REFEREE 2

The manuscript submitted to 'Soil' touches a highly relevant topic, namely the correct quantification of soil organic carbon (SOC) plus other carbon species to realistically represent soil carbon (not only) in sequestration claims.

The presented work is based on some kind of round-robin analysis of aliquoted soil material which had been prepared by the authors and shipped to various laboratories for subsequent quantitative C-analysis.

While I consider the motivation and overarching idea certainly worth for a SOIL contribution, the quality of the present status of the manuscript does not permit acceptance. In the following, I go through the manuscript from beginning to end and point out the present weaknesses – regardless of whether this is a very minor issue or a bigger one.

> **RESPONSE:** We thank you for your enthusiasm surrounding the topic of our study. We address your comments point by point below in hope of improving the manuscript for publication if the editor allows.

Abstract

Line 19/20: A mechanical grinder is no instrument for sieving.

> **RESPONSE:** A variety of mechanical grinders are used for processing soils to pass through a 2 mm screen. Commercial labs often use these grinders (as we point out in our study; Supplemental Table 1) and simply report in their methods that "soils were sieved to 2 mm". Hence, we included this method within the sieving treatments, while agreeing with the reviewer that it is not a traditional sieving method. This is clearly documented in the text.

Lines 22/23: That finer grind leads to lower variance is nothing new and can easily be explained.

> **RESPONSE:** It's true that this is considered by soil scientists as a "known" result of finely grinding soils prior to EA, and thus fine grinding is a common practice in research labs. Yet there are few published studies to support this belief (we cite the only two we could find in the text) that can be used to mandate grinding by commercial labs, and in the absence of this evidence, we found that many commercial labs offering soil C analyses for service do not finely grind soil. We therefore hope that the evidence presented in this paper can serve to encourage commercial labs to adopt a method that achieves a finer grind, leading to less variable soil C values.

Lines 23/25: Not drying soil samples prior to further processes leads to errors similarly is nothing new.

> **RESPONSE:** The same rationale presented above for grinding applies here. Again, there are very few if any publications that provide evidence that not drying soils to remove residual moisture results in more variability and/or inaccurate estimates of C, and none we could find that directly quantified the impact of drying on final C quantification. We are happy to provide evidence of this from our study that can be cited in future research. Some commercial labs we spoke with dry soils beyond air-drying or apply a moisture correction, however, most that we contacted said that they simply air-dry soil samples. Again, we hope that with this published evidence clients can be more aware of potential pitfalls, and that more commercial labs are encouraged to use oven-dried soils to improve the rigor of soil C quantification by EA.

Introduction

Lines 45/46: "sample preparation is considered the first step…". This perception of the authors underlies various expressions of this manuscript, although they do refer (towards the end) to Minasny et al. (2017), where it is correctly argued that the field sampling design is by far the largest source of error. The – in my eyes – slightly distorted relevance of all subsequent steps (independent of the fact that these are relevant, too) reverberates throughout this manuscript and may lead to misperceptions with unexperienced readers and people who prefer to seek the mistakes in the laboratory works and not in their own field work.

> **RESPONSE:** We couldn't agree more that the sampling design and method used for soil collection is important, especially when trying to detect a change in SOC stocks over time, and that's why we note it in the manuscript, as recognized by the referee. However, several other papers discuss the importance of sampling design, which is a well-recognized topic, out of the scope of this study. In this study, we want to draw attention to a much less recognized yet important factor in producing accurate soil C values, and specifically test the effect of soil processing and quantification methods on % TC, SIC, and SOC estimates. However, we appreciate the reviewer's point of view so will remove the text "the first step" add text to the revised manuscript as detailed below.
>
> **Proposed text (L42):** Major sources of error when trying to determine changes in SOC from a baseline measurement are the sampling design and location for resampling (Rawlins et al., 2009).

Lines 68ff: The discussion on sieving here and later again appears somewhat odd to me. It is known that soil material must be dried (minimum air-dried, better 40°C) prior to sieving and that optimum sieving results also demand humidity control in the sieving lab to avoid badly reproducible results.

> **RESPONSE:** We respectfully disagree with the referee here and could not find a relevant reference to support these claims that sieving should occur only on air-dried soil and be performed in a humidity-controlled environment. We agree that a humidity-controlled room would be ideal for certain soil analyses but, as far as we know, this is not a common feature in soil processing rooms, especially for commercial labs. In our combined decades of experience, sieving fresh soils is perfectly acceptable, and, in fact, required if soils are being tested for microbial biomass carbon or water stable aggregates, for example.

