

## Response of wheat varieties, *Triticum aestivum* L., to spraying by iron nano-fertilizer

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### ABSTRACT

A field experiment was carried out in winter 2019 in the north of Basra Governorate to find response of four varieties of wheat (Baraka, Tammuz-2, Latifia and Ibaa-95) to different concentrations of iron nano-fertilizer (0, 1, 2 and 3 g L<sup>-1</sup>). The experiment was designed by applying factorial experiments using a randomized complete block design (RCBD) with three replications. This study revealed the superiority of variety Baraka in grain yield and biological yield, which reached 4.892 and 12.943 ton ha<sup>-1</sup>, respectively, as a result of its superiority in growth characteristics and yield components. Iron nano-fertilizer exhibited a significant impact on all studied traits, so that, 3 g L<sup>-1</sup> displayed the highest average of grain yield (4.966 ton ha<sup>-1</sup>). Regarding to the interactions, the variety Baraka by spraying iron nan-fertilizer at 3 g L<sup>-1</sup> exhibited the highest average of grain yield (5.800 ton ha<sup>-1</sup>) due to its superiority in yield components.

**Keywords:** *Triticum aestivum* L., Varieties, Wheat, Iron nan-fertilizer.

**Article type:** Research Article.

### INTRODUCTION

Wheat crop, *Triticum aestivum* L., ranks the first in the world in cultivated area and production. Its importance is due to being the main food for over 40 countries in the world, equivalent to 35% of the world's population, since it constitutes a nutritional value represented by the good balance in grain between proteins and carbohydrates and its containment amounts of fats, vitamins and some minerals (Bushuk 1998). Although Iraq is one of the first countries with the emergence of wheat due to its cultivation factors, its productivity is below the required level of its high production (1.80 ton ha<sup>-1</sup>; Agricultural Statistics Directorate 2018) compared to global production, whose productivity reached 2.762 ton ha<sup>-1</sup> (FAO 2018). To promote this crop's cultivation, achieving a qualitative and quantitative improvement in its productivity requires firstly interest in varieties used in agriculture due to the changes in the environment. Therefore, attention must be paid to developing varieties with high productivity, good quality and suitable for the prevailing conditions. Therefore, many centres and research institutions worked in this field. Many varieties have been adopted ideal for the environmental conditions and the changes in them, with good production, excellent quality, and good stability in the region. Given these varieties which have been produced, researchers should conduct comparative experiments with local varieties. After their superiority over local varieties, experiments were conducted to adapt and improve the crop's quality and productivity. These varieties with a good economic return for farmers should be paid attention to the proper crop service operations in order to increase production and maintain the quality compatible with these varieties' performance. Among these processes, the technology of nano-fertilizers by employing nano-materials or packages of fertilizer which can supply one or more nutrients towards improving growth and production with better performance than conventional fertilizers (Rakhimova *et al.* 2021; Kamali Omidi *et al.* 2022). The latter leads to slow release mechanism of nutrients along with slow crop growth (Liu & Lal 2015). The nano-fertilizers are more soluble, effective, faster penetration and representation in plant tissues than regular fertilizers which are often not ready for plant after addition, especially those that are added to the soil. It is necessary to reduce nutrient loss in