

SOIL Discuss., referee comment RC1  
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## **Comment on soil-2021-108**

Anonymous Referee #1

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Referee comment on "Rhizodeposition efficiency of pearl millet genotypes assessed on a short growing period by carbon isotopes ( $\delta^{13}\text{C}$  and  $\text{F}^{14}\text{C}$ )" by Papa Mamadou Sitor Ndour et al., SOIL Discuss., <https://doi.org/10.5194/soil-2021-108-RC1>, 2021

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Manuscript number: Soil-2021-108

Title: Rhizodeposition efficiency of pearl millet genotypes assessed on short growing period by carbon isotopes ( $\delta^{13}\text{C}$  and  $\text{F}^{14}\text{C}$ )

General comment

Ndour and co-authors conducted an interesting study of rhizodeposition of pearl millet genotypes and net soil C-balance using natural  $^{13}\text{C}$  abundance by growing a  $\text{C}_4$  plant in a  $\text{C}_3$  soil. The findings are interesting, and the paper is generally well written. However, the authors should consider addressing the issues listed in specific comments below and some minor sentence construction/English language issues throughout the text.

Specific comments

L21-22: In the abstract, provide information or explain what you mean by "low-aggregation lines" and "high-aggregation lines". Also, in L21 clarify what you mean by "was more important".

L26: "SOC" should be written in full here, followed by the acronym in parentheses.

L26-27: Clarify the text "increasing SOC content would have beneficial effects on agriculture by increasing soil fertility" as it implies a direct effect on soil fertility rather than indirect effect. For example, increasing SOC content would enhance soil fertility through improving physical and biological properties of the soil.

L27-29: "Moreover, this strategy could be particularly relevant in the Sahel region of Africa, where very little above-ground cover remains after harvest, leading to soil carbon depletion". This sentence suggests it is difficult to increase SOC in this region. Perhaps add information in this first paragraph relating to increasing/maintaining SOC in this region of Africa.

L45: Rhizosheath is not a new trait per se.

L53: "durability". Perhaps change this to a better term.

L74: "soil moistened to its water holding capacity". Do you mean 100% water holding capacity? If so, is this level of watering relevant to the Sahel region. Perhaps add information on why this level of watering was applied.

L80: "Roots and RAS were separated by washing the roots in 50 mL". Clarify whether you mean 50 mL water.

L83: Did you also measure root tissue 13C?

L91: Perhaps delete "online".

L104-119 Section 2.4: I suggest the authors should provide more details of statistical analyses here. Currently there is insufficient details of statistical analysis (only one sentence in L118-119).

L131: "priming effect". Perhaps here you describe net soil C-balance (i.e. negative net soil C-balance) rather than priming effect per se. Consider revising.

L144: "On the contrary there is no significant difference between all four bulk soils and the control soil....". Clarify whether you mean no significant difference in delta 13C values.

L161: Change "unplanted soil control" to "unplanted control soil".

Fig 2C: Consider changing the unit for expressing "plant-derived C/plant biomass".

L178: "carbon cortege". Consider an alternative term.

L181-182: "At this stage of plant growth, the trends showed a higher carbon loss vs gain (high  $C_{lost}/C_{new}$  ratio) for the low-aggregation and intermediary-aggregation lines L220 and L3 (4.4 and 3.5) compared to the two high-aggregation lines L132 and L253 (2.9 and 3.3) (Table 1)". This finding is interesting but there is little discussion on this in the Discussion section. Perhaps consider expanding the discussion on this.

Table 1 caption: "not solvable". Do you mean the hypothesis could not be proved?