

Interactive comment on “Management-intensive Grazing Affects Soil Health” by Casey Shawver et al.

Anonymous Referee #2

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The manuscript is dealing with the question if land-use-change from crop to pasture would affect the soil properties. The manuscript is general well written however, there are three major concerns I have with the presented results: i) very short-term effects (only 1-2 year after LUC) are discussed, ii) no control treatment (e.g. no grazing) iii) no randomized established replicates. Moreover, there was a lot of effort spent to introduce the different forage mixtures but results of this factor are either discussed very extensively or are not present. Its clear that the main effect on soil function, in this initial phase, is the land-use change to grassland rather than due to the effect of grazing animals. However, this statement cannot be confirmed accurately as there were no, as far as I understood, non-grazed paddocks present in this trial. I am wondering if authors could make a clearer statement about the grazing yields and the differences

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between the mixtures in the results & discussion chapter. I guess due to the long-arable crop phase as pre-management and the extensive nitrogen application there are low biomass yields in comparison to other irrigated and well fertilized pastures leading into a reduction of plant residues, which in turn reduces the assumed carbon sequestration rate. This fact was maybe additionally triggered by the poor forage legume establishment even though high soil pH-values should allow favorable growing conditions. In addition, there are only a few information about the dairy herd available (e.g. breed) particularly with regards to the feeding strategy (e.g. supplements) and consequently about the potential nutrient excretion of grazing cattle, which make results of chemical soil properties hard to explain. Line 126: Mean of what? Monthly I guess Line 251: that you used RStudio is not relevant in this context. Line 251: as this is not a classical experimental design I am wonder if repeated measurements should be considered in your model. Line 262: seems to be very heterogenic. Give SD or SE.# Line 328: You explained that bulk densities increased. Even when this was observed with a high variation, soil carbon stocks in turn should be higher, if C content remained constant?! Table2 and 3: Table 2 is for me personally more helpful as the used index. Actually, I have my doubts about the benefits of this used index to understand the presented results.

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