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Interactive
comment

Interactive comment on "Greater soil carbon stocks and faster turnover rates with increasing agricultural productivity" *by* Jonathan Sanderman et al.

Jonathan Sanderman et al.

jsanderman@whrc.org

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Congratulations for your manuscript. I just would like to make some comments on figures that, in my opinion, may help you to improve the manuscript. Figures and tables should be completely understood when read independently of text. This means that abbreviations (although obvious or explained in the main text) should be explained again in captions. Some other changes may contribute to improve the layout.

Response: The authors are greatly appreciative of these comments to make the display figures as robust as possible. We have taken onboard and revised the figures and captions as suggested expect where noted.

So, I kindly suggest making the following changes:

Figure A1. Substitute the caption with "Relationship between organic carbon content (%OC) and bulk density for the 0-10 and 10-20 cm soil layers collected in 1997 from all trial plots". Also, use capital letter for the Y axis title: "Bulk density..." and superscript for "-3". I suggest removing the gray pattern.

Response: As suggested, caption has been changed, the y-axis title revised and the gray patterning removed.

Figure B1 and C1. You can use different symbols, different symbol colors, different line patterns and different line colors, but not all together. I suggest using one of these alternatives: [i] Different line colors with no symbols (the best option) or [ii] the same line color and pattern with different symbols, but the same color for each symbol.

Response: Option [i] is not preferred in our opinion because the point of this supplemental figure is to show the goodness-of-fit for the models used to calculate decay constants. Given we are attempting to display curve fits for 20 experiments in one graph, this was a difficult figure to draw. In each panel, there are four curves and sets of symbols all showing similar trends. In response to this comment, we have simplified by keeping the symbols constant but varying the color of the symbol and the line consistently by year.

Figure C1. "SOC" needs to be defined, but it is not used in the graph, so better substituting it with "soil organic carbon". Check the last sentence if you decide changing the layout according to the last comment.

Response: Text has been revised to spell out soil organic carbon in this figure and in Figure 3. We choose to keep the dashed line for the southern hemisphere atmospheric record because this is measured sub-annual data whereas the other curves are model results fit to the four soil data points. Symbols no longer vary to type, just by colour.

Table 1. I strongly suggest using mean $\pm$ standard deviation instead of parentheses

for the last. I like it much more when all information is in the caption and there are not footnotes.

Response: Parentheses have been replaced with $\pm$ symbol. We prefer not to remove the footnotes as most journals prefer this format and most papers in SOIL use footnotes in tables. However, if the editor would like us to revise the caption to include the footnote material, we will be happy to make the change.

Table 2. See previous comment and avoid the excessive use of symbols in tables. All footnotes may be moved to the caption: Soil carbon data summary. Mean across time and standard deviation (in parentheses) given for each rotation. Significant differences (one-way repeated measured ANOVA, ï ËŻA ËŻa < 0.05) between rotations are indicated with different letters in each column. Pa = permanent pasture, 2W4Pa = 2 years wheat followed by 4 pasture years, WW = continuous wheat, WOF = wheat-oat-fallow rotation, WF = wheat-fallow rotation. POC = particulate organic carbon, HOC = humic organic carbon, ROC = resistant organic carbon. f(POC), f(HOC) and f(ROC) are expressed as a proportion of bulk soil carbon.

Response: Again, we prefer to keep the table as is unless the editor prefers that we adopt the changes suggested by the reviewer.

Tables 3 and 5. You can make this table simpler. F-statistics may be deleted, but keep ANOVA p-values. Also, you can display only p > 0.05 (explaining it in the caption).

Response: We have deleted the row with F statistics in both of these tables. In both of these tables if we remove the non-significant data, we would need to add a row showing the global mean so there would be no net reduction in the size of the table. Given that there is only one non-significant category in each of the tables, we prefer to keep the mean data for each rotation instead of adding another row showing the global mean.

Table 4. See comment for Table 2.

Response: Again, I'll leave this decision up to the editor.

Table 6. Non-significant correlation coefficients are not necessary in the table. You can simply delete them (for example, column A/O-A may be removed). In the caption, tell the reader that only significant coefficients are shown.

Response: This table is really a numerical representation of a draftsman plot to show the degree of correlation between different measured or modeled parameters, as such we would like to include even non-significant correlations. With the use of asterisks, it is clear which of the correlations are and are not significant at given levels.

For the rest of figure, comments above are applicable. In my opinion, figures 2, 4 and 5 are perfect! Even better if colour is added to Fig. 5.

Response: For Figure 1 we have simplified by removing the symbols from panel B so there are only lines varying by colour. We chose to use grey scale for Figure 5 because of the consistent colour scheme in other figures to describe the different field trial treatments.

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