

Interactive comment on “Compared impact of compost and digestate on priming effect and hydrophobicity of soils depending on textural composition” by Amrei Voelkner et al.

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General comments

The aim of this study was to determine the effects of treated organic wastes on hydrophobicity under different soil textures and the change of microbiological activity and organic carbon content. I believe this paper has relevance to the “SOIL” journal and will be of interest to the readers. The introduction is short and lacks depth as you pose three objectives from this study. No literature was cited about the effect of organic amendments on different soils and hydrophobicity. The compost and digestate were not tested for hydrophobicity. I would caution this is a study about hydrophobicity as there is no indication the soil you are working with or the amendments are hydrophobic

C1

in nature. The RI index seem to show limited increase in hydrophobicity with all values close to 1. Also please go through the paper grammatically.

Specific comments

1. Remove objective → We replaced “objectives” by “major aims”. 2. It is expected you will determine relationships. → We changed the sentence and pointed out that the change Corg content and microbial activity should be determined in dependence of the kind of amendment (digestate or compost). 3. I don’t think you should say a special focus on soil texture. You only used 2 soils. → We agree and emphasized that the hydrophobicity of a loamy and a sandy soil was investigated. This makes clear, that only two soils were investigated. 4. Was soil hydrophobicity or the hydrophobicity of the amendment tested before mixing? → The hydrophobicity of the amendment itself (compost and digestate) was not investigated. The measurement of the hydrophobicity was conducted using the soil that was mixed with the amendment. 5. As mentioned from your introduction, the critical water content is important for the expression of soil hydrophobicity. You have tested the wetting properties of moist samples. Do you believe that the soil hydrophobicity has reached the critical level in your system? → It is true that the soil water content is a decisive parameter which can induce hydrophobicity when it falls below a certain value. It is also true that this critical water content is not reached in our system due to the experimental design. Nevertheless, complete desiccation of the soil under field conditions is no exception and the effect of drying on the development of hydrophobic conditions can be substantial. It is therefore important to consider this point. 6. Is there a reason why the Ss site had a lower organic carbon than the loamy soil? I would expect this to be reversed. → Table 1 shows that the Ss soil from Karkendamm has a higher content of organic carbon compared to the loamy soil, not the reverse. The reason for the higher Corg content of the Ss soil may be deep ploughing which was conducted in 1981 to improve the air- and water conductivity of compacted soil layers. As a result, the subsoil horizon (rich in OM) has been ploughed to the soil surface, increasing the contents of carbon at the surface of the Ss soil. 7.

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Is there a reason why the SCM and SDM were not compared to each other? → We don't agree to this point. SCM and SDM were compared to each other, e.g. page 8, l. 10-11, 17-18, 20-21. 8. The scale for Ut3 is no good in figure 2. → As shown in the introduction, one main question was the effect of the two amendments on chemical parameters of a loamy and a sandy soil. To get a direct comparison between these two textures, the scale was chosen. 9. Was the increase in RI significant? It does not look like there was much change in RI. → The increase of the RI was significant in C30 (Ss) and D40 (Ut3). 10. I disagree with the claim that fine pores are impenetrable by microorganisms. → We don't agree to that statement. It is mentioned in the manuscript that fine pores are impenetrable by bacteria, not by microorganisms. This findings were published by e.g. Gisi et al. (1997) *Bodenökologie*.

Technical corrections

1. Exsudates is spelled wrong throughout the paper → We agree. The word "exsudates" was corrected and replaced by the word "exudates" throughout the text.
2. Page 1, Line 17: replace "beginning" with "initial" → We agree. The word "beginning" is replaced by "initial".
3. Page 2, Line 20: Change "to be more increased" to "to increase" → We agree. "to be more increased" is replaced by "to increase".
4. Page 2, Line 25: Should include a before major part → We agree. an "a" is added before "major part".
5. Page 2, Line 25: should be serve as a carbon source. → We agree. an "a" is added .
6. Page 2, Line 7: Should be in a fermenter → We agree. an "a" is added.
7. Innocuousness for buffer? → Means, that an endangerment of the buffer capacity of soils due to digestate supply should be avoided.
8. Page 2, Line 32: What do you mean by across borders? → In this context, "across the borders" means the interaction of digestates in different soils that occur worldwide.
9. Page 4, Line 12: Please correct grammatically. → We totally agree. this sentence is corrected grammatically and changed.
10. Page 4, Line 16: what is "dosis"? → We agree. The word "dosis" is replaced by "compost rate".
11. Page 5, Line 14: should be on a perforated plate → We totally agree. "At" was replaced by "on".
12. Do you mean mesopores instead of

C3

middle pores? → That is right. We replaced "middle pores" by "mesopores".

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