

Table S1. Initial factor loading matrix and eigenvectors

Indicator	Principal component			Eigenvectors		
	1	2	3	A1	A2	A3
X1	0.902	-0.184	0.294	0.478	0.085	0.144
X2	0.888	0.117	0.161	0.315	0.471	-0.258
X3	-0.838	0.358	0.159	0.212	-0.402	-0.441
X4	0.749	0.418	-0.19	0.008	0.577	0.344
X5	0.014	0.794	0.385	-0.451	0.260	0.142
X6	0.585	0.648	-0.289	0.403	0.304	-0.170
X7	0.393	-0.553	-0.493	0.486	-0.134	0.263
X8	0.29	-0.429	0.776	0.156	-0.312	0.694

Table S2. The main properties of biochar and compost.

	pH	Ash/ %	TC/ %	TN/ %	AP/ (g·kg ⁻¹)	AK/ (g·kg ⁻¹)
Rice husk biochar	9.41	13.5	46.3	0.6	21.31	2.54
Wood biochar	8.89	63.5	58.9	1.3	53.52	2.69
Compost	pH	SOM/%	TN/%	TP/%	TK/%	NPK/%
	8.5	82.3	1.71	4.28	0.86	6.85

Table S3. Effects of biochar-based fertilizers and species on soil nutrient contents

Treatments		CK	MF	RH2MF	RH4MF	W2MF	W4MF	Average (Species)
TN (g·kg ⁻¹)	W	1.46±0.36	1.51±0.14	1.72±0.47	1.53±0.01	1.49±0.14	1.43±0.06	1.52±0.10B
	S	1.62±0.07	1.59±0.09	1.6±0.07	1.54±0.02	1.55±0.06	1.45±0.17	1.56±0.06B
	L	1.33±0.16	1.28±0.15	1.45±0.2	1.39±0.12	1.35±0.25	1.45±0.25	1.37±0.07A
	Average	1.47±0.14a	1.46±0.17a	1.59±0.13a	1.49±0.09a	1.46±0.11a	1.44±0.01a	
AN (mg·kg ⁻¹)	W	106.41±0.61	121.84±3.89	112.44±2.66	114.35±3.53	120.24±6.37	111.73±2.02	114.50±3.73A
	S	100.14±8.54	123.03±8.69	111.01±4.59	116.39±4	117.41±1.99	111.81±2.27	113.63±8.29A
	L	106.92±3.96	117.82±4.97	108.46±6.48	120.27±6.89	118.31±7.6	113.07±2.56	114.14±3.55A
	Average	104.49±3.78a	121.56±3.61d	110.64±2.01b	117±3.01cd	118.65±1.44d	112.2±0.75bc	
TP (mg·kg ⁻¹)	W	240.89±8.67	298.42±12.9	326.56±28.23	310.59±7.41	268.25±43.33	227.28±16.83	278.67±39.70B
	S	222.57±36.73	269.61±21.67	343.98±46.61	310.54±56.84	224.78±28.58	252.87±10.79	271.06±48.98B
	L	200.95±221.47	228.84±263.63	276.37±316.3	323.14±313.42	253.15±248.73	214.33±231.5	249.80±43.78A
	Average	221.47±20a	263.63±34.96b	316.3±33.92c	313.42±8.42c	248.73±22.07ab	231.5±19.61a	
AP (mg·kg ⁻¹)	W	11.46±0.27	53.4±2	68.75±3.12	62.92±12.4	53.53±1.16	54.59±4.91	50.78±20.22A
	S	10.48±0.38	49.09±1.91	74.84±1.83	71.44±6.55	49.77±3.64	59.53±19.54	52.53±23.20A
	L	10.99±0.12	52.49±11.33	63.54±33.96	73.51±3.81	59.36±12.62	61.31±4.87	53.53±21.93A
	Average	10.98±0.49a	51.66±2.27b	69.04±3.66c	69.29±3.61c	54.22±4.83b	58.48±3.49bc	

TK (g·kg ⁻¹)	W	21.03±1.84	21.09±0.61	22.74±0.33	23.41±0.35	19±2.62	13.67±0.68	20.49±2.82B
	S	20.54±0.58	20.43±0.91	22.34±1.18	22.88±0.82	16.44±2.54	17.14±1.61	19.96±2.65B
	L	19.36±3.47	16.31±1.76	20.5±2.38	20.58±2.98	17.23±2.22	14.45±1.59	18.07±2.48A
	Average	20.31±0.86cd	19.28±2.59bc	21.86±1.19de	22.29±1.51e	17.56±1.31b	13.76±1.35a	
AK (mg·kg ⁻¹)	W	132.1±13.5	388.12±32.75	718.26±212.75	770.21±32.16	548.73±12.52	609.92±22.73	527.89±233.93A
	S	148.06±8.28	391.82±40.64	652.01±17.44	809.11±27.22	541.58±12.16	628.36±68.65	528.49±231.33A
	L	157.91±17.76	383.87±18.58	796.09±298.74	892.96±72.01	578.83±23.98	671.5±60.97	580.53±271.61A
	Average	146.02±13.03a	388.61±3b	722.12±72.12d	824.09±62.73e	556.38±19.77c	636.59±31.61cd	