



EGUsphere, referee comment RC3
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Comment on egusphere-2022-131

Anonymous Referee #3

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-RC3>, 2022

The authors aiming for comparison of different regenerative soil management systems in comparison to conventional managed systems. They use various measures of soil structure and water retention to evaluate the quality of the management options. The topic is highly relevant for the adoption of cropping systems to climate change.

Unfortunately, the quality of the study does not convince me to suggest a publication in SOIL. The study is very weak in terms of field replications and study sites that leading in total to 6 samples. The analytical tools are basic and provide no innovative approaches. For such a small sample set one could expect much deeper analytical afford. Method descriptions partially missing and some data I found by luck in the supplements. In the cause of the review process I stopped marking down all individual specific comments. There was simply too much to correct and my time is limited.

General comments

The introduction should summarize the state of the art and introduce to the relevance of the topic. Unfortunately a larger part of the introduction (L51-70) contained technical information and methodological information. I recommend to go deeper into literature on soil management options of arable land and the connection between management of soil structure and water budget.

The study site is not characterized well. Climate data are missing at all and the distance

between the two study sites is unclear. A map would help. No information on the type of management (experimental field trial or on farm research) is provided. Since this are calcareous soils, information about parent material would be helpful. How deep below soil surface starts the bedrock? Soil texture should be measured in replicates. The method must be described. Please show the data in the main manuscript from each sample. There must be a prove (correlation etc.) that there are no texture based differences on soil properties such as soil OC or CEC. It is recommended to show values from deeper soil layers (>30cm). Otherwise the effect of texture should be evaluated. There are also several uncertainties on fertilizer management: What form of OM amendments, how much, when in the crop rotation? What kind of cover crops? Please provided more details to the sampling design: Size of the fields, distance between the sampling points in a map.

Using an ANOVA approach for statistic comparison requires the assumption of normality. Further, the sample size of 3 is very low and likely not the suitable measure. I recommend using a simple T-test, depending on the distribution of the data.

The data set on microbial parameters should be incorporated in the main manuscript. Methods must descried properly. The same is true for the OC measurements. Have the carbonates be removed from the samples?

In the conclusion there something written with vegetable cover, that was not discussed before. I did not get this point. The author's proclaimed the "optimized management" practices for the whole Mediterranean region. From this very limited data set at one sampling site it is not possible to scale up the management tools across the whole Mediterranean environment. Also the effects in the subsoil have not been taken into account.

I also highly recommend a professional language check. Many basic rules for preparing a scientific publication are ignored. For example: The manuscript is overloaded with double brackets, grammar errors or punctuation errors. Many paragraphs are not accessible, even after reading several times.

Specific comments:

L39 change eliminate to avoid. Further, cover cropping have nothing to do with soil tillage practices, examples for reduced soil tillage are e.g. mini tillage (0-10cm) , Cultivator application and everything that avoids to invert the soil of 0-30cm.

L 43 the annual soil water balance primarily depend on precipitation: I suggest optimisation of the infiltration and water storing capacity

L51-70 this belongs to the materials & method section. If you write a paper on the methods you could bring this here.

L78 managed

L86-88 the sentence is overloaded with brackets. Avoid double brackets and remove some them. Keep this in mind for the rest of the manuscript.

L97-102 this is unclear. Is only the cereal straw removed from the fields? I never heard that straw of legumes and rapeseed is removed?

L 107 which form of OM amendments, how much nutrients and OC therein?

L245 - following. Use space between \pm and the number. The same is true for $>$. Only between the numbers an % there should not be a space.

L235-238 no consistency Fig. Figure. The two paragraphs double.

L246 texture homogeneity was not measured.

L311 where does the vegetable cover comes from ?