



Regional Assessment of Soil Organic Matter Stability under No-till and Diversified Agricultural Management Practices (WP6 T6.1)



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Core-sites	Codes	Treatments
CS1 – Italy (CREA)	T1	No-till, Spontaneous cover
	T2	Tillage, Wheat + vetch cover crops (CC)
CS5 – Spain (CSIC-INIA)	T1	No-till, monocrop
	T2	No-till, wheat-vetch-barley rotation
CS7 – Lithuania (LAMMC)	T1	No-till, no CC
	T2	No-till, Persian clover CC

Study aim - to validate the established correlation between the water stable aggregates (WSA, %), soil organic carbon (SOC, %), water extractable carbon WEOC (g kg⁻¹), and soil microbial biomass SMBC (μg g⁻¹) in bulk soil, fine (0.25-1 mm), and coarse (>1mm) soil aggregates, under diversified agricultural practices across different environmental conditions at experimental sites.

Results

Indicators (soil fraction)	SMBC, μg g ⁻¹ (bulk soil)	SOC, % (1-2 mm)	WEOC, g kg ⁻¹ (1-2 mm)	SOC, % (0,25-1 mm)	WEOC, g kg ⁻¹ (0,25-1 mm)	SOC, % (bulk soil)	WEOC, g kg ⁻¹ (bulk soil)
WSA, % (0,25-1 mm)	0.87**l	0.566**l	0.613**l	0.733**l	0.495**l	0.654**l	0.694**l
SMBC, μg g ⁻¹ (bulk soil)		0.570**l	0.595**l	0.638**l	0.508**l	0.666**l	0.622**l
SOC, % (1-2 mm)			0.454**l	0.556**l	0.318*l	0.906**l	0.451**l
WEOC, g kg ⁻¹ (1-2 mm)				0.808**l	0.796**l	0.545**l	0.806**l
SOC, % (0,25-1 mm)					0.749**l	0.555**l	0.831**l
WEOC, g kg ⁻¹ (0,25-1mm)						0.412**l	0.731**l
SOC, % (bulk soil)							0.596**l

Takehome message!

- The relationship between soil aggregate stability, microbial activity, and carbon cycling has been discovered across a variety of environmental conditions and agricultural practices.
- The strong correlations observed among WSA, SMBC, WEOC and SOC highlight the pivotal role of soil structure and microbial activity in regulating soil carbon processes.
- Integrated agricultural management strategies are essential for improving soil carbon dynamics in response to these findings.

