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THE RESPONSE OF TWO CULTIVARS OF WHEAT (*TRITICUM AESTIVUM* L.) FOR FOLIAR FERTILIZATION FOR DIFFERENT STAGES OF GROWTH

Ali Kareem Hussein and Naser M. Naser
Al-Mussaib Technical College, University of Al-Furat Al-Awsat Technical, Babylon province, Iraq.

Abstract

A field experiment was conducted during the winter season 2018-2019 in Al-Sadda region belonging to Babylon province according to the order of split-split-plots within the Randomized Complete Block Design (RCBD), with three replicates, where the cultivars (Abu Ghraib and IPA 99) occupied the main plots, which is symbolized by (A1, A2) while spraying dates (branching stage, elongation stage, booting stage) occupied sub-plots which is symbolized by (B1, B2, B3). The concentrations of foliar spraying (0, 5, 10 mg.L^{-1}) occupied sub-sub-plots which is symbolized by (C1, C1, C3). Spraying was conducted using nutritious fertilizer (University fertilizer). The results showed that there was a difference between the cultivars, where the A2 cultivar was excelled in all traits of the yield and quality, except the trait of Biological yield by giving it the highest yield amounted to (5.68 tons.ha^{-1}). The results showed that there was a significant effect for the spraying dates, where the spraying date B3 was excelled in the traits of the number of grains per spike, the weight of 1000 grains, the biological yield, the harvest index, the grain yield amounted to (5.69 tons.ha^{-1}), the percentage of protein and the percentage of Gluten. While the spraying date B2 was excelled in the trait of the number of spikes only. As for Concentrations, the C2 concentration was excelled in the traits of the number of spikes and number of grains per spike, the weight of 1000 grains, biological yield, harvest index, and grain yield which amounted to (5.38 tons.ha^{-1}), It also excelled in the percentage of protein and Gluten. The interaction between A and B showed an excelling the combination of B3A2 in the traits of the number of grains per spike, weight of 1000 grains, biological yield, the percentage of protein and Gluten. The interaction between C and A showed excelling the combination of (A2 + C2) in the number of spikes.m^{-2} and the grain yield which amounted to (5.88 tons.ha^{-1}). As well as, the percentage of protein and Gluten has excelled. As for the interaction between C and B, The combination of (C2 + B3) was excelled in the traits of the number of grains per spike, weight of 1000 tablets, grain yield which amounted to (6.09 tons.ha^{-1}), the percentage of protein and the percentage of Gluten. While the triple interaction showed a significant effect, where the combination of (C2 + B3 + A2) in the traits of the weight of 1000 grains, the grain yield amounted to (6.63 tons.ha^{-1}) and the percentage of the Gluten.

***Keywords*:** wheat, cultivar, foliar fertilizer, growth stages.

Introduction

Wheat (*Triticum aestivum* L.) is a herbaceous plant belonging to the Poaceae family and wheat from one of the oldest agricultural crops known to humans. Wheat is considered the world's main crop and staple food, Which human depends on it mainly. The wheat crop is considered an old crop that was cultivated thousands of years ago and it is grown in almost all regions of Iraq. The harvested area in Iraq for the years 2012 and 2013 amounted to (1.20, 1.70 million tons.ha^{-1}), with average yield amounted to (2.00, 1.94 tons.ha^{-1}) for the two years, respectively (FAO, 2014). It is noted that despite the cultivation of wheat crop since ancient times, it still suffers from many production problems. This was reflected in the low yield of dunums when comparing the quantity of production in developed countries. These problems can be attributed to their main causes in terms of cultivation methods, crop service, and soil problems, in addition to the different of cultivated wheat cultivars, which sometimes require specificity in cultivating it and its responding to Fertilizer and environmental change. Iraqi soil, in general, has a high content of calcium carbonate and high pH tends to alkaline, thus decrease nutrient elements availability, so it is necessary to follow certain methods for the purpose of increasing the nutrient elements availability to increase the growth and production of crops and one of these methods is the use of the foliar nutrition, It is found that foliar nutrition is 20 to 8 times more efficient than soil fertilization. It is also a quick and effective method for transferring nutrients within the plant. It is also a complementary method of soil fertilization, but not the alternative method, since it distributes nutrient elements to the total vegetative almost homogeneously by adding it to soil (Bashish and Sharif 1998; Al-Jawari, 2002). foliar nutrition also plays a role in providing plant nutrient requirements during critical and plant-sensitive growth stages, which may sometimes be unavailable (Martin, 2002). Zeboon *et al*. (2016) concluded from their study that the date of adding fertilizer was more important than the added amount from the nutritious element. Therefore, the date of adding fertilizers or nutrient elements should be considered at any stage of the growth in order to be more effective and active in the consumption of these elements and benefit from them. As well as the use of highly productive cultivars and determine their suitability to the prevailing environmental conditions in the region and determining the best suitable and high productivity. Based on these things, this study aims to: Determining the best cultivar, the best concentration, spraying date, and the best interaction between factors by giving the highest yield and quality.

