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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 to the three anonymous referees for providing us thoughtful feedback and valuable comments to support the improvement of our manuscript. We were pleased to note, that two Referees found our work interesting and relevant enough to be published. We especially appreciate the third Referee's acknowledgement of the relevance of our work in the context of waste and nutrient management in African agriculture and the practice-oriented approach.

We discussed the provided comments, the raised issues, criticism and suggestions thoroughly among the authors team and agree with almost all comments. We resume,

that we have to make clearer, where the innovative aspects of our work are:

- practice-oriented experimental set-up including intercropping of local, market-relevant crops instead of rather academic testing of well studied but perhaps irrelevant grasses;

- focus on first season, as its success is crucial for implementation into practice (even if some species could not be focused for the first season);

- no significant alteration of hydraulic soil properties, an aspect often overlooked or neglected in research about soil amendments.

Furthermore, we decided to erase all data related to the urine treatment. The use of urinal deodorizer blocks inside the toilet altered the urine's quality so that it was impossible to assess the true effects of urine as fertilizer (section 2.2, p. 1227, line 6-8). Consequently we only presented but did not discuss the results of the urine treatment. However, that was confusing and incorrect.

As a general outcome of the already started revision we want to present the revised Abstract:

Andosols require regular application of phosphorus (P) to sustain crop productivity. We studied the short-term effects of amending standard compost, biogas slurry and CaSa-compost (containing biochar and sanitized human excreta) on (i) crop productivity, on (ii) the plants' nutrient status and on (iii) the soil's physico-chemical properties on an Andosol in NW Tanzania. The practice-oriented experiment design included intercropping of seven locally grown crop species planted on 9 m2 plots with five repetitions arranged as a Latin rectangle. Differences in plant growth (biomass production and crop yield e.g. of Zea mays) and crop nutrition (total C, N, P, K, Ca, Mg, Zn, etc.) were related to pH, CEC, total C and the availability of nutrients (N, P, K, etc.) and water (water retention characteristics, bulk density, etc.) in the soil. None of the amendments had any significant effect on soil water availability, so the observed variations in crop yield and plant nutrition are attributed to nutrient availability. Applying CaSa-compost

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increased the soil pH from 5.3 to 5.9 and the level of available P from 0.5 to 4.4 mg per kg. Compared to the control, adding biogas slurry, standard compost and CaSa-compost increased the aboveground biomass of Zea mays by, respectively, 140, 154 and 211 %. The grain yields of maize on soil treated with biogas slurry, standard compost and CaSa-compost were, respectively, 2.63, 3.18 and 4.40 t ha-1, compared to only 1.10 t ha-1 on unamended plots. All treatments enhanced crop productivity and increased the uptake of nutrients into the maize grains. We conclude that all treatments are viable as substitute for synthetic fertilizers. The CaSa-compost was most effective in mitigating P deficiency and soil acidification.

We are ready to revise our manuscript so that it will finally reach the high standards to be published in SOIL. Please, find our detailed responses to the Referees' comments as direct replies to each of the three comments.

Best regards,

Ariane Krause, on behalf of the author's team

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

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Interactive Comment