



Comment on soil-2021-127

Peter Leinweber

Community comment on "The distribution of phosphorus from phosphorus derived materials to different soil fractions determines the phosphorus availability in the soil" by Yuan Wang et al., SOIL Discuss., <https://doi.org/10.5194/soil-2021-127-CC1>, 2022

- 1
- 27: The manures and maize straw are P-containing materials but not P fertilizers, *sensu stricto*.
- 37: Overall, the concluding sentence is very general. Reader in fact remains uninformed, what is novel in this study. No explanation is given for the descriptive findings. For instance, cattle manure performed best but what is the "considerable practical significance" of this finding in P-recycling? ... Using all cattle manure as soil amendments = done anyway; raising more cattle ...? Or, is this an overall meaningless phrase? Authors are vague in their conclusions or remain almost unclear.
- 2

INTRO

l. 46: What in detail are "the attendant ... quality issues"? Vague expression, meaningless if no more details are given.

- 64/65: For increases and decreases explained here, different bases were used (proportions vs. contents). Thus, meaning of this statement is unclear. In fact, proportions cannot directly compared with contents/concentrations.
- 3
- 66-69: This literature evaluation is incomplete and rather selective. For sure, much more is known about P in manures and similar materials. All this should have been compiled to disclose real knowledge gaps and lay a basis for the present study. Here it reads rather vague, like "effects are complex and need to be studied". That is not a strong rationale for a laborious scientific study.
- 63-74: Again, references are very incomplete. Much more is known, even on the soil the authors mention at l. 75, 76.
- 73: "contents ... are influenced ...".
- 74-76: Weak conclusive rationale for study. What is meant with "edaphic conditions"?
- 76: "Hedley fractionation" is slang. It is a sequential P fractionation after Hedley et al., modified by Tiessen It is a division of total soil P into fractions, not fractions into fractions. Imprecise explanation.
- 78/79: This reference refers to "a subtropical region". For evidencing "wide use" some review articles should have been cited at least (I recommend reading first Cross & Schlesinger).

- 79-82: 2 contrasting statements in 1 sentence but references are not assigned to each of the statements. Unclear for reader....
- 83 ff. As already criticized above for the P fractionation, literature review of ³¹P NMR is very selective and fragmentary. For instance, not any study of P in manures and other P recycling materials has been mentioned although many of such studies have been published.
- 4:

l 96: When introducing the soils, authors should use internationally understandable soil units, like the WRB system. "Red" indicates Ferralsols or ferralic subunits of other Major Soil Units, developed from intensive weathering under subtropical/tropical climate conditions. By contrast to this system "Red" as such is not an internationally accepted soil classification; same with "fluvo-aquic" (if not in combination with a WRB unit). This imprecision is hard to understand, considering that the WRB System and secondary literature on it refer to the P issues in great detail.

- 97: "Little is known" is a phrase very often used, but this phrase is meaningless if authors do not communicate what in detail (even if it is not much) is known (... and what is unknown but important to know).
- 100-103: Authors write what they did but they do not report what they intended to find out or what their research hypotheses were. Overall, my impression of the INTRO text is "vague", "not very well reviewed" and "immature" in how the rationale for study was tried to develop.
- MATERIALS & METHODS:

Soil materials should be described in terms of WRB units and soil horizon origin. Instead of "Olsen" the detailed extractant should be given.

- 116-117: This is confusing; better assign the concentrations to each of the materials. p. 5:
- 138-142: Unclear how Pt and Pi were determined if Po is the difference Pt-Pi? Description should be clear and understandable without checking the Figure S1. l 143: variation? I do think that ³¹P NMR can quantify species.
- 148 ... contains incomplete sentence

RESULTS

l. 176: First of all, I see in Fig. 1, that the differences which appear at the end of incubation are more or less already obvious at the starting point. That indicates that the results reflect inherent properties of the materials added, rather than - or in addition to - the interactions with soil particles. Therefore, the study is incomplete without giving the analyses results for the non-amended soils (maybe controls) and amendments (prior to addition to soil). Study would gain scientific value if the authors would be able to distinguish between effects of materials composition and interaction with soil (the latter leading to differences between soils (... for which details of mineralogy must be known).

l. 180 ff: Differences between treatments better should be explained as factors. Data as percent bear the risk of confusion if basis for calculation is unclear.

l. 177: Olsen P cannot be "improved". This is bad slang. The concentration of NaHCO₃-extracted be can be increased by factor of ... (= more precise explanation)

- 179-180: Bad wording; better assign factor of increase to each treatment.

Sorry authors, here I stop reading/revising your manuscript. In my view, it is too immature to be seriously reviewed. As a reviewer, I feel wasting my time with your text. A

greatly improved version, developed and written with much more care, should be submitted which starts with thorough revision of the pertinent literature, logical deriving knowledge gaps and rationales for study, and testable hypotheses.

>>>> Finally, just a quick jump to the final section >>>>

CONCLUSIONS

I. 339: This is not new but has been shown in many previous studies.

I. 340-348: None of this is conclusion but almost all repetition of previous text. Reader cannot find any original new information from this section.

I: 343-344: This is not surprising but could be expected because of same extractant (weak NaHCO₃-solution) in sequential extraction and the so-called Olsen-method. As such, it is a meaningless result.