Soil amendment strategies determine microbial community composition and their assembly processes in a continuously cropped soil

Hongkai Liao[1] , Chunli Zheng[2], Juan Li[1], Jian Long , Yaying Li [3,4] *

[1] Guizhou Provincial Key Laboratory of Mountain Environment, Guizhou Normal University, Guiyang 550001, People's Republic of China

[2] The Key Laboratory of Environmental Pollution Monitoring and Disease Control, Ministry of Education, Department of Toxicology, School of Public Health, Guizhou Medical University, Guiyang 550025, Guizhou, People's Republic of China

[3]Key Laboratory of Urban Environment and Health, Institute of Urban Environment, Chinese Academy of Sciences, Xiamen, China

[4] Key Laboratory of Urban Environmental Processes and Pollution Control, Ningbo (Beilun) Zhongke Haixi Industry Technology Innovation Center, Ningbo, China

* Key Laboratory of Urban Environment and Health, Institute of Urban Environment, Chinese Academy of Sciences, Xiamen, China.

E-mail address: yyli@iue.ac.cn

Table S1 The properties of biochar and maize straw.

Property	Biochar	Maize straw
Total C (%)	57.6	45.6
Total N (%)	1.03	1.35
C:N	55	33
pH (1:10 w/v)	10.9	
EC (mS m^{-1})	12.3	
BET (N_2)surface area (m^2/g)	57.6	
Ash content (%)	12.1	
Particle size (mm)	<2	<2
Heating rate (°C min-1)	5	
Final temp (°C)	450	
Residue time (min)	60	
Fixed C (%)	74	

Table S2 *Adonis* test of the effect of soil amendment on microbial community composition based on 16S rRNA gene sequencing data.

Day	Adonis test	F-value	R^2
7	1%B vs CK	0.190	0.8
7	3%B vs CK	0.268	0.1
7	CaCN2 vs CK	0.231	0.2
7	RSD vs CK	0.319	0.1
18	1%B vs CK	0.222	0.4
18	3%B vs CK	0.240	0.2
18	CaCN2 vs CK	0.332	0.1
18	RSD vs CK	0.410	0.1
46	1%B vs CK	0.166	1
46	3%B vs CK	0.166	0.9
46	CaCN2 vs CK	0.222	0.4
46	RSD vs CK	0.291	0.1
Treatment		2.476	0.162**
Day		4.467	0.146**
Treatment x Day		1.527	0.200**

** indicates significance at $p<0.01$ level.

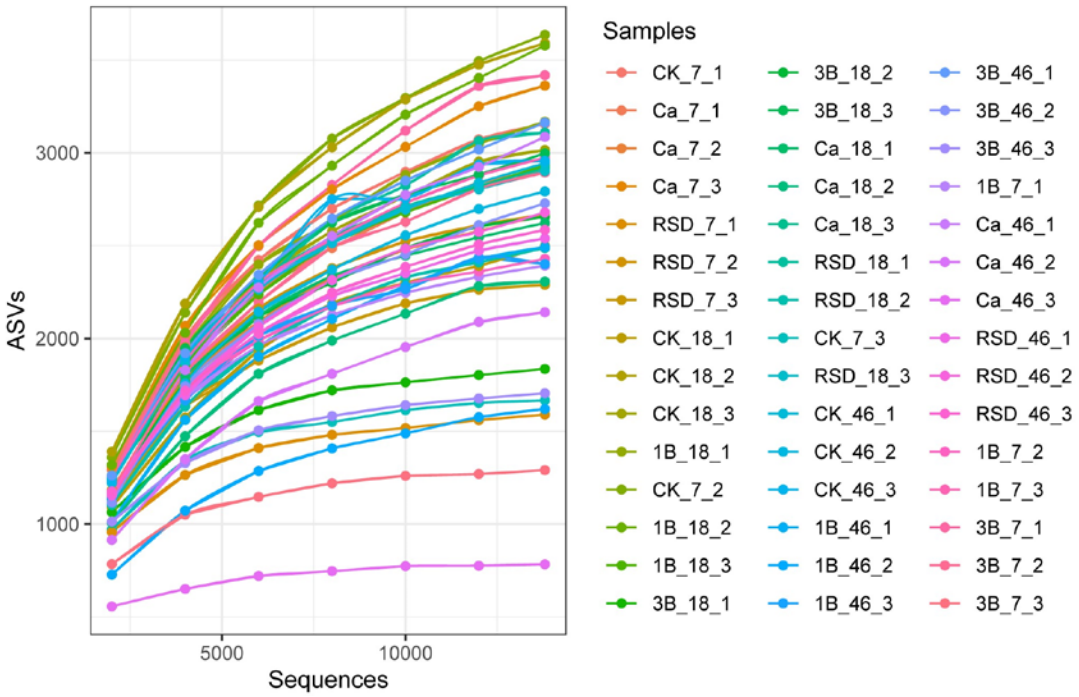

Figure S1 Rarefaction of observed ASVs at a sequencing depth of 13800 sequencing per sample.

