Earth System
Dynamics

Discussions

EGU

Interactive comment on "Changes in crop yields and their variability at different levels of global warming" *by* Sebastian Ostberg et al.

Anonymous Referee #2

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This paper succeeds in showing the relative contributions to the spread of crop yield projections from impact models, climate models and scenarios. Further, it also succeeds in demonstrating that there is potential utility to functions relating change in GMT to yield impacts in the future. Clear and precise outlining of methods and data availability makes the results of this paper easily traceable and its contents easily replicable by fellow scientists.

This paper would benefit from further discussion of methodological limitations. In particular, the following points should be addressed:

i) 5 GCMs are used to obtain climate projections. The authors should discuss the representativeness of these 5 GCMs with regards to the CMIP 5 ensemble.

C1

ii) Section 5 describes projected increases in regional crop yield variance. This section should also include a discussion of the extent of uncertainty present in these projections of rising variance.

The summary section should incorporate discussion of the above two points in relation to the strength of the conclusions drawn.

In addition to elaborating on methodological limitations, the following points require clarification and elaboration respectively:

Lines 393 – 394: The use of the word "likely" needs to be clarified here. Please provide a definitive answer as to whether or not very low present-day yield potential in these regions is leading to division by values close to zero.

Lines 396 – 405: Please give an explanation, or hypothesis for the negative effects of CO2 in the two "potentially important" regions mentioned.

In terms of mathematical formulae, symbols, abbreviations and units, the following should be addressed:

Lines 169 onwards: Please use a clearer term for fixed CO2 than YnoCO2 .

Lines 340 and 350: Please describe what a1 represents in each equation in word form.

Line 434: Please correct the use of <> in this equation.

In terms of changes to figures, the following should be addressed:

Figures 2,4,6,7 and 8: All of these figures need to be much larger to increase their readability. If possible, each figure should be on its own page.

Figure 5: This figure is only for the LPJML model, please explain the rationale for model selection or point to where other model results can be found.