Lines 84ff: After dry-sieving (2 mm), plus checking for possible remaining fine root material which will have to be removed by handpicking, the soil samples must be ground to analytical grade. The best results with the lowest standard deviation are obtained with a grain size smaller 63 micrometers. This is of particular relevance if methods like elemental analysis (EA) with very low inweights are being used (the authors refer to a machine by Elementar that is specifically designed to serve isotopic work. The standard machine, e.g., EL Cube by Elementar, takes maximum inweights of 20 to 50 mg), demanding maximum analytical sample homogeneity.

> **RESPONSE:** Thank you for pointing out the hand-picking process. We handpicked fine plant materials and will add that detail to the manuscript as detailed below.
>
> **Proposed text (L63):** Fine plant materials that are larger than 2 mm but still pass through a 2 mm sieve are often hand-picked using tweezers.

We are not aware of a reference we could include supporting the claim that grinding to less than 63 µm gives the best results. We agree that it is considered best practice in academic laboratories to fine grind soils to obtain higher precision in the data, however, in our experience, most commercial labs (and even academic/service labs) do not finely grind soils, especially to that small of a particle size. Even the ball mill that we used in our study is advertised as grinding soils to a particle size of < 125 µm. It's true that the EA used in our study can be paired with an Isotope Ratio Mass Spectrometer. In the manuscript we provided the masses of soil used for our instrument (L234): "The mass of soil used was related to its % TC where approximately 30 mg of sample was used for low % TC soils and 10 mg was used for soils considered to have medium % TC" and mention in the discussion that the level of fine grinding prior to EA may not be as important in EAs that require more mass per sample (L478 – 480): "Given that we used approximately 10 to 30 mgs of sample for elemental analysis and Cihacek & Jaconson (2007) used around 150 mg, future research should test the effects of fine grinding using EAs that require more sample mass (i.e., 1000 mg or more), as the level of grinding may not be as important."

Lines 98ff: The statement relating to neutral or basic pH soils is incorrect. Even soils with highly acidic pH (3.5 to 4.5) can show significant amounts (percentages) of inorganic as well as of organic carbon. Ferralsols/oxisols from the inner wet tropics serve as example.

RESPONSE: Thank you for making this important point! We rarely work with tropical soils, so the possibility of a low pH soil with carbonates was not considered. We will add "For typical midwestern U.S. soils" to L98 in the revised manuscript.

Line 100: must read 'Soil Survey Staff'

RESPONSE: Thank you. We will add "Staff".

Line 111: check year of McCarty et al (2010) in reference list

RESPONSE: Great catch. Thank you, we will fix the mistake in the reference list.

Materials and Methods

Line 136: I suggest splitting the very long table caption into a concise header and to move the details into a table footer to make the table more appealing. Instead of 'soil identification **number**', it should read e.g., 'code' since no numbers are being used. The sequence of the table column headers should be repeated in the table header – no different sequence.

RESPONSE: Thank you for these suggestions to improve Table 1. We agree that the caption is very long. We will adjust the table and caption as suggested.

Line 145ff: The initially stated criticism on the authors bias with the lab parts emerges here once again. To take one single sample of a 50x50 cm x 15 cm deep soul pit is radically insufficient to represent, e.g., a hectare. I suggest to simply rephrase the experimental setup from the onset and clearly and unmistakably explain that while the biggest mistakes occur in inappropriate sampling, this paper focuses on all subsequent steps and uses homogenized soil samples to test sample preparation and analysis steps.

RESPONSE: We apologize if it appears we overemphasized the relative importance of lab protocol versus field sampling. As stated above we do not intend to claim that it is "more"

impactful on final quantification, rather that it represents another critical factor affecting final SOC values that requires attention (alongside field sampling which is addressed in other studies). We appreciate the concern for readers. We want to make sure readers understand that we are not principally concerned with obtaining a representative field sample from the sites we visited. To answer our research questions, we needed the soil to be as uniform as possible for each procedural variation and replicate so that spatial heterogeneity was not a major factor driving our results. We will revise the sentence as detailed below:

Current text (L145): Soils were collected by spade from roughly a 50 cm x 50 cm area

Proposed text: To collect a relatively uniform sample and avoid a strong influence of spatial heterogeneity, soils were collected by spade from a small area, roughly 50 cm x 50 cm. The intention of this sampling procedure was not to obtain a sample that represented the field site or a large area (e.g. on the hectare scale), rather only to collect enough soil with unique (relative to other sites) and uniform properties (within the collected soil) to use for the laboratory procedure comparison.

