

***Interactive comment on “The soil fertility and leaf nutrient status in enset gardens in different altitude zones of the Gamo highlands, Ethiopia and inferences for Xanthomonas wilt prevalence” by Sabura Shara et al.***

**Anonymous Referee #2**

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General comments

This manuscript reports an observational study on soil fertility, leaf nutrient content, and *Xanthomonas* wilt disease incidence in enset gardens of the Ethiopian Gamo highlands in three different altitude zones. In general, the authors found that fertility levels in gardens were higher than in surrounding outfields, increased with decreasing the distance from the house in the garden, and tended to increase with decreasing elevation; except for N, nutrient contents of leaves and soils were not correlated; and disease incidence increased with decreasing elevation.

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The topic is relevant for the region because of the importance of enset for food security in Ethiopian highlands. In general, the manuscript is clearly written, well structured, and contains observational data that may be technically useful for local farmers and land managers. At the same time, the study lacks crop yield data and important details on management practices (e.g., amount and form of nutrients added to soils), which make it hardly useful to develop general strategies to improve crop production, enhance soil sustainability, and fight plant diseases. Also because of the observational nature of the study and sampling strategy, it fails to provide clear new insights into processes and mechanisms related to enset nutrition and *Xanthomonas* wilt disease, inasmuch as the effects of the soil fertility variables and elevation on disease cannot be not separated

Specific comments and technical corrections

L. 42. Is “(Welw.) Cheesman” needed here? L. 51-53. “The major food...” This sentence seems to be irrelevant for the present study and should be removed. L. 58-59. “Due to limited genetic research, there is also no widely adopted nomenclature for enset varieties.” Again, this sentence seems to be irrelevant for the study. L. 67-70. The authors state that there are no recommendations on nutrient management for enset. I do not have access to the full text of the references provided here by the authors (Amede and Taboge, 2007; Elias et al., 1998; Uloro and Mengel, 1994), but they do seem to deal with nutrient management for enset. The present manuscript describes an observational study, and thus the optimal nutrient requirements of enset remain unresolved (L. 366-367). L. 84. Remove “and.” L. 91. Specify here which agroecological zones you are referring to. L. 97. Change “further” to “farther”. L. 98. I suggest revising to “the relationship between soil properties, leaf nutrient contents, and affected farms was investigated.” L. 99-100. This sentence is redundant and can be removed. L. 105. Change to “state of Ethiopia, between 6...” L. 112-113. Provide a reference for the soil classification system used. L. 117-120. The zones below 2000 and above 3000 m were not addressed in the study. Why? L. 126. Why these particular sample sizes? Provide the total number of households and gardens

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in the zones. L. 127. Are there inter-varietal differences? This information should be provided if available. The authors mention in the Introduction that previous studies have reported inter-varietal differences in the level of tolerance to *Xanthomonas* wilt disease. L. 131. "it was difficult to exactly quantify..." How did this difficulty affect the results? L. 157. Change to "two fertility zones: inner (IR) and outer zone (OR)" Why are these two zones called "fertility" zones? L. 160. Did you take 40 samples per elevation zone? Please clarify. L. 163. Why 19? L. 155-170. The sampling strategy is complex and I found this text a bit difficult to follow. For the sake of clarity, I suggest providing a supplementary table summarizing the number of plant and soil samples, gardens, zones and households. L. 183. Why didn't you analyze other nutrients (e.g., Cu, Zn...)? L. 185. "by elemental analysis" is redundant. Please reword. L. 200-201. What test did you used for heteroscedasticity? Were normality assumptions checked and tested? Figure 3. Axis labels are too small. L. 227-228. "... with ranges from 31.8 to ..." These ranges are provided in Table 1 and not needed here. Table 1. I suggest providing only the most relevant information in a figure, raw data as supplementary information material. L. 239-240. "The differences in soil..." This sentence can be removed. L. 254-266. All this info is in Table 3, and this paragraph can be shortened by highlighting only relevant results. L. 359-365. Any discussion on soil fertility without on-site data on crop yields remains highly speculative. L. 368-374. This discussion is largely based on nutrient contents previously reported for banana, which are not necessarily comparable to enset. This is explicitly recognized by the authors in L: 377-379, "optimal enset nutrient levels may differ substantially from those reported for banana."

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