

Interactive comment on “Coffee husk mulch on soil erosion and runoff: experiences under rainfall simulation experiment” by H. Moreno-Ramón et al.

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Dear referee, thanks for your comments and suggestions that are below solved.

The study investigates the efficiency of coffee husk mulch as soil protector against soil erosion. It provides important findings and is within the scope of the journal. In my opinion the paper should be published. Nevertheless, it has some inaccuracies: especially, the methods as well as the results and discussion are not always clearly and thoroughly described. Nearly all inaccuracies are already described by the anonymous reviewers I-IV. I fully shared their statements and suggested improvements. I therefore suggest resubmitting the paper after major revisions. In addition to Reviewers I-IV I have some further comments and questions: -The title is incomplete: Perhaps “Influence of” is missing before “coffee husk mulch. . .” Thanks for your suggestion,

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but we think that it is not necessary to put the word “influence of” in the title. We think that it is intrinsic in the title or in the action that we are researching. Material and methods: Page 1130; Line 25: 4x3x2 in the brackets of the first sentence is superfluous and confuses the reader. It is also redundant to the explaining some sentences later.

We have removed that bracket

The rainfall simulation procedure: - Authors use a very high intensity over an unusual duration (21 min.). Perhaps this is due to the design of the rainfall simulator: Does the capacity of the water tank (25L) allow a limited duration of 21 min only? Please explain that in the manuscript. - Did you have emptied the whole tank without refilling it continuously during the experiments? Did you take into account that a decreasing water level decreases the water pressure and consequently influences the rainfall characteristics (intensity, drop diameter and kinetic energy of drops decrease over time)? Have you calibrated the rainfall intensity before, during and/or after the experiments? Did you have measure the intensity on the plot area or on the entire (larger) area under the capillaries? Please explain in detail and check again if the rainfall intensity on the plot is presented correctly!

Thanks for your suggestion. The simulator was designed by one of the authors of these paper in her Thesis (Ibañez, 2001). In that sense, the simulator was calibrated before the experiment and during the simulation. In that sense we have added more information in the materials section. For example the water level in the tank was constant. This is the new paragraph that we have rewritten:

“The rainfall simulator is a metallic structure of 3.08 m of height and 1.99 m wide by 1.59 m length (Figure 1). At the top of the metallic structure were placed a water tank with a capacity of 25 liters and a device with 51 rows and 255 droppers. The distance between the erosion tray and the droppers was 2 meters. The water level inside the tank was constant, so the hydrostatic pressure did not suffer any change, and the droppers generated the same amount of rainfall along the simulation. The average

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droplet diameter was 5.76 mm, and the falling drop speed between 4.7 and 5.5 m s⁻¹. Each erosion tray was subjected to a total rainfall of 21 minutes and an intensity of 122 mm h⁻¹ with non saline water (CE < 2 dS m⁻¹). The kinetic energy generated was 12.6 J m⁻² mm⁻¹ and the Christiansen uniformity coefficient of 98%. To obtain uniformity in the rainfall, we attached a mechanical stirrer to the device. Ibáñez (2001) measured the rainfall characteristics of the simulated rainfall."

- Page 1133; Line 16: Did you dry the samples? Please describe the data collection more precisely.

All the samples were dried in the greenhouse, so they were dry in the moment of the simulation. This is the new sentence that explain that condition:

"When the damping cycles were finished, soil trays were left at ambient temperature until they were completely dry."

Results and discussion

Because they concern to each other, "infiltration rate" and "runoff" should be presented in one chapter. It is difficult to comprehend the results in presented form. Especially runoff and infiltration results should be presented in greater detail. Maybe all measured raw data could be provided in a table. At least runoff (in litre), infiltration (in litre) and runoff coefficient (in percent) are required as additional information in table 2.

Thank you for your advice, we have modified that section, but in our opinion the outcomes are clear in the units that we have presented the data.

Conclusion The conclusion should provide some statements about further research tasks (for example: long-term erosion experiments/studies with monitoring the influence of coffee husk on soil characteristics and soil quality, composting rate of coffee husk.

Thanks for your suggestion. We have modified this section and we have added your ideas in the last paragraph.

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"As a general conclusion, on the one hand, coffee husk reduces soil losses, sediment concentration and runoff depth; and on the other hand, it increases the time to runoff and infiltration rates, so it can be used as mulch for soil protection against erosion. With low mulch application rates (1.6 kg m⁻²) and under loamy textured soils, the outcomes have been satisfactory. By these reasons, future detailed studies will be necessities for determining the effectiveness of this byproduct in field conditions"

Please also note the supplement to this comment:

<http://www.solid-earth-discuss.net/6/C623/2014/sed-6-C623-2014-supplement.pdf>

Interactive comment on Solid Earth Discuss., 6, 1127, 2014.

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