

Interactive comment on “Importance of crop varieties and management practices: evaluation of a process-based model for simulating CO₂ and H₂O fluxes at five European maize (*Zea mays* L.) sites” by L. Li et al.

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General Comments:

This is an important and interesting study that assesses the impact of different management practices and crop varieties on carbon and water fluxes from few European sites with maize. Overall, it is a comprehensive and very useful study. It provides some novel findings and further investigates the performance of ORCHIDEE-STICS as an agricultural, process-based model.

Specific comments:

1. P 2915 L 11: You mention ‘The results show that ORCHIDEE-STICS has a good potential to simulate energy, water vapor and carbon dioxide fluxes from maize croplands...’. Since the study analyzes only latent heat flux (and not sensible heat flux), pl. replace ‘energy, water vapor’ with either ‘latent heat’ or simply delete ‘energy,’.

Response: “energy,” was removed.

2. P 2915 L 28: The sites considered in this study have only maize (It does not consider all European croplands which obviously have other crops, as well).

Response: “maize” was added between “European” and “croplands”.

3. P 2922 L 7: Please provide some information relevant to the simulations (e.g. what was the model time step? Any soil data used? It seems like the site-measured meteorological data were used to drive the simulations (Please mention it). Any other input information?).

Response: Model time step, soil data and meteorological data were provided.

4. P 2925 L 3-9: Including all these R² and RMSE corresponding to each variable in a table would be better.

Response: A table (Table 4) with inclusion of R² and RMSE was provided and cited in the text.

5. P 2926 L 16: One other reason that could contribute to the mismatch of LAI and high cumulative GPP towards the late growth period is that you consider a longer growing season than what is observed (e.g. You consider the same observed harvest date even with a prescribed planting date which is 25 days earlier than the observed one, under the early planting scenario).

Response: In the refereed paragraph, both the planting and harvest dates are observed.

6. P 2930 L 5-6: It will be useful to include variety-specific GDD thresholds and the parameter values from the model in a separate table (probably referring to that table on p12, where you mention about the variety-specific parameter values).

Response: A separate table (Table 5) including GDD thresholds and the parameter values from the model was provided in the revised manuscript.

Table 5. Variety-specific threshold values of growing degree day (GDD) and the values in STICS.

Site	Variety	GDD threshold	GDD threshold in STICS
DIJ	La Fortuna	1653	1730-1955
GRI	Anjou 288	1670	1730-1955
KLI	Rosalie	1700	1730-1955
LAM	Goldaste	1920	1730-1955
LAN	La Fortuna	1653	1730-1955

7. P 2930 L 8- 26: It would be better to include this information within the subsequent paragraphs where you describe Fig. 8 and Fig. 9 separately (with some editing and concatenating).

Response: P2930 L8-26 describes results on the sensitivity of seasonal variations of NEE to fertilisation and irrigation. In the section (3.4.1) we first describe impacts of crop variety, then fertilisation and irrigation and last, impacts of planting date. In order to make clearer this plan, we split the mentioned paragraph (L8-26) in two paragraphs, one for fertilisation, the other for irrigation. Last, we change the beginning of the paragraph on ‘planting date’ as followed: ‘*Simulated seasonal variations of NEE are greatly affected by changes in planting date (Fig. 8).*’

Technical corrections:

1. P 2933 L 12: Replace ‘differ’ with ‘differs’.

Response: “differ” was changed to “differs”.

2. P 2933 L 23: You mean ‘largely’ (not ‘large’)?

Response: “large” was changed to “largely”.