

## ***Interactive comment on “Generating a global gridded tillage dataset” by Vera Porwollik et al.***

**Vera Porwollik et al.**

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Authors' responses to comments - referee #1

Thank you very much for providing helpful feedback. Please find below a point by point response to your comments.

Referee #1: Comment on line 266: the Pittelkow data are not reliable source, since they are derived from a metanalysis of not accurate data; practical field experiences particularly in rice, but also in some root and tuber crops (cassava, portato) show same or higher yields under no till and no puddling.

Authors' response: Thank you for pointing out this uncertainty in assumptions made building on data of Pittelkow et al. (2015). We improved our statement in the text, first by shifting the paragraph to the section 2.4.1 describing the concrete CA area

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downscaling to avoid confusion on the mapping rules described in the other tillage system area derivation.

Further we add on the feasibility of applying no-tillage for rice and roots/tubers production as follows: All annual rainfed root, tuber and rice cropland is excluded from the potential CA area following Pittelkow et al. (2015), who reported larger yield penalties for these crop types when applying no-tillage practices. Rice is often produced as paddy rice, requiring puddling, which is a practice modifying the soil aggregates a lot in order to facilitate the flooded condition, e.g. to suppress weed growth. A conversion from puddled to dryland rice production as well as improved drainage of tuber crops production area may require additional management steps by the farmer in order to achieve comparable yield levels with no-tillage as under conventional production methods.

Referee #1: In general the wording "land suitable for CA" should be changed. There is no land which is not suitable for sustainable farming, but those land areas referred to as suitable might be more likely for adoption of CA while other land or crop areas might require more assistance or support for adoption.

Authors' response: We support your argument that theoretically all croplands can be farmed in a sustainable way. In the manuscript and R-script we change 'land suitable for CA' and 'potentially CA-suitable area' to 'potential CA area' as wordings also used in Prestele et al. (2018) and 'scenario CA area' respectively.

## References

Pittelkow, C. M., Linquist, B. A., Lundy, M. E., Liang, X., van Groenigen, K. J., Lee, J., van Gestel, N., Six, J., Venterea, R. T., and van Kessel, C.: When does no-till yield more? A global meta-analysis, *Field Crops Research*, 183, 156-168, doi: 10.1016/j.fcr.2015.07.020, 2015.

Prestele, R., Hirsch, A. L., Davin, E. L., Seneviratne, S. I., and Verburg, P. H.: A spa-

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tially explicit representation of conservation agriculture for application in global change studies, *Global Change Biology*, 24, doi:10.1111/gcb.14307, 2018.

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Interactive comment on *Earth Syst. Sci. Data Discuss.*, <https://doi.org/10.5194/essd-2018-152>, 2018.

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