



## **Comment on soil-2021-32**

Anonymous Referee #2

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Referee comment on "Spatial distribution of argan tree influence on soil properties in southern Morocco" by Mario Kirchhoff et al., SOIL Discuss.,  
<https://doi.org/10.5194/soil-2021-32-RC2>, 2021

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### **GENERAL COMMENTS**

The topic of the work is current in terms of maintaining the fertility of the soil under arid conditions. It is an interesting study to evaluate spatial patterns of argan-tree influence. In general, this manuscript is acceptable, but the following issuers are still needed to consider.

### **SPECIFIC COMMENTS**

#### **Title**

To my knowledge the use of the term soil quality is not appropriate in this study. There is a wide literature assessing soil quality, although some authors use a few parameters it is preferable to combine them and create a soil quality index (SQI).

#### **Abstract**

Line 8-12: More generally, I suggest focusing the paragraph on the conducted study.

Line 18-23: Some data obtained should be included

Line 18: I suggest modifying the nomenclature: SOC to refer soil organic carbon and TN to refer total nitrogen. This should be modified in the whole text.

## **Introduction**

I recommend reducing the length of the text while preserving the informative value in terms of brevity.

I suggest moving Figure 1 to Material and Method section.

The authors should highlight the meaning or the purpose of this study in the introduction part. What kind of gap could you fill by doing this study?

## **Material and Methods**

The Material and Methods section is poorly organized and very confusing.

I suggest major re-write of the study area section.

Much more detail is required on how the experimental plots were design.

Figure 3 only provide precipitation at Aït Baha. Could you provide information of the other study areas?

Line 104: Pleas clarify "ca."

Line 104: "Figure 3 shows that in recent years the annual precipitation of this study area has decreased to ca. 220 mm, possibly a sign of higher aridity due to climate change". This a very vague statement. In order to make this statement, a greater period of years is necessary, and Figure 3 only 15 years were included.

Line 156: Please describe how 1-2 mm aggregates were obtained.

Under which soil conditions were the infiltration measurements carried out? Were they homogeneous?

## **Results**

Line 202-205: delete, it is described in table 2

This section is well structured and well written. Illustrations used in the text are very useful and high quality.

## **Discussion**

Line 301-302: Reiterate the objective of the work is not necessary.

In some lines it is recommended to include current references (eg. 309 or 344).

Line 322: "The medium to large effect for the unsaturated hydraulic conductivities could be explained by the higher porosity due to a higher content of organic" However porosity data is not available in the study. In this sense soil physical properties such as textural class or bulk density on microsite locations canopy and outside canopy for Argan trees are particularly relevant especially in an overgrazed environment. In addition, unsaturated hydraulic conductivity highly depends on soil's particle size distribution.

Line 324-325: "In a previous study, we found higher erosion rates as well as lower infiltration rates in the intertree areas". Please provide data erosion rates as well as infiltration rates.

Line 343: "large aggregates" Macroaggregates seems more appropriate.

Line 352: "The type of tree (architecture, size, genetic variety) could be a possible explanation for the missing significance of the directions." However, there is no information in the text about type of tree selected (eg. Crown diameter or tree age) and it

seems to be a relevant aspect in the conclusions. Has any pattern been followed to choose the analysed trees? If you have measured some parameters related to tree typology, please add them.

Line 361: "Although the soil quality decreases from T1 to T2, the T2". A soil quality index has not been developed to support this statement.

Line 364: (Qu et al., 2018) reference missing.