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MAGNETITE (FE_3O_4) NANOPARTICLES MITIGATED HEAT STRESS HAZARDS IN WHEAT

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ABSTRACT

It is well known that applications of nanotechnology in the agriculture sector have a promising achievements in the near future. The present work aimed to utilize biocompatible magnetite nanoparticles, Fe_3O_4, (MNPs) as a new approach to counteract heat stress of Wheat that might increase yield quantity and quality (mainly the impact on essential amino acids in grains). Magnetite nanoparticles were synthesized using hydrothermal method then were characterized by advanced techniques before field application. Two consecutive field experiments for wheat plants were carried out at 2013/2014- 2014/2015. Results revealed that, the best concentration increasing grain yield (kg/fad) was at 0.25 ppm MNPs. This treatment also succeeded in increasing quality (essential and non-essential amino acids) of wheat grains for Sids1 cultivar. The enhancement of yield parameters and quality may be due to the increment in the determined biochemical markers (GSH and GST) and the positive effect of some concentrations on cell organelles through that was observed by Transmission Electron microscopy to counteract heat stress.

Key words: Heat stress, Magnetite nanoparticles, Nanotechnology Wheat, *Triticum aestivum* L.