



EGUsphere, referee comment RC4
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Comment on egusphere-2022-131

Anonymous Referee #4

Referee comment on "Effects of innovative long-term soil and crop management on topsoil properties of a Mediterranean soil based on detailed water retention curves" by Alaitz Aldaz-Lusarreta et al., EGU sphere, <https://doi.org/10.5194/egusphere-2022-131-RC4>, 2022

I strongly support field research and the cropping system approach instead of individual practice comparison and believe in the extra value of long-term experiments. Thus, I feel that this research will definitely contribute to the existing knowledge. Nevertheless, as the other reviewers also commented, the manuscript needs improvements before being published.

I considered all the comments of the other reviewers and will not repeat them as I mostly agree with both. I will indeed stress though that when in a cropping system the term sustainability is included then all aspects should be considered (social economic and environmental).

The title would be more representative if it was something like "the effects of long-term conservation management on topsoil structure".

In the introduction, a more thorough review of the effects of the specific management practices on soil quality or at least on the WRC and soil aggregates should be included, and specific scientific questions and hypotheses should be structured.

The section materials and methods should be written in a clearer way.

Starting from the description of the treatments where more details should be included, such as the frequency and type of organic amendment and cover crops rather than occasional use. Also the type of mineral fertilization the quantities and frequency. Possibly a table with the crop rotation history and amendments application would be useful.

The soil's initial characteristics (for the variables that are available) will give valuable information on the effects. That is an extra value of the long term experiments and you should present it.

Focusing on the sampling procedures and especially the mixed subsample for the determination of the distribution of the aggregate, it is not clear how the required replication for the statistical analysis (at least 3 samples) happened as you indicate that "three sub-samples per sampling point, which were then mixed to obtain a composite sample)". As it is written it is not clear if you ended up with one composite sample per treatment or with three samples one at each sampling point.

In L: 105 you mention "Organic fertilization was not used in any of the study treatments until the experiment year in which an organic amendment was applied to the soil without disturbing the surface in the OPM treatment." What do you mean by experiment year? Before you mentioned that in the OPM there is frequent application of organic amendments. Do you mean before the beginning of the experiment? Ie 18 years ago? Rephrase the sentence.

In the results as well as in Table 1 you should indicate where the differences were significant. Which post-hoc test did you perform? In Figure 4, you should clearly mention what the error bars represent, you should include error bars in the in-between Magg fractions also to allow comparisons, and letters on top of each bar to indicate significant differences between the two treatments.

Focusing more on the aggregates the authors refer to the hierarchical aggregate order concept by Tisdall and Oades (1982). The wrongly present that the authors cited, mention that the magg are bonded together to form Magg. What is actually mentioned in the majority of the cited papers (eg Oades, 1984; Six et al., 1999, 2004;) is what was revised by Oades (1984) and validated by Angers (1997) that magg are formed within the Magg and not before these. The authors should correct all this paragraph and explain their results accordingly.

In the results and discussion section, the authors should interpret their results in terms of causes, compared them with the existing literature in a more detailed way, and give practical recommendations according to their results.

I hope that my recommendations along with those of the other reviewers will help you to improve the manuscript.