Line 149: 'Soil was collected from different places on the butcher paper…'. A) What is butcher paper made of? Does it contain any carbon like all other papers? If so, discuss. B) The sub-sampling description here does not suffice to allow others to judge the procedure. We generally use multi-step quartering or mechanical sample dividers to obtain true aliquots.

RESPONSE: The paper we use is found here. We refer to it as butcher but will change it to "kraft" in all occurrences throughout manuscript (L148, L149, & L189). This type of kraft paper has no water-soluble carbon and is machine made from resinous wood and non-wood sources (link). We will address this and Point B in our response below.

Line 166: I read that the soil sample was homogenized as field moist material. This would certainly introduce possible errors since even smaller differences in soil humidity make homogenizing differ between samples or different humidities.

RESPONSE: Yes, the soil was homogenized field moist since one of our sieving treatments involved sieving the soil fresh. Relevant to point B above, we homogenized to the best of our ability and collected samples from various places while it was laid out to try and minimize heterogeneity across subsamples. We included replicate as a random effect in our mixed linear models to account for this since soils were divided into their replicates first and then divided for each procedural variation. To address this comment, we will revise the text as detailed below.

Current text (L147): Each field moist soil was homogenized by removing the entire sample from each bucket, spreading the whole sample out on butcher paper, and flipping the soil over itself twice prior to collection. Soil was then collected from different places on the butcher paper to ensure representative subsamples

Proposed text: Each field moist soil was homogenized to the best of our ability. While it is impossible to eliminate variability due to heterogeneity across subsamples and replicates, we sought to minimize its contribution by spreading the entire sample out on kraft paper, flipping the soil over itself twice, and collecting soil from various parts of the kraft paper to ensure representative subsamples. The kraft paper used has no water-soluble carbon. Further, we subsampled for all replicates, including those sent to external laboratories in the same way to

minimize differences across laboratories (e.g. between CSU and external labs, see Fig. 2) due solely to soil heterogeneity.

Line 169ff: all SI units must be set with a space between number and unit. This is valid throughout and should be corrected in the entire manuscript.

RESPONSE: Thank you for pointing this out. We will add a space here and throughout the manuscript as suggested.

Line 180ff: Similar to Table 1, the header should be split into a concise header and detailed explanation below the table as a footer. The table itself prints badly in my copy. Please check.

RESPONSE: We agree that this table needs improvement. We will create a figure to replace this table using the appropriate headers and a more concise caption. We propose the figure below to replace this table in the revised manuscript.

Figure 1: The procedural variations for sieving, grinding, drying, and quantification methods of total carbon (TC), soil inorganic carbon (SIC), and soil organic carbon (SOC) concentrations. Sieving variations include the Reference (R; 8 + 2 mm), S1 (4 mm), S2 (2 mm with rolling pin), and S3 (mechanical grinder). Grinding (G) variations include R (roller table grind to < 250 µm), G1 (ball mill to < 125 µm), and G2 (no grind; < 2000 µm). Drying (D) variations include R (105 °C), D1 (60 °C), and D2 (air-dried only). For the quantification (Q) of TC, dry combustion by elemental analyzer (R; EA) and Fourier transformed infrared spectroscopy (Q1; FTIR) were tested. Quantification for SIC was tested using a pressure transducer (R; PT), FTIR (Q1), and acid fumigation (Q2; AF) where SIC is calculated by subtracting TC (EA with no AF) from SOC (EA post AF). SOC quantification procedures included subtracting SIC (PT) from TC (EA) concentrations (R), FTIR (Q1), AF (Q2), and loss on ignition (Q3; LOI).

Line 230: Instrumentation nomenclature needs to be homogenized throughout (compare with line 243).

RESPONSE: We will reformat the introduction of the FT-IR used to read (L243): "…on a Bruker VERTEX 70/HTS-XT INVENIO-R FT-IR (USA).

