Thank you very much for the very useful and constructive comments. First of all, we are deeply sorry to report you that our code contained a small bug to compute the dominant crops from MIRCA2000 data sets. We have fixed the bug and confirmed the bug correction does not affect any changes on major discussions and conclusions in the previous manuscript. At the end of this response, we summarize changes with the correction of the bug.

Following the general and specific comments, we have revised the manuscript. Here, we would like to response to the comments.

[G1] It is strange that the finer spatial resolution of SACRA is mentioned in the abstract, but in the text most interpretation, e.g. Fig. A4 is made on aggregated data, or Fig. 11 by using dominant crop classes. To my feeling, some words should be added about how dominant crop classes are extracted or used, especially in view of discrepancies of crop calendars (see specific comments).

Response: We have revised the abstract following the suggestion.

[S1] It remains a little bit unclear, why SACRA crop calendars are adjusted to meet length of MIRCA2000 crop calendar of the dominant crop (sections 2.3 and 2.4), given the fact that ONE crop is chosen for an administrative unit out of possible 6 (Table 5), from which possibly at least one might have similar maximum monthly crop area or even another subcrop in MIRCA 2000 (as e.g. for irrigated wheat in India Uttar Pradesh with two identical areas with different cropping periods, see MIRCA documentation Table I-211, FHP 09 Appendix I page I-226).

This follows question of Referee# 2 "In the case where two crops with nearly identical area in MIRCA2000 in the crop calendar, to what extent would the selection of the dominant crop influence the validity?" This would add to the discussion about the methodological reasons for discrepancies in crop calendars between SACRA, W12 and MIRCA2000.

Response: Thank you very much for invaluable comment. Following the suggestion, we have added discussions (P16L31). Also, we have added the reason of the adjustment (P10L3).

[S2-1] You did not define cropping intensity (P7L8) while using it in Table 2, Figure 5 etc. It is crucial for the understanding. Also, you should mention for/in Fig. 5 that Zabel et al. 2014 are mentioning potential = maximal cropping intensity.

Response: We add the description of cropping intensity (P6L30) and Zabel et al. 2014 (P7L15 and Fig. 5).

[S2-2] "no remarkable inter-annual variability" - I think for China and Kenya in November and December, there are differences between coloured averages. "double cropping" - I suspect that in Kansas and Spain these are other crops than the dominant crop.

Response: The corresponding sentences and administrative units has been removed in the revised manuscript due to the bug correction.

[S2-3] "Zabel et al. ... underestimate cropping intensity" & "bimodal" - I suspect that the second peak in Kenya is another crop than Maize.

Response: We have added the description (P8L21).

[S2-4] "The nearly constant NDVI is characteristic of a tropical forest" - I suspect that in Brazil Rio Grande do Sul you somehow mistakenly defined rice as the dominant group (wherase it should be maize), as in the calibration grids maize and soybeans are pure grids, crops which also have largest harvested area (rainfed and irrigated, respectively) and (probably) also maximum monthly growing area in MIRCA2000 (see MIRCA documentation Table I-73, FHP 09 Appendix I page I-88)

Response: As pointed out, our code contained the bug. Thank you very much for checking our manuscript carefully!

[S2-5] Perhaps it would help to introduce two additional columns in Table 3 (P24) with MIRCA number of cropping periods or some simplified cropping intensity (CI) for rainfed (RF) and irrigated (IR) crop class, calculated as the sum to the crop-class specific harvested area divided by the largest harvested area of the (dominant) crop.

Response: We have added the simplified cropping calendars with MIRCA in Table 3 and discussion (P7L22). Thank you very much for the suggestion.

[S2-6] Please write "nearest 30 arc-min grid". It may be worth discussing the effect of using the 0.5 degree resolution.

Response: We have revised the manuscript (P5L5). For the moment, we consider our method is not sensitive to the temperature data from our personal experiences. Therefore, we did not add the discussion about effect of the spatial resolution of the temperature data.

[S2-7-1] So what is the difference between temperate-wheat / snow-wheat vs. spring-wheat / winter-wheat?.

