

A comment for BGD

Manuscript bg-2014-249: "Biomass yield development of early, medium and late Maize varieties under a future climate in Lower Saxony, Germany"

In this manuscript, the authors estimate potential impacts of climate changes on silage maize production in Lower Saxony, using a newly developed carbon-based crop model and a high-resolution regional climate data-set. Projected biomass data are discussed with respect to a pattern of maize genotypes (early, medium and late).

The general criticism is that the manuscript is somewhat inaccurate. The aim of the paper seems clearly laid out but the modelling exercise seems poorly developed and the text is written in such a manner that is not easily legible.

This is a conventional scenario-led approach with focus on developing fine scale climate data projected into the future and used to force a crop model to infer potential impacts on yield. It seems there is little or nothing innovative. Although climate models are constantly being improved, they are not able to estimate future climate conditions with a high degree of confidence. The authors use climate data derived from the regional climate model WETTREG. However, downscaling climate projections to a higher resolution should not be seen as increasing confidence in data, and outputs from different climate models often differ, presenting users with a range of possible future climates to consider. Ultimately, a wide range of impacts and adaptation responses is possible, also considering that different impact (crop) models also may give different outputs. It is recommended that estimation of uncertainties is done by running not only several climate models but also alternative impact (crop) models supposed to simulate the same reality (ensemble modelling) so as to generate an expanded envelope of uncertainty. This is why, not only the use of WETTREG climate model (alone), but also of BioSTAR crop model (alone) is poorly justified in this study. This is also more relevant given the simplified assumptions behind this crop model (section 2.2), referred to as being in beta stage development (page 8, line 5). At least the authors should expand the exercise to other crop models simulating maize production. They may refer to benchmarking actions run at international level, e.g., for maize, Bassu et al. (2014).

Bassu et al., 2014. How do various maize crop models vary in their responses to climate change factors? *Global Change Biology*, doi: 10.1111/gcb.12520.

To sum up, this reviewer would suggest keeping with the criticism presented above for the resubmission of this manuscript.

Minor issues

In section 2.4, it is not clear the time step (daily, hourly Δt) of the weather data used to input the crop model. For Penman/Monteith ($\Delta Penman-Monteith$, with a hyphen not a solidus) evapotranspiration (page 10, line 6), for instance, the FAO-56 approach for daily calculation was probably adopted, but please specify.

At any rate the few other existing studies are hinting towards the same result. Please cite such published studies.