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Atmospheric Chemistry and Physics Discussions

Interactive comment on "Impacts of near-future cultivation of biofuel feedstocks on atmospheric composition and local air quality" *by* K. Ashworth et al.

Anonymous Referee #2

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This paper describes the results of biogenic emissions and chemical transport model simulations when various biofuel production assumptions are made. The production of biofuels will change a given landscape, alter the fluxes of biogenic emissions to the atmosphere, and impact the atmospheric chemistry that determines ozone and organic aerosol concentrations. As the use of biofuels increases in the near future, it is important to understand and quantify the feedbacks to the atmosphere and the Earth System. This paper does tackle this issue and goes beyond the few studies that have investigated this topic in the past. Further, this paper uses more realistic scenarios of biofuel use and implementation than past studies and provides more robust results. This paper is relevant for Atmospheric Chemistry & Physics. I recommend that this

paper be published; however, more details and clarifying points need to be included before this should be done. I provide here my comments and suggestions.

This paper was well-written, but I believe that more detail is needed to describe some of the key components of the modeling study and the results. For example, what was the bSOA mechanism applied by the global model?

How much are the isoprene emissions scaled in the Scenarios (Page 24862, line 7; Page 24863, line 6)? How were these scaling factors defined?

Was a diurnal profile assigned to the bVOC emissions and the NOx emissions from the biofuel crops?

Why were N emissions from fertilizers included in the oil palm scenarios, but not the SRC?

In the result section, please specify if the changes in ozone concentrations are annual averages, or for another time period. The results are also shown in absolute changes in ozone concentrations; it may be interesting to say something about the % change in concentrations- or a map would be interesting, too.

The paper focuses on changes in isoprene emissions, but it may be valuable to comment on the impact of crop replacement of monoterpene-emitting forests?

Please provide more details to the modeling component of the Deposition evaluation. For example, Pg. 24869, line 13-15, how much was the leaf area and roughness length changed? (From what to what?).

Interactive comment on Atmos. Chem. Phys. Discuss., 11, 24857, 2011.