Materials and Methods

A field experiment was conducted during the winter season 2018-2019 in Al-Sadda region belonging to Babylon province according to the order of split-split-plots within the Randomized Complete Block Design (RCBD), with three replicates, where the cultivars (Abu Ghraib and IPA 99) occupied the main plots, which is symbolized by (A1, A2) while spraying dates (branching stage, elongation stage, booting stage) occupied sub-plots which is symbolized by (B1, B2, B3). The concentrations of foliar spraying (0, 5, 10 mg.L^{-1}) occupied sub-sub-plots which is symbolized by (C1, C1, C3). Spraying was conducted using nutritious fertilizer (University fertilizer). The land of the experiment was prepared from plowing, smoothing and settling, it was then divided into three replicates. Each replicate includes main

plots, sub-plots, and sub-sub-plots. The number of experimental units is (54) and the area of the experimental unit is (2 x 2 m^2). The number of lines within the experimental unit is (8) and The distance between one line and another is 20 cm. Random samples were taken from the soil of the experiment before cultivating at a depth of (0-30) cm to estimate some physical and chemical traits.

Table 1: Physical and chemical traits for the soil.

PH	Electrical conductivity EC ($dS.m^{-1}$)	Volumetric distribution for the soil particles ($g.kg^{-1}$)			Organic matter%	Total Nitrogen%	Soil texture
		Clay (%)	Silt (%)	Sand (%)			
7.9	2.6	352	392	256	0.9	0.30	Loam

The soil was fertilized with phosphate fertilizers before cultivating, with the rate of (100 $kg.ha^{-1}$) and urea fertilizer (200 $kg.ha^{-1}$). It was added into batches the first one at the beginning of the branching stage and the second one in the booting stage (Jaddoa, 2003). The soil of the experiment was irrigated after cultivating directly and quietly to ensure that the seeds remained in the cultivating lines to ensure germination and The crop service was conducted. The nutritious fertilizer (l University fertilizer) was used which locally produced (Advisory Office for College of Agriculture, University of Basra), which contains a group of micro and macronutrient elements.

Table 2: Ingredients of liquid nutritious fertilizer.

Ingredients	The percentage
Nitrogen	7%
Phosphorus	5%
Potassium	7%
magnesium	0.5%
Potassium Humate + Micronutrient elements	0.5%

The following traits were studied:

1. Number of spikes
2. The number of grains per spike
3. the weight of 1000 grain (g)
4. The total yield of grain ($tons.ha^{-1}$)
5. biological yield ($tons.ha^{-1}$)
6. Harvest index (%)

The averages were compared with the least significant difference (L.S.D) below the level of 5% (Al-Rawi and Khalaf Allah, 1980).

