Occurrance and maintaining micronutrient levels in calcareous soils (using soil amendments enriched with micronutrients)

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The present study under taken to investigate: (i) Evaluate soil amendments efficiency, i.e., organic and synthetic on enhancing physical and chemical properties of calcareous soils. (ii) Conducted a comparative study between the methods of micronutrients application in the presence of soil amendments. (iii)Study the effect of soil amendments (organic and synthetic) on the availability of micronutrients in soils along 135 days. (iv)Evaluate the relationship between organic and synthetic soil amendments and wheat plants productivity under calcareous soils conditions. To achieve these objectives a pot experiment under greenhouse, a field experiment and incubation experiments were carried out.The pot experimentThe greenhouse experiment was carried out with six virgin soils differs in their texture and calcium carbonate percentage collected from north western coastal area at winter 2002-2003. The used soil amendments was Bio-Green compost, El-Nile organic compost, El-Oboure compost, Bitumen emulsion and PVA at a rate of 1% was added to soils under three treatments of micronutrients enrichment, (i) incubated with sulfate form of Fe, Mn and Zn for two weeks and added to soil (ii) added as a separated addition with chelating compounds of Fe, Mn and Zn-EDDHA at agriculture and finally the amendments was added without of micronutrients application. Wheat plants (Giza 168) was used as indicator plant,dry matter yield, Fe, Mn and Zn concentration an total uptake, available Fe, Mn and Zn, soil aggregates and a tive calciumcarbonate were determined, the obtained resul s could be summarized as follows:- The highest increasing value of dry matter yield w s occurred in El-Mathany sandy clay loam soil while Ras El-H kmma sandy loam gave the lowest one.- Application of soil amendments led to increase wh at dry matter yield, the highest increasing value associated wi Bio-Green compost while the lowest one was obtained by Bi en emulsion.Application of micronutrients either as mineral or chelates form considerably increased dry matter yield of wheat. The influence of chelated one surpassed the other one. Micron trients form efficiency could be arranged in the order:Chelating > Mineral > without micronutrients a lication-The highest Fe, Mn and Zn concentration was found compost combined with mineral application of micrMathany soil, for Fe, Mn and El-Nile organic comp Mathany soil for Zn. While the lowest one was asbitumen emulsion as without micronutrients appli Ghazala soil for Fe, Mn and bitumen emulsion Heknuna soil for Zn.y Bio-Green nutrients El-st under El-ociated with ation under der Ras-E1-- The highest Fe, Mn and Zn uptake was found compost under El-Mathany soil for Fe, Mn and lowest one was observed by bitumen emuls micronutrients application under Ras El-Hekmma soand Zn.Bio-Green n, while the on without 1 for Fe, Mn-The highest soil aggregates was obtained by Bio-Green compost under Ras-El-Hekmma soil while the lowest one was associated with the control treatment of El-Mathany soil.-Active CaCO3 was negatively and significantly correlated with dry matter yield, Fe, Mn and Zn concentration and uptake, and available form of micronutrients, wherever a positive correlation was obtained with soil aggregates.The incubation experiment:The incubation experiment was carried out to investigate the availability of micronutrients during planting seasonThe obtained results could be summarized as follows:-Application of mineral form of micronutrients with different soil amendments was more efficient in increasing available Fe, Mn and Zn compared to chelated form without micronutrients

application.-Values of DTPA-extractable Fe, Mn and Zn increased by increasing periods of incubation and the most affective period were 15 days incubation for Fe and 45 days for Mn and Zn.-Available Fe, Mn and Zn extracted with DTPA increased by increasing soil amendment application rates under all incubation periods. The highest values were found with the third rate (0.75%).