

## Supplementary Material

**Table S1:** The heavy metal enrichment coefficient

Treatment	aboveground heavy metal enrichment coefficient			belowground heavy metal enrichment coefficient		
	Cr	Pb	Cd	Cr	Pb	Cd
CK	0.052±0.002a	0.135±0.011b	0.172±0.006a	0.172±0.006a	0.163±0.006b	0.075±0.004d
GFC0	0.038±0b	0.086±0.01b	0.095±0.003b	0.095±0.003b	0.101±0.011ab	0.188±0.012a
GFC2	0.031±0.002c	0.028±0.001b	0.064±0.007d	0.064±0.007d	0.038±0ab	0.176±0.014a
GFC4	0.03±0.001c	0.031±0.001b	0.08±0c	0.08±0c	0.04±0.002ab	0.143±0.001b
GFC8	0.028±0c	0.037±0.002ab	0.076±0.001c	0.076±0.001c	0.034±0.001a	0.114±0.004c

Notes: The values represent mean ± standard error. Different letters in the same column indicates significant differences ( $P < 0.05$ ).

**Table S2:** The heavy metal transfer coefficient

Treatment	Cr	Pb	Cd
CK	0.052±0.002a	0.135±0.011b	0.172±0.006a
GFC0	0.038±0b	0.086±0.01b	0.095±0.003b
GFC2	0.031±0.002c	0.028±0.001b	0.064±0.007d
GFC4	0.03±0.001c	0.031±0.001b	0.08±0c
GFC8	0.028±0c	0.037±0.002ab	0.076±0.001c

Notes: The values represent mean ± standard error. Different letters in the same column indicates significant differences ( $P < 0.05$ ).

**Table S3:** Effects of various matrix treatments on the total nutrient and organic matter content of the matrix.

Treatment	Total nitrogen		Total phosphorus		Total potassium		Organic matter	
	g/kg	g/kg	g/kg	g/kg	g/kg	g/kg	g/kg	g/kg
CK	8.367±0.029a		2.664±0.177c		18.389±0.199a		8.923±0.229d	
GFC0	8.74±0.017a		3.504±0.101bc		14.86±0.115b		9.075±0.253d	
GFC2	4.55±0.05b		5.366±0.173a		13.593±0.003c		10.151±0.114c	
GFC4	7.75±0.103a		4.633±0.091ab		14.793±0b		11.504±0.073b	
GFC8	7.383±0.104a		4.213±0.003ab		11.33±0.229d		13.933±0.227a	

Notes: The values represent mean ± standard error. Different letters in the same column indicates significant differences ( $P < 0.05$ ).

**Table S4:** Effects of various matrix treatments on the available nutrients, matrix pH, and EC of the content of the matrix.

Treatment	Available Nitrogen		Available phosphorus		Available potassium		pH	EC ms/cm
	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg		
CK	105.5±3.606b		61.997±2.07b		124.385±1.288c		6.817±0.164c	1.771±0.015c
GFC0	85.667±5.008d		72.28±3.257a		224.013±0b		7.433±0.025b	2.068±0.074abc
GFC2	94.667±3.329c		70.252±0.36ab		224.013±0b		7.457±0.029b	2.497±0.062a
GFC4	127.467±5.273a		53.148±3.139c		224.013±0b		7.543±0.051ab	2.265±0.094ab

GFC8	66.633±0.231e	67.073±3.385ab	321.782±2.951a	7.633±0.04a	1.9±0.062bc
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Notes: The values represent mean ± standard error. Different letters in the same column indicates significant differences ( $P < 0.05$ ).

**Table S5:** Contents of heavy metals in different parts of the cucumber seedlings.

Treatment	aboveground			belowground		
	Cr mg/kg	Pb mg/kg	Cd mg/kg	Cr mg/kg	Pb mg/kg	Cd mg/kg
CK	3.814±0.235bc	3.47±0.091b	0.163±0.007a	12.528±0.707a	4.193±0.071c	0.352±0.007d
GFC0	3.915±0.018ab	3.821±0.077a	0.075±0c	9.796±0.278c	4.463±0.071b	1.061±0.058a
GFC2	3.577±0.024c	3.508±0.183b	0.112±0.007b	7.32±0.37d	4.764±0.071a	1.126±0.007a
GFC4	4.021±0.112ab	3.261±0.025b	0.108±0.007b	10.695±0.032bc	4.219±0.071c	0.839±0.014b
GFC8	4.164±0.007a	3.542±0.145ab	0.117±0.007b	11.233±0b	3.271±0.073d	0.712±0.014c

Notes: The values represent mean ± standard error. Different letters in the same column indicates significant differences ( $P < 0.05$ ).

**Table S6:** Contents of heavy metals in substrates.

Treatment	Cr mg/kg	Pb mg/kg	Cd mg/kg
CK	73.035±1.61e	25.693±1.424e	4.735±0.18c
GFC0	102.694±0.052d	44.53±4.028d	5.647±0.06b
GFC2	115.111±6.555c	123.905±2.659a	6.407±0.55a
GFC4	134.354±0.039b	104.779±2.826b	5.873±0.078ab
GFC8	148.348±1.306a	96.019±0.271c	6.259±0.122ab

Notes: The values represent mean ± standard error. Different letters in the same column indicates significant differences ( $P < 0.05$ ).