For clarity purpose, we have listed the reviewer's comments in bold italics, authors' response in the normal font. The changes made in the manuscript are in normal italics font.

We have added one new Table 1. Table 3 (old Table 2) has further been modified. In addition, we have added two new figures: Figure 1 (old Figure S1, which has further been modified based on the reviewers comments) and Figure 4 (old Figure S2). The numbers for the rest of the figures have been changed accordingly: Figure 2 (old Figure 1), Figure 3 (old Figure 2); Figure 5 (old figure 3), Figure 6 (old Figure 4), and Figure 7 (old Figure 5).

Authors' Response to Reviewer#1 Comments

1.The separation of the two sites into a calibration and a validation set does not appear in the analysis of the results. When analyzing these results, it should be kept in mind that the Mead simulation was calibrated, whereas the Bondville site was not. Even though it can be valuable to show results of both, they should not be compared directly. It would be preferable to see this distinction more explicitly in the Results section

Response: We have now made a clear separation between calibration site and validation site both in method and results sections. First, we discuss model calibrated best fit model results at calibrated site, which is the Mead site, for LAI, biomass partitioning, canopy height, GPP, water fluxes and energy exchange between atmosphere and canopy (Section 4.1.1). Second, we discuss the ISAM model evaluation results for the evaluation site, which is the Bondville site (Section 4.1.2). Finally, we discuss the model biases for both sites together to avoid repeated discussion (Section 4.1.3).

4.1 Model Calibration and Evaluation
4.1.1 Best Fit Model Results for Calibrated Site

Figures 1a-f show the model-calibrated results for LAI, aboveground biomass and canopy height over the period 2001-2004 at the Mead, NE site. These figures suggest that the calibrated model is able to simulate dynamic phenology development, carbon allocation, LAI and canopy height growth processes over multiyear growing seasons at the Mead, NE site. The model also captures well the measured trends of root growth with soil depth during the growing season of 1980 for corn at the Mead site (ISAM-Dynamic case results in Figures 4a-c). Moreover, modeled best fit results with measurements for soil water content during the growing seasons for both corn and soybean years are shown in Figures 3e, 3j).

Table 2 shows the statistical analysis and Figures 2a-h and Figures 3a-j compare modeled and measured data for GPP, energy fluxes (Rn, LH and H) over the period 2001-2004. The statistical analysis and direct model-data comparison results suggest that model estimated carbon assimilation and energy and water fluxes, with the exception of sensible heat flux, are in good agreement with observations at Mead site. The relatively low dr_h *and* dr_d *values are found for H under corn and soybean rotation, suggesting that modeled results are not consistent with* *observations. The possible reasons for the differences between the modeled and measured data at the Mead site are discussed together with the differences at Bondville site in the section 4.1.3.*

4.1.2 ISAM Results for Evaluated Site

Overall, the model estimated results for LAI, aboveground biomass, root biomass and canopy height over the time period 2001-2004 (Figures 1j, 1k and 1l) compare well with corresponding measured values at the Bondville, IL site, with a few exceptions. The model slightly overestimates aboveground biomass (Figure 1k) and canopy height (Figure 1l) for soybean during the 2004 normal vegetative phenology stage (Julian days from 170 to 200). These results indicate that the model calibrated parameters are not only able to simulate the dynamic LAI, phenology, carbon allocation and canopy height processes at Mead, but also able to capture seasonal variability in LAI, biomass and canopy height growth at the Bondville site. The model is also able to capture the basic daily variation in soil moisture under corn and soybean rotation during growing period 2001-2004 at Bondville site (Figures 3o, t), suggesting that the model parameterization for corn and soybean root profiles, which is calibrated based on the Mead site field data, can also be applied to other sites or regions. Similar to the Mead site, the model captures well both measured diurnal and seasonal variability in GPP, net radiation and latent heat, but not sensible heat flux (Table 2), Figures 2i-p and Figures 3k-t). The possible reasons for these differences are discussed below.

4.1.3 Model Estimated Biases in Carbon and Energy Fluxes

The text in this section is the same as it was in sections 4.1.1 and 4.1.2 of the original manuscript.

