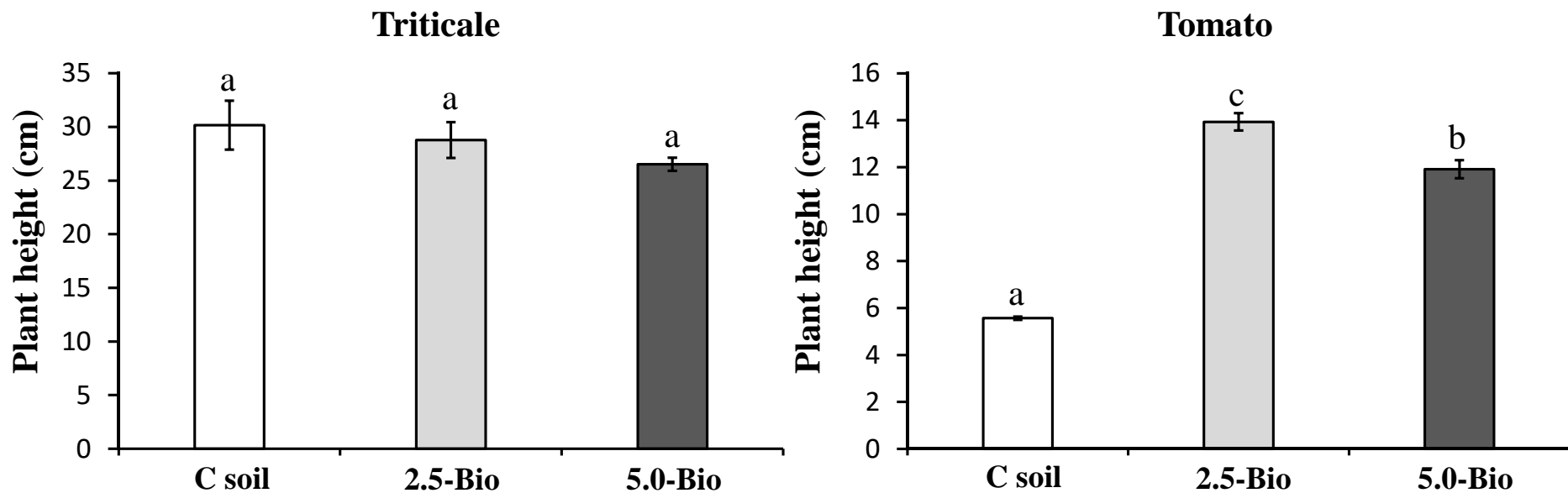


**Figure S1.** AWCD, H' and Richness values of contaminated (C soil) and amended soils (2.5-Bio or 5.0-Bio). Different letters indicate significant differences between treatments ( $P < 0.05$ ).



**Figure S2.** Height of triticale and tomato plants grown in contaminated (C soil) and amended soils (2.5-Bio or 5.0-Bio). For each plant species, different letters indicate significant differences between treatments ( $P < 0.05$ ).

**Table S1.** Selected chemical properties of the biochar used in this study. Values represent mean  $\pm$  SE (n = 3). u.d.l.: under detection limit (i.e.  $< 0.2 \mu\text{g}\cdot\text{L}^{-1}$ ).

Chemical analyses	
pH	$9.30 \pm 0.01$
pH <sub>PZC</sub>	$5.0 \pm 0.01$
EC ( $\mu\text{S}\cdot\text{cm}^{-1}$ )	$9.91 \pm 2.79$
Ash (%)	$2.44 \pm 0.10$
Cation exchange capacity (CEC, $\text{cmol}_{(+)}\text{ kg}^{-1}$ )	$18.81 \pm 0.30$
Total organic carbon (%)	$61.32 \pm 0.06$
Total nitrogen (%)	$0.30 \pm 0.02$
Total carbonate (%)	$1.52 \pm 0.02$
Water dissolved organic carbon (DOC, $\text{mg}\cdot\text{kg}^{-1}$ )	$0.020 \pm 0.003$
Available P ( $\text{mg}\cdot\text{kg}^{-1}$ )	$84.52 \pm 3.01$
Water soluble and exchangeable K ( $\text{cmol}_{(+)}\text{ kg}^{-1}$ )	$0.62 \pm 0.02$
Exchangeable Ca ( $\text{cmol}_{(+)}\text{ kg}^{-1}$ )	$45.08 \pm 0.95$
Exchangeable Mg ( $\text{cmol}_{(+)}\text{ kg}^{-1}$ )	$3.28 \pm 0.03$
COOH groups ( $\text{meq}\cdot\text{g}^{-1}$ )	$0.14 \pm 0.02$
Phenolic groups ( $\text{meq}\cdot\text{g}^{-1}$ )	$2.10 \pm 0.32$
Pseudo-total Fe ( $\text{mg}\cdot\text{kg}^{-1}$ )	$524.8 \pm 12.7$
<i>Pseudo-total PTEs concentration (<math>\text{mg}\cdot\text{kg}^{-1}</math>)</i>	
Sb	u.d.l.
As	u.d.l.
Cd	u.d.l.
Mn	$358.1 \pm 5.1$
Pb	u.d.l.
Cu	$207.1 \pm 2.9$
Zn	u.d.l.

