

Reply on RC1

Jörg Schneckner et al.

Author comment on "Microbial activity responses to water stress in agricultural soils from simple and complex crop rotations" by Jörg Schneckner et al., SOIL Discuss.,
<https://doi.org/10.5194/soil-2021-35-AC1>, 2021

Thank you for your comments. We think they will improve the manuscript. Below we have replied to your specific comments and have adapted the manuscript accordingly.

A few additional comments:

- If you have access to measured texture (%sand), it would be informative to add that to table 1 to better understand the underlying soil physical gradient.

>> We agree that physical soil properties are playing an important role in C dynamics and most likely also water dynamics and thus the response to changes in water content. It is interesting that OC is highest in SD with the nominally heaviest soils and lowest in MI with the nominally lightest one. The other two sites however don't fit as nicely with both having silty loam and similar dynamics in terms of their water contents during drought and flooding (Table S1) but while CO has as low OC as SD, MD soils are significantly higher. We also only found significant changes in OC through management in MD, which has an intermediate soil texture. Soils from these two sites also responded differently to the water stress. Also, C loss through respiration calculated per g SOC was higher in CO than at the other sites, which all showed similar respiration rates. A pattern which seems not to reflect a soil texture gradient. Unfortunately, we do not have data on the specific soil textures from the soil samples we used for incubation but we think, based on the comparison of CO and MD soils and the results on respiration, that a texture gradient alone might not explain the differences between sites we found. Maybe detailed investigations of soil physical properties, including texture, mineralogy and soil pore properties might help explain some of the results we got but these analyses should be carried out on a larger gradient and are probably topic of a separate study. We have however added some thoughts on soil physics in the discussion. Lines 268-271

- How long have the cropping rotations been in effect before sampling? It would be helpful to have that information in the methods so the reader doesn't have to track it down in the referenced studies.

>> We have added the year, when the field treatments were established to table 1

- The supplemental information includes Table S2. Is there a Table S1?

>> Thank you for noting this, we have now renamed the table to S1

