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Land management modifies soil microbes and health

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Perennial grazing can maintain soil health similar to that seen in native ecosystems. Photo by Wayne Polley.

Soil health is vital for maintaining agricultural productivity for food security and for helping agricultural systems mitigate and adapt to climate change. By improving soil health, we can develop sustainable and climate-resilient food systems. Determining indicators of soil health that are both accurate and accessible will allow for wider understanding of which management practices preserve soil health.

In a recent *Journal of Environmental Quality* article, researchers at the USDA-ARS in Texas studied the impacts of a wide range of land management systems on soil health. These systems included native prairie, row cropping, annual grazing, and perennial grazing. Soil health was explored using nutrient status, carbon storage, microbial population, and the Haney Soil Health Tool.

Soil carbon storage was consistently linked to other indices, making it an ideal index for widespread use. Indicators for perennial grazing systems closely matched the native prairie while annual grazing and cropland grouped together with lower health scores. Of the row crop systems, no-till maize with winter cover crops had more soil carbon and higher microbial populations—closer to those seen in perennial systems. Overall, this study highlights the importance of minimizing soil disturbance and selecting appropriate best management practices.

Dig deeper

Menefee, D.S., Collins, H., Smith, D., Haney, R.L., Fay, P., & Polley, W. (2022). Cropping management in a livestock–pasture–crop integration modifies microbial communities, activity, and soil health score. *Journal of Environmental Quality*. **https://doi.org/10.1002/jeq2.20315**

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Back to issue

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