

## PATH COEFFICIENT ANALYSIS OF TWO WHEAT VARIETIES (*TRITICUM AESTIVUM* L.) UNDER THE INFLUENCE OF MAGNETIZED IRRIGATION WATER

Muhamed A. K. AL-Abody\* and Kahtan A. H. AL-Dohan

Department of Field Crops, College of Agriculture, University of Basrah, Iraq.

\*e-mail : mohammad.kalaf@uobasrah.edu.iq

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**ABSTRACT :** A field experiment was carried out during the winter season 2017-2018 in one of the agricultural fields of kteban area (15) km East of Basrah city. The study aimed to evaluate the performance of two varieties of wheat crop (Iraq and Babylon-113) under the influence of four levels of magnetization intensity of irrigation water (0, 1500, 2000 and 2500) Gauss. According to a randomized complete block design (RCBD), the field experiment was carried out with three replications. The variety Iraq outperformed, registering the highest average for plant height, tillers number m<sup>2</sup>, spikes number m<sup>2</sup>, number of grains spike<sup>-1</sup>, grain yield kg. ha<sup>-1</sup> reached (92.32 cm, 471.10 tillers. m<sup>2</sup>, 457.90 spikes. m<sup>2</sup>, 55.18 grains spikes<sup>-1</sup>, and 4558.0 kg. ha<sup>-1</sup>) respectively, while the variety Babylon-113 surpassed by giving the highest weight of 1000 grains of 38.44 g. The intensity of magnetization of irrigation water affected the intensity (2500) Gauss by giving the highest average of plant height, tillers number m<sup>2</sup>, spikes number. m<sup>2</sup>, number of grains of spike<sup>-1</sup>, 1000 grains weight, and grain yield were (96.72 cm, 515.8 tillers m<sup>2</sup>, 502.7 spikes m<sup>2</sup>, 54.46 grains spike<sup>-1</sup>, and 5374.0 kg. ha<sup>-1</sup>) respectively. While the effect of interaction between varieties and magnetization intensity of irrigation water has a significant impact, as the variety Iraq surpassed at magnetization intensity at 2500 Gauss, recording the highest average of plant height, tillers number m<sup>2</sup>, number of spikes m<sup>2</sup>, number of grains spike<sup>-1</sup>, and grain yield reached (100.27 cm, 542.7 tillers. m<sup>2</sup>, 527.3 spikes. m<sup>2</sup>, 63.52 grains. spike<sup>-1</sup> and 5574.0 kg. ha<sup>-1</sup>), respectively. The use of irrigation water magnetization technique led to a decrease in irrigation water salinity and an increase in nutrient readiness, thus increasing the yield components and increasing grain yield. The existence of a positive and high significant correlation between the yield of seeds, plant height, tillers number m<sup>2</sup> spikes number m<sup>2</sup> and grains number per spike<sup>-1</sup> is reached (0.875 \*\*, 0.942 \*\*, 0.935 \*\* and 0.717 \*\*), respectively, as shown. The results of the path coefficient analysis are that the two attributes of spikes number of m<sup>2</sup> and grains number of spike<sup>-1</sup> are the two most influential characteristics in grain yield of the wheat crop, which can be used as electoral guides in the subsequent breeding programs to increase the grain yield for this crop.

**Key words :** Path coefficient analysis, varieties of wheat, magnetically treated water.

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### INTRODUCTION

The crop of wheat, *Triticum aestivum* L., is one of the most important small grain crops globally because of its strategic role in achieving food security. It is considered an important nutritional value represented by a good balance in its grains between proteins and carbohydrates. It contains quantities of protein, fats, vitamins (B1 and B2) and some mineral salts (Al-Yunis, 1992). There is a gap between the quantity of production and actual need, and the self-sufficiency ratio of this crop is only about 30% (Killidar *et al*, 2010). Therefore, researchers and

plant breeders resort to finding possible means to raise wheat productivity and improve its quality. Among these primary means is selecting high yield varieties that are suitable for environmental conditions and establishing a breeding program based on the identification of electoral evidence based on the physiological and morphological characteristics that contribute directly and indirectly to the grain yield. Since the simple correlation coefficient measures the correlational relationships in their abstract form, the researchers resort to the path coefficient analysis, giving additional information about the simple

reached (0.928\*\*). These results are consistent with Al-Salim *et al* (2017). The reason for this correlation between the yield and its tested components may be attributed to the influence of genetic factors and the magnetization effect of irrigation water.

### CONCLUSION

The variety Iraq outperformed by giving the highest grain yield of 4558.0 kg.ha<sup>-1</sup>, the magnetization intensity exceeded 2500 Gauss by giving the highest grain yield of 5374.0 kg.ha<sup>-1</sup> and the use of irrigation water magnetization technology reduced the salinity of irrigation water and increased the readiness of nutrients, increasing the amount of grain. The grain yield was correlated with a positive and high significant correlation with plant height, number of tillers m<sup>-2</sup> number of spikes m<sup>-2</sup> and number of grains spike<sup>-1</sup> also the results of the path coefficient analysis showed that the two characteristics of the number of spikes m<sup>-2</sup> and the number of grains spike<sup>-1</sup> are the two most influential characteristics of the grain yield of the crop. Wheat can be used as electoral guides in subsequent breeding programs to increase the grain yield of this crop.

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