Interactive comment on "Distinguishing between early and late covering crops in the land surface model Noah-MP: Impact on simulated surface energy fluxes and temperature" *by* Kristina Bohm et al.

Anonymous Referee #1

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Bohm et al., investigate the impacts of including early versus late cover crops in Noah-MP to model surface-atmosphere fluxes in an agricultural region in Germany. The manuscript is overall very well written and I have only minor comments. As Noah-MP is getting used more often in regional climate simulations, the authors demonstrate a good method for improving the seasonal agriculture dynamics and land use representation within Noah-MP. There are a couple areas that I think could be improved upon.

1: A map of the Kraichgau region of Germany with the accompanying GVF data and the spatial representation of ECC vs. LCC would help readers conceptualize the study

region and better understand what a 10% increase in LCC share means.

2. The weather data driving Noah-MP is derived from the study site EC1. Comparing the surface energy fluxes calculated by Noah-MP to observations with the eddy covariance instrumentation at EC1 would aid readers in understanding how improved (by splitting crops into ECC and LCC) the surface fluxes are compared to generic crop representations included with Noah-MP.

3. It's difficult to discern whether Noah-MP is being run only for the study site EC1 (point location) or for the entire Kraichgau region. The authors state Noah-MP simulations were performed for the entire Kraichgau region but Table 2 shows GVF dynamics for only for 1 point. If it's for a single point location, then more language is needed to clarify this. If it's for the entire region then a justification for using weather data acquired at one point location for simulating the energy fluxes of the entire Kraichgau region is needed. A discussion of the spatial resolution of Noah-MP would then be needed as well.

4. Since eddy covariance data exists for the site EC1, discussion about how the other Noah-MP parameters (included in Noah-MP parameter table) might influence the results when vegetation type is set to 2 such as SAI or roughness length.