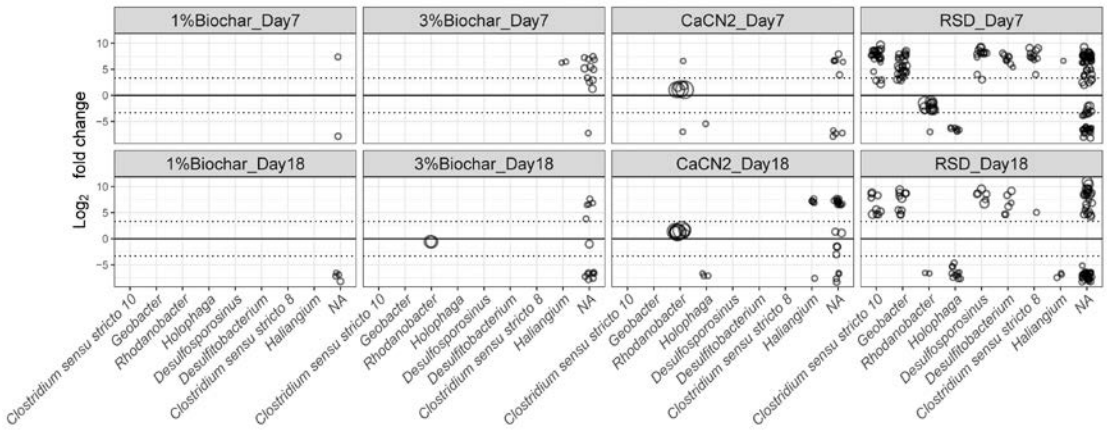

Figure S2 Log2-fold changes in the relative abundance of ASVs (treatment vs. CK) at day 7 and day 18 at the genus level. Each circle shows a single ASV, and the size of the point represents the mean abundance among all samples (baseMean). Each circle denotes proportion fold-changes that had an adjusted P-value below a false discovery rate of 10%.

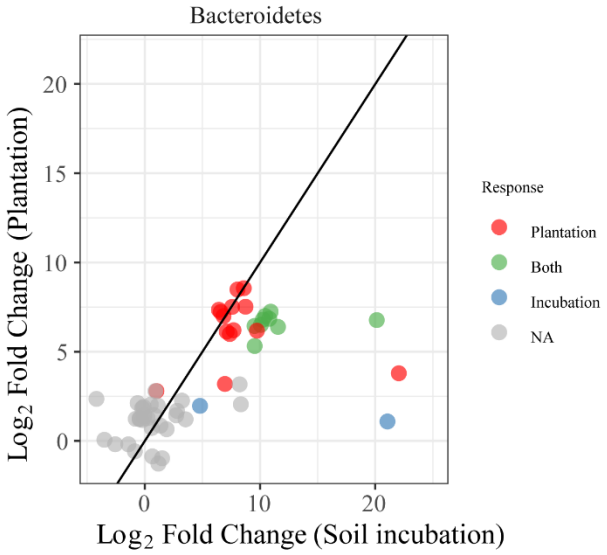

Figure S3 Log_2 fold change in RSD vs. CK during soil incubation and after the plantation of tomatoes for significant responders in the phylum Bacteroidetes. The line represents 1:1. Each point represents a single ASV. Points are colored by whether the response was significant in plantation or soil incubation. Green indicates significance for both soil incubation and plantation.

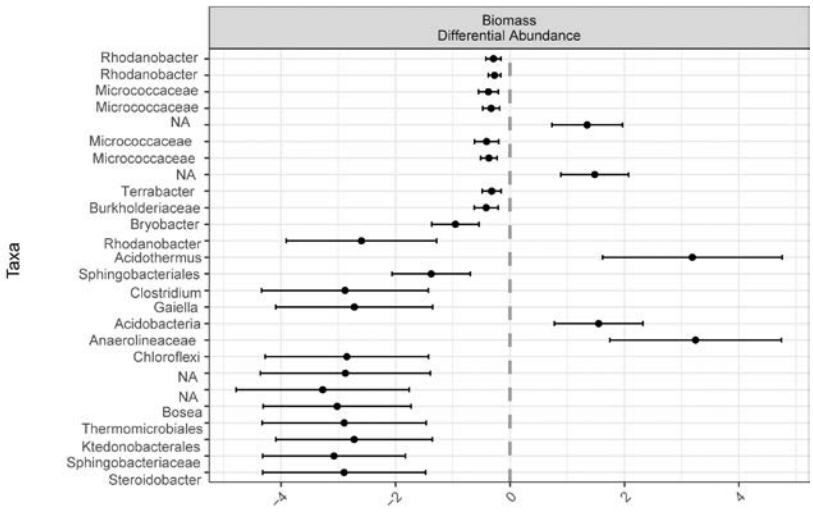

Figure S4 The significant models between ASVs and plant biomass. The coefficient estimate indicates positive or negative responses to the parameter and is shown with a 95% confidence interval.