Results and Discussion

The yield traits and its components

Number of spikes

Table (3) indicates that there are significant differences between the two cultivars in the number of spikes per m^2. The A2 cultivar has excelled on the A1 cultivar by giving it the highest average number of spikes per m^2 amounted to (341.33 $spike.m^{-2}$). The reason may be due to genetic variation between cultivars (Trehan *et al*., 1970). These results agree with (Al-Zarkani, 2016), which mentioned that cultivars differ among themselves and guide them to genetic variation. As for Spraying dates, it was observed from the same table, the B1 spraying date was excelled on the rest of the spraying dates by giving it the highest average amounted to (381.32 $spike.m^{-2}$). While the B3 spraying date gave the lowest average amounted to (339.37 $spikes.m^{-2}$). It can be attributed to the fact that B3 spraying date reached the final stages of growth and it no longer has an effect on this trait because the tillers at this stage have been formed. The concentrations have significantly affected this trait, where the C2 concentration was excelled by giving it the highest average amounted to (340.33 $spike.m^{-2}$), which did not differ statistically from the C1 concentration by giving it an average amounted to (340.08 $spike.m^{-2}$), while the control treatment gave the lowest average number of $spikes.m^{-2}$ amounted to (339.88 $spike.m^{-2}$). This is due to the fact that high concentrations have increased the number of branches and this is in turn positively affects the increase in the number of spikes. These results agree with (Nima *et al*., 2011; Zeboon, 2013; Abedulkareem, (2016) in their study where found a significant increase in this trait by increasing the concentrations of fertilizer. The bi-interaction BxA showed a significant effect, From the table, the interaction treatment B1xA2 was excelled by giving it the highest average amounted to (343.18 $spike.m^{-2}$), While the interaction treatment B2xA1 gave the lowest average amounted to (338.40 $spike.m^{-2}$). The table data also showed a significant effect for bi-interaction CxA, where the bi-interaction treatment C2xA2 was excelled by giving it an average amounted to (341.63 $spike.m^{-2}$) But did not differ statistically from the interaction treatment C1xA2, which gave an average amounted to (341.50 $spike.m^{-2}$) while the interaction treatment C1XA1 gave the lowest average amounted to (338.67 $spike.m^{-2}$). We also note that there is no significant effect for bi-interaction (C + B) and the triple interaction (C + B + A) in this trait.

Number of grain in spike

Table (4) indicates that there are significant differences between the cultivars in the number of grains in spikes, where the A2 cultivar gave the highest average amounted to (60.37 $grain.spike^{-1}$), while A1 gave an average amounted to (57.01 $grain.spike^{-1}$). The table showed significant differences between the spraying dates, where the spraying date (B3) was excelled by giving it the highest average amounted to (61.94 $grain.spike^{-1}$) while the spraying date first time (B1) gave the lowest average amounted to (55.93 $grain.spike^{-1}$). The reason may be due to the fact that the plant has reached advanced growth stages, the spraying of nutrient elements goes to directly support the fruit growth. This result agrees with (Al-Zarkani, 2016), where indicated that there were significant differences between the oats cultivars under study. The table showed significant differences between the concentrations of spraying, where the concentration C2 was excelled by giving it the highest average amounted to (59.79 $grain.spike^{-1}$) which was not statistically different from the concentration C1, which gave (59.17 $grain.spike^{-1}$) while the concentration C0 gave the

lowest average amounted to (57.11 grain.spike^{-1}). This may be due to the role of certain elements such as K, Which reduces the infertility of flowers. This result agrees with (Taban, 2002; Nima *et al*., 2011). Bi-Interaction between the two cultivars and spraying dates indicated significant differences, where The interaction treatment (A2 + B3) gave the highest average amounted to (61.94 grain.spike^{-1}) which did not differ statistically from the interaction treatment (A1 + B3), which gave (61.90 grain.spike^{-1}) while the interaction treatment (A1 + B1) gave the lowest average amounted to (50.96 grain.spike^{-1}). The reason is that spraying at the booting stage took advantage of all the nutrient elements in strengthening the ovaries to form grains and high concentrations, while the bi-interaction between the cultivars and concentrations. Table (4) indicates that there are no significant differences in this trait. From the same table, significant differences were observed in bi-interaction between the spraying dates and concentrations, where the interaction treatment (B3 + C2) was excelled by giving it the highest average amounted to (64.23 grain.spike^{-1}) while the interaction treatment (B1 + C0) gave the lowest average amounted to (55.02 grain.spike^{-1}). This is attributed to the positive role for nutrient elements, with high concentrations, and spraying at this stage is considered to be an optimal nutrient in promoting the growth of the yeast. The data of the table indicate that there were no significant differences between the cultivars, spraying dates, and concentrations in this trait.

