

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 Typic Torrifluvents, 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⁻¹ mg 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, green, grains

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 2 ways, either by cytoplasmic bridges under the layer of coteel 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.

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 (Wilsie, 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; Zhao *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 (Fageria, 2009). Iron also enters many compounds in plant cells.

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 (Tong, 2006).

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 Typic Torrifluvents according to the American Soil Survey Staff, 2006 Soil Survey. 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 F_{0,1,2} and zinc (100, 50, 0) Zn. L₁ and 0 1 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 3 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.

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

Property/units	Values
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 (mmol L⁻¹)	
Ca ⁺⁺	10.51
Mg ⁺⁺	8.55
Na ⁺	8.33
K ⁺	0.45
So ⁴⁻	11.60
Cl ⁻	17.22
HCO ³⁻	6.41
CO ³⁻	0
Soil particals (g kg⁻¹soil)	
Sand	185
Silt	495
Clay	320
Tuxtucure (Silt clay loam)	
Bulk density (Meg m ⁻³)	1.30
Avalabile N (Mg kg ⁻¹ soil)	45.30
Avalabile P	11.50
Avalabile K	190

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.

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 Ebba 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 Ebba 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,

Table 2: The combined effect of iron and zinc in zinc concentration inwheat leaves of class Ebba 99

Avarege	Zn ₂	Zn ₁	Zn ₀	ZnFe
51.35	54.25	51.43	48.37	Fe0
54.50	57.13	55.50	50.87	Fe1
59.08	64.70	59.19	53.35	Fe2
	58.69	55.37	50.86	
LSD _{0.05}	Zn, Fe = 4.30		Fe = 1.25 Zn = 1.25	

Table 3: The combined effect of iron and zinc in iron concentration in wheat leaves of Ebba99

Avarege	Zn ₂	Zn ₁	Zn ₀	ZnFe
162.66	169.89	162.90	155.20	Fe0
173.93	181.59	173.88	166.33	Fe1
181.51	190.50	185.31	168.73	Fe2
	180.66	174.03	163.42	
LSD _{0.05}	Zn, Fe = 3.90		Fe = 2.45 Zn = 2.4	

Table 4: Interaction of iron and zinc in iron concentration in wheat leaves of the research class 7

Avarege	Zn ₂	Zn ₁	Zn ₀	ZnFe
140.19	143.63	139.42	137.51	Fe0
145.32	148.71	145.91	141.33	Fe1
149.50	153.80	150.69	144.00	Fe2
	148.71	145.34	140.95	
LSD _{0.05}	Zn, Fe = 2.91		Fe = 0.89 Zn = 0.89	

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.kg⁻¹ in wheat leaves. The 7th 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 Table 4, the zinc spray showed a significant effect on the iron concentration 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 1 mg.kg⁻¹ and an increase of 5.50 and 3.11%, sequentially.

As 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 Zn₂Fe₂ interaction which was 153.80 mg.kg⁻¹ plant and the lowest value was in the comparison treatment Zn₀Fe₀ amounted to 137.51 mg.kg⁻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

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

Avarege	Zn ₂	Zn ₁	Zn ₀	ZnFe
42.98	44.20	43.50	41.25	F ₀
45.46	47.80	45.66	42.91	F ₁
47.42	50.95	48.30	43.00	F ₂
	47.65	45.82	42.39	Avarege
LSD _{0.05}	Zn, Fe = 0.95	Fe = 0.47	Zn = 0.47	

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 Table 2-5 that spraying of iron and zinc individually or together resulted 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-Naimi and Abdullah (1999), Dhahi *et al.*, (2009).

CONCLUSION

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.

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