

Biogeosciences Discuss., referee comment RC2
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Comment on bg-2021-53

Anonymous Referee #2

Referee comment on "Effect of organic carbon addition on paddy soil organic carbon decomposition under different irrigation regimes" by Heleen Deroo et al., Biogeosciences Discuss., <https://doi.org/10.5194/bg-2021-53-RC2>, 2021

This paper is dealing with the role of reductive desolution of Fe (oxyhydr)oxides in a six-week pot experiment with rice plants coupling with reduction of native organic carbon (OC) as an alternative soil electron acceptor. The goal of this study was to point out the role of Fe content on crop residue (Maize shoots), which can be fastly consumed by microorganisms or eventually stabilised as Fe-organic carbon complexes. The authors used two Bangladeshi soils with contrasting SOC-to-reducible-Fe (SOC:Fe_{ox}) ratios were kept under a regime of alternate wetting and drying (AWD) or continuous flooding (CF). The topic is well-suited for a publication in Biogeosciences, but it may be improved, before publication. I suggest minor revision.

- Lines 55: In the introduction, the choice and importance of maize shoots, which can be rapidly metabolized by micro-organisms, should be discussed more largely than in lines 55
- The data are looked at from a maize straw addition point of view, but the initial carbon (TC) is not really looked at, or it has not been clearly explained: what is the initial carbon between substrate C, basal soil derved C.
- What are the international standards used in lab? What are their $\delta^{13}\text{C}$ values? This should be given. These terms should be defined early in the M&M section, related to analytical procedure. This will help the reader for a better understanding.
- Lines: 90-95: Moreover, why 2 different soils are taken for the experiment, with two different TC amount? It can be difficult to appreciate the difference since the initial soils are not the same for the experiment?
- Line 90-95: It was mentioned that soils were sampled 2014. Did authors check the soil physicochemical and biological properties before starting the experiment at 2018? If so how was the variations/changes of soil properties?

Please also note the supplement to this comment:

<https://bg.copernicus.org/preprints/bg-2021-53/bg-2021-53-RC2-supplement.pdf>