Line 231: To reduce possible misunderstandings, introduce a comma between '% TC' and 'and % SOC'…

RESPONSE: Respectfully, we would prefer not to add a comma as we do not think one is needed.

Line 237: a unit is missing after '0.04'. Personal remark: Our lab regularly obtains a lower limit of determination of 0.04 wt-% in standard application for C and a related SD between 0.02 and 0.04 wt-% on an EL Cube).

RESPONSE: We will add % TC after 0.04.

Line 251: Check publication year for R Core Team in reference list.

RESPONSE: We will check. Thank you.

Results

Page 10, Figure 1. Any figure or table should never directly follow a chapter or section header. The three sub-figures display three different scales (Y-axis). That is certainly not ideal to allow for an unbiased understanding of the figure's message.

RESPONSE: Thanks for pointing this out. We will move the figure and make several changes based on your comments and the comments from Referee 1 as detailed below.

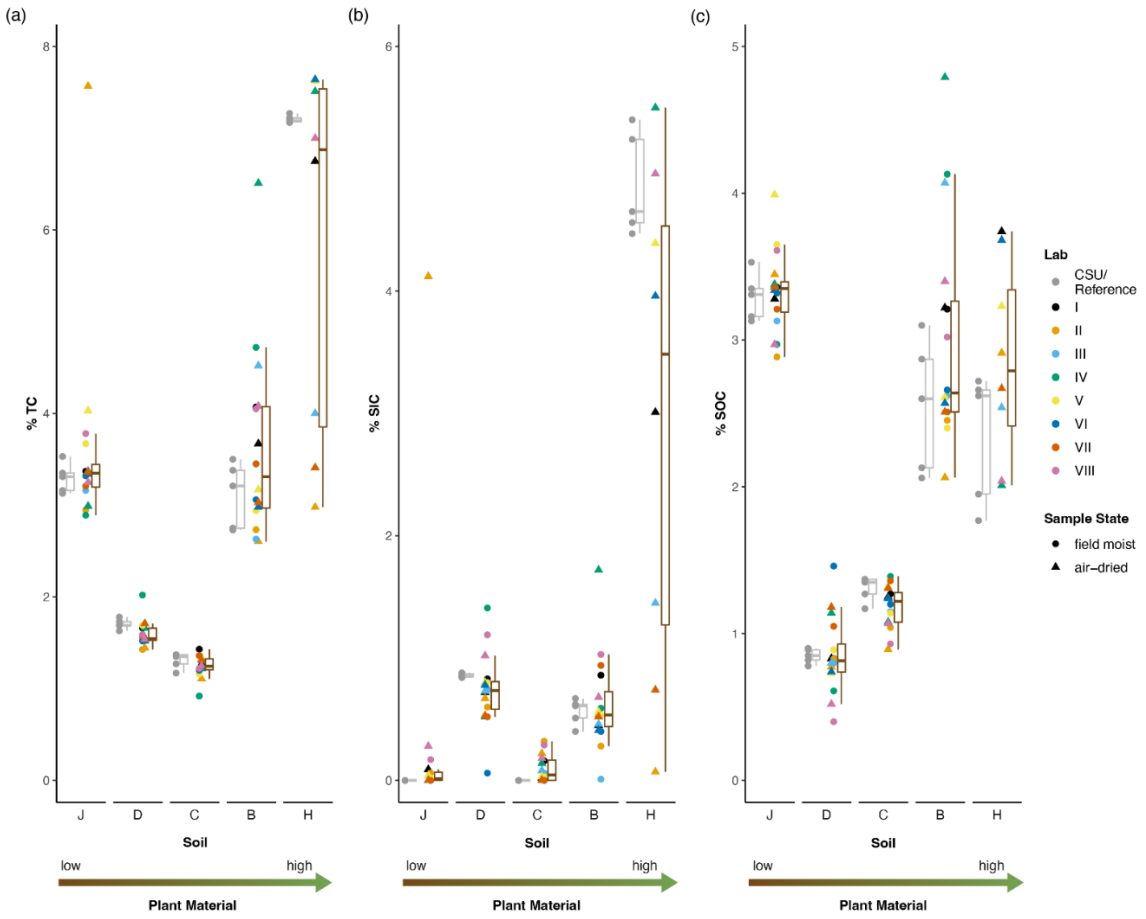

Figure 2: The distribution of total carbon (TC; panel a) soil inorganic carbon (SIC; panel b) and soil organic carbon (SOC; panel c) concentrations from eight service soil testing laboratories and Colorado State University (CSU). Box plots report the median, first and third quartiles for values from all soils (field moist and air-dried) analyzed at service soil testing laboratories (brown boxplot) and CSU (grey boxplot; n=5). Whiskers extend to the upper and lower data point that are within 1.5 times the interquartile range. For soils B, C, D, and J, two samples were sent to each external lab, one air-dried and one field moist (n=16). One sample from soil H was sent to each lab (n=8). Refer to Table 1 for a description of the soils, Figure 1 for Reference (CSU) methods, and Supplemental Table S2 for external service soil testing laboratory methods.

Line 271: Unit is missing after 'and 1.45'

RESPONSE: We apologize that the unit is unclear. We will revise the text as detailed below.

Current Text (L270): Within a given lab, reported values for % TC, % SIC, and % SOC for the same soil (sent as either air-dried or field moist) varied by up to 4.62, 4.06, and 1.45 respectively.

Proposed text: Within a given lab, reported values for the same soil (sent as either air-dried or field moist) varied by up to 4.62 % TC, 4.06 % SIC, and 1.45 % SOC.

Page 12, Figure 2: The procedures (x-axis) should display horizontal indicators (here P0, P1, etc.). To simplify, and since the term 'Procedure' is printed below, the number would suffice. Again, to avoid perception bias, the legend should explicitly point out that the is factor 10 between the y-axis of a) and b).

RESPONSE: We will change the figure (Fig. 3 in revised manuscript) using the new naming scheme we describe above in the proposed Figure 1 for the sieving treatments. The difference in the y-axis scale is pointed out in the caption but we will make the caption more concise and concise as proposed below. X-axis labels are angled for fit.

NEW FIGURE:

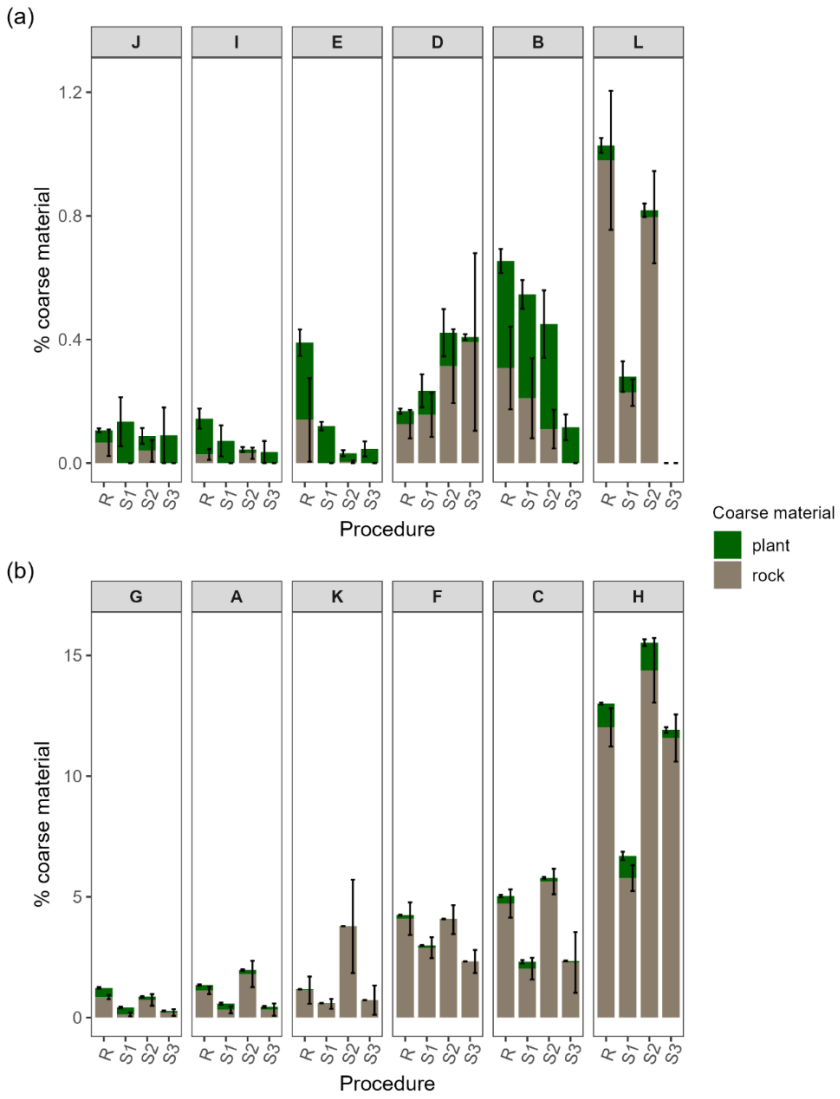

Figure 3: A stacked bar graph illustrating the proportion of coarse material removed from the total soil mass with four different sieving procedures: R (8 + 2 mm), S1 (4 mm), S2 (2 mm with

rolling pin), and S3 (mechanical grinder) described in Figure 1. Stacked bars represent the mean (± standard error; n=5) of coarse material identified as plant (top; green) or rock (base; beige). Letters refer to soils as described in Table 1. Panel a (top) includes soils with less coarse material (up to 1% on average), and Panel b (bottom) includes soils with more than 1% coarse material

Page 13, Figure 3: This figure prints badly. The symbols need to be bigger, and the axis formatting with black lettering and slightly larger and horizontal (x-axis) lettering.