Figure 1 See Page 40

2.The use of a detailed description of crop development, as provided in section 2.2.1, could and should be addressed in the results. E.g., Fig. S1 from the supplementary material is interesting in this respect, and would be better placed in the main manuscript. It may be possible to extend this figure to show the effects of the new phenology scheme used.

Response: As pointed out earlier, we have now moved the Figure S1 (now Figure 1, See Page 40) to the main manuscript. We have also extended this figure to show the effects of the new phenology scheme by comparing simulated LAI (ISAM-Dynamic) with prescribed LAI used in the original ISAM (ISAM-StaticLAI).

3.The language is generally good, but the Results section uses a mixture of present and past tense, which is awkward to read.

Response: We have now corrected the tenses in the entire manuscript.

4.9901 / 21: What does "hydrological and thermal inactive bedrock layers" mean? I presume that these layers are not hydrologically and thermally inactive, as there would be no need to include five of them in that case.

Response: The statement in the original manuscript was not correct. The ISAM includes 10 hydrologically and thermally active soil layers, and five hydrological inactive bedrock layers. The five bedrock layers are only active for thermal diffusion. Accordingly, the text is modified.

"There are sunlit/shaded canopy, 10 hydrologically and thermally active soil layers, 5 hydrologically inactive and thermally active bedrock layers."

5.9905 / 16: The LAI dependence of development is unexpected (in most models, development is not linked to crop growth), and it would be good to explain this. Is there a reference for this effect?

Response: Your point to be noted that development of phenology is generally not accounted for LAI in the crop growth model. The ISAM model uses maximum PFT-specific LAI (LAI_{max}) as a LAI threshold value to simulate the crop phenology. When modeled LAI becomes larger than the LAI_{max}, the modeled phenology is transitioned to reproductive growth stage. This point is further clarified in the revised manuscript.

"The crop-specific maximum LAI (LAI_{max}) is used as a threshold value to control crop growth development (Kim and Wang, 2005). When modeled LAI becomes larger than the threshold LAI, the modeled phenology is transitioned from vegetative to reproductive growth stage and the leaves begin to turn brown and start falling."

6.9905 / 20: Is the cold temperature effect on yield limited to certain growth stages only?

Response: The frost related damage of crops could happen any time after emergence stage, if the frost damage condition is satisfied, that is if the mean daily temperature for five consecutive days remains below 273.2K. We have revised the text to clarify this point.

"The effect of extreme cold temperature on yield, which is referred to here as frost damage condition, is accounted for by assuming 100% loss of yield. This condition is activated any time after emergence stage when the mean daily temperature for five consecutive days falls below 273.2K (Eq.A8) (Darby and Lauer, 2000)."

7.9908 / 24: The claim that the two sites have "distinct climate and soil characteristics" is not supported by the conditions described in the section below. In fact, growing season average temperature conditions differ by 0.2 K only, and the sites have very similar precipitation amounts. If these sites are really distinctly different, e.g. in the seasonality, please specify in what respect. The similarity between the sites should be discussed in more general respect as well. To what extent do the authors expect this model and parameterization to be applicable to different parts of climate space?

Response: Your point is well taken. We have revised the text in order to include all information referred in your comments.

"Both sites have similar annual mean temperature averaged for the time period 2001-2004, which is around 284K at Mead, NE and 285K at Bondville, IL. However, the annual accumulated precipitation averaged for the time period 2001-2004 at the Bondville, IL site (about 787mm) is about 183 mm higher than that at Mead, NE site. About 60 mm of this difference is observed during June and July, when precipitation is positively correlated with both corn and soybean yields. In addition, there are differences in soil characteristics at two sites. The Mead, NE site sits on deep silt clay loam (Suyker et al., 2004), whereas Bondville, IL site sits on silt loam (Hollinger et al., 2005). The soils at the Mead site have lower water infiltration rate and lower plant-available water storage ability than the soil at the Bondville site."

8.9909 / 9: Which "site climate" parameters does the model require as input? It would be helpful to get this information, either here or in the beginning of section 2

Response: As requested, we have provided the information about climate variables data that are required to drive the model.

"The model requires hourly/half-hourly driving data for the following climate variables: mean surface air temperature, precipitation rate, incoming shortwave radiation, long-wave radiation, wind speed and specific humidity. The data for these variables for each site are obtained from AmeriFlux database."

