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EFFECT OF SPRAYING IRON AND ZINC CONCENTRATIONS IN GRAIN AND LEAF CONTENT FOR TWO VARIETIES OF WHEAT CROP

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Abstract

A field experiment was carried out in the fields of the Faculty of Agriculture, University of Baghdad, in a soil mixed with green clay, classified under the group TypicTorrifluvents, to study the effect of paper feeding in iron and zinc in grains and leaves in wheat grains 99, 29 and 7. The experiment was carried out using the whole randomized sections and three replicates (0, 50 and 100 mg) Fe-1, (0, 50 and 100) Zn-1mg in the stages of plant growth and interference was sprayed in the same proportions.

The results showed that all iron and zinc concentrations and their interactions significantly increased all study parameters. However, the Zn2Fe2 interaction coefficients achieved the highest values with a value of 190.50 mg.kg^{-1}

Key words : Iron, zinc, paper feeding, various wheat varieties.

Introduction

The focus has been on the introduction of some of the latest technologies in agriculture, including paper feeding. The pests confirmed that 85% of the plant needs can be given through paper feeding. The plant takes some nutrients from the leaves in two ways, either by cytoplasmic bridges under The layer of cuticle to the skin cells and then to the cytoplasm, or transmitted through the gaps between the paper cells and the paper interfaces reached the bark (Al-Sahaf, 1989).

Soils of these areas often have low to medium available, low iron (Fe), manganese (Mn) and zinc (Zn) (AL-Taey and Majid, 2018; Al-Juthery *et al.,*2018)

It uses paper feeding to ensure rapid and effective response by the plant and to address the shortfall in the need of micro nutrients in particular.

Soil in several countries of the world suffers from iron deficiency and zinc due to the high degree of soil reaction and high content of carbonate minerals, which is reflected in the production of crops in those soils (Foucs, 2003). Since wheat is a grain crop belonging to the Najila family, In human life through a good balance between proteins and carbohydrates in their grains (Wilise, 1962).

A number of studies have indicated the response of wheat plant to added zinc and iron to soil or through paper feeding (Tarighi *et al.,* 2012 and Ai-Qinge *et al.,* 2011).

The role of iron and zinc is very important in terms of micronutrients that activate a number of enzymes and growth hormones, as well as their role in oxidation and reduction processes (Fogeria, 2009). Iron also enters many compounds in plant cells. (Martin, 2002).

Zinc also has other important nutrients that are important to humans, animals and plants, as well as its role in the production of healthy, high-quality vaccine (Tony, 2006).

Due to the difference in grain varieties and crops in response to oxidation with micronutrients, so this study was conducted to determine the response of wheat varieties to sprinkle with different concentrations of iron and zinc and their effect in some qualities of the crop.

Materials and Methods

A global experiment was conducted in one of the fields of the Faculty of Agriculture - University of Baghdad with a green clay mixed tissue classified under the TypicTorrifluvents according to the American Soil Survey

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Staff, 2006. Several random samples were taken from different places of soil of the experiment field and depth (0-30 cm), Dried and then Naamat and then analyzed and mixed with each other and took from them a single composite sample and conducted the physical and chemical analysis required before planting and shown in table 1. The agricultural land in the lines between the line and the last 20 cm was sprayed with iron and zinc according to the three stages of the growth of the crop and according to the concentrations of each element (100, 50, 0) Mg. Fe. L^{-1} and its symbol F0, F1, F2 and zinc (100, 50, 0) Zn. L1 and Zn0, Zn1 and Zn2, and their interactions were sprayed with the same concentrations, all nutrients were added in the form of ferrous sulphate and zinc sulphate at each stage of growth (vegetative growth stage, ventral phase and flowering stage). The total randomized segments were three replicates according to the RCBD design. Comparisons were made between the arithmetic averages and according to the test, the least difference was LSD and at 0.05.

Results and Discussion

It is noted from table 2 that iron and zinc additive interaction significantly affected the concentration of zinc in wheat leaves. Fe1 and Fe2 Feast increased the zinc concentration of wheat varieties (99, 29, and 7) compared with the comparison treatment of 59.08, 55.50 mg / kg (Zn2, Zn1) increased Zn1 concentration in wheat leaf 99. The Zn2, Zn1 and Zn1 increased by 8.86,15.39% respectively while the concentration of iron concentrations Zinc was significant in the treatment of zinc concentration in wheat leaves and the highest value was When the interference of Zn2 Fe2 was treated between 64.70 and the lowest value it had at Zn0 Fe0 interference treatment was 48.37 mg. Kg^{-1} plant.

