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Interactive comment on “Interactions between organisms and parent materials of a constructed Technosol shape its hydrostructural properties” by M. Deeb et al.

Anonymous Referee #2

Received and published: 25 January 2016

This is an interesting study, which I consider appropriate for publication in SOIL after some improvements. My main concern is that some passages should be rearranged and that results and discussion should be carefully separated.

In the following, all of my suggestions for improvement of the manuscript, are listed.

Abstract

Page 1310, line 2 and throughout the manuscript: "uptake of topsoil" sounds strange to me. Probably the authors mean the relocation of the topsoil?

Page 1310, lines 6 and 11: Do the authors mean the same when using the terms "deep

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Interactive Discussion

Discussion Paper



horizons of soils“ and "parent material“? Please be precise with these terms, especially as there is no unique definition of "subsoil“ or "deep subsoil“.

Page 1310, line 11 and throughout the manuscript: Please write "parent material“ without hyphen.

Introduction

Page 1311, lines 1ff: I think the authors mean "Understanding of the influence of bioturbation. . . is not straightforward“.

Page 1311, line 12: See above (topsoil uptake).

Page 1311, lines 13ff: Please give a reference for this. Is the release of CO₂ the only reason against the use of topsoil?

Page 1311, line 21: Please write "pedogenesis of natural soils“.

Page 1311, lines 24ff: There is an abrupt change of the topic here. Please rephrase or rearrange.

Page 1311, line 25: "This has led to consider“ sounds strange. Please rephrase.

Page 1311, line 24 to page 1312, line 2: This passage sounds a bit confuse and too defensive. It does not get clear to me what is the main statement here.

Page 1312, line 7ff: This is not necessarily true in all cases. Parent materials of soil formation may already have been exposed to vegetation. For instance, terrestrial eolian sediments like loess are wide-spread parent materials. For deposition of loess, at least a grass vegetation cover is required. Highly abundant microrhizoliths in this sediment (calcified fine roots, frequently called pseudomycelia under the assumption of abiotic formation) give evidence of this. Further, roots of many tree and shrub species are able to penetrate deeper parts of the soil as well as soil parent material, entailing incorporation of root- and microorganism-derived organic matter.

SOIL

2, C694–C698, 2016

Interactive
Comment

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Interactive Discussion

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Page 1312, line 23 to page 1313, line 24: The last two paragraphs of the Introduction are not very well structured. Both begin with "we were interested". Please rearrange these parts and be more focused. In my opinion, they could be shortened a bit.

Page 1313, line 5: What are "rhizosphere inhabitants"? Do you mean microorganisms?

Page 1313, line 16: Please explain shortly to the reader what a soil shrinkage curve is.

Page 1313, line 17: Please write "The influence of parent material properties. . ."

Material and methods

Page 1314, line 3: So far I thought that a constructed Technosol is build from soil parent material (or deep soil horizons), mixed with green waste. But here, I read that the deep soil material is the waste material. This is confusing for me.

Page 1314, lines 10ff: To keep the manuscript a bit shorter and make it more clearly arranged, I suggest to put all of the soil parent material properties in a table.

Page 1314, line 12ff: Why do you once just mention the perentages of clay, silt and sand and then, in the second part of the sentence, explain the grain size boundaries? It should be the other way round.

Page 1314, lines 20ff: Would it be possible to give the information, which plants (grasses, shrubs?) and also which plant parts (roots, shoots, branches?) the green waste compost derives from?

Chapter 2.3: Do I understand it right that all the parameters were calculated only based on the uppermost 5 cm of the microcosms, whereas the microcosms had a height of 12.5 cm? I am not familiar with the SSC model, but it is likely that the microcosms, after 21 weeks of plant growth, were completely rooted. Therefore, I wonder if the total volume of the microcosms should be used to calculate these parameters.

Page 1318, lines 14ff: Is it really necessary to mention all of these size classes for the roots? In the Results section, only two size classes are mentioned.

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Results

Page 1319, lines 21ff: It would be sufficient to give one decimal.

A general remark on the Results section: In my opinion, there is already a lot of interpretation in this chapter (and at the end of section 3.1 even a small conclusion). If Results and Discussion sections are separated, then the former should contain only description of the obtained data.

Page 1320, line 8 and throughout the manuscript: Please write "effects of GWC portions/percentage" instead of "effects of GWC".

Section 3.2: If you mention figures with 4 (Fig. 3) or even 6 diagrams (Fig. 4), then it is appropriate to mention also, which part of the figure you refer to in the text (Fig. 3a, Fig. 4d etc.).

Page 1320, lines 28ff: Again, reducing the values to one decimal makes it easier to read the text. Page 1321, line 14: The phrasing "looked smaller" sounds colloquial to me.

Page 1321, lines 16f: Headings of sections 3.2 and 3.3 are nearly the same, and it does not get clear immediately what is the difference. Maybe these sections could be merged?

Page 1322, line 22 to line 26: This information should not be part of the Results section.

Discussion

Page 1324, line 21: "constructed"

Page 1326, lines 14f: Isn't this a repetition from the Results section? As stated above, the authors should carefully distinguish between results and discussion.

Generally, when discussing the influence of roots and earthworms for soil, it could be helpful to cite the review by Kautz et al. (2013, SBB).

SOIL

2, C694–C698, 2016

Interactive
Comment

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Section 4.3: Here, not only the influence of plants is discussed, but also the interaction of plants and earthworms. Thus, maybe sections 4.2 and 4.3 could be merged?

Page 1327, lines 7ff: Very long and complicated sentence. Please split.

Page 1328, line 5: Do you mean "needs to include ecological aspects"?

Conclusions

Page 1328, line 20: "in the same way LIKE. . ."

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SOIL

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