Biogeosciences Discuss., 12, C7868–C7870, 2015
www.biogeosciences-discuss.net/12/C7868/2015/

Biogeosciences Discussions
Open Access
EGU

Interactive comment on "No-tillage lessens soil CO_2 emissions the most under arid and sandy soil conditions: results from a meta-analysis" *by* K. Abdalla et al.

Anonymous Referee #2

Received and published: 23 November 2015

General comments

This manuscript presents an important analysis of soil organic carbon stocks (SOCs) and CO2 emissions changes in response to tillage treatments. The authors identify majors driver of these changes using very rich dataset from 46 peer-reviewed papers and discuss their findings in a careful and comprehensive manner. This work is clearly an important contribution to the literature surveying the state of the art in terms of tillage impacts and highlighting important aspects that could improve models. Overall, the paper is clearly structured and is in the scope of Biogeosciences, thus is suitable for publication.

Full Screen / Esc
Printer-friendly Version
Interactive Discussion
Discussion Paper

Specific comments

P. 15500, l. 25: I think it would be helpful for the reader if you explain better if CO2 emissions are derived from only soil heterotrophic respiration or both autotrophic and heterotrophic. Precision on that should be included.

P. 15503, l. 20: I suggest authors to present soil CO2 emissions in relation with the yearly amount of C input which may improve the paragraph 3.1 and give an idea about the mineralization order of magnitude. These statistics about C input should be added, also, in the table 3. The amount of yearly C input helps authors to deeply interpret data and to explain such differences in CO2 emissions rather than a simple description of results.

I would suggest authors to cite recent literature which would provide more robust support for claims made in the paper. May be you could discuss the results of this study in comparison of yours (e.g. Powlson. D. S et al., 2014. Limited potential of no-till agriculture for climate change mitigation. nature climate change).

The authors did not take use of data on isotopes, if they exist, or discuss its use in evaluating SOC stocks change and the mean residence time. A few sentences on this kind of data in the discussion could add to the already thorough discussion.

The perspective of models use seems exciting and authors suggest some models (e.g. RothC, Century, and DNDC). It's curious, however, how authors intend to simulate the tillage effect; some sentences on this could be nice.

Finally, I would encourage authors to explore implications of their findings in relations with other tillage practices such as rotational tillage.

Technical comments

P. 15499, l. 14: "China,no-tillage" space is required

P. 15502, l. 8: Why variables SOCc and b, are replaced by x1 and x2 in the equation 1.

BGD

12, C7868–C7870, 2015

x1 and x2 are not used later. I would suggest to rewrite the equation with SOCc and b.

P. 15504, l. 8: add "fig. 1a" to the sentence; “. . .and humid climates (Fig. 1a)”

P. 15505, l. 1: Authors may need to rephrase the two first sentences to avoid repetitions of “soils” used 7 times. You may use treatments instead of tilled and untilled soils.

P. 15507, l. 13: The sentence is too long; authors may need to rephrase it in a concise way.

P. 15513, l. 19: Correct the reference “Dimisss et al (2013)” by “Dimassi et al. (2013)

P. 15527: fig. 1 precise if it’s SOC content or stocks, same comment for figures 3, 4, 5, 6, 7 and 8

Interactive comment on Biogeosciences Discuss., 12, 15495, 2015.