

## **Authors response to the editor**

In order to place this study in a larger context, as noted and proposed by all four reviewers, we did a lot of changes in the manuscript, which are difficult to describe in a point by point list. The most transparent way to follow the changes we did would be the original manuscript in track changes mode, but such type of MS-Word document is not possible to upload to the system. Therefore, I will send a word file directly to the editor, and outline below only major changes.

In our revised manuscript, in general we followed the line indicated in our replies to comments of the four referees, with two exceptions explained under 1) and 2):

- 1) Bulk density of 3<sup>rd</sup> layer: our pedotransfer type of modelling to estimate bulk density of the lowest soil layer was questioned especially by ref. 1. Instead of expanding this chapter as indicated in our reply we decided to simply skip this exercise, leaving empty cells in Table 1 and in Table S3, and providing the following statement in the last para of Ch. 2.2.: “For the lowest layer or C-horizon we only have BD values from the soil profiles (see Table S2), because the BD of the lowest layer was not considered for carbon stock calculation, and undisturbed samples were difficult to get. “

When presenting related results in Ch.3.2. SOC, physical and chemical soil properties, we inserted in 3<sup>rd</sup> para the following statement: “The BD values of the lowest layer 55-100 cm can only be estimated from the values taken at the soil profiles for the C-horizon (see Table S1); with an average of 1.37 and 1.55 g cm<sup>-3</sup> for the PP and NF sites, respectively, the BD of the NF site appears to be somewhat higher, in consistency with its higher sand content compared to the PP site (see Table 1).”

- 2) In order to improve consistency and readability of the paper as mentioned by all reviewers, we re-organised the discussion with a first chapter 4.1. Site comparability. Compared to the previous chapter 4.1 we shortened the first three paras, added a para on spatial structure, and moved the last para of 4.2. to 4.1. Other topics like the first para in Ch 4.2., discussing organic matter decomposition, or the vertical soil structure in PP (Ch. 4.4.), were deleted or substantially reduced.
- 3) In supplementary material, we added Table S3 (Correlation matrix) and Figures S1 & S2 presenting each two photos of profiles in PP and NF. The Photos may also be suited for the main text.

- 4) In order to better reflect the state of knowledge in the introduction and in the discussion, we cancelled six older and partly redundant references with six more recent and more relevant ones, following also here the reviewer's advice.
- 5) We explained in more detail in Ch. 2.1. Site description, 5<sup>th</sup> para, the non-presence of stones at both NF and PP and made reference to this point also in the results chapter 3.2. 2<sup>nd</sup> para
- 6) We explained in more detail in Ch. 2.2. 3<sup>rd</sup> para, the non-presence of a litter layer
- 7) We changed the 2<sup>nd</sup> part of the abstract giving more focus on principal aspects linked to core findings (heterogeneity and sampling design, tillage and spatial structure, reporting)
- 8) In conclusions, we added 3 paras to put the paper in a larger context: basic constraints and requirements of paired plot studies to proof impacts of LUC on SOC