The materials and methods are similarly clear, though a few additions would improve reproducibility, including citations for data sources and the R packages used. I would also suggest the authors use a term other than "ecosystems" when referring to the experimental sites, as this risks creating confusion about the nature of the study locations, particularly since the main distinction between plots is soil fertility. Soil fertility is certainly an important driver of ecosystem differentiation, but since no other distinguishing factors are discussed, the term risks overstating the contrast between sites.

Please add the appropriate citations to data sources in the materials and methods. For example, please include a citation for the Météo-France data mentioned on line 109.

Thank you for these helpful suggestions. We have revised the Materials and Methods accordingly. Citations have been added for the data sources and the R packages used to improve reproducibility (Brooks et al., 2017; Hartig, 2022; Lenth, 2024; Météo-France Open Data; R Core Team, 2025). We agree with the reviewer comment on the use of the term "ecosystems", thus we replace it with " plots" throughout the manuscript to avoid overstating the differences among the study units, whose main distinction is their soil fertility.

The Results section would benefit from a few changes to help readers follow the main takeaways. First, the opening paragraph should define the half-mast year more explicitly, given how heavily the term is used throughout this section. Second, the figures would benefit from panel labeling and more consistent in-text callouts. Third, the Figure 6 caption needs revision, as it is currently difficult to understand how the data were binned and the objectives and takeaways from it. Also, please consider adding an indicator of the different seasons to the graph to help the reader more easily understand the data.

We agree that the definition of the half-mast year was not sufficiently explicit. We have revised this paragraph to clarify that 2014 was considered a half-mast year in S1 and S2 because fruit production was substantially lower than during the three full mast years (2016, 2020, and 2023). Moreover, we move this information to the 2.1. section because it's more about the methodology than the results. « *Over the 2012–2023 study period, four mast years (MY) occurred simultaneously across the three plots: 2014, 2016, 2020, and 2023. On the S1 and S2 plots, these MY could be further classified into two categories: (i) three full mast years (2016, 2020, and 2023), characterized by high fruit production, and (ii) one half-mast year (2014), characterized by substantially lower fruit production than the full mast years.*»

We improved the figures 2 to 9 by adding panel labels, revising the captions, and defining all abbreviations, and updated the corresponding in-text figure callouts. Finally, we modified the Figure 6 and its caption, by adding colored bars as visual indicators of the different season to make the message clearer : « *Figure 6: Mean periodic canopy exchanges fluxes of K (a), Mg (b), N (c), P (d) and S (e), during MY (mast years ; red line) vs. NMY (non-mast years ; black line). Fluxes are expressed in mg m^{-2} per 28-day sampling period. Positive values indicate net canopy leaching, whereas negative values indicate net canopy uptake. The x-axis represents the 13 successive 28-day sampling periods covering one year (January to December). Colored bars above the x-axis indicate the four seasons: winter (blue), spring (green), summer (yellow), and autumn (brown). Asterisk indicate significant differences between MY and NMY without plot distinction (*<0,05 ; ** < 0,01 ; *** < 0,001).»*

The Discussion does a good job relating the main results to existing literature. That said, I would like to better understand why soils were not directly sampled in this study, particularly since the authors themselves note that such coupled research remains scarce, and the analysis relies heavily on the fertility gradient between sites. More detail on soil nutrient stores would strengthen the manuscript, especially given some apparent inconsistencies in Table 1. For example, site S3, described in the manuscript as the least fertile, shows comparatively high organic matter content, particularly at the surface, relative to the other sites. The manuscript attributes S3's lower fertility to reduced nutrient and water reserves, but S3 is also the shallowest soil, which could be just as influential in driving the greater production observed during mast years. This is not a fatal flaw in the study design, but the authors should clarify how the fertility gradient was characterized. For instance, whether fertility is based on organic matter content, base saturation, or another metric/metrics. Making this explicit would also strengthen the discussion of study limitations and future research directions.

Thank you for this thoughtful comment. We agree that a more explicit description of the fertility gradient is helpful. The objective of this study was not to assess short-term changes in soil properties induced by mast years, as soil nutrient stocks and most soil properties integrate biogeochemical processes over much longer timescales than the duration of our study. Consequently, we relied on the chemical characterization and nutrient stocks calculation of the 3 plots performed by Calvaruso et al. (2017) (Table 4), which remains representative of the 2012–2023 study period.

To avoid ambiguity, we have clarified in the revised manuscript the definition of ecosystem fertility and the concept of fertility gradient in the M&M section 2.1 : « *According to the previous studies conducted at the Montiers site which characterized the relationships among soil nutrient reserves, soil water availability, and stand growth, the three study plots formed a gradient of ecosystem fertility (Calvaruso et al., 2017; Kirchen et al., 2017). This ecosystem fertility gradient was clearly reflected in wood production (stem+branches), which decreased from 10.0 ± 0.5 t ha^{-1} yr^{-1} on S1, 8.0 ± 1.1 t ha^{-1}*

yr^{-1} on S2 and 5.8 ± 0.8 t ha^{-1} yr^{-1} on S3, the latter being the plot with the lower nutrient and water reserves (mean productivity values for 2012-2015 ; Kirchen et al., 2017). Nevertheless, despite the fertility gradient, all three plots remained within the highest beech yield classes in north-eastern France (Seynave et al., 2008). »