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THE POTENCIAL ROLE OF SOIL APPLICATION OF A *TRIS*(3-HYDROXY-4-PYRIDINONATE) IRON (III) COMPLEX IN IRON DEFICIENCY CHLOROSIS TREATMENT

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Iron (Fe) Deficiency Chlorosis (IDC) is a serious environmental problem affecting the growth of several crops in the world, mainly in alkaline soils. The application of synthetic Fe chelates is one of the most common measures to avoid IDC. This nutritional disorder is characterized by a significant decrease in leaf chlorophyll content and in yield and crop quality. This is due to the fact that in high pH soils there is a limited Fe bioavailability, due to the low solubility of Fe hydroxides and the consequent impairment Fe uptake. Here, we tested the capacity of a *tris*(3-hydroxy-4-pyridinonate) Fe(III) complex, $[Fe(mpp)_3]$, in comparison with FeEDDHA, to amend IDC in soybean (*Glycine max*) plants grown under alkaline soil conditions. Seeds were firstly primed using a solution of each Fe chelate and, thereafter, two methods of application were applied to the plants: irrigation and foliar spraying. Plants treated with the Fe chelates showed a better performance when compared with controls. Plant emergence when treated with $[Fe(mpp)_3]$ by irrigation was two days longer than in FeEDDHA treated plants. However, chlorophyll concentration (SPAD values) at the end of the assay was 20% higher on $[Fe(mpp)_3]$ treated plants than on FeEDDHA treated plants. When treated by foliar spraying, $[Fe(mpp)_3]$ plants did not differ from the FeEDDHA treated plants on the number days till emergence and, SPAD values were 21% higher for $[Fe(mpp)_3]$ treated plants. Further work is in progress in order to evaluate biomass production and mineral distribution on the different treatments. These preliminary results show the great potential held by $[Fe(mpp)_3]$ in IDC treatment in an agricultural context.

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