

Interactive comment on “Calibrating soybean parameters in JULES5.0 from the US-Ne2/3 FLUXNET sites and the SoyFACE-O₃ experiment” by Felix Leung et al.

Anonymous Referee #1

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-General comments The authors developed a crop-modelling framework considering the effect of ozone, which is one of the important climate change factors. The model performance was validated by the results obtained from a novel SoyFACE experiment. The manuscript addresses an important technical issue in the modelling how to incorporate with ozone impacts and what is a current problem for further development. The focus of the paper is well phrased and relevant for the journal Geoscientific Model Development. I have just a few minor comments and suggestions, that should be addressed before the final acceptance.

-Specific comments

C1

L47: The authors mentioned “Recently...” but Morgan et al. 2004 is a quite old paper. Probably better to cite also latest ozone FACE studies (e.g. Agathokleous et al. 2017, Environmental Science and Pollution Research, vol. 24, pages 6634-6647; Paoletti et al., 2017, Science of the Total Environment, vol. 575, pages 1407-1414).

L147: Better to cite also CLRTAP (2017):

https://icpvegetation.ceh.ac.uk/sites/default/files/FinalnewChapter3v4Oct2017_000.pdf

L193-194, “. . . fractional reduction of photosynthesis by O₃, F. . .”, “F=1.40”, “F=0.25”: I suppose not “F” but “a” as you mentioned in lines 168-169.

L194, “. . .equation 1, 2 . . .”: I suppose not “equation 1, 2” but “equation 2, 3”.

L221, “Threshold of O₃ flux (mmol m⁻² s⁻¹)”: The unit should be “nmol m⁻² s⁻¹”.

L307: Better to add some brief sentence in order to support your speculation about plant density and leaf area. For example, Jaumer Ricaurte’s paper (Ricaurte et al., 2016, Crop Science, vol. 56, pages 2713-2721) would be helpful.

Fig. 2: It is hard to identify symbols (model simulations vs observations). Better to use different colours as you did in the other figures.

Table 4: Correct the units. The unit of fractional reduction of photosynthesis should be “mmol⁻¹ m²”. Instead, the unit of the threshold of ozone flux should be “nmol m⁻² s⁻¹”.

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