

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

**Anonymous Referee #3**

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General comments:

The study describes and evaluates the new parameterization and improved coding added to JULES-crop since the original paper by Osborne (2015); it specifically evaluates the new parameterization used for maize crop over irrigated sites in Mead, Nebraska. The paper deals with an important study; however, it has certain major flaws.

Although the Abstract indicates that observations for maize at all three sites of Mead, Nebraska including one rain fed site (i.e. US-NE3) has been considered in deriving model parameters, according to the Introduction and the other sections, only the model performance for irrigated maize has been evaluated; some results from the rain fed maize might enhance the quality and validity of this study.

C1

The JULES-crop simulations were run on crop tiles. At the US-NE2 site, soybean crop is also present in crop rotation on the same crop tile during even-numbered years. It would have been interesting to see how the model simulates crop-rotation on the same crop tile/s, as the paper also mentions that the model has been differently parameterized for C3 and C4 crops. This is very important, especially as the authors have plans for coupled-runs in the future, where the model should be able to simulate the carbon fluxes over a continuous time series. At least some mention/description on the model performance with regard to crop rotation needs to be included.

The paper is a bit too long; especially the number of figures is too large. Please try to reduce the number of figures, leaving only those that are essential and directly related to the predicted fluxes.

Specific comments:

Although the text on line 13-14 on p 35 mentions that the use of certain parameters improves the prediction of LAI, the improvement in the magnitude can be seen only during certain years when we compare the Figures 23 and 24. It seems that the model still needs improvement with regard to LAI, as the seasonality is not properly captured by the modeled LAI compared to the observed LAI.

The reader hardly can get any information from Tables 1-4; an additional column which describes each parameter listed in columns 1 and 2 might be helpful (or the model terms in column 2 could be replaced with easily understandable descriptors of each parameter). The column heading of the last column may be changed to ‘Remarks’ (instead of ‘Discussion’).

The paper does not seem to be in its final form, as still there are some typos and other errors, some of which are described below. So a thorough check on those is also needed.

P3 L13 ‘resp’ should be replaced with ‘respectively’

C2

P5 L20 has 'a number options'. Please correct it.

P5 L24 Zenith angle dependence (of what)?

P6 L17 Q10 should be replaced with Q10

P14 L11 Instead of 'downloaded 15.09.2016', please provide a proper reference/web source.

P15 L24 (and everywhere else) 'Parametrisation' needs to be replaced with 'parameterization'.

P 20 Figure 4 has several lines in each color. Unless the authors explain what those are, the figure does not have much meaning to it (e.g. what are those several lines in black color mean? Which site does each of those correspond to?).

P 47 Heading of Table 5 mentions 'thermal units in degree days', whereas 'degree days' does not appear anywhere else in the text (According to P3 L1 crop development status is parameterized by a crop development index (DVI) which is determined by specific thermal time parameters set by the user (P3 L6-7). Degree days in Table 5 need to be related to the above description on p3.

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