

AGRICULTURAL & ENVIRONMENTAL LETTERS

Perenniality and Crop Diversity Enhance Soil Health

Soil health has received heightened interest because of its association with long-term agricultural sustainability and ecological benefits. However, which practices are most effective at improving soil health indicators over time? The Rhizosphere Dynamics Lab from The Ohio State University set out to answer this question in a new report published in *Agricultural & Environmental Letters*.

The team measured soil health across the Biofuel Cropping Systems Experiment located at the Kellogg Biological Station in Michigan. Established in 2008, the Experiment consists of 10 systems increasing in diversity and perenniality, including four no-till annual crops, two monoculture perennials, and four polyculture perennials.

The study found that nine years post-establishment, crop diversity enhanced soil health in both annual and perennial systems. Rotated annuals with a cover crop increased permanganate oxidizable carbon and soil organic matter relative to continuous corn. Most striking however, is that perenniality combined with crop diversity was most effective at enhancing both labile and processed pools of soil carbon. This indicates that planting perennial polycultures could be an effective strategy for increasing nutrient pools and stabilizing soil carbon over time.



Here, the most diverse perennial polyculture treatment at the Kellogg Biological Station in southwest Michigan showcases the beauty of a restored prairie. Photo by Julie Doll.

Adapted from Sprunger, C.D., Martin, T., & Mann, M. (2020). Systems with greater perenniality and crop diversity enhance soil biological health. *Agricultural & Environmental Letters*, 5, e20030. <https://doi.org/10.1002/ael2.20030>

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