

## Supplementary Online Material

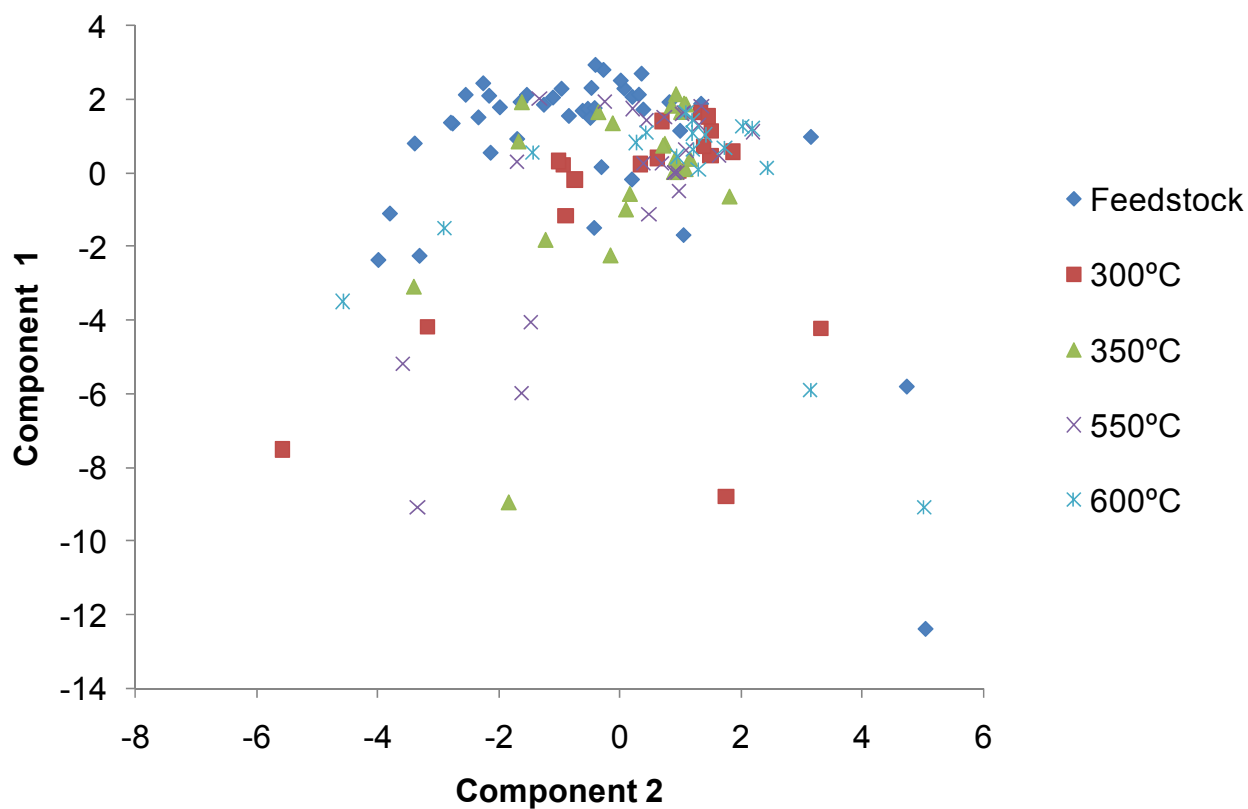
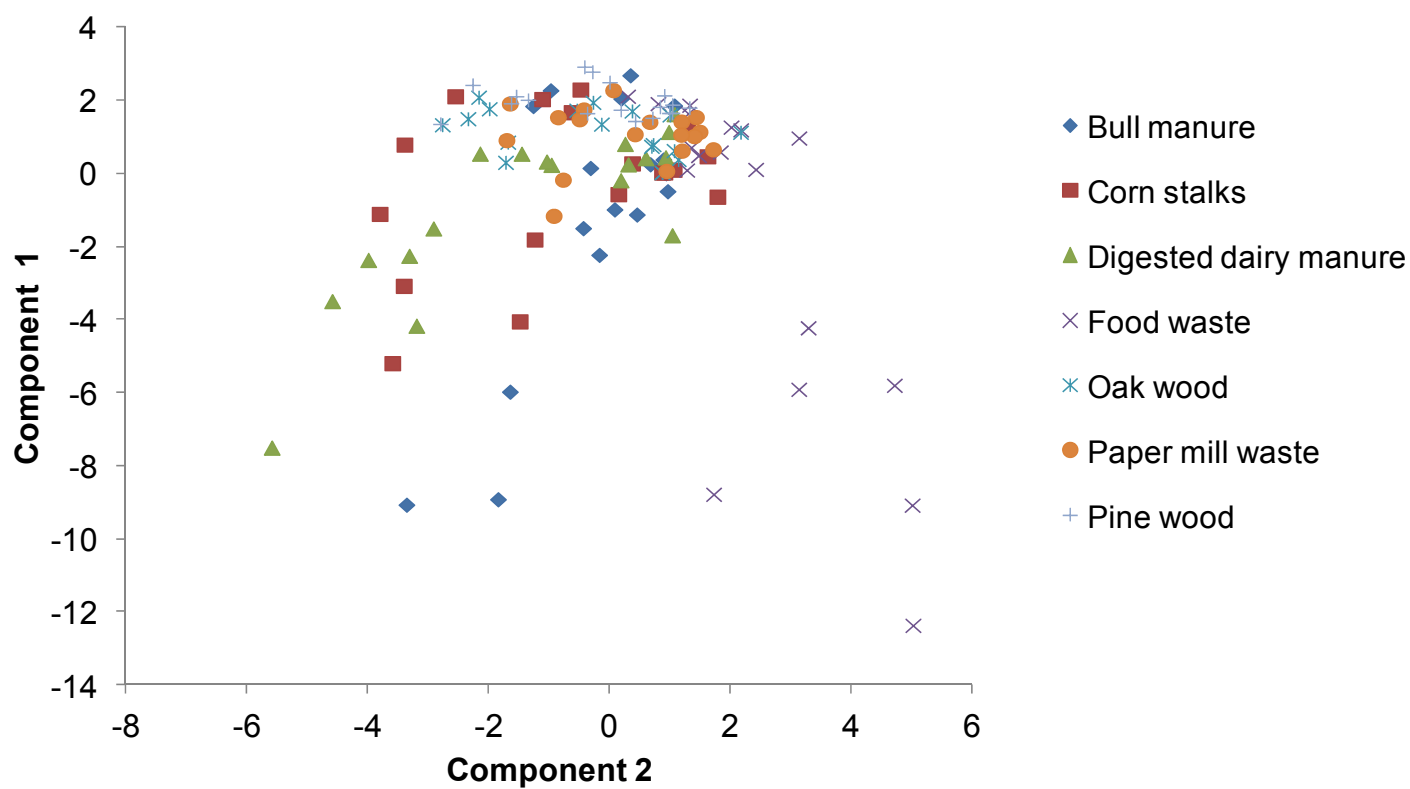
**Supplementary Table S1.** Limit values for pollutant burden in biochars in different guidelines of biochar quality assessment.