Table 2: The combined effect of iron and zinc in zinc concentration in wheat leaves of class Ebaa99.

Zn / Fe	Zn0	Zn1	Zn2	Average
Fe0	48.37	51.43	54.25	51.35
Fe1	50.87	55.50	57.13	54.50
Fe2	53.35	59.19	64.70	59.08
Average	50.86	55.37	58.69	
Zn= 1.25		Fe=1.25	Zn, Fe= 4.30	$LSD_{0.05}$

It is also noted in table 3 that the results of the statistical analysis had a significant effect on the increase of iron concentration in the leaves of wheat class Ebaa 99, where the Fe2 Fe1 Fe1 iron concentration to increase the concentration of iron in these papers and the value of 181.51,173.93 mg. Kg^{-1} plant compared to the treatment Compared to 162.66 mg. Kg -1 plant and the impact of zinc spray to increase the concentration of iron in the leaves of wheat class Ebaa 99 and the highest increase in concentrations Zn1 and Zn2 estimated at 180.66, 174.03 mg. Kg^{-1} plant and the proportion of increase in mg. And an increase of 6.49, 10.55% compared to the comparison treatment of 163.42 mg. Kg^{-1} plant for the effect of interference has been affected by Iron concentration in wheat leaves and the highest value was in the treatment of Zn2Fe2 interference, which amounted to 190.50 mg kg^{-1}, the least measured in the treatment of the comparison of the value of mg kg^{-1} plant measured at the lowest value was in the comparison treatment of 155.20 mg Kg^{-1} plant

It is noted from table 4 that the concentration of iron and zinc concentrations significantly affected the concentration of iron mg. 1 kg in wheat leaves. The 7 th grade of iron spray gave the highest concentration in these papers at 149.50 and 145.32 for Fe2 and Fe1. With a Fe0 comparison of 140.19. Kg. 1. In the same table, the zinc spray showed a significant effect on the iron concentration

Table 1: Some physical and chemical properties of the study soil before planting Adjective.

Property		Measuring unit	The value
pH			7.77
ECe		dS m^{-1}	4.65
CEC		Centemol+Kg^{-1}	24.10
Soil organic mater		g Kg^{-1} soil	13.00
gypsum			4.33
Lime			245
Ions dissolved in soil solution	Ca^{++}	mmol L^{-1}	10.51
	Mg^{++}		8,55
	Na^{+}		8,33
	K^{+}		0.45
	$So4^{-}$		11.60
	Cl^{-}		17.22
	$HCO3^{-}$		6.41
	$CO3^{-}$		0
Soil particals	Sand	g kg^{-1} soil	185
	Silt		495
	Clay		320
Texture	Silt Clay Loam		
Bulk density		Meg m^{-3}	1.30
Available N		Mg kg^{-1} soil	45.30
Available P			11.50
Available K			190

Table 3: The combined effect of iron and zinc in iron concentration in wheat leaves of Ebaa99.

Zn / FeZn	Zn0	Zn1	Zn2	Average
Fe0	155.20	162.90	169.89	162.66
Fe1	166.33	173.88	181.59	173.93
Fe2	168.73	185.31	190.50	181.51
Average	163.42	174.03	180.66	
Zn= 2.45		Fe=2.45	Zn,Fe= 3.90	$LSD_{0.05}$

Table 4: Interaction of iron and zinc in iron concentration in wheat leaves of the research class7.

Zn / Fe	Zn0	Zn1	Zn2	Average
Fe0	137.51	139.42	143.63	140.19
Fe1	141.33	145.91	148.71	145.32
Fe2	144.00	150.69	153.80	149.50
Average	140.95	145.34	148.71	
Zn= 0.89		Fe=0.89	Zn,Fe= 2.91	$LSD_{0.05}$

in wheat leaves. The highest value was found in the Zn2 and Zn1 spray treatments, which were 148.71, 145.34 mg. Compared with a comparison of 140.95 mg kg $^{-1}$ plant with an increase of 1kg^{-1} mg and an increase of 5.50% and 3.11% sequentially.

As noted in table 4, the treatment of the interference significantly affected the increase in the iron concentration in the wheat leaves of the research class 7 and the highest value was in the treatment of the Zn2 Fe2 interaction, which was 153.80 mg. Kg -1 plant and the lowest value was in the comparison treatment Zn0 Fe0 amounted to 137.51 Mgkg^{-1} plant.

