

Effect of different iron sources on growth and physiological characteristics of two commercial cultivars of lettuce in a hydroponic culture

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Abstract

Iron is an essential element for plant growth, which is involved in many plant processes such as photosynthesis and activating enzymes involved in mitochondrial and photosynthetic electron transfer. In order to investigate and compare the effect of different sources of iron on yield and physiological characteristics of two cultivars of lettuce in hydroponic culture, a complete random factorial experiment was performed in Nutrition Film Technique (NFT system). The factors involved lettuce cultivar at two levels (leaf Gardesco and head Gardesco) and iron sources at three levels (ferrous sulfate, Fe-EDDHA and nano-Fe-chelate, all with 20 mM concentration). Results indicated that maximum yield and physiological parameters (Fv/Fm, PI, soluble sugars, proline, chlorophyll a, b, total and carotenoids) were obtained in Fe-EDDHA treatment and leaf lettuce Gardesco cultivar. But the highest uptake of nutrients (iron, copper, manganese, nitrogen and phosphorus) belonged to the Fe-EDDHA treatment and head lettuce Gardesco cultivar. According to the results, it is recommended to use Fe-EDDHA chelate as a reliable iron source, to increase the yield of leaf lettuce Gardesco cultivar in Nutrition Film Technique in hydroponic systems.

Keywords: Iron, Lettuce, Nutrient film technique.

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