General comments:

The authors incorporated an irrigation scheme into the ISBA LSM and compared it with satellite-based data to evaluate the improvement in accuracy. As the authors pointed out, the consideration of an irrigation scheme in LSMs is one of important challenges, and it will be a great contribution to this field if it is properly demonstrated. However, it is difficult to say that the authors' objective has been achieved in the manuscript in the following points. Therefore, a major revision or rejection seems appropriate.

(1): The results presented indicate the improvement in accuracy due to the introduction of crop phenology such as emergence and harvest, rather than that of an irrigation scheme

(2): Even with the introduction of crop phenology and an irrigation scheme, there is still a large difference from observations, especially in seasonal changes. The major reason for this difference may be that appropriate validation data are not used rather than model problems. For example, the observational LAI change shown in Figure 4 is odd for a crop LAI change (the model LAI change is more plausible). To solve this problem, it would be appropriate to compare the model output with the site-scale LAI and GPP observed on the farm.

Minor comments:

L66–69: Irrigation schemes have been integrated into several large scale LSMs such as CLM. More intensive literature review on the topic is needed.

L90: Brief description on the SURFEX is needed here.

L139–140: Describe lon. and lat. of the two places in the same way.

L158: Is simulated LST soil surface temperature under the canopy? Can satellite measure it?

L195: What is difference between the irrigation amount and the irrigation rate?

L216: through?

Section 2.4: It is better to place this section at the beginning of Section 2 for easier understanding.

L314: Clarify ISBA_ref does not include crop phenology

Section 2: The detail of crop phenology and LAI development should be described.

Section 3.1: Simply compare irrigation water amount between observations and simulations, and show the correlation and significance.