

SOIL Discuss., referee comment RC1
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Comment on soil-2020-94

Anonymous Referee #1

Referee comment on "Nutrient limitations regulate soil greenhouse gas fluxes from tropical forests: evidence from an ecosystem-scale nutrient manipulation experiment in Uganda" by Joseph Tamale et al., SOIL Discuss.,
<https://doi.org/10.5194/soil-2020-94-RC1>, 2021

It is not clear in the abstract or materials and methods that the fertilizer was split applied. I suggest that the authors work on making this clear from the reader upfront. I also mention the rates and frequency of fertilizer application.

Ln 48: Th this the word "geochemsitsry" was supposed to be "geochemistry"

Ln 121-122: why where these fertilization rates chosen? What was the rationale?

Ln 125: How much fertilizer was applied at different times. Consider mentioning the rates of N and P application.

Ln 127-128: How was the soil sampled collected in a pit? Or using augers? Be clearer on what was done.

Ln 142: Considering the expected peak in GHG emission following fertilizer application, why was the intensity of GHG monitoring not increased immediately after fertilization?

Ln 152: The gas measuring window 9 am-4 pm is too wide. Wouldn't air temperature be different at 9 am and at 3 pm for instance.

Ln 173 Ammonia or Ammonium?

Ln 264: In Fig 3a it does not appear CO₂ fluxes ever went above 250 mg C m⁻² h⁻¹ yet here you give the range as 60 to 330 mg C m⁻² h⁻¹? Please explain or correct.

Ln 288: In Fig 3b, it does not appear CH₄ uptake was ever above -200 mg C m⁻² h⁻¹, yet

here you have it as $-278 \text{ mg C m}^{-2} \text{ h}^{-1}$? Please explain or correct.

Ln 353: I think "mirobial" was supposed to be "microbial".

Ln 400-402: Does the relationship not depend on the form of mineral N (NH_4^+ or NO_3^-)? Also see: Banger, K.; Tian, H.; Lu, C. Do nitrogen fertilizers stimulate or inhibit methane emissions from rice fields? *Glob. Chang. Biol.* 2012, 18, 3259–3267; for insights on the mechanisms.

Ln 430: What do the results look like when you correlate N_2O with either NH_4^+ or NO_3^- .