9.9909 / 10: How many years of spinup do you need to obtain a steady state?

Response: About 200 years. We added a statement in the revised text to address your point.

"We spin-up the model for each site with corn-soybean rotation under repeating site climate data from 2001 to 2004 years for about 200 years until the soil temperature and soil moisture reach the steady state."

10.9909 / 16: What are the summation signs for in Equation (1)? Is this a summation over time? And if yes, what is the time interval you perform the correction on?

Response: The summation is over two growing seasons used in this study for each crop. We have revised the equation and text.

"
$$f = \frac{\sum_{i=1}^{i=N}(Rn_i - G_i - S_i)}{\sum_{i=1}^{i=N}(LH_i + H_i)} \quad \text{Eq.1}$$

Where f is the correction factor, N is the total number of available observations at hourly time interval over two growing seasons for each crop."

11.9910 / 4: Please add brackets to the first line in Equation (2), so that the denominator cannot be misunderstood.

Response: The bracket has been added.

12.Fig. 1: Are the error bars on observations and simulations resulting from the individual days during the growing seasons? Describe the meaning (e.g. "Error bars indicate +/- 1 sd of variation between individual days"). The wording "diurnal averaged" is confusing: it is the annually averaged (or averaged over the growing season) diurnal cycle you are showing?

Response: We agree that wording for figure caption is confusing. The solid lines show the mean diurnal variations for each flux (GPP, Rn, H, LH) over the 2001-2004 growing periods; that is the mean of 2 years of diurnal variations of each flux. For corn, the diurnal cycle of each flux is averaged over 2001 and 2003 growing season, whereas for soybean the diurnal cycle of each flux is averaged over 2002 and 2004 growing season. The error bars indicate ± 1 standard deviation (SD) over the two growing seasons for each crop. Accordingly, we have now revised the figure caption (now Figure 2 in the revised manuscript).

"Figure 2: Measured and model simulated mean diurnal variations in gross primary productivity (GPP), net radiation (Rn) at the canopy top, sensible heat (H), and latent heat (LH) fluxes. The diurnal cycle of each flux shown here for corn and soybean is the mean diurnal cycle over two growing seasons. For corn, the diurnal cycle is averaged over 2001 and 2003 growing seasons, whereas for soybean it is averaged over 2002 and 2004 growing seasons. The error bars indicate ± 1 standard deviation (SD) of variation for hourly/half hourly values over the two growing seasons."

13. 9913 / 16: There is reference here to the development stages, but it is impossible to read these stages from the figure. See my comment above on the description of these as well.

Response: Since the periods for these stages can vary from year to year, depending on the climatic conditions, we have not defined the time periods in the figures. However, we now provide Julian day range values for penology stages when we refer them in the text. A few examples of the revised text are as follows.

"The overestimated H and underestimated LH are observed during the normal vegetative period (between Julian day 192 and 223) and the initial reproductive period between Julian day 224 and 252) in 2002 at the Mead site (Figure 3h)."

"Similar partitioning discrepancies between H and LH are also observed during the normal vegetative period (between Julian day 170 and 200) of the 2001 corn growing season and at the end of the 2003 corn growing season at Bondville (Figures 3m-n)."

14.Fig. 2 and 5: It would be good to know which of these panels/graphs were maize and which were soybean years for each of the two sites.

Response: We have revised the figure captions for Figures 2 and 5 (now Figures 3 and 7) to clarify it.
For Figure 2(now Figures 3):

"Flux values for individual sites are represented by a set of two figures. For corn, the top panel figure shows the flux values for the year 2001 growing season and the bottom panel for the 2003, whereas for soybean the top panel figure shows the flux values for the year 2002 growing season and the bottom panel for the year 2004"

For Figure 5 (now Figure 7):

"The odd years 2001 and 2003 are the corn plating years, whereas the even years 2002 and 2004 are the soybean planting years."

15.9913 / 27: It is misleading to talk about "measured" H and LH, as these are not the true measured values, but the adjusted/corrected ones.

Response: Following your suggestion we have revised "measured " to "corrected ".

