Biogeosciences Discussions

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Comment on bg-2021-352

Anonymous Referee #2

Referee comment on "Assessing the impacts of agricultural managements on soil carbon stocks, nitrogen loss, and crop production – a modelling study in eastern Africa" by Jianyong Ma et al., Biogeosciences Discuss., https://doi.org/10.5194/bg-2021-352-RC2, 2022

General comments: The LPJ-GUESS model was used here to examine seven crop management practices and their effect on soil carbon (C) pool, nitrogen (N) loss, and crop yields under different climate scenarios that is the present-day climate situation in Eastern Africa and its potential for the future. The study tackles an important topic and will allow us to improve our understanding of how improved agricultural management can protect soils and lessen soil greenhouse gas emissions in Eastern Africa, where there are currently very few such data available. I thus believe that the topic is very interesting and of great relevance to Biogeosciences. In terms of design and evaluation results, the manuscript is well written with a good structure. The authors have really done their work in the discussion of the results which are well referenced. I believe the work is very relevant and very important, apart from a few very minor adjustments that should be made to the manuscript. For example, the authors should briefly explain what they mean by standard management and standard simulation in the manuscript, which has been used throughout the manuscript. In Kenya, beans and maize are intercropped primarily. Since beans represent one of Kenya's major crops, is there any reason they weren't included here? Otherwise, this work for me has been well done.

Specifically

LN 380 Is there an explanation for the overestimation in production in pulses and sorghum in Fig 4.

LN447: I wonder if you can explain the unexpectedly low soil C sequestration rates from 2004-to 2015 by looking at the history of the experimental field.

LN452. In Kenya, 80% of the land is semi-arid and arid. I think you need to point out the western part of the country, however.

LN 458 Did you observe any termite mounds in the experimental fields?