The results of the statistical analysis indicated that the concentration of iron and zinc concentrations in the zinc concentration in wheat leaves of the research class 7 had a significant effect on this effect and that the iron spray increased the concentration of zinc by values of 47.42, 45.46 mg. In the Fe2 treatment, Fe1 was measured by a comparison treatment with a value of 42.98 mg. Kg^{-1} with an increase of 10.33 and 5.77% sequentially. The results of the statistical analysis in Table 5 indicated that zinc spraying had a significant effect on increasing the concentration of zinc in wheat leaf Research 7, and the highest value was through the second spray treatment Zn2, which amounted to 47.65 measured by the treatment of comparison Which was 42.39 mg. Kg^{-1}. The effect of the effect of the overlap was significantly increased in the zinc concentration in wheat leaves. Research class 7 and its highest value were treated with Zn2 Fe2, which was 50.95 and the lowest value was 41.25 mg. Plant.

It is noted from the tables above (2, 3, 4 and 5) that spraying of iron and zinc individually or together resulted

Table 5: Interaction of iron and zinc in the concentration of zinc in wheat leaves of the research class 7.

Zn / Fe	Zn0	Zn1	Zn2	Average
Fe0	41.25	43.50	44.20	42.98
Fe1	42.91	45.66	47.80	45.46
Fe2	43.00	48.30	50.95	47.42
Average	42.39	45.82	47.65	
Zn= 0.47		Fe=0.47	Zn,Fe= 0.95	$LSD_{0.05}$

in increased concentrations of iron and zinc in wheat leaves for different varieties (99 and 99) but different percentages for each of the varieties used in this study Since the varieties differ in each category depending on the genetic factors or environmental factors and may be attributed to the important role of these nutrients in increasing the content of the leaves of chlorophyll, which led to increased efficiency of photosynthesis and increased processing of seeds from the plant food and spraying these nutrients led to an increase in growth Vegetative growth may have increased other nutrients The results of this study are summarized in the leaflets of wheat and various varieties. This is mentioned by al-Nuaimi (1999) and reached by Abu Dahi and others (2009).

References

Abu Dhahi, Y.M., R. Karim and F. Mohsen Al-Taher. The Effect of Paper Feeding of Iron, Zinc and Potassium Elements on the Growth of Wheat Buckwheat. *Iraq Agricultural Science Journal*, **40(1):** 81-69.

Al-Juthery, H.W.A., N.S. Ali, D.K. A. Al-Taey and E.A.H.M. Ali (2018). The impact of foliar application of nanaoffertilizer, seaweed and hypertonic on yield of potato. *Plant Archives,* **18(2):** 2207-2212.

Ai-Qing, Z., B. Qiong-Li, T. Xiao-Hong, L. Xin-Chum and W.J. Gale (2011). Combined effect of iron and Zinc on micronutrient levels in wheat (*Triticum aestivum* L.). *J. Environ. Biol.*, **32:** 235-239.

Al-Sahaf, F.H. Applied Plant Nutrition, Dar Al-Hikma Press, Baghdad University. Ministry of Higher Education and Scientific Research, Republic of Iraq.

Al-Naimi, S.N.A. (1999). Soil Fertility and Fertility. Second Edition Ministry of Higher Education and Scientific Research, Mosul University.

Al-Taey, D.K.A. and Z.Z. Majid (2018). Study Effect of Kinetin,Bio-fertilizers and Organic Matter Application in Lettuce under Salt Stress. *Journal of Global Pharma Technology*.

Black, C.A. (1965). Methods of soil analysis; Amer. Soc. of Agron. Mono.,No. 9 part 2.

Fageria, N.K. (2009).The Use of Nutrients in Crop plants.CRC

press, Boca Raton, FL.

Focus (2003). The importance of micronutrients in the region and b enefits of including the m in fertilizers. *Agro chmicals Report*, **111(1):** 15-22.

Martin, P. (2002). Micronutrients deficiency in Asia and the Pacific, Singaphore, 18-30.

Tong, W. (2006). Growing food. Aguide to food production, pp. 3333. Vallace, B.L and K.L Falchuk. 1991. The biochmical basis of zinc physiolgy. Physiol.Reu.73.

Soil survey staff (1993). Soil survey manual. U.S..D.A. Hand book No 18, USgovernment printing office Washington D.C.20402.

Tarighi, H., M. Majidian, A.H. Baghaie and M. Gomarian (2012). Zinc availability of two wheat cultivars in soilamended with argainc and inorganic Zn sources. *African J. Biotechnology*, **11(2):** 436-443.

Wilisie, C.P. (1962). Crop adaptation and distribution. W. H..Feeman and company Sanfransisco, USA.