Supplement of

Long-term storage of air-dried samples compromises water-extractable organic carbon as a soil health indicator

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Table S1. Results of two-way ANOVA testing the effects of cover crops and time on % changes of soil health indicators. Asterisks denote significance levels (*p < 0.05, **p < 0.01, ***p < 0.001). Significant effects are shown in bold.

(a) % Changes in WEOC

Effects	df	Sum Sq	Mean Sq	F value	Pr(>F)	Significance
Cover crops	2	2779	1389	0.878	0.427161	
Time	**2**	**34684**	**17342**	**10.958**	**< 0.001**	***
Cover crops:Time	4	5816	1454	0.919	0.467416	
Residuals	27	42730	1583			

(b) % Changes in WEN

Effects	df	Sum Sq	Mean Sq	F value	Pr(>F)	Significance
Cover crops	2	484	242	1.315	0.285	
Time	**2**	**18312**	**9156**	**49.721**	**< 0.001**	***
Cover crops:Time	4	802	201	1.089	0.382	
Residuals	27	4972	184			

(c) % Changes in Cmin

Effects	df	Sum Sq	Mean Sq	F value	Pr(>F)	Significance
Cover crops	2	74	37	0.381	0.687	
Time	**2**	**14774**	**7387**	**75.943**	**< 0.001**	***
Cover crops:Time	4	122	30	0.313	0.867	
Residuals	27	2626	97			

(d) % Changes in POX-C

Effects	df	Sum Sq	Mean Sq	F value	Pr(>F)	Significance
Cover crops	2	697	348.3	1.032	0.370	
Time	2	1212	606.1	1.796	0.185	
Cover crops:Time	**4**	**4780**	**1195**	**3.542**	**0.019**	*
Residuals	27	9109	337.4			

Table S2. Pairwise comparisons of mean values of POX-C concentrations. Asterisks denote significance levels (*p < 0.05, **p < 0.01, ***p < 0.001). Significant effects are shown in bold.

(a) Within each time point

Time	Contrast	Estimate	Standard error	df	t-ratio	p-value
2019	Millet-Mixture	19.19	13	27	1.478	0.3172
	Millet-Sunn hemp	10.08	13	27	0.776	0.7206
	Mixture-Sunn hemp	-9.11	13	27	-0.701	0.7647
2020	Millet-Mixture	-0.78	13	27	-0.060	0.9980
	Millet-Sunn hemp	7.55	13	27	0.581	0.8314
	Mixture-Sunn hemp	8.33	13	27	0.641	0.7989
2021	**Millet-Mixture**	**-47.62**	**13**	**27**	**-3.667**	**0.0030****
	Millet-Sunn hemp	-20.25	13	27	-1.559	0.2803
	Mixture-Sunn hemp	27.38	13	27	2.108	0.1071

(b) Within each cover crop type

Crop	Contrast	Estimate	Standard error	df	t-ratio	p-value
Millet	2019-2020	2.409	13	27	0.185	0.9812
	2019-2021	18.343	13	27	1.412	0.3489
	2020-2021	15.934	13	27	1.227	0.4480
Mixture	2019-2020	-17.562	13	27	-1.352	0.3796
	2019-2021	**-48.472**	**13**	**27**	**-3.732**	**0.0025****
	2020-2021	-30.910	13	27	-2.380	0.0618
Sunn	2019-2020	-0.126	13	27	-0.010	0.9999
hemp	2019-2021	-11.986	13	27	-0.923	0.6308
	2020-2021	-11.861	13	27	-0.913	0.6368

