 4) that there is a significant effect of the fertilizer treatments for plant height during the growing season, as the T5 fertilizer plant recorded a higher average in plant height that reached 172.96 cm, followed by the T4 nano fertilization treatment with an average of 168.06 cm, and it is clear that all fertilizer treatments significantly outperformed the treatment The T1 control, which recorded the lowest significant difference for this trait, reached 157.84 cm during the growing season. The plant as a result of using the T5 treatment of NPK nano fertilizer shows the importance of the work of this fertilizer with its unique and distinctive properties such as its small particles and high and effective surface area,

which enables it to increase the speed of penetration, absorption and representation, in addition to increasing enzymatic activity and speed in biochemical reactions at their nano level. These results are consistent with Findings **(Laware & Raskar, 2014)** that the role of nano composites contribute to encouraging and improving growth characteristics. The significant increase of the plant to the treatment of organic emulsion (Appetizer) on the vegetative total of the maize plant by the action of seaweed extract and nano-micro-elements is attributed to the supply of the plant with the necessary nutrients that are difficult to reach from the soil, which in turn leads to an increase in the enzymes of cell divisions and this in turn leads to increased growth Vegetative plant **(Kalra *et al.*, 2020)**. The results of (Table, 4) show that there is a significant difference between the cultivars for this trait, as Baghdad3 recorded a higher average plant height of 170.04 cm, while Sumer recorded a lower average of 162.85 cm compared to other cultivars. As for the interaction, the results indicate that there is no significant difference between the combinations of cultivars and fertilizer treatments in that trait, as the effect of the two factors under study was singular, and the differences were apparent.

Table (4): Effect of spraying organic emulsion (Appetizer) and NPK nano fertilizer with urea on cultivars and the interaction between them on plant height.

Fertilization transactions	Varieties			Average transactions
	Fajr1	Sumer	Baghdad3	
T1	156.54	154.17	162.82	157.84
T2	163.20	162.79	169.32	165.10
T3	166.81	164.83	169.11	166.92
T4	167.56	163.87	172.76	168.06
T5	174.08	168.61	176.19	172.96
L.S.D 0.05		N.S		1.998
Average varieties	165.64	162.85	170.04	
L.S.D 0.05		2.906		

Ear height

The results of (Table, 5) showed that there were significant differences between the different fertilization treatments, where the T5 fertilization treatment was superior to the rest of the other treatments for ear height trait, as it recorded a higher average of 70.01 cm during the planting season, then followed by the T4 fertilization treatment with an average of 65.55 cm, while the control treatment T1 gave a lower average. For this trait, it reached 60.50 cm, and from the results of (Table, 5) it is clear that all fertilizer treatments outperformed the control treatment T1 during the planting season. and gibberellins, which increase the cell size and elongate the phalanges, which in turn leads to an increase in plant height **(Fageria *et al.*, 1997)**. And then the spike with the plant, and the significance of the T4 fertilization treatment is attributed to the role of nano-microelements in supplying the plant with the necessary nutrients, in addition to having a wide surface area that increases biochemical reactions and cell division enzymes, which leads to a reduction in oxidative damage, delayed aging and increased plant growth **(Kalra *et al.*, 2020)**. The results indicate that there are significant differences between the cultivars for this trait, as Baghdad3 cultivar gave a higher average of 67.11 cm, while Sumer cultivar gave a lower average of 63.24 cm. These results are in agreement with **(Jassem & Kateb, 2017)**. As for the interaction, the results indicate that there is no significant difference between the combinations of cultivars and fertilizer treatments in that trait, as the effect of the two factors under study was independent of the other factor and the differences were only apparent.

Table (5): The effect of spraying the emulsion (Appetizer) and NPK nano fertilizer with urea on the cultivars and the interaction between them in the height of the ear.

Fertilization transactions	Varieties			Average transactions
	Fajr1	Sumer	Baghdad3	
T1	60.14	60.17	61.18	60.50
T2	62.74	62.74	65.83	63.77
T3	62.71	63.48	67.04	64.41
T4	65.71	61.60	69.34	65.55
T5	69.63	68.22	72.17	70.01
L.S.D 0.05		N.S		1.546
Average varieties	64.186	63.24	67.11	
L.S.D 0.05		2.000		

