



Comment on soil-2021-35

Elizabeth Bach (Referee)

Referee 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-RC1>, 2021

Dear Schneckner et al,

I have reviewed your manuscript "Microbial activity responses to water stress in agricultural soils from simple and complex crop rotations" submitted to SOIL. The study examines soil respiration in a lab incubation of soils collected under simple row-crop rotations and complex/multi-species rotations. Soils spanned a moisture gradient from Colorado to Maryland. The incubations replicated drought and flooding stress events. Additional response variables: microbial biomass, enzyme activity, and N₂O production were collected from the driest and wettest sites. Responses were consistent to stress events and generally returned to control levels after stress was removed. Cropping rotation did not affect any of the soil or microbial responses. Given the variation in agricultural management across these sites, which reflects variation in practices across this geographic scale, the data area analyzed appropriately, and results interpreted reasonably.

It might strengthen the paper to consider the field sites as spanning both a climatic gradient and soil texture gradient. Soil organic carbon numbers match the soil texture gradient more strongly than the precipitation gradient (e.g. sandy clay loam in SD had the highest SOC and sandy loam in MI had the lowest), which is interesting in and of itself, as soil physical properties seem to be a stronger driver than plant inputs and climate. Since the responses here are from soil incubations without plants, it might be interesting to explore the effects of soil texture more deeply.

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