SOIL Discuss., author comment AC5
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Reply on AC2

Jörg Schnecker et al.

Author comment on "Microbial activity responses to water stress in agricultural soils from simple and complex crop rotations" by Jörg Schnecker et al., SOIL Discuss., https://doi.org/10.5194/soil-2021-35-AC5, 2021

Lines 227-232 now read: "Flooding and drought caused significant changes in soil N and C pools, microbial biomass, microbial enzyme activities, and nitrous oxide production. Except for experimentally-manipulated water content and a decrease in respiration during drought, no variables changed consistently and significantly among soils from Colorado and Maryland (Fig. 4 and 5). In general, drought tended to decrease measured parameters, while flooding increased them. Microbial biomass C increased during the first flooding event in soils from complex rotations in Maryland and strongly decreased during the fifth drought cycle in all Maryland soils. Microbial biomass in soils from Colorado was not affected by the treatments. "

and Lines 100-115:

"

After sampling, soils were sieved and shipped on ice to the University of New Hampshire and refrigerated at 5□ for less than one week. Approximately 30 g soil from each replicate plot (three from Colorado and four from each of the other sites) were weighed into 100 mL plastic cups resulting in a total of twenty-seven cups per replicate from Colorado and Maryland and six for South Dakota and Michigan. Soils in the microcosms were adjusted to 50% water holding capacity (WHC). One set of cups was covered with parafilm and kept at constant water content by replacing evaporated water once a week and after every CO_2 measurement, over the course of 165 days. One set of cups was subjected to drought and another to flooding (Fig.1). All soil microcosms were kept at a constant temperature of 25□. Microcosms for the drought treatment were allowed to gradually dry out over the course of 3 days, kept at peak drought for 4 days, and slowly brought back to 50% WHC by adding one third of the evaporated water every day for three days to avoid even short time flooding effects. Microcosms for the flooding treatment were gradually brought to 100% WHC but not higher to avoid submerging the soils in water over the course of three days, were then kept at 100% WHC for 4 days and were then kept open to dry back to 50% WHC again within 3 days. Drought and wetting were repeated after two weeks of soils being held at constant WHC. Soils were subjected to a total of five stress cycles during the first 125 days of the total 165-day-incubation period. Soils from all sites, rotations and water treatments were set up twice: To determine long-term recovery, one set was subjected to only one stress cycle and was kept at 50% WHC for 6 weeks after

the stress. The second set was subjected to a total of 5 stress cycles. For each combination of rotation complexity, water treatment and harvest we had three replicates from Colorado and four from Maryland, South Dakota and Michigan."