



EGUsphere, referee comment RC6  
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## **Comment on egusphere-2022-469**

Anonymous Referee #6

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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-RC6>, 2022

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The manuscript "Wetting and drying cycles, organic matter and gypsum play a key role in structure formation and stability of sodic Vertisols" presents, as title says, the results of a study to evaluate the role of biotic and abiotic factors on aggregate formation and stabilization of sodic soils after the addition of gypsum and organic amendments (feedlot manure, chicken manure, lucerne pallets, and anionic poly acrylamide). Soils were amended and after 4 wetting and drying cycles (WD) different physical, chemical, and biological characteristics were measured and statistically analysed. According to results, WD cycles can improve aggregate stability of studied soils after the addition of amendments, but this process depends on the type of organic amendment. The addition of gypsum together with the amendments, further enhance the stability of aggregates, and dispersion became negligible after the second WD cycle. Authors concluded that WD is a key factor improving aggregation and stability of sodic Vertisols.

The text denotes a considerable amount of field and laboratory work. In general, the manuscript is organised and clear. It proves an effort to measure and relate a number of soil characteristics to study aggregation in sodic Vertisols. English grammar and spelling are accurate. There are some old references but they can be considered as cornerstone to support the introduction and discussion sections. Figures and tables are of good quality and necessary. Manuscript needs a MINOR revision before being accepted for publication. It needs to consider the following remarks.

General comments:

- Please explain abbreviations before using them. As PAM in line 28.
- It is important to define what you call large and small macroaggregates in the abstract and introduction (one needs to read until line 225 to find it out).
- Hypotheses are always very welcome. Thanks for doing so.

- Tables 1 and 2 are OK but probably they can be presented in the results section.
- It is not straightforward to see significant differences in the figures (vertical bars are not helpful). Why don't you simply mark where the differences are significant?
- Pay attention to the use of unpublished references to support your discussion. This can create some uncertainty in your assumptions.

Specific remarks:

- Why did you choose to analyse a soil depth of 10 cm? In addition, did you sample one core from 0 to 10 cm or there were several cores depending on the size of the ring?
- Can you please include the formula given by Oster and Jayawardane (1998)? I assume you did use to calculate the 2.5 Mg ha<sup>-1</sup> of gypsum added to soils.
- Amend "change".
- Are these changes significant?
- In Fig. 1, explain what are LMA, SMA, MIC, and MIN in the caption.