

Supplementary material

Table S1. Total content of elements in soil fertilized with biogas digestate (BD) and mining waste (mudstones - MS) (mean, n=3)

(mgkg ⁻¹ DW)	Type of fertilization									
	2014					2016				
	C	NPK	MS	BD	MS+BD	C	NPK	MS	BD	MS+BD
Zn	15.0	20.1	18.3	17.2	19.2	14.3	17.5	15.2	13.2	20.1
Cu	2.5	4.0	6.1	3.3	5.5	3.2	4.4	7.2	2.9	8.6
B	7.5	11.7	9.9	7.8	9.6	16.8	12.0	10.3	7.1	14.2
Sr	9.3	11.6	15.9	7.6	29.1	10.5	11.5	19.6	8.1	26.2
Cd	0.5	0.5	0.4	0.4	0.4	0.5	0.6	0.4	0.4	0.6
Mn	246	180	189	213	214	217	202	220	213	241
Al	5192	4560	5178	4563	6276	4140	4374	5172	3782	4093
Pb	10.4	10.6	11.2	9.5	12.8	10.1	10.8	11.3	9.7	15.6
Ba	32.0	33.3	36.4	31.0	51.8	32.4	32.5	34.1	29.7	51.0
Ni	7.9	5.8	8.6	5.2	8.5	15.2	11.7	9.6	12.0	15.7
Co	2.5	2.2	3.0	2.0	3.8	2.5	2.4	2.8	2.0	4.3
Cr	10.3	15.1	13.8	8.8	16.8	10.6	12.0	12.1	9.9	20.3
Fe	3555	4275	3799	3063	4173	3590	4138	3583	3115	4276
Average	9091	9130	9289	7932	10821	8063	8829	9097	7205	8787

C = control (podzolic soil – PS without fertilization); NPK = PS + N, P, K, Mg, Ca, S (120 N, 100 P₂O₅, 120 K₂O, 40 MgO, 60 Ca, 30 SO₂ kg ha⁻¹, respectively); MS = PS + 155 t DW of MS ha⁻¹; BD = PS + 5.1 t DW of BD ha⁻¹; MS+BD = PS + 155t DW of MS ha⁻¹ + 5.1 t DW of BD ha⁻¹

Table S2. Total content of elements in in grain of winter wheat fertilized with biogas digestate (BR) and mining waste (mudstones - MS) (mean, n=3)

(mgkg ⁻¹ DW)	Type of fertilization									
	2014					2016				
	C	NPK	MS	BD	MS+BD	C	NPK	MS	BD	MS+BD
Zn	18.9	16.2	18.7	16.4	24.1	17.2	15.1	24.5	19.4	19.6
Cu	2.6	2.6	3.3	3.0	3.0	2.6	2.3	3.1	2.9	2.3
B	1.9	1.9	2.7	2.4	2.4	3.4	1.7	1.8	1.5	2.1
Sr	2.2	2.1	2.5	2.2	2.3	3.0	3.1	3.9	2.2	2.6
Cd	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Mn	36.8	23.3	30.8	31.3	39.5	37.9	26.3	53.8	40.8	43.4
Al	714	743	750	694	659	650	604	685	602	658
Pb	1.6	1.5	1.2	1.2	1.1	1.5	1.3	1.2	1.3	1.2
Ba	5.0	3.3	4.6	4.3	3.7	3.1	2.1	1.8	2.9	2.0
Ni	0.7	0.5	0.7	0.7	0.8	0.5	0.6	0.6	0.5	0.6
Co	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.2
Cr	0.7	0.7	0.7	0.7	0.4	0.4	0.2	0.2	0.2	0.2
Fe	30.6	23.3	29.7	25.2	24.7	27.8	19.9	19.9	27.2	22.0
Total	816	819	845	782	761	748	677	796	702	754

C = control (podzolic soil – PS without fertilization); NPK = PS + N, P, K, Mg, Ca, S (120 N, 100 P₂O₅, 120 K₂O, 40 MgO, 60 Ca, 30 SO₂ kg ha⁻¹, respectively); MS = PS + 155 t DW of MS ha⁻¹; BD = PS + 5.1 t DW of BD ha⁻¹; MS+BD = PS + 155t DW of MS ha⁻¹ + 5.1 t DW of BD ha⁻¹