

Interactive comment on “Simulating soil organic C dynamics in managed grasslands under humid temperate climatic conditions” by Asma Jebari et al.

Anonymous Referee #1

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Recommendation: Reject

Comments 1. The design of the study is not convincing. The authors proposed modifications for the Rothamsted Carbon (RothC) model for an improved prediction of soil organic carbon (SOC) dynamics in grassland soils. The proposed modifications are (i) change of the soil water function, (ii) use of the Van Soest fractionation for the estimation of pools (p. 4 to 5), (iii) separation of plant residue inputs into three components, and (iv) accounting for the animal treading effect. The authors present some interesting ideas for improvements. Unfortunately, there was no experimental design developed for such potential improvements of the RothC model. For instance, the was

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no experiment devoted to improvements of the soil water function (e.g. using different water contents) or to improvements of pool estimations (e.g. using isotopes and fractionation). Overall, the importance of the different modifications cannot accurately be studied with the experimental design used.

2. The data basis of the study is too weak. Unfortunately, the modifications were tested only on eight data points in total (initial and final SOC stocks for four field experiments, Fig. 2). This is not sufficient. Any overestimation of the SOC stock caused by one of the four modifications may be balanced by an underestimation due to another modification.

3. The parameterization is not convincing. Unfortunately, the authors use the IOM estimation equation by Falloon et al. (1998) which is based only on total SOC stocks. This IOM estimation adds additional uncertainty to the modelled SOC dynamics.

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