Pollutant	Unit	IBI (2013) <sup>1</sup>	Schmidt et al. (2013) <sup>2</sup>		Shackley et al. (2013) <sup>3</sup>	
			basic grade	premium grade	standard grade	high grade
As	mg kg <sup>-1</sup>	12 to 100	n.a.	n.a.	100	10
Cd	mg kg <sup>-1</sup>	1.4 to 39	1.5	1	39	3
Cr	mg kg <sup>-1</sup>	64 to 1200	90	80	100	15
Co	mg kg <sup>-1</sup>	40 to 150	n.a.	n.a.	n.a.	n.a.
Cu	mg kg <sup>-1</sup>	63 to 1500	100	100	1500	40
Pb	mg kg <sup>-1</sup>	70 to 500	150	120	500	60
Hg	mg kg <sup>-1</sup>	1 to 17	1	1	17	1
Mn	mg kg <sup>-1</sup>	n.a.	n.a.	n.a.	n.a.	3500
Mo	mg kg <sup>-1</sup>	5 to 20	n.a.	n.a.	75	10
Ni	mg kg <sup>-1</sup>	47 to 600	50	30	600	10
Se	mg kg <sup>-1</sup>	1 to 36	n.a.	n.a.	100	5
Zn	mg kg <sup>-1</sup>	200 to 7000	400	400	2800	150
Bo	mg kg <sup>-1</sup>	only declaration	n.a.	n.a.	n.a.	n.a.
Cl	mg kg <sup>-1</sup>	only declaration	n.a.	n.a.	n.a.	n.a.
Na	mg kg <sup>-1</sup>	only declaration	n.a.	n.a.	n.a.	n.a.
PAHs	mg kg <sup>-1</sup>	6 to 20	12	4	20	20
BETX		n.a.	n.a.	n.a.	to be confirmed	to be confirmed
PCDDs/Fs	ng kg <sup>-1</sup>	9 (ng kg <sup>-1</sup> TEQ)	20	20	20	20
PCBs	mg kg <sup>-1</sup> TEQ	0.2 to 0.5	0.2	0.2	0.5	0.5
pH		only declaration	n.a.	handling information if pH>10	only declaration	only declaration
EC	dS m <sup>-1</sup>	only declaration	n.a.	n.a.	optional	optional