RESPONSE: We will remove Figure 3 in the current manuscript based on an observation and comment made by Referee 1 which we have addressed in our response to them.

Page 16, Figure 5: Same as with fig. 2, including homogenized axis scales

RESPONSE: Fig. 2 will be moved into supplemental and replaced with a figure illustrating CV % SOC just for the grinding treatment comparisons (R replaces P0, G1 replaces P4, and G2 replace P5 in the revised manuscript) as proposed below:

NEW FIGURE:

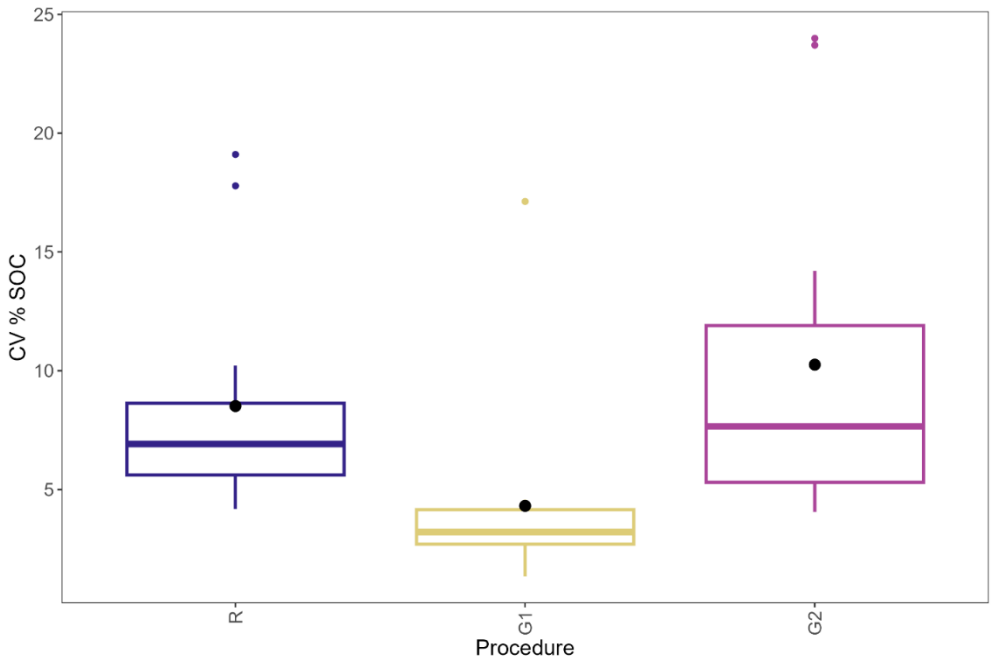

Figure 4: The distribution of the coefficient of variance (CV) across all soils (n=12) for each of the three grinding procedures tested, as described in Figure 1. Box plots report the median, first and third quartiles. Whiskers extend to the upper and lower data point that are within 1.5 times the interquartile range. Black dots represent the mean CV % SOC.

