

**Table S1.** Experimental design of plots describing all 20 modalities studied

Modality		Concentration (t/ha)
Non-inoculated	Unvegetated	<i>Unamended</i>
		1.5
		45
		1.5
	Vegetated	45
		1.5
		45
		1.5
Inoculated	Unvegetated	<i>Unamended</i>
		1.5
		45
		1.5
	Vegetated	45
		1.5
		45
		1.5

**Table S2.** Influence of amendments and vegetation (V: vegetated, UV: unvegetated, NI: not-inoculated, I: inoculated, LS: ladle slag and OS: oven slag, NA: not-amended, 1.5 and 45 t.ha<sup>-1</sup>) on most abundant phyla relative abundance. One way ANOVA  $\pm$  standard error. Means followed by the same lowercase letter are not significantly different, by one-way ANOVA comparison and post-hoc Fisher test ( $\alpha = 0.05$ ).

Phyla	V	UV	NI	I	LS	OS	NA	1.5t.ha <sup>-1</sup>	45t.ha <sup>-1</sup>
<i>Actinobacteria</i>	0.62 $\pm$ 0.013a	0.50 $\pm$ 0.013b	0.56 $\pm$ 0.02a	0.57 $\pm$ 0.02a	0.58 $\pm$ 0.019a	0.53 $\pm$ 0.019a	0.58 $\pm$ 0.027a	0.58 $\pm$ 0.019a	0.52 $\pm$ 0.019a
<i>Proteobacteria</i>	0.18 $\pm$ 0.004b	0.20 $\pm$ 0.004a	0.19 $\pm$ 0.005a	0.19 $\pm$ 0.005a	0.20 $\pm$ 0.005a	0.19 $\pm$ 0.005b	0.17 $\pm$ 0.007b	0.19 $\pm$ 0.005ab	0.20 $\pm$ 0.005a
<i>Gemmatimonadota</i>	0.06 $\pm$ 0.007b	0.14 $\pm$ 0.007a	0.10 $\pm$ 0.010a	0.10 $\pm$ 0.010a	0.09 $\pm$ 0.011a	0.11 $\pm$ 0.011a	0.10 $\pm$ 0.016a	0.09 $\pm$ 0.011a	0.12 $\pm$ 0.011a
<i>Myxococcota</i>	0.046 $\pm$ 0.001a	0.045 $\pm$ 0.001a	0.044 $\pm$ 0.001a	0.047 $\pm$ 0.001a	0.044 $\pm$ 0.002a	0.046 $\pm$ 0.002a	0.048 $\pm$ 0.002a	0.62 $\pm$ 0.01a	0.62 $\pm$ 0.01a
<i>Acidobacteriota</i>	0.018 $\pm$ 0.002b	0.32 $\pm$ 0.002a	0.025 $\pm$ 0.01a	0.024 $\pm$ 0.01a	0.022 $\pm$ 0.002b	0.029 $\pm$ 0.002a	0.022 $\pm$ 0.003a	0.024 $\pm$ 0.002a	0.027 $\pm$ 0.002a
<i>Bacteroidota</i>	0.016 $\pm$ 0.001b	0.021 $\pm$ 0.001a	0.019 $\pm$ 0.001a	0.018 $\pm$ 0.001a	0.017 $\pm$ 0.001b	0.020 $\pm$ 0.001a	0.017 $\pm$ 0.001a	0.017 $\pm$ 0.001a	0.020 $\pm$ 0.001a
<i>Thermoplasmatota</i>	0.017 $\pm$ 0.001a	0.016 $\pm$ 0.001a	0.017 $\pm$ 0.001a	0.017 $\pm$ 0.001a	0.019 $\pm$ 0.001a	0.014 $\pm$ 0.001b	0.018 $\pm$ 0.002ab	0.014 $\pm$ 0.001b	0.019 $\pm$ 0.001a
<i>Patescibacteria</i>	0.008 $\pm$ 0.001a	0.009 $\pm$ 0.001a	0.008 $\pm$ 0.001a	0.009 $\pm$ 0.001a	0.009 $\pm$ 0.001a	0.007 $\pm$ 0.001b	0.009 $\pm$ 0.001a	0.007 $\pm$ 0.001b	0.009 $\pm$ 0.001a
<i>Firmicutes</i>	0.007 $\pm$ 0.001b	0.009 $\pm$ 0.001a	0.008 $\pm$ 0.001a	0.008 $\pm$ 0.001a	0.008 $\pm$ 0.001a	0.008 $\pm$ 0.001a	0.009 $\pm$ 0.001a	0.007 $\pm$ 0.001b	0.009 $\pm$ 0.001a
<i>Verrucomicrobiota</i>	0.004 $\pm$ 0.001b	0.006 $\pm$ 0.001a	0.006 $\pm$ 0.001a	0.005 $\pm$ 0.001a	0.005 $\pm$ 0.001a	0.006 $\pm$ 0.001a	0.004 $\pm$ 0.001ab	0.004 $\pm$ 0.001b	0.006 $\pm$ 0.001a
<i>Nitrospirota</i>	0.004 $\pm$ 0.000b	0.006 $\pm$ 0.000a	0.005 $\pm$ 0.000a	0.005 $\pm$ 0.000a	0.004 $\pm$ 0.000a	0.005 $\pm$ 0.000a	0.005 $\pm$ 0.001a	0.005 $\pm$ 0.000a	0.005 $\pm$ 0.000a
<i>Spirochaetota</i>	0.004 $\pm$ 0.000a	0.004 $\pm$ 0.000a	0.004 $\pm$ 0.000a	0.004 $\pm$ 0.000a	0.004 $\pm$ 0.000a	0.004 $\pm$ 0.000a	0.004 $\pm$ 0.001a	0.003 $\pm$ 0.000a	0.005 $\pm$ 0.000a
<i>Campylobacterota</i>	0.003 $\pm$ 0.000a	0.003 $\pm$ 0.000a	0.003 $\pm$ 0.000a	0.003 $\pm$ 0.000a	0.003 $\pm$ 0.000a	0.002 $\pm$ 0.000a	0.003 $\pm$ 0.000a	0.003 $\pm$ 0.000a	0.002 $\pm$ 0.000a
<i>Planctomycetota</i>	0.001 $\pm$ 0.000b	0.002 $\pm$ 0.000a	0.002 $\pm$ 0.000a	0.002 $\pm$ 0.000a	0.002 $\pm$ 0.000a	0.002 $\pm$ 0.000a	0.001 $\pm$ 0.000a	0.002 $\pm$ 0.000a	0.002 $\pm$ 0.000a
Others phyla	0.007 $\pm$ 0.000b	0.011 $\pm$ 0.000a	0.009 $\pm$ 0.000a	0.008 $\pm$ 0.000a	0.009 $\pm$ 0.001a	0.009 $\pm$ 0.001a	0.008 $\pm$ 0.001a	0.009 $\pm$ 0.001a	0.009 $\pm$ 0.001a