16.9916 / 8: How do you quantify water stress here? Or in other words, the 60% reduction is 60% of what?

Response: 60 % relative to ISAM-StaticR case. We have now stated this.

"The increased water uptake from deeper and moist root zone in the ISAM-Dynamic case mitigates the intensity of water stress during the growing season by about 60% of the ISAM-StaticR case."

17.9916: You discuss 2001-2003 here in detail, which show an increase for all parameters with the new dynamic description. How about Bondville 2004? Moreover, in your discussion of increased GPP and LH, it is good to separate increased amounts from improved data fit - see as well my comment on the abstract.

(1) We believe you are concerned about the following statement, which appears on *page 9916/line 15* of the original manuscript. "there is no apparent difference in plant water transpiration between ISAM-StaticR and ISAM-DynamicR case over the 2004 growing season at both sites (Figure 6a)". To clarify your concern we have extended the discussion about all fluxes for the year 2004 at Bondville site.

"Both sites experience moist weather conditions during the summer of 2004. For example, the accumulated precipitations at Mead and Bondville sites for the period from June to July 2004 are about 91% and 63% higher than the average for the same time period over 2001-2003 Therefore, soybean experiences no water stress condition at both sites in 2004 and the estimated water transpiration fluxes for ISAM-StaticR and ISAM-Dynamic cases are approximately the same (Figure 7a). This also results in similar values for estimated GPP and LH fluxes for both cases (Figures 7b-c)."

(2) Regarding your other comment about separating the effects of "***improved data fit",*** the results shown here for two cases are based on separate calibrations of the model for each case, that is the best fit results for ISAM-StaticR and ISAM-DynamicR (now named as ISAM-Dynamic) cases. So, the results shown for both cases are fitted results and the improvement in the results for ISAM-Dynamic case as compared to ISAM-StaticR is due to improved parameterization of rooting depth and its distribution in the soil layers. To further clarify this point, we have revised the text (See Page 20, Lines 633-637 for ISAM-StaticR calibration description and Page 12, Lines 374-382 for ISAM-Dynamic calibration description)

"The root distribution based on ISAM-StaticR case is calculated based on the root depths at which plants have 50% of their total root biomass and a dimensionless shape-parameter describing root profile (Schenk and Jackson, 2002). Since ISAM-StaticR case assumes no temporal variation in root fraction in each soil layer, we use average values for three observed corn root profiles discussed in section 3 to calibrate the ISAM-StaticR case. For the ISAM-Dynamic we calibrate two parameters, α and bb, appearing in Eq. A 41 by using the same three observed corn root profile data as used in ISAM-StaticR case. "

18.9918 / 14: The comparison between measurement bias and measurement uncertainty has not been discussed in the Results, which would be interesting (and necessary if you want this in your conclusions).

Response: To address your comment, we have added the discussion about the comparison between model bias and measurement uncertainty.

"Richardson et al. (2006) estimates overall random measurement error at the Mead, NE site averaged about 15.5 W m^{-2} for H, and for LH fluxes for the 2002 and 2003 growing seasons. The estimated root mean squared error (RMSE) for the modeled H and LH fluxes for the Mead site averaged 20.3 and 16.7 W m^{-2} for 2002 and 2003 growing seasons, which are slightly higher than the measurement uncertainty. This result suggests that current estimates of overall model biases in partitioning H and LH may be slightly overestimated without considering the measurement uncertainty."

19.Table A1: What is the meaning of the two parameters in the "Value" column? Is this soybean and maize, respectively? Please clarify.

Response: The first and the second values in the "Value column" are for corn and soybean, respectively. A description to address this point has now been added in the caption of Table A1 (See Page 48).

20. The authors do not discuss their results in a larger perspective, there is no critical assessment of the applicability of this model, or e.g. a comparison with other studies. It would be interesting to learn whether the authors expect the presented developments and parameterizations to work as well for other regions, or other crops.

Response: To address this comment, we added the text at the end of result section (section 4.1).

