

Soil

Comment: "Several grammatical and syntax issues are present within the manuscript, as well as many incorrect statements (e.g. mentioning non-significant results in the abstract and saying an increase in BH dosage and rainfall amount blocked BH migration in the abstract). These issues have not been outlined, however, in light of two major issues I have with the project design which makes me sceptical of the results and if cannot be fixed is reason to reject the manuscript.

1) The main conclusion of the manuscript is the ranking of four soil types in regards to the mobility of BH, and their susceptibility to leaching BH. However, only a single sample has been taken for each soil type and as such, there is no measure of variability within the soil types that would be necessary to make sweeping statements about the soil type as a population. Due to this, the conclusions like:

"Based on the mobility retention factor ($R_f = 0.34-0.90$), the mobility of BH in thin soil layers was ranked in the order Lixisols > Anthrosols > Ferralsols > Phaeozems"

would need to be changed to:

"Based on the mobility retention factor ($R_f = 0.34-0.90$), the mobility of BH in thin soil layers was ranked in the order $S4 > S3 > S1 > S2$ "

as you can only justifiably say that there is a difference between the samples as opposed to soil types.

Response: *Thank you for your comments. Some of the statements in the summary do have errors. We have revised the statements in the summary and revised them as follows according to your requirements:* Based on the mobility retention factor ($R_f = 0.34-0.90$), the mobility of BH in thin soil layers was ranked in the order $S4 > S3 > S1 > S2$. The R_f value of BH was linearly positively correlated with soil sand content and pH, and negatively correlated with other physical and chemical properties of soil. BH was difficult to leach in S2, less difficult to leach in S1, and easy to leach in S3 and S4. Increasing the BH dosage, rainfall amount, leaching solution pH and adding anionic (dodecyl benzene sulfonic acid) or nonionic (Tween-80) surfactant promoted BH migration in soil columns. In contrast, increasing the adding humic acid and cationic surfactant (cetyl trimethyl ammonium bromide) blocked BH migration in soil columns. *And modify the soil type to S1-S4 in the full text*

Comment: The method indicates that 4 cm diameter by 30 cm cores were packed with 600 to 700 g of air-dried soil. A core packed with 600 g of soil would have an air-dried bulk density of 1.59 g/cm^3 , while a core packed with 700 g would have an air-dried bulk density of 1.86 g/cm^3 . Thus, cores have a potential variation of 15-17% in air-dried bulk

density which would have significant impacts on the porosity of the cores, the dynamics of water and thus the dynamics of the solute. This issue in the method would make me sceptical of any of the results from the leaching experiments.

-Additional questions about the method were if the soil was uniformly dried? Was the water content of the soil at packing determined? Because variation in moisture content at packing can introduce significant artefacts especially when dealing with variable soils.

Response:

All the soil was spread on the floor before the column was filled with ventilation and dried, then ground and sieved, and finally the moisture content of each soil after drying was measured by the drying method, and the moisture content of S1, S2, S3, and S4 were 3.5 %, 4.7%, 1.7%, 2.1%. All water contents are below 5%, and the impact on the soil column leaching test is almost negligible; thank you for your opinion, we have added this data to Table 1; another On the other hand, because the mechanical composition of different soils is different, and the content of sand and clay particles in different soils is different, the bulk density of the main soil after filling the column is different, resulting in the same volume of soil quality will be inconsistent, appearing 600-700g The quality within the range. However, all the soil in the soil pillar is the soil after being compacted, and it will not artificially cause the gap to be not filled.