Page 17, Figure 6: While again the axis scales should be equal, this figure is somewhat odd to me and appears to compare “apples and pears”. Direct comparison is only possible with one modification of degrees of freedom.

RESPONSE: The panels are not meant to be compared to each other and the y-axis scales are different because each panel has a different variable on the y-axis. We show here how the various quantification methods we tested correlate to the measured, reference values for each variable. We believe the way in which we present these data and provide the linear regression equation and p-value is acceptable.

Discussion

Lines around 421: I cannot agree with these conclusions/recommendations. It should go without saying that only experienced laboratories that adhere to GLP do qualify. That implicitly means that there is a very tight quality control and documentation. No other labs should be considered. To determine organic carbon (TOC), acid fumigation is a necessity. However, the related process must be clearly defined.

RESPONSE: We respect the referee's opinion to disagree with our recommendation but wonder if our recommendation here was unclear. The NAPT certification we refer to in L421 was introduced earlier in L53. Because NAPT certified labs are sent soils that have been processed in the same way, the certification indicates that whatever instrument they are using to procure soil C estimates is accurate. And while some certifications may cover other laboratory procedures, they do not necessarily guarantee that a given lab adheres to them in all cases, and shortcuts may be taken without a client's knowledge. Further, we based our study on direct communication with several popular commercial laboratories that are regularly used by clients seeking to quantify SOC stocks and changes for real projects. Regardless of whether "no other labs should be considered", our conclusions and recommendations are relevant because these labs are being actively used. There are also commercial and service labs that are not NAPT (or alternative) certified so the client would have no way of knowing if the data is "in the ballpark" or not. We recommend the client use labs that have an NAPT certification (or comparable). That seems in line with what this comment suggests. Organic carbon is determined using methods that do not involve acid fumigation, as we have included, explained, and tested in our study. We define the other methods as being LOI using a conversion factor of 0.58 of % SOM to % SOC or calculating % SOC by the difference of % SIC from % TC if inorganic C was measured. In soils without SIC, SOC is equal to TC and acid fumigation does not need to be performed. We also include predicting % SOC using FTIR spectroscopy as a promising method.

Lines 453ff: Here and at other occasions, the authors point out lab costs for some more time-consuming procedures. I like to remind them that the by far most costly part of obtaining decent analytical results for anything is high-quality sample acquisition. The rest is relatively cheap and should not serve to argue for cost-savings. More precisely here: 2 mm sieving should be beyond discussion. One my sieve 8 mm or whatever in the field already to reduce the material to be transported to the lab and kept on hold in freezer or fridge, but that is irrelevant in this context. The authors seem not to know automated sieving machines (e.g., Fritsch, Retsch) that allow lab personnel to do other work while the sample(s) is being sieved. Automated sieving comes with the added advantage that it increases reproducibility of the process.

RESPONSE: The referee is correct in pointing out that we do not mention automated sieving machines in the current manuscript. Thank you for bringing that to our attention. The authors have one in their lab and have used it before. However, in our experience it only produces good results in sandy soil with low aggregation, and otherwise aggregates larger than the sieve mesh do not pass through, making the process inefficient. That, combined with the fact that none of the labs we interviewed used it, is why we did not include this procedure in our test. We will address this lack of recognition in the revised manuscript in the discussion as detailed below. Depending on the research questions, we do not recommend sieving fresh soils in the field unless you have a

field scale with you to weigh the samples field moist to apply a moisture correction for an accurate bulk density value later. We disagree that the time to process soil should not be considered in our discussion. The turnaround time expected in commercial labs is astoundingly fast, as clients want their data as soon as possible. Further, cost savings are imperative for commercial labs that often operate on thin margins and so can be a major factor in deciding commercial lab protocols.

Proposed text (L448): There are machines available that automate the sieving step of soil processing, but we chose not to include an automated sieving machine as one of our sieving treatments because none of the labs we surveyed use one and we have found them to be less efficient on soils with higher clay. However, it may be worthwhile to test the effectiveness of various automated sieving machines in future studies for their potential to increase throughput.

Line 460: Check spelling for Ryterr 2012

RESPONSE: Thanks. We will fix the spelling.

Line 461: In consequence to what I expressed above, I cannot agree with the suggestion made here.