"The simulated results for carbon and energy fluxes for corn and soybean at both sites suggest that the model calibrated parameters can not only be used to accurately simulate corn and soybean growth at water stresses sites, like the Mead, but also accurately simulate corn and soybean growth at sites in the normal non-irrigation region, like the Bondville site. Since the extended version of the ISAM model couples the dynamic carbon allocation processes, with the vegetation structure simulation (LAI, root depth and distribution at each soil layer), the model has advantage to simulate the crop yield and resultant carbon and energy fluxes under different environmental conditions and variability. However, the ability of model to simulate corn and soybean growth at the large-scale still needs to be evaluated and also compared with simulation from other land surface models in the future study."

21.From the four developments described in section 2, only (2) and (3) from the list above are assessed in section 4. Of course, the model is generally evaluated, but it would be worthwhile to learn as well how important improvements (1) and (4) are for the model's performance.

Response: To address your point, we have performed additional model simulations to show the importance of other crop growth dynamic processes, including dynamic carbon allocation, dynamic LAI, and dynamic canopy height. These experiments and the results of these experiments are described in section 4.2 and its sub sections 4.2.2, 4.2.3 and 4.2.5. The Table 3 (old Table 2), which has now been modified based on the reviewers comments, in the original manuscript has now extended to include Willmott values for additional model simulations.

*"**4.2 The Effects of Different Dynamic Processes on Modeled Results***
In this section we evaluate the importance of four dynamic process considered in this study, (1) dynamic carbon allocation, (2) dynamic LAI, (3) dynamic root distribution and (4) dynamic scale height by performing following additional model simulations:
ISAM-Static: This model is based on fixed carbon allocation, prescribed LAI, prescribed canopy height, as well as prescribed root depth and root allocation faction in each soil layer. All these four processes have been included in the original version of ISAM (El-Masri et al., 2013).
ISAM-StaticC: Same as ISAM-Dynamic experiment, but the carbon allocation parameterization is based on fixed carbon allocation scheme as assumed the original version of the ISAM.
ISAM-StaticLAI: Same as ISAM-Dynamic experiment, but uses prescribed LAI development as assumed in the original version of the ISAM.
ISAM-StaticR: Same as ISAM-Dynamic experiment, but uses pre-determined root depth and root fraction for each soil layer in space and time as assumed in the original version of the ISAM.
ISAM-StaticH: fixed canopy height parameterization, but uses fixed canopy height parameterization as assumed in the original version of the ISAM.

In the original version of the ISAM (El-Masri et al., 2013), referred to here ISAM-Static, the carbon allocation fractions for leaf, stem, root and grain pools for each phenology stage are *assumed to be the same values as in the case of ISAM-Dynamic but without accounting for limitation of water, light and nutrients (Table A1) and these fraction values are assumed to be the same for each model year run. The LAI is not dependent on the carbon allocation simulation as in the case of ISAM-Dynamic experiment, rather the LAI values in the original version of ISAM are attained from multiyear average site-specific MODIS land product subsets (ORNL DAAC, 2011). The root distribution in the ISAM-Static is calculated based on the root depths at which plants have 50% of their total root biomass and a dimensionless shape-parameter for describing root profile (Schenk and Jackson, 2002). Since the static root distribution case assumes no temporal variation in root fraction in each soil layer, we use average value of three observed corn root profiles (see section 3) to calibrate the static root distribution case. The fixed canopy heights in the ISAM-StaticH experiment are assumed to be the maximum canopy height of specific vegetation type (Ha) from Ameri-Flux data sets (Table A1).*

In order to evaluate the performance of integrated effects of dynamic crop growth processes implemented in this study (ISAM-Dynamic case) and the individual dynamic crop growth processes, we compare the Willmott indexes (dr_d) for carbon and energy fluxes based on individual five experiments discussed above with the estimated dr_d for ISAM-Dynamic case (Table 3).

4.2.1 Static versus Dynamic Crop Growth Processes

The Willmott index values (dr_d) for daily mean GPP, Rn, H and LH fluxes in ISAM-Dynamic case are higher than that in ISAM-Static case and several are much closer to 1, except for no apparent improvement in dr_d values for corn GPP and Rn fluxes at the Bondville site (Tables 3). These results suggest that the implementation of dynamic crop growth scheme in ISAM significantly strengthens the ability of model to capture seasonal variability in measured carbon and energy fluxes for crops. No differences in dr_d values for corn GPP and Rn fluxes at the Bondivlle site for ISAM-Dynamic and ISAM-Static experiments are due to that fact that processes considered in both experiments are unable to capture a crop lodging effect, as discussed in section 4.1.