[S2-7-2] Here winter wheat is mentioned, while you speak also of snow-wheat. This wording should be homogenized.

Response: We have added the descriptions about differences between temperate-wheat / snow-wheat vs. spring-wheat / winter-wheat (P5L10). Also, we have removed the descriptions of spring and winter wheat to avoid confusions.

[S2-8] Please delete "common", as maximum nNDVI is 1. But mention that NDVIbas is different for nNDVI 1, or 2.

Response: Revised as suggested (P7L10).

[S2-9] "16 crop types (Table 1b)" : Perhaps Table 2, P23?

Response: Thank you for correction. We have revised it (P7L16).

[S2-10] Please insert "The location of six ..."

Response: We have revised the title following the suggestion (P7L18).

[S2-11] "First estimation..." would be inline with Figure 1. You describe crop calendars for temperate crops and snow-wheat. What about rice and multi-cropping?

Response: Figure 1 has been revised. We also estimate CC for rice and multi cropping (P9L4).

[S2-12] Eq.8 & 9: What are "F" and "F-1"?

Response: We have add the description (P11L15).

[S2-13] "no-crop calendar" - Please explain how you could the derive NDVI-Crop!

Response: We have revised the description (P12L4).

[S2-14] "Averaged _adjusted_? crop calendars over MIRCA? administrative units.

Response: We have revised the description. As pointed out in the end of the Section 2, all comparisons in Section 3 are performed with adjusted CC for SACRA (P12L9).

[S2-15] "Major cultivation season" - Please explain how you defined major vs. second (first, area, etc.).

Response: We define major and second cultivation season with Eq. (7) (P10L14).

[S2-16] "only single cropping grids" - Please explain how this possibly influences the result.

Response: Following the suggestion, we have add the description (P12L18).

[S2-17] Do you mean "GLCC AND Ecoclimap" (i.e. alternative or?) or "GLCC + Ecoclimap" forest land cover (sum of both possible pixels)

Response: We have revised the description (P13L11).

[S2-18] Please mention code of unit (as in Table 5) in text (and in caption of Figure 11), to be much faster readable.

[S2-19] Please mention that assigned code is SACRA code (and not MIRCA code) in Table 3.

Response: Revised as suggested.

[S2-20] Why should finer resolution help to reduce uncertainty in NDVI? I suspect that a possible reason major discrepancy in crop calendars for interpretation is the selection of one dominant crop class.

Response: We have revised the description following the suggestion (P14L14).

[S2-21] Please insert "from NDVI-Pure" for clarification of source.

[S2-22] Please insert "sowing (OR harvesting)"

[S2-23] Please insert "1st (OR end)"

Response: Revised as suggested (Appendix-A).

[S2-25] Please insert an explanation of the square on the right side of the figure (-2), and perhaps an explanation of the major cultivation season. Didn't you only use single cropping grids (also in Figure A3)?

Response: Revised as suggested (Fig. 9). Also we have add the description how to decide the major cultivation season (caption of Fig. 9). In Fig. 10 and Fig. A3, only single cropping grids are used to compute the averaged sowing date (captions of Fig. 10 and Fig. A3).

[S2-26] Please specify "nNDVIsw or nNDVIhv" in order to be clear to refer to either parameter and not the ratio of both.

Response: Revised as suggested (Fig. A1).

[Changes in the manuscript with the correction of the bug]

As we reported, out code contained a bug to compute dominant crops in grids. Therefore, the correction of the bug affects: 1) global distribution of dominant crops, and 2) dominant crops of the administrative units. We have confirmed the bug correction does not affect any changes on major discussions and conclusions in the previous manuscript. Here, we summarize changes with the correction of the bug.

Due to the correction of the bug, following figures are updated.

- Figures 2, 5, 9, 10, A1, A2, and A3
- Table 4

Selected administrative units for comparison of cropping intensity has been revised.

- Table 3
- Figure 6

Identified administrative units with large difference in sowing dates has been revised.

- Table 5
- Figures 11 and A4