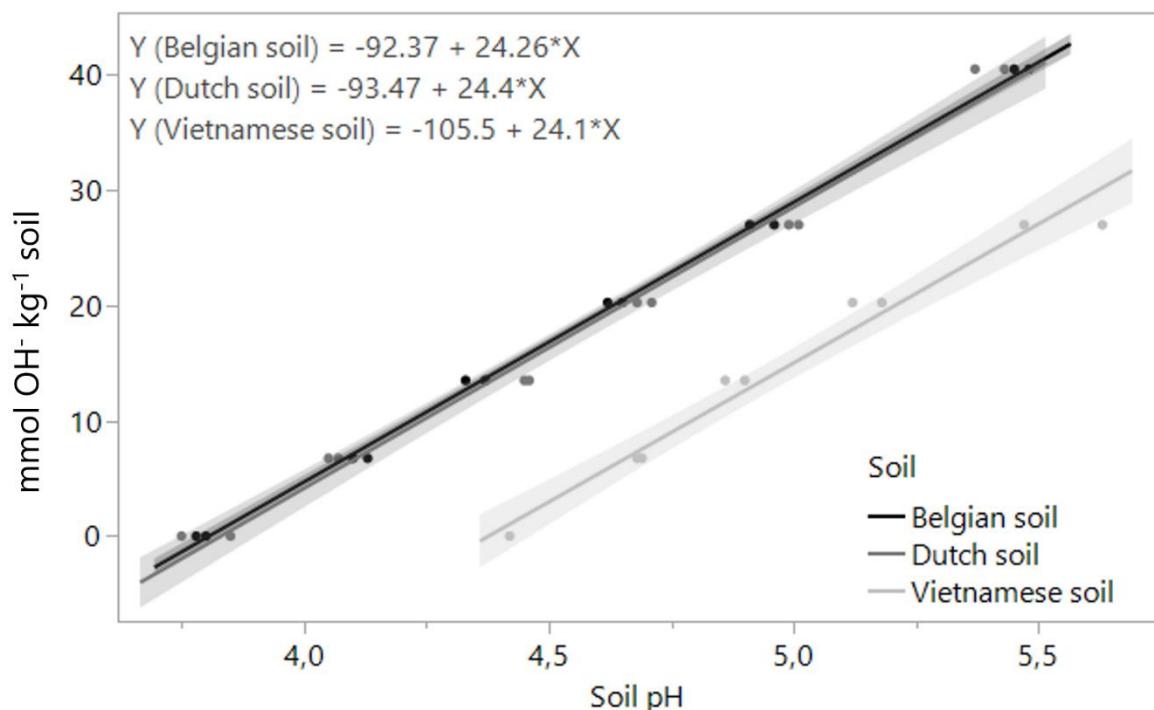
1 **Supplementary information**

Y (Belgian soil) = -92.37 + 24.26*X
Y (Dutch soil) = -93.47 + 24.4*X
Y (Vietnamese soil) = -105.5 + 24.1*X

4 Figure S1: Determination of pH buffer capacities of Dutch, Vietnamese and Belgian soil as the slope of
5 the curve plotting the amount of base added (mmol OH$^-$ kg^{-1} soil) as a function of the resulting soil pH
6 determined in 10^{-3} M CaCl$_2$, at 1:5 solid-liquid ratio.

