



## Article

# Supplementary Materials: The Variation of Soil Phosphorus Fractions and Microbial Community Composition under Consecutive Cucumber Cropping in a Greenhouse

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**Table S1.** Variations in soil basic properties with increasing continuous cropping rounds in the greenhouse soil.

Cropping rounds	pH	EC	TK (g·kg <sup>-1</sup> )	AN (mg·kg <sup>-1</sup> )	AK (mg·kg <sup>-1</sup> )
1	7.27±0.02a	0.18±0.01b	13.10±0.51b	21.58±0.58b	237.54±14.88c
9	7.28±0.03a	0.23±0.01a	18.60±0.13a	54.83±2.54a	380.27±15.43b
13	7.26±0.02a	0.23±0.00a	19.03±0.63a	64.75±5.05a	298.72±7.11bc
21	7.23±0.02a	0.27±0.01a	19.03±0.37a	68.83±4.21a	816.85±37.60a

Different letters indicate significant difference among the treatments on  $p < 0.05$ .

**Table S2.** Changes of soil inorganic phosphorus and organic phosphorus contents and relative distribution of P after long-term continuous cropping.

Continuous cropping rounds	Contents of P (mg·kg <sup>-1</sup> )			Relative distribution of P (%)	
	TP <sub>i</sub>	TP <sub>o</sub>	TP <sub>t</sub>	TP <sub>i</sub>	TP <sub>o</sub>
1	807.25±6.69c	98.06±12.75d	905.31±6.62c	89.19±1.33ab	10.81±1.33bc
9	2087.41±75.83b	235.73±11.92c	2323.14±63.91b	89.81±0.79a	10.19±1.33c
13	2030.94±44.67b	385.04±4.80b	2415.98±49.34b	84.06±0.14c	15.94±1.33a
21	2914.94±145.50a	505.76±14.18a	3420.70±136.98a	85.15±0.90bc	14.85±1.33ab

Different letters indicate significant difference among the treatments on  $p < 0.05$ .

**Table S3.** The relative distribution of P after long-term continuous cropping.

Continuous cropping rounds	Relative distribution of P (%)		
	Labile P	Moderately labile P	Non-labile P
1	27.78±1.49a	54.66±1.19b	17.55±0.34a
9	24.86±0.14a	63.87±0.34a	11.24±0.19b
13	23.52±0.91a	65.67±0.92a	10.82±0.50b
21	26.66±1.65a	65.80±1.99a	7.54±0.36c

Different letters indicate significant difference among the treatments on  $p < 0.05$ .

**Table S4.** The contents of P fractions and relative distribution of P after long-term continuous cropping.

Continu- ous crop- ping rounds	Contents of P (mg·kg <sup>-1</sup> )								
	Resin-P <sub>i</sub>	NaHCO <sub>3</sub> P <sub>i</sub>	NaOHP <sub>i</sub>	Dil. HCl-P <sub>i</sub>	Conc. HCl-P <sub>i</sub>	Residual-P <sub>i</sub>	NaHCO <sub>3</sub> P <sub>o</sub>	NaOHP <sub>o</sub>	Conc. HCl-P <sub>o</sub>
1	132.02±8.92 c	68.83±0.76 d	115.18±0.39 c	340.20±12.49c	133.86±1.50 b	17.16±1.64 d	50.78±6.79c	39.391±4.57 c	7.89±2.28b
9	319.88±18.6 4b	136.29±4.02 c	168.30±4.30 b	1200.50±60.85 b	158.80±3.46 a	103.64±2.87 a	120.95±2.46 b	114.73±9.46 b	0.05±0.05b
13	288.46±19.3 2b	162.29±1.82 b	169.33±8.48 b	1175.35±22.01 b	154.28±0.69 ab	81.23±6.46b	117.38±6.91 b	241.34±4.43 a	26.32±1.50b
21	502.26±33.9 2a	212.27±2.43 a	351.59±9.38 a	1662.04±162.2 9a	136.85±8.68 b	49.93±5.28c	193.47±4.04 a	242.13±15.6 4a	70.151±1.50 b