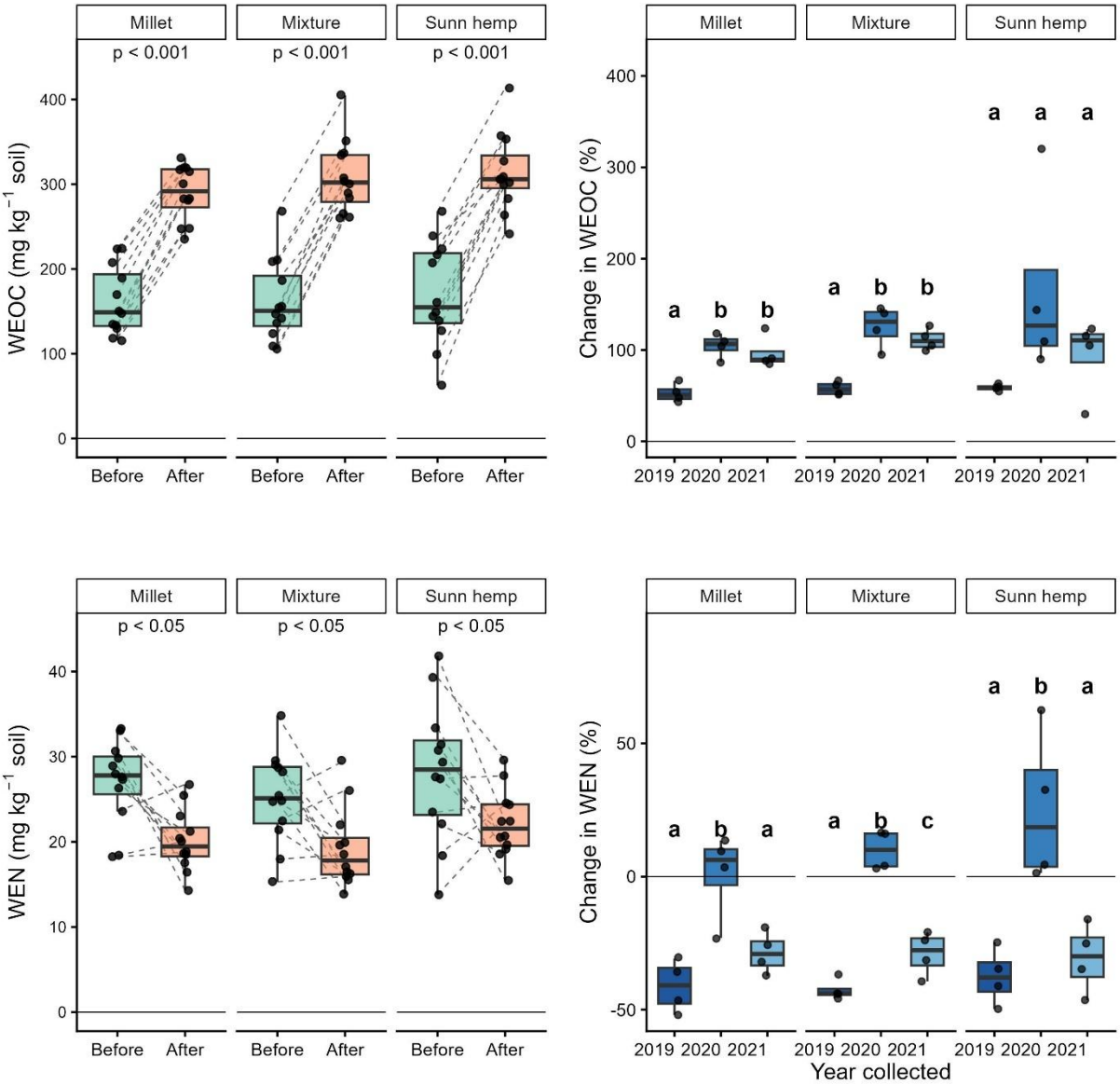
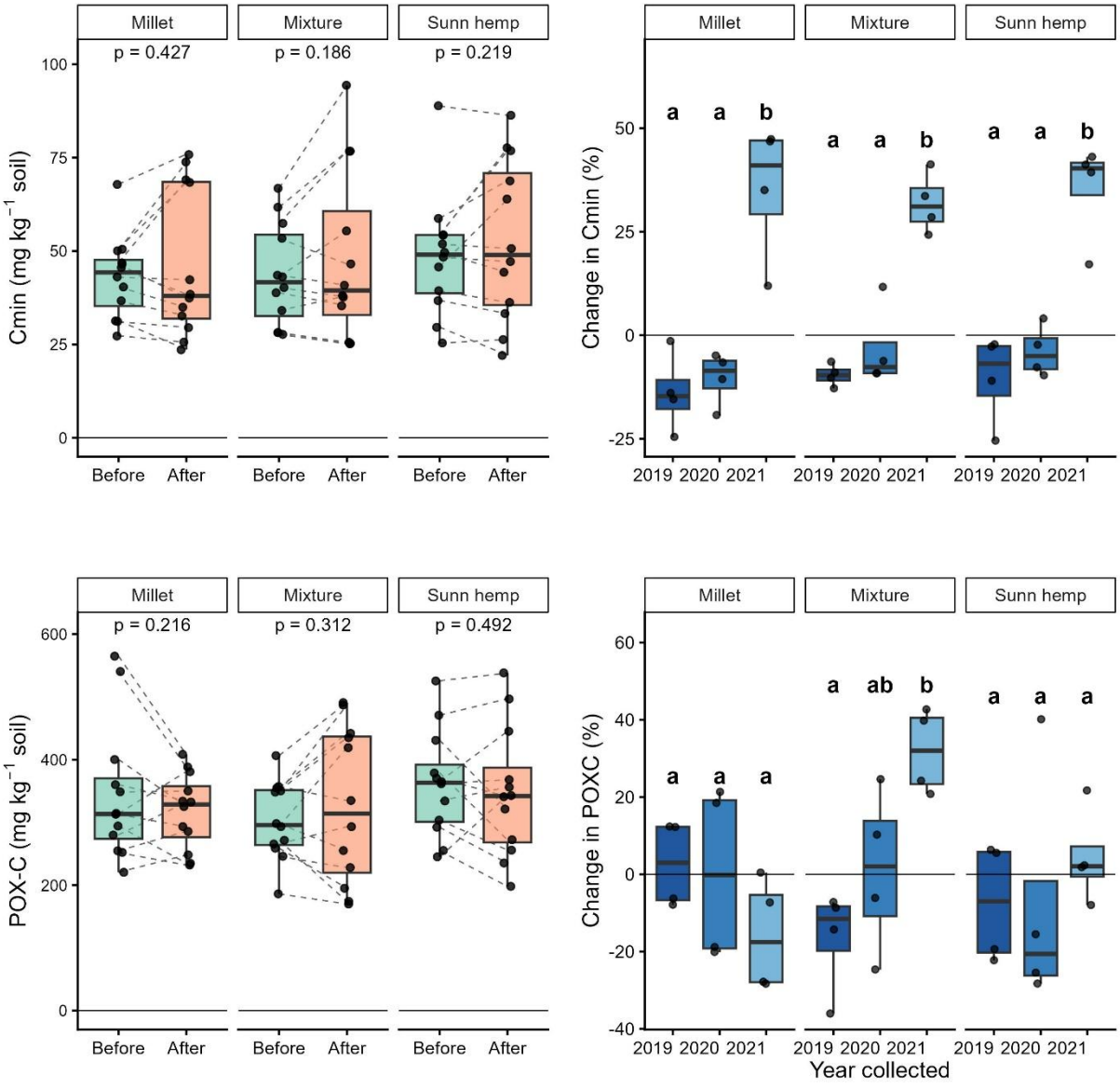


Figure S1. After soil storage, WEOC increased significantly ($p < 0.001$), whereas WEN decreased ($p < 0.05$) across all cover crops, where the paired observations are shown by dotted lines, and p-values from paired t-tests are also shown. Percent change analysis revealed consistent pattern in WEOC for millet and mixture crops, whereas WEN responses were more variable by year and cover crop, where years sharing the same lowercase letter are not significantly different (Tukey HSD).



45 **Figure S2. No significant difference in Cmin and POX-C concentrations between before and after soil storage across all cover crops, where the paired observations are shown by dotted lines, and p-values from paired t-tests are also shown. Percent change analysis revealed consistent patterns in Cmin for all crops, whereas POX-C responses were stable for millet and sunn hemp but varied for the mixture crop, where years sharing the same lowercase letter are not significantly different (Tukey HSD).**