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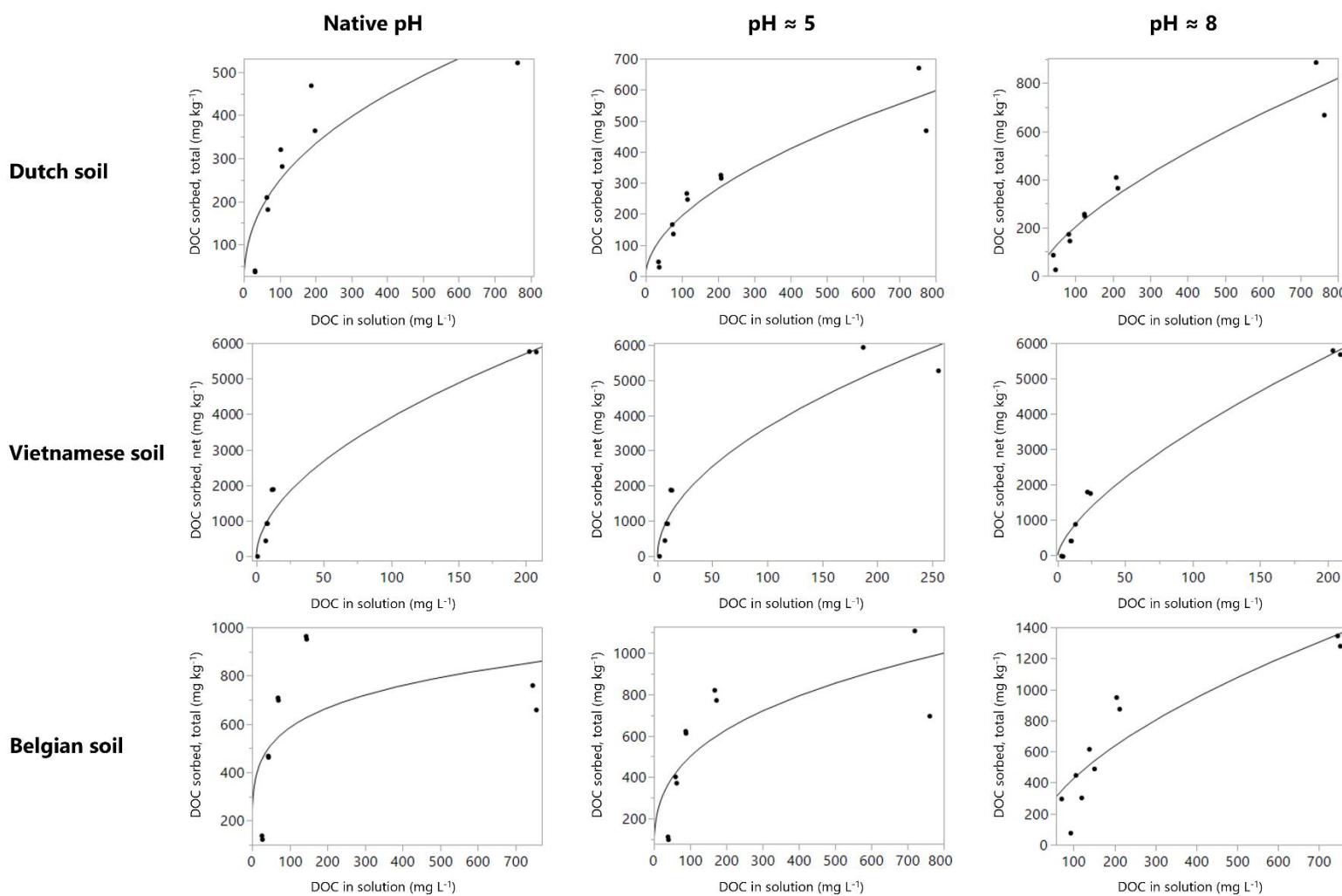
Figure S2: DOC adsorption isotherms of the Dutch, Vietnamese and Belgian soil, each at three different soil pH levels: native pH, pH ≈ 5 and pH ≈ 8. For the Vietnamese soil, the y-axis represents the net sorbed DOC. For the Dutch and Belgian soil, the y-axis represents the total sorbed DOC (including the DOC already present on the soil matrix in the unamended soil).

Table S1: Other characteristics of soils used in the column leaching experiments

Characteristics		Dutch soil	Vietnamese soil	Belgian soil
Clay[a]	(%)	2.2	34.2	8.3
Silt[a]	(%)	10.5	65.8	91.7
Sand[a]	(%)	87.3	0.0	0.0
Total N[b]	(%)	0.05	0.07	0.08
Fe_{ox}[c]	(g kg^{-1} soil)	0.63	0.60	2.82
P_{ox}[c]	(g kg^{-1} soil)	0.31	0.02	0.12
Al_{ox}[c]	(g kg^{-1} soil)	0.96	1.30	0.85

[a] Clay, silt and sand fractions determined with LS 13 320 Laser Diffraction Particle Size Analyser by Beckman Coulter, [b] Total N measurement is based on the principle of oxidative digestion with controlled oxygen supply, [c] Oxalate extractable Fe, P and Al (Schwertmann, 1964)

Table S2: Soil pH values (0.01 M CaCl$_2$, 1:5) measured in soil slices after the dismantling of column experiment 1. The red line represents the border of the treated layer. Mean values with the same letter (uppercase for Dutch soil, lowercase for Vietnamese soil) are not significantly different (Tukey, α = 0.05). Values in bold represent significantly higher ΔpH values (Dunnett, p < 0.05) than the ΔpH value of the 5-6 cm soil layer of the same column.

pH	DUTCH SOIL				VIETNAMESE SOIL			
Depth (cm)	Control	OA	Lime	Lime + OA	Control	OA	Lime	Lime + OA
0-1	3.67A	4.45B	7.08C	7.04C	4.24a	4.53a	7.14b	7.31b
1-2	3.63A	4.17A	6.99B	7.00B	4.22a	4.26a	6.87a	7.14a
2-3	3.60A	3.72A	**4.19A**	**5.19A**	4.22a	4.22a	4.44a	4.52a
3-4	3.62A	3.64A	3.64A	3.73A	4.22a	4.22a	4.25a	4.25a
4-5	3.62A	3.62A	3.62A	3.70A	4.21a	4.23a	4.23a	4.25a
5-6	3.61A	3.60A	3.60A	3.67A	4.22a	4.23a	4.23a	4.24a

Table S3: Soil pH values (0.01 M CaCl$_2$, 1:5) measured in soil slices after the dismantling of column experiment 2. The red line represents the border of the treated layer. Mean values with the same letter (uppercase for intact soil, lowercase for sieved soil) are not significantly different (Tukey, α = 0.05). Values in bold represent ΔpH values that are significantly higher (Dunnett, p < 0.05) than the ΔpH value of the 5-6 cm soil layer of the same column.

