

Abstract:

In order to evaluate the effects of polymeric iron chelates and iron nanoparticles on quantitative and qualitative characteristics of forage sorghum an experiment in factorial experiment in a completely randomized design with 3 replications was conducted in educational and research greenhouse located in Baqiyatollah Azam (Chahnimeh), University of Zabol, in 2015-16. Fertilizer treatments used in this study consisted of 10 iron sources (Control, Polymeric nano iron oxide, Nano iron oxide, Monodispersed nano iron oxide, Monodispersed nano iron oxide polymeric, iron chelate, Polymeric iron chelate, iron sulfate, Polymeric iron sulfate, Green nano iron), that was used at 2 levels (soil application: 0.270, 0.405 mg.kg⁻¹ and foliar application: 0.25, 0.5 g.L⁻¹). According to the results, it was determined that different sources of iron play a significant role in improving the growth parameters (tallest and shortest of root, diameter and volume of root, fresh and dry weight of root, height and diameter of stem, fresh and dry weight of shoot) and the plasma membrane of stability index (leaf and root) and the leaf chlorophyll content (a, b, carotenoid and total) and nutrients uptake of root and shoot plant organs (potassium, phosphorus, iron and manganese) so that it was significant the level of 5% in all studied parameters. Generally, the effect of some of the sources of iron, on root and shoot parameters growth, leaf and root of the plasma membrane of stability index, chlorophyll content of leaves, and nutrient concentration of sorghum forage roots and shoots was positive. Also, it was observed that in most parameters treatments Monodispersed nano iron oxide and Monodispersed nano iron oxide polymeric in some cases (regardless of how the application and treating concentrations) were more effective. In the case of treatment method, in soil and foliar applications, the effect of different sources of iron on root and shoot parameters growth, plasma membrane stability index, chlorophyll content of leaves, and nutrient concentration of sorghum forage roots and shoots was positive. The highest rates of most of the growth indices, leaf plasma membrane stability index, leaf chlorophyll content as well as root and shoot concentrations of some nutrients was obtained through foliar method and the levels of 0.25 gr.L⁻¹. Thus, shows the priority of the foliar method in most of the growth indexes as well as leaf chlorophyll content. It should be mentioned that methods of soil and foliar application to nutrients of the root and shoot is as priority as plasma membrane stability index and both methods have the same effect on nutrient uptake and plasma membrane stability index.

Key words: Nano technology, Polymeric iron chelates, Nano iron oxide, Forage sorghum.



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Title

**Investigation of the Effect of Polymeric Iron Chelates,
Nano-Chelated Iron & Nano Iron Oxide on the Growth
Parameters of Forage Sorghum (*Sorghum Bicolor*)**

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