Weight of 1000 grain (g)

Table (5) indicates significant differences in the trait of the weight of 1000 grains, where the A2 cultivar gave the highest average amounted to (37.67 g) while the A1 cultivar gave an average amounted to (31.67 g). This is due to the difference in genotypes between the cultivars which affects the weight of grain. This result agrees with (Andrus zezak *et al*., 2011; Jaddoa and Baqir, 2012; Hussein, 2012), Hassan and Al-Daoudi, 2014). The table showed significant differences between the spraying dates, where the spraying date (B3) was excelled by giving it the highest average amounted to (37.44 g) while the spraying date first time (B1) gave the lowest average amounted to (30.67 g). This result agrees with (Mohammad and Isa, 2013). The table showed significant differences between the concentrations of spraying, where the concentration C2 was excelled by giving it the highest average amounted to (35.39 g) which was not statistically different from the concentration C1, which gave (34.78 g) while the concentration C0 gave the lowest average amounted to (33.83 g). These results agree with (Al-Mohammadi, 2010) and (Ali and Aboud, 2015), which found that high concentration and foliar fertilization gave the highest weight of 1000 grains for wheat. Bi-Interaction between the cultivars and spraying dates indicated significant differences, where the interaction treatment (A2 + B3) gave the highest average amounted to (38.22 g) which did not differ statistically from the interaction treatment (A2 + B2), which gave (37.89 g) while the interaction treatment (A1 + B1) gave the lowest average amounted to (24.44 g). It is noted in the table that there are no significant differences between the cultivars and concentrations in these traits. Table (5) indicates that there are no significant differences in this trait. From the same table, significant differences were observed in bi-interaction between the spraying dates and concentrations, where the interaction treatment (B3 + C2) was excelled by giving it the highest average amounted to (37.83 g) which did not differ statistically from the interaction treatments (B2+C2) and (B3 + C1), which gave (37.67 g) while the interaction treatment (B1 + C0) showed the lowest average amounted to (30.33 g). From the table data, there were significant differences in the triple interaction between the cultivars, spraying dates and, concentrations where the interaction treatment (A2 + B3 + C2) was excelled on the other interaction treatments by giving it the highest average amounted to (39.00 g), while the interaction treatment (A1 + B1 + C0) gave the lowest average amounted to (24.00 g). This result agrees with (Mohammed and Eisa, 2013).

Total grain yield (tons.ha^{-1})

Table (6) shows that there are significant differences between the cultivars, where the A2 cultivar was excelled by giving it the highest average amounted to (7.76 tons.ha^{-1}) while the A1 cultivar gave the lowest average amounted to (6.20 tons.ha^{-1}). The reason is due to its significant excelling in the area of the flag leaf, the yield components, the length of the spike, and the number of spikes as shown in Table (3), The number of grains as shown in Table (4) and the weight of 1000 grains as shown in Table (5). This result agrees with (Al-Haidari and Al-Baldawi, 2011), where there was a significant positive correlation between the grain yield and its three components. The results also showed significant differences between the spraying dates, where the spraying date B3 was excelled on the other spraying dates by giving it the highest average amounted to (7.87 tons.ha^{-1}) While there are no significant differences between the spraying dates B1 + B2. The reason may be that the booting stage is more beneficial than nutrient elements as they transport synthesized elements directly to the sink. The table showed a significant effect between the concentrations where the C2 concentration was excelled on the other concentrations by giving it an average of (7.27 tons.ha^{-1}). This result agrees with (Mohsen *et al*., 2014). The table also shows that there are no significant differences in the interaction between the two cultivars and the spraying dates. From the data of the table also note that there are significant differences between the cultivars and concentration, where the interaction treatment (A2 + C2) was excelled by giving it the highest average amounted to (8.05 tons.ha^{-1}) While the interaction treatment (A1 + C0) gave the lowest average amounted to (5.76 tons.ha^{-1}). From the same table, significant differences were observed between the spraying dates and concentrations, where the interaction treatment (B3 + C2) was excelled on the other interaction treatments by giving it the highest average amounted to (8.25 tons.ha^{-1}), while the interaction treatment (B1 + C2) gave the lowest average amounted to (5.96 tons.ha^{-1}). This date did not differ statistically with interaction treatment (C1 + C0). As for the tripe interaction, we notice that there are significant differences between the interaction treatments. The interaction treatment (A2 + B3 + C2) was excelled by giving it the highest average amounted to (8.54 tons.ha^{-1}), while the interaction treatment (A1 + B1 + C0) gave the lowest average amounted to (3.95 tons.ha^{-1}).

