bgd-11-C3507-2014

We would like to thank the referee for his fair remarks and criticism of our study. We would like to address the points step by step (Referee comments are presented in *italics*.)

1) *The general "tone" of the paper could be more positive. It seems in much of the discussion, the potential "negatives" are discussed more than the "positives" that the models predict. For example, in the conclusion "new breeds and cropping techniques will also aid to counteract the negative effects of climate change" says negative but in fact your models show they will be positive. In the abstract you state "In addition summer temperatures will become less optimal for all maize crops. Only if the plants can supply themselves sufficiently with water...". Again you model shows this is positive*

We agree that the tone is at times indeed somewhat negative.
A phrase like *"In addition summer temperatures will become less optimal for all maize crops. Only if the plants can supply themselves sufficiently with water..."* refers to the different behavior of the varieties, as the development of the medium maize is not always positive. Even towards the end of the century, yield gains are relatively small for this variety, thus some unaccounted for negative effects might lead to a decline in yields. Still we agree that the tone has to be changed as it does not adequately represent our findings, so we checked the article in this regard

2) *Temperature increases and moisture decreases seem a bit extreme but I am not a model expert.*

We can here only relate to the model developers quoted in the study, with validation data for the model and region. Also the changes are within the scope of the IPCC model projections, though the uncertainties naturally grow the farther a depicted timeframe lies in the future

3) *Description of the varieties (hybrids) would be useful including days to maturity and relative yield potential*

We did inquire about this with the main developer of the crop model. He himself used data from test sites in Poppenburg and Werlte in Germany. He did not specify which breeds or hybrids were actually used and rather used average results from a number of early, medium and late varieties. A rough estimation by required temperature sums would be around 1400°C for early, 1550°C for medium and 1650°C for the late variety. We added this information in a more general way to the description, as the mentioned temperature sums are more of an estimation

4) *It seems your models suggest greater yields, especially from the late varieties. It also is implied that farmers can shift from early and medium varieties to late varieties. I assume the late varieties are higher yieldings. Therefore, there can be an additive effect of 25% increase in late variety yields plus the extra yield from late versus early and medium varieties. This combined effect is large and should be discussed.*

Yes, we omitted this effect in the discussion as we initially focused on the differences each variety shows as compared to its today's yield. We however added a comparison of absolute yields between the varieties (as a ratio where the medium variety would be 1). This hopefully provides some more insight into the mentioned effect.

5) *Variability is discussed and it is implied that biological variability will increase. That may be true but the authors should note that the variability maybe a function of the models themselves*

There are indeed hints that the variability of (summer) precipitation and maize yields are closely related, as both are largest in the decade 2051-2060. However this relationship cannot be found for all decades, thus the issue of variability is more complex and would need further testing/research. We clarified this further in the discussion