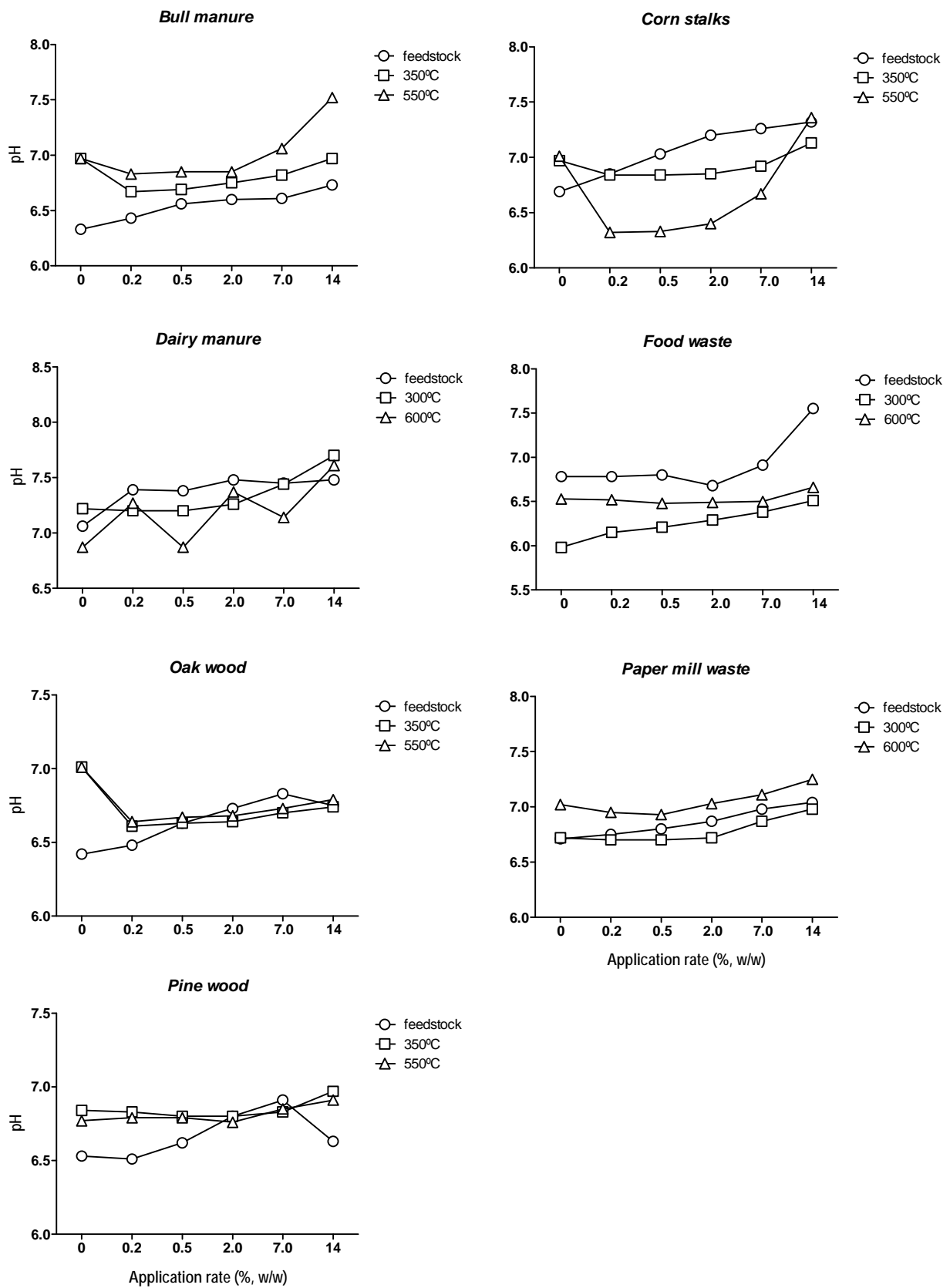
<sup>1</sup> IBI range of maximum allowed threshold for test category B (biochar must be below the highest value of the range)

