

## ***Interactive comment on “Organic wastes from bioenergy and ecological sanitation as soil fertility improver: a field experiment in a tropical Andosol” by A. Krause et al.***

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We are thankful for providing us thoughtful feedback and valuable comments to support the improvement of our manuscript. We discussed the provided comments, the raised issues, criticism and suggestions thoroughly among the authors team. Please find our responses below and also see the final author’s comment.

Best regards,

Ariane Krause, on behalf of the author’s team

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Comment #1: The results are of interest and of certain scientific relevance, and fit the scope of the journal.

Comment #2: But this manuscript is too descriptive and sometimes it seems more a project report than a scientific publication. The topic has been correctly introduced, but before the aim of the work is described in the final part of the introduction, a rather personalized description of previous experiments run with the materials used as amendments in the present manuscript seems a bit unconventional for this type of publications.

Response: We appreciate the general positive evaluation of the introduction we provided. We agree with the Referee’s statement that parts of our manuscript are too descriptive. We will revise the manuscript accordingly. Therefore, we suggest reworking the section 1.3 (p. 1224) so that the rationale of using the soil amendments is deduced more scientifically instead of reviewing content of our earlier publication. In addition, we consider shifting details about the materials used as amendments from section 1.3 (p. 1224, line 22–28) to the section 2.2 on soil amendments. By this, we can also react on Comment #3 of Referee #1 and Comment #6 of Referee #2.

Comment #3: The description of the experimental design in the Materials and Methods section is not clear enough, and relies too much on that published in previous articles. This manuscript has to stand alone and a brief description of the amendments and a much clearer description of the experimental procedure have to be added to the text.

Response: We agree and will rephrase chapter 2 on “Material and Methods” so that the paper itself delivers all needed information. As mentioned, we will describe the soil amendments in detail in M&M.

Comment #4: For example, the number of replicate plots per treatment is not mentioned until page 1228, some basic information about the different amendments (pH, moisture/organic matter content, etc.) cannot be found throughout the manuscript, and the description of the grass cover used with that treatment is not clear.

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Response: Number of replicates is given on p. 1226, line 10-13. However, we agree that this description is rather difficult to understand so we will rephrase it accordingly. We will also add information about the replications in the improved Abstract (see author's general comment). Furthermore, we will add an additional table providing information about the amendment's chemical characteristics and nutrient contents etc. We will also rephrase and improve the explanations on the grass cover.

Comment #5: It is also strange the fact that two of the crops (African egg and pepper) are not used or mentioned in the results and discussion of the manuscript.

Response: We planted African eggplant and pepper as part of the chosen intercropping system. The local agricultural expert recommended this because our aim was to be in line with local agricultural practices. However, these two plant species are perennial and harvesting started only in June 2014 when our experiment was finished. So we decided to integrate them in the intercropping but exclude them from analysis. However, we will make this point clearer when revising our manuscript.

Comment #6: The latter section is too descriptive, and the text is quite difficult to read in a comprehensive way, as too many parameters are commented in too much detail.

Response: We agree. To significantly improve "Results & Discussion", we suggest the following changes for the revised submission: 1. Elimination of section 3.5 where we provide an outlook on how the tested soil amendments can contribute to close nutrient cycles on small-scale farms in Karagwe. However, by withdrawing this section we will enhance the focus on the results of the field experiment. We can shorten this section to only one sentence in the conclusion. 2. Elimination also of section 3.6 to reduce the amount of information provided in this chapter and to support the readers' focus on the most important results of the experiment. (Also see our response to comment #10.) 3. We will completely rewrite the chapter to improve readability.

Comment #7: The manuscript would benefit from a summarized results and discussion section, where the main effects of the different amendments are commented as a whole

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for the different crops.

Response: We agree and will adjust the manuscript accordingly.

Comment #8: This part of the manuscript needs to read better and to include a deeper discussion of the results, which are simply compared to previous ones in the current version of the article. The effects observed in the soil and, especially, in the different crops, have to be related to the properties of the amendments and to the changes in the soil physico-chemical properties and nutritional status.

Response: We agree, that the observed effects need to be discussed in relation to the soil amendments. However, in our opinion we already did this by discussing effects on plant growth, plant nutrition and changes in soil properties. For example we discussed different P contents in the tested soil amendments and related them to the observed differences in CAL-extractable concentrations of soil P. Furthermore, we applied the vector nutrient analysis to identify the primary response of maize plants to improved P availability. In addition, we discussed the different CaO-equivalents of the soil amendments in the context of the observed changes in soil pH. We also discussed, that under the given tropical conditions, an increase in soil pH will positively affect the availability of nutrients in the soil, hence stimulate biomass growth. As typical for the local Andosol, nutrient deficiencies and acidity in the soil were most present on the unamend control plots, which depressed plant growth. However, we will work on improving comprehensibility of chapter "Results and Discussion".

Comment #9: Section 3.4 (nutrient balancing) is not clear at the moment and may have to be reconsidered and rewritten by the authors in a more comprehensive way.

Response: We agree and will improve the section and will do the adjustments accordingly.

Comment #10: Section 3.6 (further aspects) is somehow speculative and may have to rely on the results of the present experiment.

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Response: We agree and suggest withdrawing this section and erase especially the subjective impressions. However, we will keep two relevant aspects: (1) the effect of biogas slurry on beans plant will be moved to section 3.2 (Results and discussion of biomass production, p. 1234 f.) and (2) the discussion of the practical application and the addition of urine to CaSa-compost, which are based on recent scientific results. The latter issue will be shortened and moved to section 2.2 (p. 1226 f.), hence integrated into the revised and improved description of the used soil amendments.

Comment #11: Once the manuscript is corrected, the conclusions of the article may have to be accordingly revised

Response: We agree and will do so.

Comment #12: The quality of figures 2-4 may have to be also improved and make them easier to understand. Move most of the information in the figure legends to the text (M&Ms) and leave only the basic information to understand and interpret the graphs there

Response: We agree and will change the captions accordingly. For example, we will move information on the applied method from Fig. 2 to section 2.3 and the description of soil physical examinations.

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Interactive comment on SOIL Discuss., 2, 1221, 2015.