

## ***Interactive comment on “Proximal sensing for soil carbon accounting” by Jacqueline R. England and Raphael Armando Viscarra Rossel***

**Anonymous Referee #1**

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This review paper is prepared on the basis of 132 well selected original papers covering the current state of proximal sensing for soil organic C accounting methods. The problems described in the article are topical and worth putting forward analysts who are dealing with management practices to sequester soil organic C. Before making a decision concerning publication of the article some remarks given below should be considered. Some parts of this review are too general or even "empty", and they do not inform the reader about the range of possibilities (techniques) that can be used for the purpose such as OC analysis and its limitation. The paragraph 4.1.2 (vis-NIR and mid-infrared spectroscopy), authors should mention the mobile (on-the-Go) field vis-NIR sensors which are available today (Shibusawa et al., 2001; Mouazen et al., 2005; Christy, 2008) and provide high-resolution sampling with the results obtained in some

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studies. It should also be pointed out in which cases the respective literature provides a comparison of a lab method with respective field techniques on the same samples or not. Without the comprehensive information on the potentially promising field methods, a researcher intending to develop them towards practical applicability is not provided with realistic information expected by a review. The paragraph 4.1.3 (Laser Induced Breakdown Spectroscopy (LIBS)) in my opinion is the worst part. The authors must refer to LIBS as an emerging method for estimating soil OC, with a comment how this approach can be useful for soil analysis. Papers: Bricklemyer, R.S., Brown, D.J., Barefield, J.E., Clegg, S.M., 2011. Intact Soil Core Total, Inorganic, and Organic Carbon Measurement Using Laser-Induced Breakdown Spectroscopy. *Soil Sci. Soc. Am. J.* 75, 1006-1018; da Silva, R.M., Milori, D.M.B.P., Ferreira, E.C., Ferreira, E.J., Krug, F.J., Martin-Neto, L., 2008. Total carbon measurement in whole tropical soil sample. *Spectrochim. Acta Part B At. Spectrosc.* 63, 1221–1224; Senesi, G.S., Senesi, N., 2016. Laser-induced breakdown spectroscopy (LIBS) to measure quantitatively soil carbon with emphasis on soil organic carbon. A review. *Anal. Chim. Acta* 938, 7–17, can be used as a source of the methodology description as well as trends in this field. Table 4 would be the central point regarding the soil C accounting in this manuscript, however, the results reported in this table are not clear. It should mention the range of exact analytes, and sample preparation applied along with the references of these studies. The conclusion is much too long. Concluding remarks should clearly be stressed that the development of the field techniques towards practical applicability still have to follow and the literature provides rather proof-of-concepts-studies so far.

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