



EGUsphere, referee comment RC1
<https://doi.org/10.5194/egusphere-2022-469-RC1>, 2022
© Author(s) 2022. This work is distributed under
the Creative Commons Attribution 4.0 License.

Comment on egusphere-2022-469

Manfred Sager (Referee)

Referee comment on "Wetting and drying cycles, organic amendments, and gypsum play a key role in structure formation and stability of sodic Vertisols" by Sara Niaz et al., EGU sphere, <https://doi.org/10.5194/egusphere-2022-469-RC1>, 2022

Just a comment to the presented paper:

My experience about drying and rewetting changes in alkaline nutrient-rich chernozem columns, packed in columns, are these:

Permanent wetting fixed S, and slightly mobilized P, Fe and siderophiles (Mn, V, Cr) because of slow oxygen consumption, as well as slight shrinkage of volume. Subsequent drying and rewetting lead to a flush of sulphur and partially selenium, as well as fixation of P and Fe because of intermediate aeration from drying. Aggregate stability was not analyzed. Freshly precipitated Fe(OH)₃ forms colloids and micro-aggregates.

Of course, some decisions have to be taken beforehand, which might influence the result - thus literature is contradictory at the first glance. Samples were air-dried and sieved before the experiment - like in my experiment also. But the organic amendments were air-dried before the incubation experiment also, which means loss of NH₃ and H₂S/H₂Se during the drying stage as well as aeration, in favour of aerobic microbes. Again, after the incubation experiment, drying and aeration was done also.

Unfortunately, a manuscript rating is needed, to send this text; please do not consider it too much

Differences are interpretable due to different microbes present in the organic amendments, whereas polyacrylamide means practically zero. Gypsum is rather soluble, and favours bacteria of the sulfur cycle.

Changes in micro-aggregates might be interpretable in precipitation of pedogenic oxides
resp. pyrite

I wonder, why no data about mobile chemical fractions, nor soil minerals or soil
amorphous phases have been done.