

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 F^{14}C)

#Topical Editor comment:

General comment: One thorough review was obtained for your paper and unfortunately another reviewer withdrew. I have read the paper as well to provide some additional comments. In general, little is needed before this paper can be accepted for publication. Please be careful on the use of the term 'rhizosphere' when conducting measurements of rhizosphere soil. This just needs terms changed in a few places. Details of 'water holding capacity' are needed in section 2.1. Mention value and the approach used to get this measurement. Also give brief details on how the soil was moistened.

Response: We thank you for handling our submission, and for serving as a second referee with the withdrawal of the reviewer 2.

We have provided in the “Pearl millet cultivation” subsection the value of the water holding capacity and detail of its determination: “ Each pot was filled with 1.5 kg of the soil moistened to its water holding capacity (8%) which was determined gravimetrically from the graph of water loss kinetics during 18 hours. This watering level was adopted to have a good germination rate as the soil was sandy with a low water retention capacity, and we have used bottomless pots which allow water infiltration as in Ndour et al (2017)”

Section 2.2.3.

Comment 1: line 99 - 'weighed'

Response 1: the suggested correction was done

Comment 2: line 100 - 'in the presence of...'

Response 2: the suggested correction was done

Comment 3: Line 101 'graphite was then...'

Response 3: This suggestion was adopted

Section 3

Comment 4: Line 145 - 'rhizosphere' rather rhizosphere

Response 4: This suggestion was adopted

Comment 5: Figure 1 - put units on the SOC % plot so it is clear it is gravimetric and not volumetric

Response 5: This suggestion was adopted, the unit of SOC is expressed in (%wt) and this was mentioned on the Y axis title of **Fig. 1 (a)**

Comment 6: line 155 - 'was found between...'

Response 6: We replace "evidenced" by "found"

Comment 7: line 158 - '(L220) and intermediary-aggregation (L3) lines...'

Response 7: This suggestion was adopted

Comment 8: Fig 2 - be consistent with units. (a) and (b) should both be g kg^{-1}

Response 8: In figure 2 (b) we expressed Plant-derived C mass in (g). We think the absolute value is more informative than a relative value, here.

Comment 9: Fig. 2 caption - 'deposited' rather than 'deposed'

Response 9: This suggestion was adopted

Comment 10: Line 178 - '..hypothesis 3 (priming)'

*Response 10: We adopted this suggestion: only hypothesis 3 (**priming**) made it possible to solve the equations*

Comment 11: Future research needs/outlook is missing at present. Secondary impacts to improved soil properties would also benefit from being described

Response 11: We added the research perspectives in the conclusion: “ Further studies should focus on studying the profile of root exudates among these pearl millet genotypes to see in what extent it could contribute to the variation observed in plant-derived C dynamic in the rhizosphere. Nevertheless, whatever the relative contribution of the quantity and the quality of root exudation in shaping the rhizosheath size, this latter is now recognized as relevant root trait and genetic studies are being conducted to detect their QTLs and controlling genes in pearl millet, and this would provide interesting tools to breeders for the selection of efficient genotypes for a sustainable production.”