RESPONSE: We are sorry the reviewer disagrees with our suggestions. We hope that all the clarifications provided above will help readers to better appreciate our points. Our suggestions are based on the findings of our research. We certainly could have included more treatments and/or used soils on a larger gradient of % SOC, texture, etc. However, we had to limit our treatments based on feasibility, time, and affordability. Moreover, we included processing and quantification methods that are commonly used in U.S. commercial soil testing labs based on direct communication with popular labs. We believe we did our due diligence to create a robust experimental design and use robust statistical analyses to support our conclusions and recommendations.

Line 470: Grinding just like sieving should be free of individual bias. There are various mills on the market that allow for multiple (up to 8) samples to be ground to analytical grade in a few minutes with almost perfect homogeneity (as shown by laser granulometry).

RESPONSE: We do recommend using a ball mill to achieve the highest precision and do not doubt that some commercial labs use the grinders the referee points out. We hope that more labs adopt a fine grinding method after seeing the results of our study. If there's a ball mill on the market with high throughput, that would be ideal.

Line 488ff: Again in addition to what I wrote above on drying, air-drying (20–25 °C) is the conditio-sine-qua-non. Yet, if no other critical analyses (e.g. mercury) need to be undertaken on that material, then 40–60 °C drying is better since it compensates for inhomogeneities in laboratory climatology. See also line 491.

RESPONSE: We agree that drying beyond room temperature is better for elemental analysis, as we have presented evidence for in this study. However, we do neglect to include the option of applying a moisture correction instead of drying the whole sample for EA analysis. We will be sure to include this as a potential option in the discussion section as detailed below.

Proposed text (L565): However, an alternative, especially if soils with high % OC are being analyzed, is to include a moisture correction so that the true oven-dried soil mass is being input into calculations for % C determination.

Line 494ff: I do not understand the argumentation that their 'results were not texture or OM-dependent…' How so?

RESPONSE: We are sorry this was not clear. We will revise the text as detailed below.

Current text (L495): Our results were not texture or OM dependent since there was no interaction of drying and soil, so suggest that air-dried soils, generally, will result in the underestimation of % C as calculated as the mass fraction per unit of dry soil (Popleau et al., 2015).

Proposed text: Given we did not find a statistically significant interaction of drying and soil in our model, our results suggest that the effect of drying procedure on final SOC quantification does not vary significantly with texture or OM level. We therefore suggest that air-dried soils, generally, will result in the underestimation of % C as calculated as the mass fraction per unit of dry soil (Popleau et al., 2015).

Line 516: better to use 'it is'

RESPONSE: Good catch. We will change it.

Line 525f: Direct comparisons are only possible within one methodologically-consistent approach. One can run the EA prior to sample acidification to obtain TC, then run another aliquot after acidification to obtain TOC – the difference of which allows for the calculation of TIC. To shift instruments (methods) and determine, e.g., TC with one technique (e.g., Leco CS-analyzer), then TOC with EA is no good idea to obtain high-quality results. However, if done correctly in all steps, then you must expect very small errors between TC and TOC results from one and another method.

RESPONSE: We agree with the referee that it is ideal to vary as little as possible between methods for direct comparisons to determine whether a given step has an impact. The first way of obtaining % SIC that you described is what we did for our method abbreviated as P9 (which will be changed to Q2 in the revised manuscript). We correlated that to our reference method (R which is P0 in the current manuscript). We agree that it's important to use the same instrument when analyzing soils for % TC and then analyzing them again after acid fumigation for % SOC. We used the same instrument in this study and will add text to the manuscript to make this suggestion clear.

References

The reference list demands homogenization in formatting, bibliographical completeness, and accuracy of all citations. See, e.g., Bates et al. 2015; Bernoux and Cerri 2005; Lenth 2022; McCarthy et al. n.d.; R Core Team 2022.

RESPONSE: Thank you for being so thorough and checking our reference list. We will make the necessary changes to make all reference formatting consistent and correct any mistakes.

Bottom line: As already mentioned, the motivation of the authors deserves applause. However, the submitted manuscript falls somewhat short to deliver what it takes in order to meet the self-set goals. I suggest a thorough revision prior to re-submission.

> **RESPONSE:** Thank you for your time reviewing our manuscript. If the editor allows, our manuscript will be improved with your edits and comments in mind. We hope that our answers to your comments above have made the objective of our study clearer.