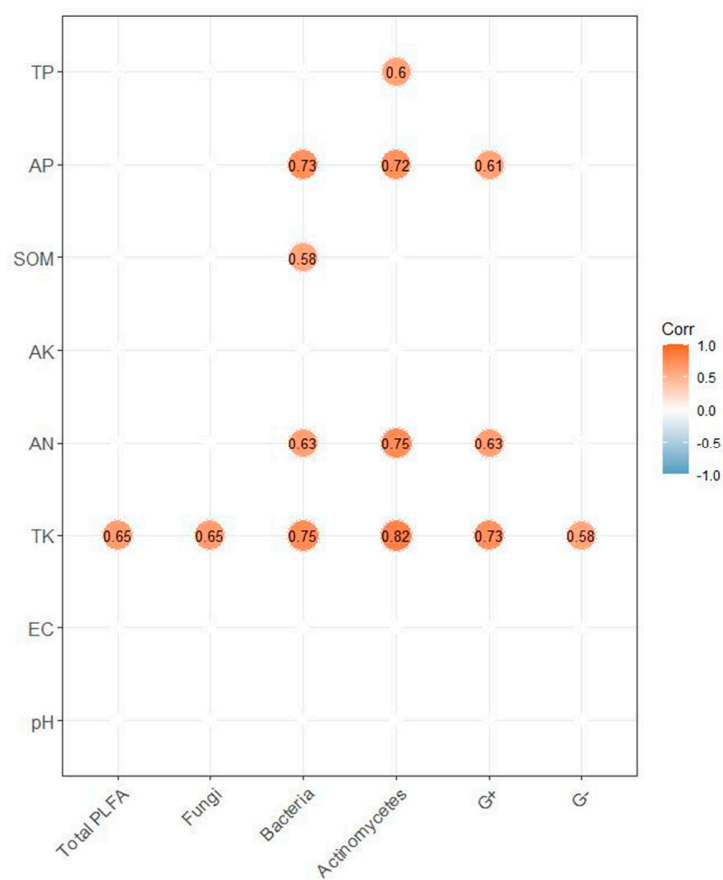
Continu- ous crop- ping rounds	Relative distribution of P (%)								
	Resin-P <sub>i</sub>	NaHCO <sub>3</sub> P <sub>i</sub>	NaOHP <sub>i</sub>	Dil. HCl-P <sub>i</sub>	Conc. HCl-P <sub>i</sub>	Residual-P <sub>i</sub>	NaHCO <sub>3</sub> P <sub>o</sub>	NaOHP <sub>o</sub>	Conc. HCl-P <sub>o</sub>
1	14.58±0.94a	7.60±0.08a	12.72±0.05a	37.59±1.57b	14.79±0.27a	1.89±0.18c	5.6±0.71a	4.35±0.47c	0.87±0.25ab
9	13.75±0.44a	5.89±0.33b	7.27±0.38c	51.64±1.25a	6.84±0.17b	4.46±0.01a	5.22±0.25a	4.97±0.54bc	0.00±0.00b
13	11.93±0.64a	6.72±0.17ab	7.00±0.25c	48.66±0.57a	6.39±0.13b	3.35±0.20b	4.87±0.32a	10.01±0.39a	1.07±0.45ab
21	14.75±1.22a	6.23±0.32b	10.29±0.27b	48.38±2.95a	4.03±0.40c	1.47±0.17c	5.68±0.34a	7.13±0.69b	2.04±0.14a

Different letters indicate significant difference among the treatments on  $p < 0.05$ .

**Table S5.** The relative distribution of P<sub>o</sub> after long-term continuous cropping.

Continuous crop- ping rounds	Relative distribution of P <sub>o</sub> (%)		
	NaHCO <sub>3</sub> P <sub>o</sub>	NaOHP <sub>o</sub>	CHCIP <sub>o</sub>
1	51.87±1.93a	40.32±0.57c	7.82±1.97ab
9	51.47±1.57a	48.51±1.57b	0.02±0.02c
13	30.49±1.83c	62.73±1.94a	6.78±2.83b
21	38.32±1.43b	47.78±1.84b	13.90±1.43a

Different letters indicate significant difference among the treatments on  $p < 0.05$ .



**Figure S1.** Pearson correlation analysis for PLFA and soil basic properties under long-term continuous cropping. EC, electrical conductivity; TP, total phosphorus; TK, total potassium; AN, available nitrogen; AP, available phosphorus; AK, available potassium; SOM, soil organic matter.