pH	BELGIAN INTACT SOIL				BELGIAN SIEVED SOIL			
Depth (cm)	Control	OA	Lime	Lime + OA	Control	OA	Lime	Lime + OA
0-1	3.58A	3.97A	6.47B	6.60B	3.56a	4.05a	6.18b	6.45b
1-2	3.54A	3.71A	6.42B	6.30B	3.56a	3.86a	6.28a	6.20a
2-3	3.40A	3.51A	3.96A	**4.26A**	3.53a	3.69a	5.63a	**4.88a**
3-4	3.37A	3.44A	3.39A	3.51A	3.53a	3.64a	4.24a	3.74a
4-5	3.38A	3.43A	3.29A	3.41A	3.51a	3.55a	3.64a	3.55a
5-6	3.42A	3.42A	3.28A	3.37A	3.51a	3.55a	3.57a	3.54a

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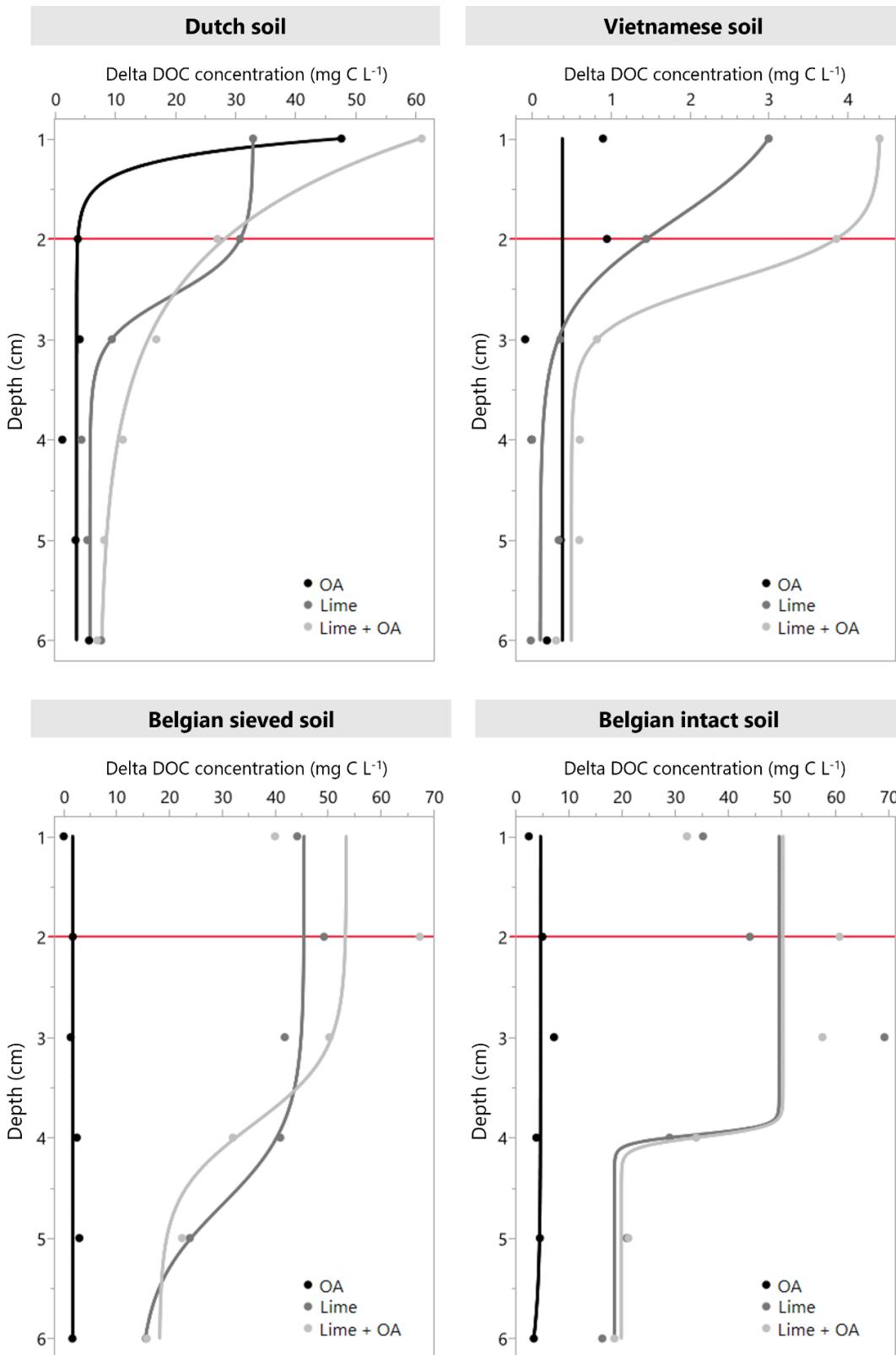
Figure S3: Data points and sigmoidal fits (Eq. 2) of the depth profiles of ΔDOC concentrations (mg C L⁻¹) (difference between DOC concentration in specific soil layer and the DOC concentration of the control treatment in the corresponding soil layer) values in soil slices after dismantling of the columns. The red horizontal lines represent the border of the treated layer.

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