Biological yield (tons.ha^{-1})

Table (7) shows that there is no significant effect of the cultivars in this trait, which it agrees with (Jubail and Badr, 2014), where there was no significant effect for the spraying

dates. The B3 concentration was excelled on the B3 concentration by giving it the highest average amounted to (16.2 tons.ha^{-1}), while the spraying date B1 gave the highest average amounted to (14.93 tons.ha^{-1}). The excelling of the spraying date B3 may be due to the fact that the manufactured nutrient elements will go directly to the grain (sink), thus increasing the yield and weight of the grains. As for the concentrations, the table also shows that the C2 concentration was excelled by giving it the highest average amounted to (15.87 tons.ha^{-1}), but it was not statistically different from the C2 concentration, which gave an average amounted to (15.60 tons.ha^{-1}). The reason is that when the plant reaches the final stages of growth, the elements will support the formation of grains and there was no waste of nutrient elements. This result agrees with (Hakan, 2005), Increasing the concentration of foliar fertilizers has led to an increase in the biological yield of wheat plants. The overlap between the interaction treatment of A2 B3 was excelled by giving it the highest average amounted to (16.36 tons.ha^{-1}), but it did not differ statistically from the interaction treatment A1 B3, which gave a biological yield amounted to (16.06 tons.ha^{-1}). While no significant differences were found between AC, BC, and ABC in this trait.

Harvest index %

Table (8) indicates that there are significant differences between the cultivars in this trait. The A2 cultivar was excelled by giving it the highest average amounted to (35.56 %) while the A1 cultivar gave the lowest average amounted to (31.81%). The reason for the superiority of the A2 cultivar is due to its superiority in the yield components as shown in Tables (7, 6, 5, 8). This result agrees with (Wali, 2010; Latif *et al*., 2011) who confirmed the difference in wheat cultivars in the harvest index and a result of their differing ability to convert materials from source to sink. While the same table shows that there are significant differences in the spraying date, where the spraying date B3 was excelled on the rest of the spraying dates by giving it the highest average amounted to (35.20%). The results showed that there was a significant difference between the used concentrations, where the CO concentration gave the highest average amounted to (34.28%) which it was not statistically different from the C2 concentration, while C1 gave the lowest average amounted to (32.89%). The results of the bi-interaction between the cultivars and spraying dates, the cultivars, and the spraying concentrations indicate no significant effect in this trait. While the bi-interaction between the spraying dates and concentrations noted the superiority of interaction treatment B3 + C0 gave the highest average amounted to (36.33%) which it did not differ statistically from the interaction treatment B3 + C2, while the interaction treatment B2 + C2 gave the lowest average amounted to (32.12%). The results of the triple interaction indicated that there were no significant differences between the interaction (cultivars and spraying dates and concentrations) in this trait.

