Author Response to Anonymous Referee #1

Review comment	Author response
For the international readership of SOIL it might be of limited interest, since all results are related to Germany without direct implications for outside Germany	This comment was already contradicted by reviewer 3. Indeed, the paper is exclusively about LTFE in Germany. But we expect the paper to be also interesting for an international readership because it provides a carefully developed example on how a large number of long-term field experiments can be comprehensively characterized with meta-information. On the other hand, the intersection of LTFE with spatial data is new and could also arise the interest of international readers, either with regard to the specific data usage of the German LTFE, or as inspiration for using their own LTFE.
More details need to be outlined how the access to data will be provided in the future. The one sentence in l. 68 ("There is a focus on reseach data from LTFEs") is not enough	We see this paper as a kind of vision or as motivation to make the LTFE data freely available. We expect that the comprehensive overview of meta-information will trigger motivation of LTFE holders to share their data for re-use and scientific cooperation. It facilitates the direct (bilateral) cooperation between interested scientists and LTFE holders for co-authorship. Nevertheless, we will go more into detail in the manuscript how to convince LTFE operators to enter the data in the BonaRes database.
Maybe more abundant soil data, such as texture or soil type, can be used for classification and the representativeness analysis	We are going to conduct a further analysis with texture or soil type data.
l. 6: Soil monitoring of climate impact can be performed much more cost efficient on permanent sampling sites (such as "Bodendauerbeobachtung"). Since LTFEs do not represent real practice field sites they might miss some trends that can only be monitored at farmers' field sites. The value of LTFEs is to provide data on management impacts (under changing climate).	Both methods and programs have their specific goals and advantages. While soil monitoring sites (BDF) show soil changes during normal management, LTFE follow an experimental design. The strengths of the collective analysis of LTFE therefore is the analysis of LTFE with similar treatments in the form of a meta-analysis. However, if the LTFE data are available anyway, it is also conceivable to use LTFE in a similar way to BDF by evaluating the "conventional fertilization and tillage" treatments collectively that are existing in most LTFE.
L 16: The representation and distribution of management options in the LTFEs is missing as a result in the abstract. Since this is the main aim of LTFEs it would be worth to include one	We are going to include that in the abstract.

or two sentences on how management treatments are covered in LTFEs in Germany.	
l. 28: In agriculture, plant nutrition is linked to fertilisation. Thus, these are not two but one and the same aspect.	We are going to express this more clearly
l. 39: The definition of "control treatments" is not clear. Is the control treatment defined by each LTFE or does it depend on the study? Customary or common management practices are changing over time e.g. the fraction of reduced tillage or fertilisation type and amount. Is the control treatment than also changing over time?	The definition we gave here is for the purpose of defining 'control treatment' for our study. The second point is a fundamental problem for long time series of LTFE, since the management changes repeatedly over time. This must be considered in individual time series to see how strong the breaks are and whether or not these time series can then be used.
l. 45: Change "landscapes to "soil" since LTFEs does not comprise landscapes.	This refers to the collective analysis of LTFE. We will state that more clearly.
l. 99 and 102: Why 191? 94+87=181	We will correct that.
l. 156: It is not comprehensible why many grassland LTFEs were excluded. This need to be explained and justified since grassland trials are under-represented in the compiled LTFE dataset. Above it is written that LTFEs are useful beyond the original scope or research theme. Here it is argued that the research theme of the grassland trials did not fit and were therefore excluded.	Most LTFE were originally implemented for agronomic purposes. Accordingly and particularly for grassland LTFE, most research questions are agronomic in nature and not closely related to the soil. In this paper, we intended to reveal the value of LTFE for soil related questions. We therefore only included those LTFE in our study, for which soil data are existing. We will state this more clearly.
l. 192: What is a technical college? A university of applied sciences?	Sorry. Yes, university of applied sciences. We will correct that.
l. 200-206: This section is redundant and repetition from above an can be removed.	We will do that.
l. 214-l. 223: For an international readership of the journal, it would be good to provide a map with the names of the regions mentioned here or include the names in Fig 5.	We are going to do the one or the other.
Fig. 3: The colours are not easy to distinguish, in particular that for tillage, fertilisation and crop rotation.	We are going to change the colours respectively change the whole figure according to the comments of the other reviews.
Fig 5 and 6: The dispersion of points from only single experimental sites with different experiments results in biased impressions, e.g. that the whole region of Halle is covered with LTFEs even though there might be only one single experimental site. I propose to either strongly reduce the dispersal of the points from one site or completely avoid them since this map aims at illustrating the spatial distribution and representativeness of LTFEs and one site with many trails mostly does not contribute in achieve a higher representativeness of soils and climate.	OK. We will revise these illustrations, combine the points per location and subject, and adjust the point size according to the number of LTFE at a location.
Fig 5: The map seems to be incomplete for German agricultural land (with is the reference for this study). Mostly grassland seem to be	We think CORINE is a good basis because CORINE is also available for Europe. It is raised according to the same rules within Europe, uses

missing, e.g. in the pre Alps, the Sauerland or in North-Western Germany. Readers expect that the class "other land" comprise only non-agricultural land. Maybe CORINE data are not appropriate but ATKIS Basis DLM data can be used.	a uniform legend and would therefore ensure connectivity. ATKIS is specific to Germany and is outside of Germany not relevant. CORINE provides data for a reference year. ATKIS has a permanent update cycle of 5 years. Each federal state does this on its own. Every year a fifth of every state is being photographed (aerial photos), preferably in spring, and updated on this basis. So there is not land use for one year but a mosaic of 5 years. For this reason and the fact that the aerial photos come from spring, the differentiation of arable and grassland is not so easy at ATKIS. For these reasons we would like to continue using CORINE.
Fig. 7: This illustration with boxes is unusual and thus difficult to read. Since the yaxis contains distinct values (no classes) a representation with points or lines would be more appropriate.	We will change the figure. Referee #2 also commented on this figure and suggested smaller column widths and larger row heights.