

Interactive comment on “The importance of management information and soil moisture representation for simulating tillage effects on N₂O emissions in LPJmL5.0-tillage” by Femke Lutz et al.

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Dear Editor and Referees,

Thank you for the thorough evaluation of our manuscript and the very helpful and detailed feedback. This is much appreciated. We were able to address all of the reviewers' points, which helped to improve the scientific rigor and presentation of our work in this paper.

In this letter we list the referees' comments, each point followed by our responses, and

the changes in the manuscript.

The responses and subsequent modifications to the manuscript have been derived in consultation with all co-authors.

Best regards,
Femke Lutz

Referee # RC2

Lutz and co-authors validated a model that estimates soil N₂O emissions in tillage and not tillage agriculture against field experiments. They report that (1) the model performance is improved by using including site-specific land use information as a model input instead of global model estimates and that (2) the model performance bias (overestimation of emissions) is reduced by a better parametrization of hydrological processes (to avoid an overestimation of soil moisture).

This is a well-structured manuscript that makes important contributions to the incremental improvement of the LPJmL5.0-tillage model. The manuscript is well structured and easy to read. Overall, I find the author work convincing and have only minor comments:

Thank you for the positive general assessment.

Referee comment 1: I recommend removing the grey background and grid form the plots to improve the figures readability.

Answer 1: *Thank you for your comment. We removed the grey background and grid to improve the readability of the figures as suggested.*

Changes in manuscript 1: *The improved figures can be found throughout the entire manuscript.*

Referee comment 2: General discussion and conclusion sections are almost of the same length and largely redundant.

Answer 2: *We agree that there is redundant information in those sections. Therefore, we shortened the conclusions by focusing on the main objectives of the work.*

Changes in manuscript 2: *The modified version of the conclusion can be found in Line 475ff.*