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Integrated grazing and cover crop management enhances soil organic matter accumulation

May 28, 2026

Left: Cover crop fields that have not been grazed. Right: Grazing on plots seeded with mixed cover crops. Photos courtesy of Said Hamido.

Soil organic matter (SOM) is central to soil health, controlling nutrient cycling, structure, water retention, and long-term carbon storage. Understanding how management practices influence SOM is critical for improving agricultural sustainability and climate resilience.

However, it remains unclear how grazing intensity and cover cropping interact over time and across soil depths to affect SOM buildup and whether these effects are consistent through time and soil profile.

Researchers from the Rodale Institute analyzed SOM under different grazing and cover crop treatments over three years at two depths (0–10 cm and 10–20 cm) using a three-way ANOVA. SOM increased across all treatments, but the strongest gains occurred under non-grazed cover crop systems (NGCC), exceeding 4.0% in surface soils by 2024. Grazed and non-cover systems showed weaker gains, and deeper soils remained lower and less responsive.

Overall, continuous cover and reduced disturbance substantially enhance SOM accumulation, especially in surface layers. These results support integrated management approaches that combine cover cropping with reduced grazing pressure to improve soil fertility and carbon storage over time.

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Hamido, S. A., Ghalehgolabbehbahani, A., & Smith, A. (2026). The role of grazing management in shaping soil organic matter and carbon pools in regenerative organic agriculture. *Agronomy Journal*, *118*, e70338. https://doi.org/10.1002/agj2.70338

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