

Interactive comment on “Increase in soil organic carbon by agricultural intensification in northern China” by Y. Liao et al.

Anonymous Referee #4

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The paper analysed the change in soil carbon stocks and content over a period of three decades for a county in northern China. Although the paper is well written, and the authors collected a relevant data set, the paper lacks details on the methodology and data sources, which should be added. The subject of the paper is interesting, but does not really provide a substantial contribution to scientific progress, as there have been more studies that showed that agricultural intensification in China can lead to increased SOC levels.

Minor comments: * Page 16499, line 7: Unit not clear * Page 16499, line 25: here is mentioned that few if any study exist on the SOC content and stock change, however, later in Table 3 several studies are mentioned for Northern China, thus change this text. * Page 16500: Add also some information on the total size of the county * Page

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16501: How many soil samples were derived from the Annual Soil Fertility Survey for each year? * Page 16501: It is not clear whether land use is also reported in the soil survey * Page 16502: According to Pribyl (2010) a conversion factor of 0.5 would in most cases be more appropriate * Page 16502: At which level was the climate data obtained, average for the county or higher resolution? And temporal resolution? * Page 16503: Data analysis section should be extended, explaining better how the data were calculated, how many samples, and average for each land use? * Page 16505 and Figure 2: How was the SOC stock under construction land determined? I would expect that this should be lower, as the toplayer is often removed. * Page 16506, line 20: Not by precipitation, as that was not a significant correlation according to Table 1 * Page 16508, line 1: Why was the C input from organic fertilizers not included in the analysis, although not significant, it could be added to Table 1. * Page 16508: The N₂O emissions will be even higher, here only the direct emissions are accounted for, but including the indirect emissions (ammonia volatilization and leaching and runoff) and the emissions from crop residues will double this value

References:

Pribyl, D.W. 2010. A critical review of the conventional SOC to SOM conversion factor. *Geoderma* 156, 75-83.

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