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Interactive comment on "Evaluation of JULES-crop performance against site observations of irrigated maize from Mead, Nebraska" *by* Karina Williams et al.

Anonymous Referee #1

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Improving the representation over croplands is indeed an important direction to a better Earth system model. Using JULES-crop and data from two eddy flux sites, the authors of this manuscript adjusted parameters for maize and examined the performance of JULES-crop over the sites. The presentation of the manuscript is detailed. However, some revisions are still needed in order to reflect the state-of-the-art understanding on the pros and cons of the model and its implication for the modelling community.

Crop phenology simulated by JULES-crop is still purely temperature driven. Many crop models have evolved to include impacts from other factors, such as precipitation, nutrient and day length. The authors should recognize biases it may bring in simulating crop phenology.

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Many of the results have not been well presented and discussed. For example, Figure 23 not only shows that the JULES-crop has low bias in simulating LAI, but also shows that the capability of the model to capture interannual variability of LAI is very limited. Why is that? The high bias of GPP and low bias of LAI is intriguing. This should be further explored and explained because it appears implying that models might get good results with wrong reasons.

The discussion of scaling up from sites to the globe is too superficial. At least, there are tests that the authors can do to facilitate this discussion. For example, the authors can compare the site simulations against global simulations (Osborne et al. 2015) or the site simulations with parameters from. Osborne et al., (2015). This will give us better impression on the uncertainties JULES-crop has now for global simulations. Otherwise, I did not see the reason why this is the conclusion of this study.

It is also important to compare the efforts in JULES-crop with other land surface crop model, such as CLM-crop and ORCHIDEE-crop.

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