**Table S2.** Statistical analysis adopted for each of the investigated traits.

<b>Trait</b>	<b>Statistical analysis</b>
Triticale height	ANOVA
Triticale root (dw)	ANOVA
Tomato shoot (dw)	ANOVA
Cd tomato shoot	ANOVA
Pb tomato root	ANOVA
Zn triticale shoot	ANOVA
Zn triticale root	ANOVA
EC	ANOVA
Organic matter	ANOVA
Total P	ANOVA
Total N	Kruskal-Wallis
P olsen	ANOVA
DOC	ANOVA
Pseudo-total Cd and Zn	ANOVA
Pb released NaOAc	ANOVA
Pb released Na <sub>2</sub> EDTA	ANOVA
Cd released Ca(NO <sub>3</sub> ) <sub>2</sub>	ANOVA
Cd released Na <sub>2</sub> EDTA	ANOVA
Zn released Ca(NO <sub>3</sub> ) <sub>2</sub>	ANOVA
Zn released NaOAc	ANOVA
Cd, Pb, and Zn residual	ANOVA
SMB-C	ANOVA
Heterothrophic bacteria	ANOVA
Actinomycetes	ANOVA
Tomato height	Kruskal-Wallis
Tomato root (dw)	Kruskal-Wallis
Pb Tomato shoot	Kruskal-Wallis
Zn Tomato shoot	Kruskal-Wallis
Zn Tomato root	Kruskal-Wallis
Cd Tomato root	Kruskal-Wallis
Pb Triticale shoot	Kruskal-Wallis
Cd Triticale shoot	Kruskal-Wallis
Pb Triticale root	Kruskal-Wallis
Cd Triticale root	Kruskal-Wallis
pH soil	Kruskal-Wallis
CEC	Kruskal-Wallis
Pseudo-total Pb	Kruskal-Wallis
Pb released Ca(NO <sub>3</sub> ) <sub>2</sub>	Kruskal-Wallis
Cd released NaOAc	Kruskal-Wallis
Zn released NaOAc	Kruskal-Wallis
Zn released Na <sub>2</sub> EDTA	Kruskal-Wallis
Fungi	Kruskal-Wallis
Pseudomonas spp	Kruskal-Wallis

DHG  
URE

Kruskal-Wallis  
Kruskal-Wallis

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**Table S3.** Quality control (QC) of the received sequence data. Sequences surviving each QC step of each sample are provided in the sequential columns.

Sample_ID	Input	Filtered	DenoisedF	DenoisedR	Merged	Non chimeric	No Eukaryotic, or uncharacterised	No Chloroplast	No Mitochondria
S1 0 %	19,220	9,326	7,999	7,608	4,624	3,829	3,793	3,793	3,793
S2 0 %	26,957	12,663	11,165	10,684	6,447	4,825	4,755	4,755	4,747
S3 0 %	19,239	9,101	7,799	7,354	4,287	3,630	3,630	3,630	3,630
S4 2.5 %	20,502	9,702	8,423	7,860	4,478	3,600	3,593	3,593	3,593
S5 2.5 %	44,491	20,764	18,696	17,841	11,285	8,273	8,221	8,221	8,221
S6 2.5 %	23,098	11,175	9,579	9,188	5,399	4,098	4,088	4,088	4,088
S7 5 %	29,373	13,305	11,773	11,173	6,664	5,499	5,487	5,487	5,487
S8 5 %	38,806	16,553	14,781	13,911	8,582	6,762	6,683	6,675	6,675
S9 5 %	39,323	19,026	17,040	16,121	10,139	7,429	7,384	7,384	7,384
<b>Total</b>	<b>261,009</b>	<b>121,615</b>	<b>107,255</b>	<b>101,740</b>	<b>61,905</b>	<b>47,945</b>	<b>47,634</b>	<b>47,626</b>	<b>47,618</b>
<b>% of initial</b>		<b>46.6%</b>	<b>41.1%</b>	<b>39.0%</b>	<b>23.7%</b>	<b>18.4%</b>	<b>18.2%</b>	<b>18.2%</b>	<b>18.2%</b>