Conclusions

1- The A2 cultivar (IPA 99) gave the highest average in all studied traits except for the biological yield did not have a significant effect on this trait. The A2 cultivar also gave the highest grain yield amounted to (5.68 tons.ha^{-1}).
2- The best date for spraying the foliar nutrition is the booting stage, which has excelled in all the studied traits except for the number of spikes in which the first date (spraying in the branching stage) was excelled.
3- The cultivars responded to the high concentration of boron, where the C2 concentration was excelled on all the studied traits except the harvesting index.

Table 3: Effect of foliar fertilization and spraying date in the trait (number of spike.m^{-2}) for two cultivars of wheat.

Cultivars	Spraying date	Concentration of foliar fertilizer (ml.L^{-1})			Average A× B
		C0	C1	C2	
A1	B1	339.13	339.30	339.83	339.42
	B2	338.20	338.23	338.77	338.40
	B3	339.33	338.47	338.47	338.76
A2	B1	342.93	343.23	343.37	343.18
	B2	340.07	341.10	341.33	340.83
	B3	339.60	340.17	340.20	339.99
L. S. D (0.05)		**N.S**			**0.395**
Cultivar \ Concentration of foliar fertilizer		**C0**	**C1**	**C2**	**Average A**
A1		338.89	338.67	339.02	338.86
A2		340.87	341.50	341.63	341.33
L. S. D (0.05)		**0.406**			**0.26**
Spraying date \ Concentration of foliar fertilizer		**C0**	**C1**	**C2**	**Average B**
B1		341.03	341.27	341.60	341.30
B2		339.13	339.67	340.05	339.62
B3		339.47	339.32	339.33	339.37
L. S. D (0.05)		**N.S**			**0.279**
Average C		339.88	340.08	340.33	
L. S. D (0.05)		**0.287**			

Table 4: Effect of foliar fertilization and spraying date in the trait (number of grain in spike) for two cultivars of wheat.

Cultivars	Spraying date	Concentration of foliar fertilizer (ml.L^{-1})			Average A× B
		C0	C1	C2	
A1	B1	48.60	52.70	51.57	50.96
	B2	57.37	58.47	58.73	58.19
	B3	59.27	62.37	64.07	61.90
A2	B1	61.43	61.00	60.27	60.90
	B2	57.40	57.63	59.73	58.26
	B3	58.60	62.83	64.40	61.94
L. S. D (0.05)		**N.S**			**2.214**
Cultivar \ Concentration of foliar fertilizer		**C0**	**C1**	**C2**	**Average A**
A1		55.08	57.84	58.12	57.01
A2		59.14	60.49	61.47	60.37
L. S. D (0.05)		**N.S**			**3.10**
Spraying date \ Concentration of foliar fertilizer		**C0**	**C1**	**C2**	**Average B**
B1		55.02	56.85	55.92	55.93
B2		57.38	58.05	59.23	58.22
B3		58.93	62.60	64.23	61.92
L. S. D (0.05)		**1.630**			**1.566**
Average C		57.11	59.17	59.79	
L. S. D (0.05)		**0.941**			

Table 5: Effect of foliar fertilization and spraying date in the trait (weight of 1000 grain) for two cultivars of wheat.

Cultivars	Spraying date	Concentration of foliar fertilizer (ml.L^{-1})			Average A× B
		C0	C1	C2	
A1	B1	24.00	25.33	24.00	24.44
	B2	31.33	33.67	36.67	33.89
	B3	36.00	37.33	36.67	36.67
A2	B1	36.67	36.67	37.33	36.89
	B2	37.33	37.67	38.67	37.89
	B3	37.67	38.00	39.00	38.22
L. S. D (0.05)		**1.693**			**1.294**
Cultivar \ Concentration of foliar fertilizer		**C0**	**C1**	**C2**	**Average A**
A1		30.44	32.11	32.44	31.67
A2		37.22	37.44	38.33	37.67
L. S. D (0.05)		**N.S**			**3.183**
Spraying date \ Concentration of foliar fertilizer		**C0**	**C1**	**C2**	**Average B**
B1		30.33	31.00	30.67	30.67
B2		34.33	35.67	37.67	35.89
B3		36.83	37.67	37.83	37.44
L. S. D (0.05)		**1.197**			**0.915**
Average C		33.83	34.78	35.39	
L. S. D (0.05)		**0.691**			

Table 6: Effect of foliar fertilization and spraying date in the trait of the Total grain yield (tons.ha^{-1}) for two cultivars of wheat.