<sup>2</sup> EBC maximum limit suggested for standard and high grade quality biochar

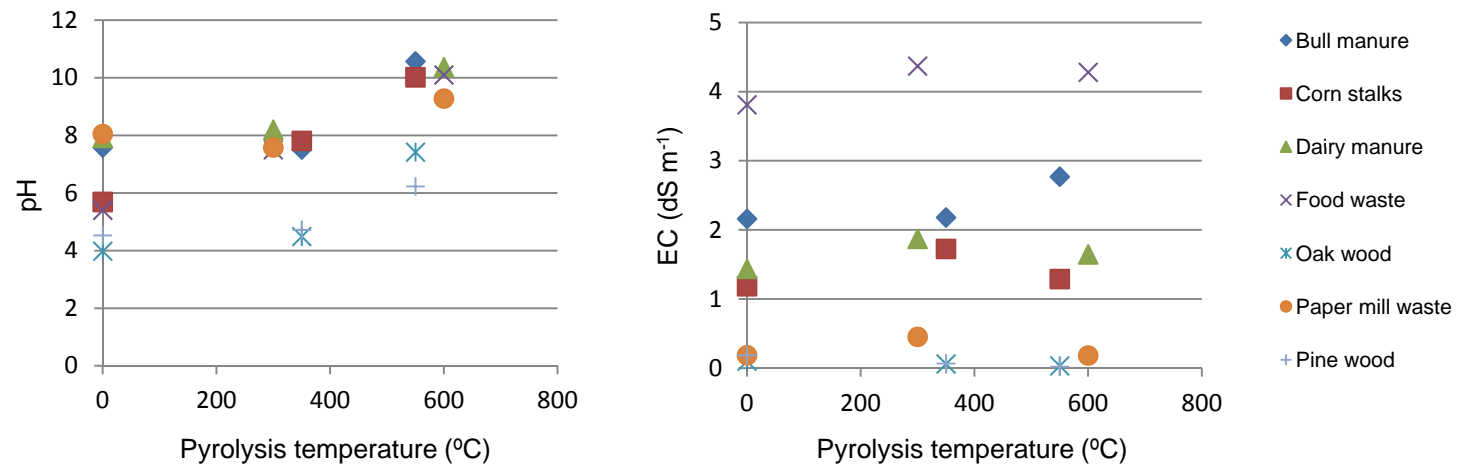
<sup>3</sup> BQM threshold for basic and premium quality grade