4.2.2 Static versus Dynamic Carbon Allocation

Figures 1b, e, h, k show that the estimated aboveground biomass for corn and soybean are in much better agreement with measurement for ISAM-Dynamic case than for ISAM-StaticC case. In addition, ISAM-Dynamic case better captures the seasonal variability in leaf carbon mass, as indicated by LAI (figures 1a, d, g, j), and the root carbon biomass (figures 1h, k) than the ISAM-StaticC case. The improvements in estimated seasonal aboveground biomass, leaf and root carbon biomass for ISAM-Dynamic case are more for soybean than for corn at both sites. These results indicate that the dynamic carbon allocation scheme in the ISAM-Dynamic case is able to capture the response of carbon allocation to water, temperature, light stresses, leading to a better simulation of aboveground total biomass and leaf carbon amount. With better simulated seasonal variability in carbon allocations, the dr_d values for GPP, H and LH calculated based on ISAM-Dynamic case are generally closer to 1 than based on ISAM-StaticC case (Table 3), except for corn GPP at Bondville site. No improvement in corn GPP at Bondville for ISAM-Dynamic is because the model is unable to capture the sharp reduction in GPP due to crop lodging with gusty wind, as discussed in section 4.1, even after accounting the dynamic processes. Nevertheless, our results suggest that implementation of the dynamic carbon *allocation parameterizations improves the model estimated results for GPP, H and LH fluxes, especially for soybean.*

4.2.3 Static versus Dynamic LAI

Figures 1a, d, g, j show that prescribed LAI usually underestimates LAI over the growing seasons at both the Mead and Bondville sites. In addition, prescribed LAI is not able to partition ground vegetation LAI and crop LAI, leading to a wrong estimates of growing season length for the crop. The underestimation of the LAI over the growing season results in underestimation of the amount of solar radiation absorbed by the canopy, leading to underestimation of GPP and LH, but overestimation of H. In contrast, the ISAM-Dynamic version of the model, which accounts for the dynamic green and brown LAI parameterizations, is able to capture observed seasonal variability in LAI (Figures 1a, d, g, j). As a result of this, ISAM-Dynamic based GPP, Rn, H and LH fluxes for corn and soybean at both sites are in much better agreement with the observations than in the case of ISAM-StaticLAI, except for corn GPP and Rn at the Bondville site. The dr_d values for ISAM-Dynamic are higher by 2-13% for Rn, 3-41% for GPP, 18-39% for H and 19-35% for LH at both sites than for ISAM-StaticLAI case (Table 3). The improvement for soybean is usually larger than for corn. The less improvement for corn GPP and Rn at the Bondville can be attributed to the fact that ISAM-Dynamic and ISAM-Static cases are unable to capture gusty wind effect on LAI.

4.2.4 Static versus Dynamic Root Distribution

Text in this section is same as it was in the original manuscript

4.2.5 Static versus Dynamic Canopy Height

Table 3 shows that dr_d values have small differences between ISAM-StaticH and ISAM-Dynamic cases, relative to comparisons discussed above, indicating that the implementation of dynamic canopy height simulation does not apparently improve the carbon and energy fluxes for these crops. This is perhaps due to the fact that there is no large seasonal variability in canopy height for corn and soybean. Thus, replacing prescribed canopy height to seasonally variable canopy height does not significantly change the atmospheric turbulence above the crop canopy or the carbon and energy fluxes.

Table 3. The Willmott index (dr_d) to quantify the degree to which observed daily mean GPP and energy fluxes are captured by the model for corn and soybean at the Mead and Bondville sites. The n is the number of observation at the daily step.