Number of leaves

The results of (Table, 6) show that there are significant differences between the different fertilization treatments, as well as the interaction between the cultivars. The treatment of T5 fertilization outperformed the rest of the treatments and gave the highest average for the trait of the number of leaves per plant amounted to 15.23 leaf.plant^{-1} during the planting season, while the treatment of T1 fertilization gave the lowest average for this trait amounted to 12.97 leaf. plant^{-1}, as also evident from the results of (Table, 6) All fertilizer treatments outperform the control treatment, and this result is consistent with what was reached **(Buzea *et al*., 2007)**, as they found that the nano-fertilizer elements have the ability to stimulate vegetative cells during the stage of division and elongation through their direct effect on the leaf formation area and the increase in the number of their division in addition to the effect On the hormones responsible for the formation of leaves and increase their number. The nitrogen element also contributes to increasing the emergence of one or more leaves, and when combined with other elements, it forms building blocks for a number of plant growth components **(Below, 2009)**. The results also showed that there were significant differences between the cultivars for the number of leaves per plant, where the cultivar Baghdad3 recorded the highest average for that trait, which amounted to 14.26 leaf. plant^{-1}, while the cultivar Sumer gave the lowest average of 13.72 leaf. plant^{-1}, and the reason for this is due to the difference in the genotypes of the cultivars **(Abdullah *et al*., 2010)**. As for the interaction, the results indicate that there is no significant difference between the combinations of cultivars and fertilizer treatments in that trait, as the effect of the two factors under study was independent of the other factor and the differences were only apparent.

Table (6): The effect of spraying the emulsion (Appetizer) and NPK nano fertilizer with urea on the cultivars and the interaction between them on the number of leaves.

Fertilization transactions	Varieties			Average transactions
	Fajr1	Sumer	Baghdad3	
T1	13.1	12.3	13.5	12.97
T2	13.7	13.2	13.7	13.53
T3	13.9	13.9	13.9	13.90
T4	14.1	14.1	14.7	14.30
T5	15.1	15.1	15.5	15.23
L.S.D 0.05		N.S		0.2937
Average varieties	13.98	13.72	14.26	
L.S.D 0.05		0.2242		

Chlorophyll content of SPAD leaves

The content of chlorophyll is related to the process of carbonization, as the growth of the plant increases with the increase in the content of chlorophyll, and this increase in the content of chlorophyll is positively reflected on the increase in the leaf area, which depends on increasing the volume and efficiency of the carbonization process in leaves **(Akma *et al.*, 2010)**. (Table, 7) shows that there were significant differences between the fertilization treatments for chlorophyll content of leaves. Whereas, the T5 nano-fertilizer treatment outperformed the rest of the treatments and recorded a higher average of chlorophyll content of 60.09 mg^{-1}/100 gm fresh weight in the leaves, in Comparison with the control treatment T1, which recorded a lower average for that trait of 45.79 mg^{-1}/100 gm fresh weight, and from the results of the analysis table It turns out that all the different fertilizer treatments have outperformed the control treatment, and the reason for this is that nanofertilizer materials possess chemical and physical activity compared to traditional fertilizers, which results in an increase in the surface area of their particles, and the presence of a large number of atoms of nanofertilizer on the outer surface leads to stimulation Chlorophyll splits, thus increasing the ability of chlorophyll pigments to absorb light from solar radiation and then convert it into chemical energy stored in the form of organic materials that can move to all parts of the plant to benefit from it to accomplish its various functions **(Sharifi & Rokhzadi, 2016)**. The nitrogen element also has an important role in increasing chlorophyll in the content of plant leaves, as it is included in the composition of the compound Porophyrins, which is important in the formation of chlorophyll and cytochrome enzymes necessary for the process of respiration and the synthesis of carbon, which is positively reflected in building an excellent vegetative group for the crop **(Darren *et al.*, 2000)** and that this agrees with **(Uribelarrea, 2009)**. The results show that there are no significant differences between the cultivars under study for this trait, and the difference was only apparent, as the Baghdad3 variety recorded the highest chlorophyll content in leaves with an average of 55.49 mg^{-1}/100 g fresh weight, while the cultivar Sumer gave the lowest average of 53.13 mg^{-1}/100 gm fresh weight. The reason may be due to the convergence of the genetic response to the growing conditions. As for the interaction, the results indicate that there is no significant difference between the cultivar combinations and the fertilizer treatments in the chlorophyll content of the leaves of the plant, as the effect of the two factors under study was individually and the differences were apparent.

Table (7): The effect of spraying the organic emulsion (Appetizer) and NPK nano fertilizer with urea on the cultivars and the interaction between them on the chlorophyll content of leaves.

Fertilization transactions	Varieties			Average transactions
	Fajr 1	Sumer	Baghdad 3	
T1	44.37	45.37	47.63	45.79
T2	52.07	54.13	52.63	52.94
T3	53.43	52.93	56.53	54.30
T4	56.27	54.53	59.10	56.63
T5	60.03	58.67	61.57	60.09
L.S.D 0.05		N.S		2.291
Average varieties	53.23	53.13	55.49	
L.S.D 0.05		N.S		

CONCLUSIONS

According to the above-mentioned results, the treatment of NPK nano fertilizer and the organic emulsion treatment with two-thirds of the recommendation of urea fertilizer achieved the best results in most growth characteristics, and the treatment of spraying with nano NPK fertilizer significantly outperformed the vegetative growth indicators and all its components compared with the rest of the treatments The fertilizer, and the synthetic variety Baghdad3 was significantly superior in most vegetative growth indicators and its components compared with the two synthetic varieties Fajr1 and Sumer.

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