New insights on carbon use efficiency using calorespirometry – a bioenergetics-based model

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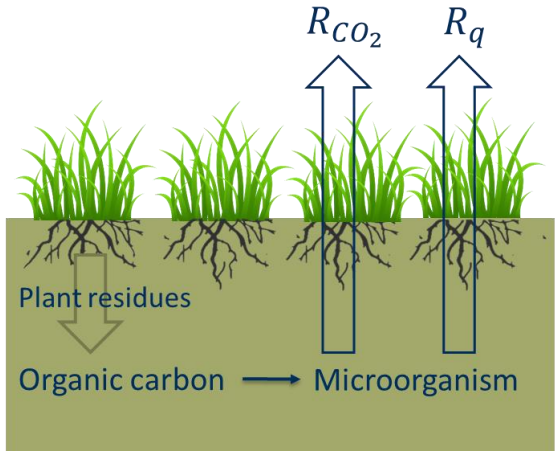
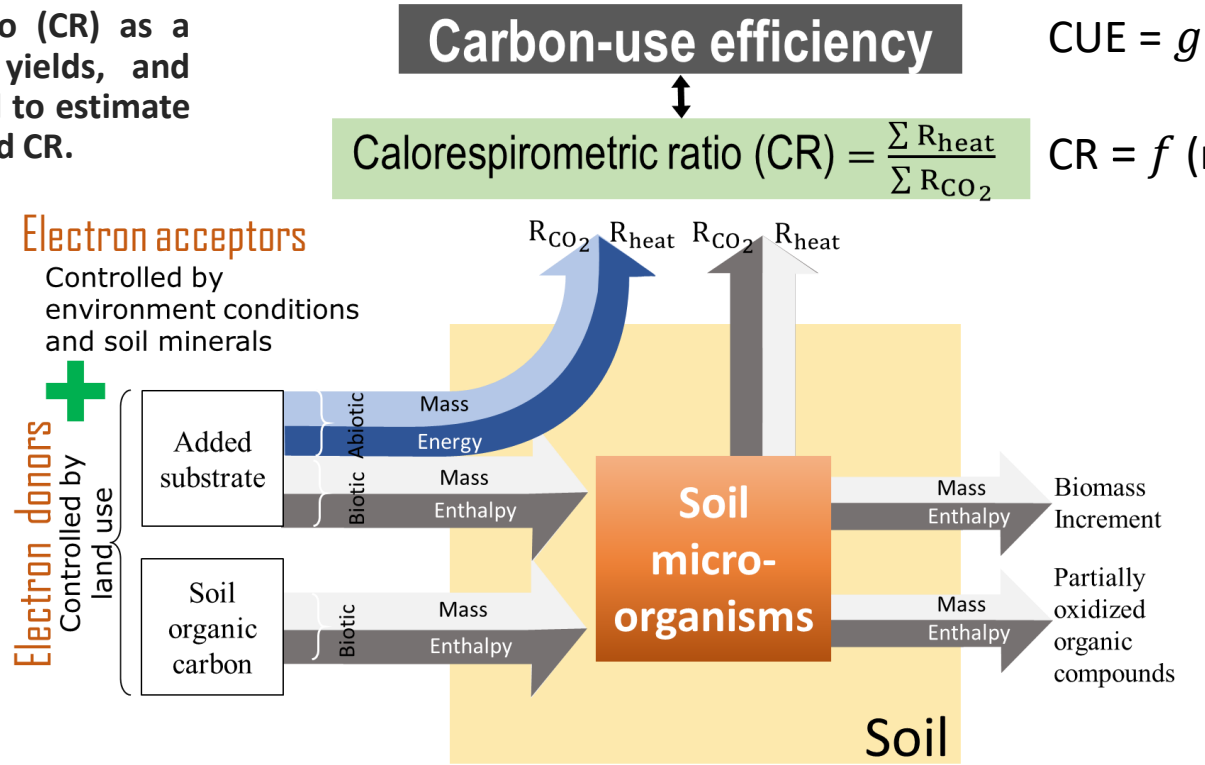
We provide a framework to explain the observed variability in the calorespirometric ratio (CR) as a function of metabolic rates, growth yields, and substrate quality. This framework is used to estimate carbon use efficiency (CUE) from observed CR.

Calorespirometry is the simultaneous measurement of heat production and respiration rate from soils.



Microorganisms produce both CO_2 (R_{CO_2}) and heat (R_q) during decomposition of organic matter.



A bioenergetics-based model

$$\mathrm{CUE} = f(\mathrm{CR})$$

CUE = g (metabolic rates, growth yields, substrate quality)

CR = f (metabolic rates, growth yields, substrate quality)

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