Data	Sites	Crop	*n*	dr_d (ISAM-Dynamic)	dr_d (ISAM-Static)	dr_d (ISAM-StaticC)	dr_d (ISAM-StaticLAI)	dr_d (ISAM-StaticR)	dr_d (ISAM-StaticH)
GPP	Mead, NE	Corn	235	**0.86**	0.50	0.77	0.61	0.57	0.84
		Soybean	232	**0.83**	0.60	0.70	0.63	0.72	0.83
	Bondville, IL	Corn	232	**0.71**	0.69	0.71	0.69	0.71	0.71
		Soybean	207	**0.92**	0.81	0.83	0.83	0.81	0.92
Rn	Mead, NE	Corn	235	**0.89**	0.81	0.89	0.84	0.88	0.89
		Soybean	232	**0.90**	0.80	0.87	0.82	0.88	0.86
	Bondville, IL	Corn	232	**0.83**	0.82	0.82	0.81	0.83	0.82
		Soybean	193	**0.93**	0.81	0.81	0.82	0.81	0.92
H	Mead, NE	Corn	235	**0.71**	0.31	0.66	0.57	0.30	0.71
		Soybean	232	**0.68**	0.47	0.46	0.49	0.50	0.68
	Bondville, IL	Corn	178	**0.47**	0.19	0.29	0.40	0.19	0.40

		Soybean	135	**0.77**	0.61	0.61	0.62	0.61	0.77
LH	Mead, NE	Corn	235	**0.87**	0.50	0.81	0.70	0.55	0.80
		Soybean	232	**0.77**	0.57	0.63	0.59	0.64	0.76
	Bondville, IL	Corn	178	**0.50**	0.37	0.42	0.42	0.40	0.49
		Soybean	135	**0.88**	0.65	0.65	0.65	0.64	0.87

22. Minor remarks:
(1) ***9898 / 23: "without dynamic case" is an awkward terminology and should be specified more clearly (same on l. 25)***

Response: We have now changed "without dynamic case term to "the static root distribution simulation".

(2) 9898 / 24: Use "increased" instead of "improved in this sentence. The increase in GPP and LH in most cases indeed improves the results, but expressing the improvement in percent would give rise different expectations in terms of the reference to which you improve.

Response: We have revised the text.

(3) 9899 / 20: The statement that corn/soybean is the most common crop rotation world- wide needs a reference.

Response: The following reference has been added.

Nafziger, E.: Cropping systems. In: Illinois agronomy handbook. Available on line at: http://extension.cropsci.illinois.edu/handbook/, 2012.

(4) 9902 / 21: **remove** ***"the"***
Response: We have revised the text as you suggested.

(5) 9904 / 7: Add "the" in front of "hydrological cycle" and "energy cycle"
Response: We have revised the text as you suggested.

(6) 9904 / 14: Replace "with dynamic root distribution" by "with a dynamic root distribution"

Response: We have revised the text as you suggested.

(7) 9906 / 2: Remove "An"
Response: We have revised the text as you suggested.

(8) 9908 / 5: Replace "varies" by "vary"
Response: We have revised the text as you suggested.

(9) 9911 / 26: Replace "varies" by "vary"
Response: We have revised the text as you suggested.

(10) 9912 / 11: Please use SI units for the wind speed, i.e. m/s
Response: We have revised the text as you suggested.

(11) 9912 / 22: Remove "are"
Response: We have revised the text as you suggested.

(12) 9913 / 10: replace "that also add to discepancy" with "which adds to the discrepancies"
Response: We have revised the text as you suggested.

(13) 9913 / 12: Replace "indicates" with "indicating"
Response: We have revised the text as you suggested.

(14) 9913 / 13: I think that dr_d would be better described with "seasonal pattern" than "daily pattern"
Response: We have revised the text as you suggested.

(15) 9913 / 26: replace "balanced" with "balance"
Response: We have revised the text as you suggested.

(16) 9914 / 13: replace "independent" with "independently"
Response: We have revised the text as you suggested.

(17) 9915 / 24: replace "moisture" with "moist"
Response: We have revised the text as you suggested.

(18) 9916 / 3: check spelling of "DynamicR"
Response: We have revised the text as you suggested, and now DynamicR is renamed as Dynamic.

(19) 9916 / 8: remove "in"
Response: We have revised the text as you suggested.

(20) 9918 / 19: Check the sentence starting with "Since we..."
Response: We have revised the text.

"Since we have developed a flexible process-based crop growth modeling framework, it can also be applied to simulate not only other food crops, such as wheat, but also energy crops, such as Miscanthus and switchgrass."