

Interactive comment on “Vertical nutrient and trace element migration in cambisols after application of residues from anaerobic digestion of manure” by M. Sager

Anonymous Referee #3

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Report on the manuscript SOIL-2016-44, titled “Vertical nutrient and trace element migration in cambisols 2 after application of residues from anaerobic digestion of manure”, by Manfred Sager.

This manuscript focuses on the impact of biogas residues on soil chemical fertility. The author studies the movement of elements through columns filled with soil material. A small amount of biogas manure (maize residues and pig manure), pretreated with FeCl₂ in order to fix H₂S, was mixed with the first centimeters of soil material at the top of columns. During the experiment (8 weeks), water was added periodically and eluates were collected and different element content and parameters were analyzed. After the experimental period, soil columns were sliced and analyzed separately.

C1

Although objectives are not clearly enounced, the general purpose of the manuscript falls within the scope of SOIL. The study of the dynamics of different elements included in the study (Al, B, Cr, Cu, Fe, Mn, Na, Ni and Pb) is interesting for a wide audience.

Nevertheless, I very much regret to say that the manuscript can not be considered for publication in SOIL and, in my opinion, it must be rejected.

Some of my main concerns are:

- 1) The structure of the manuscript is very poor. The introduction is over long and includes a chain of general subsections that make only general statements and, although some paragraphs are more interesting than others, it do not contribute to [1] explain why this research is necessary (it is!) and [2] situate the research in a general context.
- 2) Objectives are not clearly explained. Many parts of the experiment do not correspond to stated objectives (eg, the analysis of many elements in eluates).
- 3) Methods are poorly described. I suggest starting with a general description of the experiment (an “Experimental design” subsection) followed by the description of analyses. Many details are absent (eg, the number and size of soil slides extracted from columns). Soil analyses are describe briefly with a simple reference to the name of the Austrian standard method, which is a poor description for a wide-world audience.
- 4) “Results and discussion” are included in the same section (3, lines 284-377). This is not a bad option, but some parts of the results are not discussed at all. In this part, results are shown, but discussion is absent. Only one reference is provided in section 3.1 (Sager et al., 2990), two in section 3.2 (Sager, 2002; Sager, 2004) and none in section 3.3.
- 5) Surprisingly, a new “Discussion” section is included (4, lines 379-629). In this case, discussion exists, but results are included too.
- 6) No statistics are used. Mathematical support of results and conclusions is completely absent.

C2

7) The reference list is not updated (only eight references published after 2010). Although I am not an strict enemy of including some types of non-peer-reviewed sources, the number of items in the list is excessive and includes project reports (eg: Unterfrauner. 2009), congress contributions (eg: Sager, 1991) or other sources (eg: Zimmer, 2009).

8) Lines 732-747 and 756-761 should be included in a letter to the editor, not in the manuscript.

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C3