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Labile carbon testing predicts soil function responses to management

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Co-author Shawn Lucas gathers information on the soil carbon status of a field by analyzing permanganate oxidizable soil carbon. Modern handheld spectrophotometers make this rapid and practical method easy to incorporate into field assessment kits. Photo by Jonathan Palmer.

Soil carbon is a key determinant of soil health, and soil carbon sequestration is also increasingly recognized as an important means of mitigating the effects of greenhouse gas emissions. There is heightened interest in testing soils to determine if improved management could benefit soil health or facilitate soil carbon storage.

Researchers tested permanganate oxidizable soil carbon (POXC) to predict soil functional responses to management practices that build soil organic matter. The research, published in the *Soil Science Society of America Journal*, examined responses to rye cover crops in paired fields of the same soil type but with different organic matter contents due to prior soil management history.

The research showed that, in general, soil functions including aggregation, mineralizable nitrogen, and mineralizable carbon had greater positive responses to rye in fields that tested lower in POXC and total organic carbon at the outset of the experiment.

The POXC test is simpler and more rapid than testing total organic carbon and can be conducted in the field. This methodology may be useful to producers, researchers, and Extension professionals as a tool for identifying carbon-depleted soils that would benefit from improved soil organic matter management and could have potential for sequestering carbon.

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Lucas, S., and Weil, R. (2021). Can permanganate oxidizable carbon predict soil function responses to soil organic matter management? *Soil Science Society of*

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