Nutrient availability in soils in relation to the different methods of extraction (Fe, Mn, Zn and Cu)

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SUMMARYNinety eight surface soil sample were collected from different locations throughout the A.R.E. to assess the status of cationic micronutrients (Fe, Mn, Zn and Cu) in different soils of Egypt, also to define which extractant is the best for extracting specific nutrient as seven different extractants were used to extract Fe and Mn, while, eight extractants were used to extract Zn and Cu. The obtained results were as follows:1)Extractable Fe, Mn, Zn and Cu ranged from 884.00 to 0.15, 718.50 to 0.07, 75.91 to 0.04 and 39.64 to 0.08 mg kg-i, respectively.2)Almost of indigenous soil parameters related, in different levels of significancy, with extractable fractions of Fe. Mn, Zn and Cu.3)The tested methods of extraction that could be more promising for assessing soil Fe availability could be ordered descendingly, according to their "r" values, with nutrients uptake by barley seedlings as follows:Mehlich III > AAAc-EDTA > DTPA > CAT > AB-DTPA, with "r" values of 0.288*** 0.287***, 0.283***. 0.249* and 0.228*, respectively..4)All the tested procedures, (except BDW) showed significant correlations with Mn plant uptake at a very high significant levels, they could be arranged according to their "r" values, descending in the order:Mehlich III > CAT > AAAc EDTA > ABDTPA > DTPA > Coca-Cola with "r" values of 0.501***,0.469***, 0.410"*, 0.379***, 0.358** respectively.5)The methods of soil Zn extraction that a correlated with Zn plant uptake cou according to their "r" coefficient desc order: CAT (r =.-- 0.292**), W.H. (r = 0.26 EDTA (r = 0.224*).6)The tested methods of micronutrients extr, ction. yielded always significant correlation between the extractable Cu values and Cu plant uptake. The ob•erved relation significancy decreased in the order:W.H. > Mehlich III> AAAc EDTA > C T > DTPA > AB-DTBA > DTPA, with "r" values, 0.3 6***, 0.382***.0.356***, 0.296", 0.275", 0.249* and 0.248*,respectively.7)Using stepwise regression, it is clear that the model which included indigenous soil paramete s, extractable fractions of cationic micronutrients and plant parametersis the most suitable model to predict the uptake of cationic micronutrients.For Fe R2= 0.976***, the regression equation included Fe conc., DM and BDM, for Mn R2 = 0.981***, the regression equation included Mn conc., DM, oca-Mn and DTPA Mn, while, for Zn R2 = 0.978*** and tie regression equation included Zn conc., DM and pH. But n case of CuR2 = 0.977 and the regression equation inclu ed Cu conc. and DM.and 0.322***e significantlyd be arranged dingly in the) and AAAc-