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*Supplementary Information of*

**The effect of soil amendments on the greenhouse gas production in agricultural peat soils**

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**Table S1.** The elemental composition of amendment substances used in the experiment. Analysis methods: <sup>a</sup>= ICP-OES, <sup>b</sup>=gravimetric moisture % analysis, <sup>c</sup>=CHN-analysis, <sup>d</sup>=laboratory reagent lot analysis.

	Foundry sand	Gypsum	Biochar	CaCO <sub>3</sub>
B mg kg <sup>-1</sup>	27 <sup>a</sup>	23 <sup>a</sup>	7 <sup>a</sup>	
Ca mg kg <sup>-1</sup>	3390 <sup>a</sup>	135000 <sup>a</sup>	3970 <sup>a</sup>	
Cd mg kg <sup>-1</sup>	<0.5 <sup>a</sup>	<0.5 <sup>a</sup>	<0.5 <sup>a</sup>	
K mg kg <sup>-1</sup>	1090 <sup>a</sup>	<100 <sup>a</sup>	2000 <sup>a</sup>	≤0.01 % <sup>d</sup>
Mg mg kg <sup>-1</sup>	2170 <sup>a</sup>	27 <sup>a</sup>	550 <sup>a</sup>	≤0.01 % <sup>d</sup>
Mn mg kg <sup>-1</sup>	102 <sup>a</sup>	2 <sup>a</sup>	488 <sup>a</sup>	
P mg kg <sup>-1</sup>	155 <sup>a</sup>	1920 <sup>a</sup>	295 <sup>a</sup>	
S mg kg <sup>-1</sup>	517 <sup>a</sup>	111000 <sup>a</sup>	61 <sup>a</sup>	≤0.005 % <sup>d</sup>
H <sub>2</sub> O %	<0.1 <sup>b</sup>	6.4 <sup>b</sup>	10.6 <sup>b</sup>	
C %	3.99 <sup>c</sup>	<0.05 <sup>c</sup>	86.6 <sup>c</sup>	
N %	0.04 <sup>c</sup>	<0.02 <sup>c</sup>	0.18 <sup>c</sup>	≤0.003 % <sup>d</sup>

**Table S2.** Correlation matrix. Correlations were calculated for each soil land use type separately (AGR; agricultural, AFF; afforested, FOR; forest). N min.; net N mineralization rate, Net N.; Net N nitrification rate, SO<sub>4</sub><sup>2-</sup>; sulfate concentration, NO<sub>2</sub><sup>-</sup>; nitrite concentration, NO<sub>3</sub><sup>-</sup>; nitrate concentration, NH<sub>4</sub><sup>+</sup>; ammonium concentration, IC; inorganic carbon concentration, TOC; total organic carbon concentration, EC; electrical conductivity, pH; soil pH, CH<sub>4</sub>; day 14 methane production rate, CO<sub>2</sub>; day 14 carbon dioxide production rate, N<sub>2</sub>O; day 14 nitrous oxide production rate. Significance levels: \*\*p <= 0.05. Correlations for agricultural soils were calculated based on 80 replicates, and 20 replicates each for afforested site soil and peatlands forest site soil.

Agricultural soils (AG)												
N min.												.64*
SO <sub>4</sub> <sup>2-</sup>											.09	.06
NO <sub>2</sub> <sup>-</sup>										.04	.67*	.99*
NO <sub>3</sub> <sup>-</sup>									.52*	.28*	.4*	.58*
NH <sub>4</sub> <sup>+</sup>								.46*	.39*	.31*	.22*	.4*
IC						.24*	.29*	.9*	-.11	.78*	.87*	
TOC					.84*	.36*	.35*	.85*	.15	.59*	.82*	
EC				-.07	-.06	.12	.01	-.06*	.32	.13*	-.08*	
pH			-.04*	.78*	.68*	.28*	.2*	.71*	.44*	.49*	.66*	
CH <sub>4</sub>			-.2*	-.03	-.11	.17	-.06	.07	.13	-.33*	.03	.16
CO <sub>2</sub>		.26*	.35*	-.02	.59*	.63*	.3*	.65*	.67*	.21	.6*	.7*
N <sub>2</sub> O	-.02	.21	-.04	-.1	.12	.1	.04	-.13	.02	-.17	.07	0
	CO <sub>2</sub>	CH <sub>4</sub>	pH	EC	TOC	IC	NH <sub>4</sub> <sup>+</sup>	NO <sub>3</sub> <sup>-</sup>	NO <sub>2</sub> <sup>-</sup>	SO <sub>4</sub> <sup>2-</sup>	N min.	Net N.
Afforested site soil (AF)												
N min.												.84*
SO <sub>4</sub> <sup>2-</sup>											-.07	-.14
NO <sub>2</sub> <sup>-</sup>										-.14	.84*	.99*
NO <sub>3</sub> <sup>-</sup>									.87*	-.07	.97*	.86*
NH <sub>4</sub> <sup>+</sup>								.83*	.79*	-.12	.89*	.77*
IC						.79*	.88*	.84*	-.16	.92*	.86*	
TOC					.82*	.54*	.58*	.64*	-.21	.64*	.67*	
EC				-.33	-.13	.24	-.03	-.17	.36*	.07	-.18	
pH			-.43*	.72*	.76*	.51*	.78*	.82*	-.08*	.7*	.82*	
CH <sub>4</sub>			.62*	-.38*	.08	.27	-.02	.35	.41*	-.08	.22	.42*
CO <sub>2</sub>		.21	.83*	-.19	.79*	.91*	.75*	.92*	.79*	-.1	.92*	.79*
N <sub>2</sub> O	.89*	.34	.77*	-.14	.71*	.91*	.79*	.89*	.81*	-.17	.89*	.8*
	CO <sub>2</sub>	CH <sub>4</sub>	pH	EC	TOC	IC	NH <sub>4</sub> <sup>+</sup>	NO <sub>3</sub> <sup>-</sup>	NO <sub>2</sub> <sup>-</sup>	SO <sub>4</sub> <sup>2-</sup>	N min.	Net N.
Peatland forest (FR)												
N min.												.16
SO <sub>4</sub> <sup>2-</sup>											.28	-.22
NO <sub>2</sub> <sup>-</sup>										-.21	.15	1*
NO <sub>3</sub> <sup>-</sup>									-.19	.5*	.73*	-.2
NH <sub>4</sub> <sup>+</sup>								-.31	.9*	-.2	.17	.9*
IC						.88*	-.16	1*	-.17	.16	.99*	
TOC					.19	-.09	.01	.15	.5*	-.41*	.13	
EC				-.39*	-.21	.24	-.22	-.19	.17	.08	-.17	
pH			-.36	.62*	.85*	.61*	.03	.83*	.22	.11	.81*	
CH <sub>4</sub>			.33	.2	.47*	.27	-.04	.26	.29	-.39*	.23	
CO <sub>2</sub>		.4*	.81*	-.23	.22	.9*	.17	.88*	-.02	.31	.87*	
N <sub>2</sub> O	-.35	-.23	-.14	-.47*	.29	-.28	-.47*	-.26	-.28	-.19	-.52*	-.29
	CO <sub>2</sub>	CH <sub>4</sub>	pH	EC	TOC	IC	NH <sub>4</sub> <sup>+</sup>	NO <sub>3</sub> <sup>-</sup>	NO <sub>2</sub> <sup>-</sup>	SO <sub>4</sub> <sup>2-</sup>	N min.	Net N.

