

SOIL Discuss., referee comment RC1
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Comment on soil-2021-18

Anonymous Referee #1

Referee comment on "The effects of sealing on urban soil carbon and nutrients" by Roisin O'Riordan et al., SOIL Discuss., <https://doi.org/10.5194/soil-2021-18-RC1>, 2021

I have read <The effects of sealing on urban soil carbon and nutrients> with interest, of which the topic falls in the scope of SOIL.

This work investigated the effects of artificial soil sealing in urban areas on soil properties, soil carbon and soil nutrients stocks. The results highlighted the potential importance of anthropogenic additions to soil carbon stocks under sealed surface. In addition, this work reported some interesting results such as the sealed undisturbed soil had higher ammonium content but lower nitrate content as compared with the sealed anthropogenic soil.

My major concern is the classification of sealed undisturbed (SU) soil and sealed anthropogenic soil (SA). The urban sealed soil that had >40% mass proportion of coarse sand fraction (particles in 2-200 μm are coarse sand according to IUSS) was considered as SA, because visible artefacts were found in these soils. It seems a little arbitrary, in my opinion, and more details should be given to facilitate the readers to distinguish SA and SU, such as the specific mass proportion of artefacts of the SA. The artefacts proportion is a more important index to classify anthropogenic soil. Since the SU and SA had different soil textures, the effects of soil texture on soil carbon and soil nutrients should be considered/discussed.

Specific comments:

Line 14-15, ambiguous, please revise.

Line 72, soil nutrient dynamic is a broad concept, which includes nitrogen nitrification, phosphorus sorption, etc. This work did not investigate specific soil nutrients dynamics. Please revise.

Line 171 and in other places, $p = 0.006$? Please add '='.

Line 342-343, urbanization will result in phosphorus enriched in soil (e.g. Water, 2019, 11: 2504). This may influence phosphorus content and stock of urban sealed soils depending on when the soil was anthropogenically covered. If the urban soil, which is already phosphorus enriched, is converted to urban sealed soil, the resulted urban sealed soil may have higher phosphorus content.

Table 1, the statistical analysis result is not easy to be understood. Actually, these data was also presented in figures. Please incorporate the statistical results in the figures and delete Table 1.