



EGUsphere, referee comment RC5
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Comment on egusphere-2022-131

Anonymous Referee #5

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-RC5>, 2022

Dear Authors,

I read with pleasure your MS entitled "Evaluation of a long-term optimized management strategy for the improvement of cultivated soils in rainfed cereal cropland based on water retention curves" by Aldaz-Lusarreta et al. The MS deals with the effect of an optimized agronomic protocol on water retention curve, pore size distribution (PSD) and aggregate stability. The Authors concluded that the soil under the optimized system reflected a better quality –or less degradation– compared to conventional management after 18 years of adoption.

The MS falls within the Journal's scope and will interest Journal's readers however I have some major and minor issues to draw to your attention.

- The structure of the abstract should be re-arranged by clearly dividing it into classical sections (introduction, M&M, results, conclusions). In particular, a few sentences regarding M&M should be added to introduce the reader to the work you did.
- What is the caution of applying organic amendments under no-till? Nitrate Directive and, the more recent NEC Directive claim for greater caution in applying N sources. How can you meet environmental criteria by broadcasting organic waste on the soil surface and not incorporating it? This would result in greater ammonia volatilization and a high risk of leaching. Consequently, also the nitrogen use efficiency would result very low without improving the soil structure due to the low amendments-soil particle mixing.
- The Authors used an indirect method (capillary method) to estimate the PSD however nowadays a lot of direct non-destructive methods are available for a direct assessment of PSD. Therefore, the limitations of your study as related to the adopted methods should be included and discussed in detail.
- The authors presented the water retention curves but only tested the statistical

differences between some relevant points (e.g., at saturation). Contrarily, a direct statistical comparison between the curves might give more value to your study.

- LL85-86: please insert standard WRB soil classification
- A more in deep discussion of your data as related to other published studies is missing in particular in the PSD section. There is a lot of literature on how different agronomic managements impact PSD. Just for example:
 - Conservation Agriculture Had a Poor Impact on the Soil Porosity of Veneto Low-lying Plain Silty Soils after a 5-year Transition Period. Piccoli, I., Camarotto, C., Lazzaro, B., Furlan, L., Morari, F. *Land Degradation and Development*, 2017, 28(7), pp. 2039–2050.
 - Zero tillage has important consequences for soil pore architecture and hydraulic transport: A review. Wardak, D.L.R., Padia, F.N., de Heer, M.I., Sturrock, C.J., Mooney, S.J. *Geoderma*, 2022. 422,115927
- The conclusion section needs to be re-arranged by removing the summary-like part (LL301-316) and should go beyond the study results