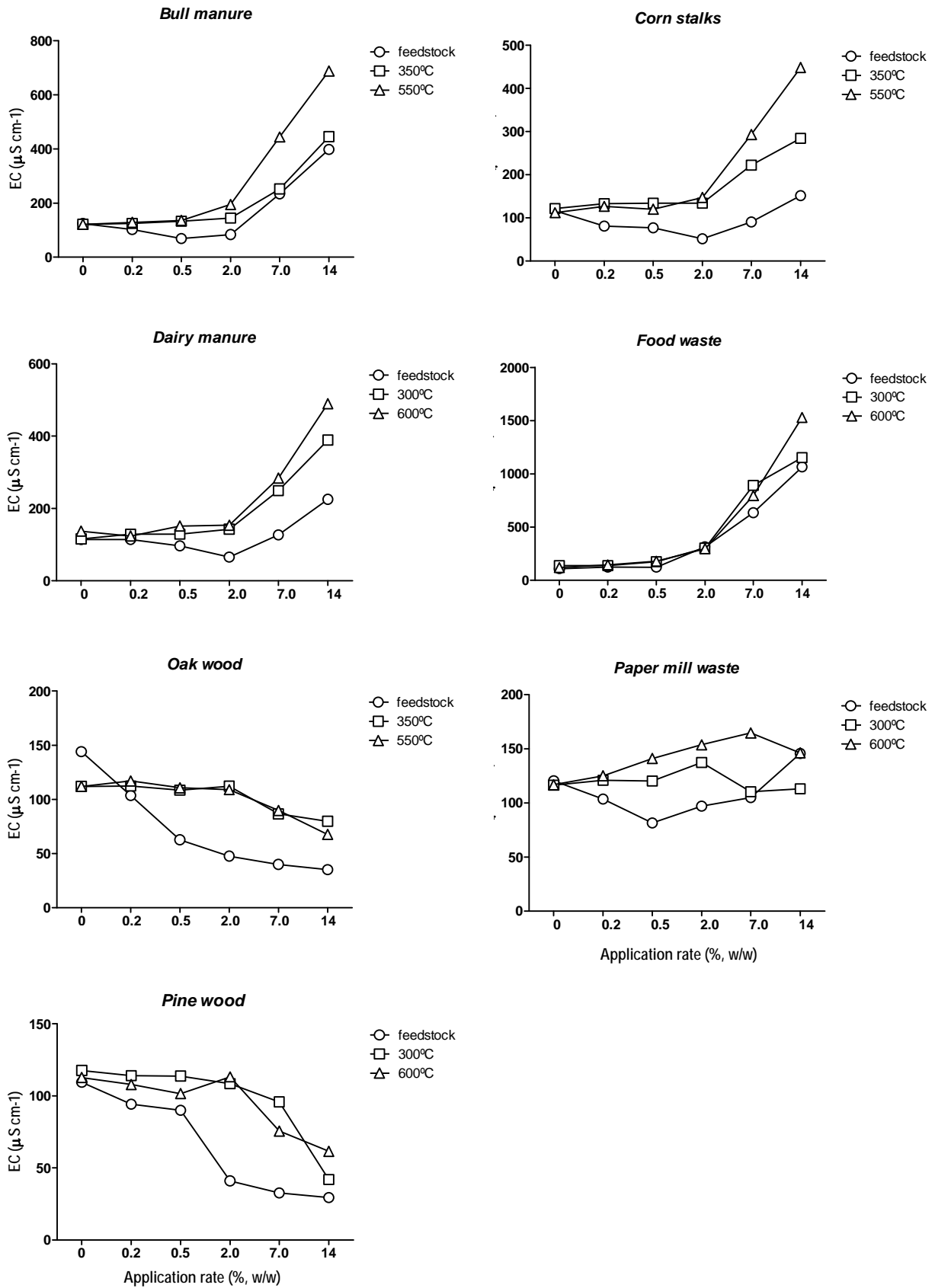
**Supplementary Figure S1.** Scatterplot of the principal component analysis of the soil physicochemical properties measured in the different soil-material mixtures, grouped by feedstock (upper graphic) and pyrolysis temperature (lower graphic). The first component explained 33.4% of the variance while the second explained 14.9% of the variance.



**Supplementary Figure S2.** pH in the different soil-material mixtures at increasing application rates; n=2.



**Supplementary Figure S3.** pH and electrical conductivity in a 1:20 (w:v) solution for the different feedstocks and biochars. Data for unpyrolyzed feedstocks correspond to a pyrolysis temperature of zero; n=2.



**Supplementary Figure S4.** Electrical conductivity in the different soil-material mixtures at increasing application rates; n=2.