

Hydrol. Earth Syst. Sci. Discuss., referee comment RC2
<https://doi.org/10.5194/hess-2022-30-RC2>, 2022
© Author(s) 2022. This work is distributed under
the Creative Commons Attribution 4.0 License.

Comment on hess-2022-30

Anonymous Referee #2

Referee comment on "Investigating the effects of herbaceous root types on the soil detachment process at the species level" by Jian-Fang Wang et al., Hydrol. Earth Syst. Sci. Discuss., <https://doi.org/10.5194/hess-2022-30-RC2>, 2022

This manuscript deals with overland flow lab experiment to study the effects of two different herbaceous type with different root system architecture on the soil detachment process. They explore the influence of 7 plant densities (including the control-bare with no plants). The paper explores the associated interaction between the promoted changes in soil properties as bulk density, soil cohesion, soil aggregation and soil organic content due to the influence of the root architecture and density.

Major concern:

As a general, there is a huge effort on the dataset collection and soil laboratorial analyses otherwise, the experimental set-up is poor in terms of statistical confidence. The experimental design is not appropriate for a scientific journal since it counts only with two replicates per treatment (line 178), so the reliability of results and thus conclusions are not convincing me.

I would recommend to explore in the dataset if densities 5 and 10, 15 and 20, and 25 and 30 plant/m² could be aggregated, in other words, are differences between 5 vs 10, 15 vs 20, 25 vs 30 plant/m²? If statistically there are no differences, then you could try to built your treatments based on ranges of 5-10, 15-20, 25-30 plant/m², in order to get more statistical confidence, and then properly discuss your results.

Moderate concern:

In mat/met section, any of the soil properties is referenced (line 239-249).

Please, define the meaning of "S" type sampling (line 239).

Number of plots should be 26, including the control-bare.

In 2.5. Statistical analyses should explain if data is normal or non-normal, so the use of parametric or non-parametric test. This item should be properly developed.

From my understanding, soil moisture also influences soil detachment, so repeated overland flow experiments would modify the initial soil moisture content, which must to be considered as a co-factor or factor on soil detachment processes, mainly on repeated overland flow experiences. Proper statistical tools should be properly applied for the repeated measurement statistical analyses.

Many equations are used but any of them is referenced, please, equations should be referenced.

English language-grammar must be deeply revised.

Units should be carefully revised. See line 25 for the soil detachment rate (i.e.: *six planted densities ranged from 0.034 **kg m² s⁻¹** to 0.112 kg m² s⁻¹ for BI and was ranged from 0.053 **m² s⁻¹** to 0.132 m² s⁻¹ for AG,*)