

Interactive comment on “Parametrization consequences of constraining soil organic matter models by total carbon and radiocarbon using long-term field data” by L. Menichetti et al.

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We are grateful to the referee for the comments and the improvement they will bring to the manuscript, and glad that the manuscript was appreciated.

P6L14, P7L8, P19L24-25, P22L14, P25L2, Table 1. All the comments concerning typographic issues, units and references will be dealt with according to the comments.

P6L18-19. The properties indicated are from the topsoil. The study concerns just the topsoil (0-25 cm), and this is so far not adequately specified in the paper as pointed out also by referee 2. We will provide to describe this in detail.

C1

P6L2. Also aboveground byproducts are removed, while belowground production is incorporated into the soil. This will be described better.

P10L15-16. If the referee refers to the different kinetic fractionation of isotopes in maize compared to C₃ plant due to the malate-aspartate pathway, this should not influence the ¹⁴C signature because of ¹³C normalization. The ¹³C normalization is a standard procedure in ¹⁴C data reporting, and has been considered in the manuscript. The ¹³C data are used to take care of any fractionation due to chemical kinetic effects and to filter these effects out from the ¹⁴C signal. This is true also for the mechanism associated to the photosynthetic pathways.

P13L7. Order of supplements will be rearranged.

P13L21-22. Notations will be standardized.

P17L4-18. We will consider moving the indicated section to the results, and we judge this a really useful suggestion.

Figure3. The letters refer to the different parameters, as indicated also on the y axis. Letters to indicate subpanels have been utilized as best practice, although they are not utilized in the text. We believe it can be useful to have them there for future references. We will specify in the caption what the letters refer to.

Figure9. Caption is wrong, referring to a former version of the same figure. Sorry for the mistake. The panels are now referring to structure I (A), II (B), III (C), IV (D) and V (E). This will be modified.

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C2