Cultivars	Spraying date	Concentration of foliar fertilizer (ml.L^{-1})			Average A× B
		C0	C1	C2	
A1	B1	3.95	4.53	4.21	4.23
	B2	6.08	6.66	7.30	6.68
	B3	7.24	7.88	7.95	7.69
A2	B1	7.72	7.67	7.72	7.70
	B2	7.28	7.40	7.88	7.52
	B3	7.49	8.12	8.54	8.05
L. S. D (0.05)		**0.275**			**N.S**
Cultivar \ Concentration of foliar fertilizer		**C0**	**C1**	**C2**	**Average A**
A1		5.76	6.36	6.49	6.20
A2		7.50	7.73	8.05	7.76
L. S. D (0.05)		**0.159**			**0.94**
Spraying date \ Concentration of foliar fertilizer		**C0**	**C1**	**C2**	**Average B**
B1		b1	5.83	6.10	5.96
B2		b2	6.68	7.03	7.59
B3		b3	7.36	8.00	8.25
L. S. D (0.05)		**0.195**			**0.203**
Average C		6.63	7.05	7.27	
L. S. D (0.05)		**0.112**			

Table 7: Effect of foliar fertilization and spraying date in the trait of the Biological yield (tons.ha^{-1}) for two cultivars of wheat.

Cultivars	Spraying date	Concentration of foliar fertilizer (ml.L^{-1})			Average A× B
		C0	C1	C2	
A1	B1	13.49	14.40	14.03	13.98
	B2	15.10	15.30	15.40	15.27
	B3	15.40	16.43	16.33	16.06
A2	B1	16.20	15.80	15.63	15.88
	B2	15.50	15.50	16.57	15.86
	B3	15.67	16.17	17.25	16.36
L. S. D (0.05)		**N.S**			**0.386**
Cultivar \ Concentration of foliar fertilizer		**C0**	**C1**	**C2**	**Average A**
A1		14.66	15.38	15.26	15.10
A2		15.79	15.82	16.48	16.03
L. S. D (0.05)		**N.S**			**N.S**
Spraying date \ Concentration of foliar fertilizer		**C0**	**C1**	**C2**	**Average B**
B1		14.85	15.10	14.83	14.93
B2		15.30	15.40	15.98	15.56
B3		15.53	16.30	16.79	16.21
L. S. D (0.05)		**N.S**			**0.273**
Average C		15.23	15.60	15.87	
L. S. D (0.05)		**0.470**			

Table 8: Effect of foliar fertilization and spraying date in the trait of the Harvest index (%) for two cultivars of wheat.

Cultivars	Spraying date	Concentration of foliar fertilizer (ml.L^{-1})			Average A× B
		C0	C1	C2	
A1	B1	32.41	30.60	31.96	31.66
	B2	31.10	30.02	29.83	30.32
	B3	33.83	32.48	34.03	33.45
A2	B1	34.44	35.11	34.56	34.70
	B2	35.08	35.42	34.59	35.03
	B3	38.84	33.72	38.27	36.94
L. S. D (0.05)		N.S			N.S
Cultivar \ ~~Concentration of foliar fertilizer~~		**C0**	**C1**	**C2**	**Average A**
A1		32.45	31.04	31.94	31.81
A2		36.12	34.75	35.81	35.56
L. S. D (0.05)		**N.S**			**2.47**
Spraying date \ ~~Concentration of foliar fertilizer~~		**C0**	**C1**	**C2**	**Average B**
B1		33.43	32.86	33.26	33.18
B2		33.09	32.72	32.21	32.67
B3		36.33	33.10	36.15	35.20
L. S. D (0.05)		**1.762**			**1.270**
Average C		34.28	32.89	33.87	
L. S. D (0.05)		**1.017**			

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