

Interactive comment on “Fixation kinetics of chelated and non-chelated zinc in semi-arid alkaline soils: Application to zinc management” by Theophilus K. Udeigwe et al.

Anonymous Referee #2

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For the most part this is a well-done study. There is valuable information to add to the scientific literature concerning micronutrients in semi-arid soils. However, I am very troubled by the apparent lack of ability to document level of variability in the work done to characterize the soil series used in this study, if at all possible this variability should be documented.

In addition, it seems the authors would have a better paper if they combined this with their paper on Cu, also submitted to Solid Earth. Cover all the micronutrients at one time in one paper. I know this doesn't get the authors as many papers, but the one paper will likely be better cited than the separate papers because it will be more complete. Also, there is a large amount of overlap between the Cu and Zn paper that is not

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good. The authors are basically trying to publish the same data twice as two different papers. For this reason I recommend rejection of this paper, and combining the Cu and Zn data.

This manuscript needs a careful editing for English. The English is pretty good, but there are small issues scattered through the manuscript that distract from the overall reading. The first author is at Texas Tech, I suggest asking a native English speaking colleague to read through the manuscript and make suggestions.

Lines 80-82 – Are there any publications in the literature, even extension publications, to back this statement about low levels of micronutrients in the agricultural soils of the Texas High Plains? A citation would significantly strengthen this statement.

Line 110 – “...(15-30 cm) soils...” should be “...(15-30 cm) soil samples...” We don't collect entire soils, we collect samples of soils.

Section 2.2 – Was there any replication of the samples used to characterize the soils, or was there just one run for each site and each depth? I know composited soil samples are common in soil fertility studies, but the way this was done doesn't give any feel for the variability in these soils, which is very important. On Table 1, for example, it can be seen that there is a fair amount of difference between the values obtained for OM, clay, and CaCO₃ in the three soil series. Is this a true difference, or an artifact of getting a single soil sample that isn't particularly representative? We don't know, because we don't have any measure of variability in the soils used for the study. Whether or not there is a difference between these soils is an important question in this study. Do we see a lack of difference in micronutrient behavior in these three soils because they are similar, or in spite of the fact they are different? The inability to determine this is a major weakness of this study.

Line 202 – In addition to Adriano, 2001 and Kabata-Pendias, 2010, I recommend citing Czarnecki and Düring, 2015 here.

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Line 255 – Some non-significant relationships were found in the non-chelated soils. This is acknowledged in Line 267, but that fact should be clear from the beginning.

Table 1 – Measures of variability for these properties?

References Czarnecki, S., Düring, R.-A., 2015. Influence of long-term mineral fertilization on metal contents and properties of soil samples taken from different locations in Hesse, Germany. SOIL 1, 23-33. doi:10.5194/soil-1-23-2015.

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