**Table S3.** Influence of amendments and vegetation (V: vegetated, UV: unvegetated, NI: not-inoculated, I: inoculated, LS: ladle slag and OS: oven slag, NA: not-amended, 1.5 and 45 t.ha<sup>-1</sup>) on biolog substrats family.

State	Amendment	Dose (t.ha <sup>-1</sup> )	Inoculation	Carbohydrates	Amino acids	Carboxylic acetic acids	Amines amides	Polymers
Unvegetated	Unamended		NI	998±254	658 ±185	908±109	124±40	420±45
			I	1119±231	735±120	924±136	165±38	434±61
	Ladle slag	1.5	NI	1092±665	607±102	889±220	128±40	428±108
			I	1382±377	883±103	1053±215	207±89	519±39
		45	NI	1006±268	741±66	885±135	138±47	500±87
			I	904±453	715±130	892±100	158±51	426±77
	Oven slag	1.5	NI	929±233	754±131	1041±239	181±34	425±69
			I	727±43	751±210	936±219	235±130	412±53
		45	NI	718±447	650±54	821±177	172±52	364±43
			I	879±348	661±118	914±144	123±60	421±70
Vegetated	Unamended		NI	1470±192	865±78	1105±48	213±28	528±94
			I	1710±311	876±115	1245±101	207±53	553±129
	Ladle slag	1.5	NI	1685±250	736±22	1230±159	212±38	523±86
			I	1612±302	785±163	1081±270	193±32	567±127
		45	NI	1371±459	823±112	1113±233	225±25	460±85
			I	1283±397	830±86	961±104	179±53	529±81
	Oven slag	1.5	NI	1579±316	792±132	1065±146	192±83	575±101
			I	1479±219	767±116	1153±135	226±42	505±113
		45	NI	1851±137	690±99	1232±54	182±32	620±126
			I	1685±407	835±83	1237±142	195±47	546±109