Science Societies

Soil Energetics Framework Quantifies Soil Functionality

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Conceptual diagram highlighting the seasonal energy inputs and outputs of a conventional corn

Conceptual diagram highlighting the seasonal energy inputs and outputs of a conventional corn–soybean system. See https://doi. org/10.1002/agg2.20314 for abbreviation definitions. Source: Ken Wacha.

In agricultural systems, vast amounts of energy flow in and out of the soil throughout the growing season. Improvements in soil functionality have been noted in systems with net positive supplies of energy into the soil, which support soil biology capable of enhancing nutrient cycling and aggregation.

In a recent article in *Agrosystems, Geosciences & Environment*, a conceptual framework is introduced that tracks energy entering and leaving the soil. The framework accounts for impacts from different cropping systems, tillage intensities, and raindrop-induced erosion events. The authors considered a conventional till (CT) and no-till (NT) corn–soybean rotation, as well as a grassland system to assess the framework. They

found that net energy supplied over a growing season was negative for CT, around net zero for NT, and positive for grassland systems.

This research can help producers implement certain practices that decrease energy losses and improve soil functionality by accessing excess supplies of energy in the soil.

Adapted from Wacha, K., Philo, A., & Hatfield, J.L. (2022). Soil energetics: A unifying framework to quantify soil functionality. *Agrosystems, Geosciences & Environment*, 5, e20314. https://doi.org/10.1002/agg2.20314
