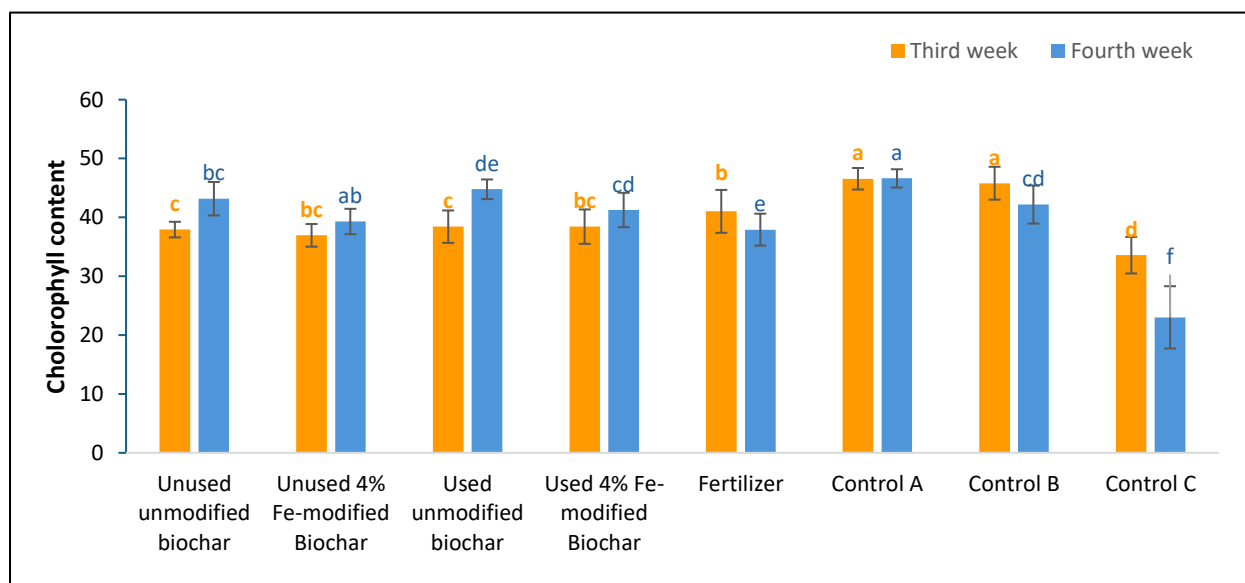


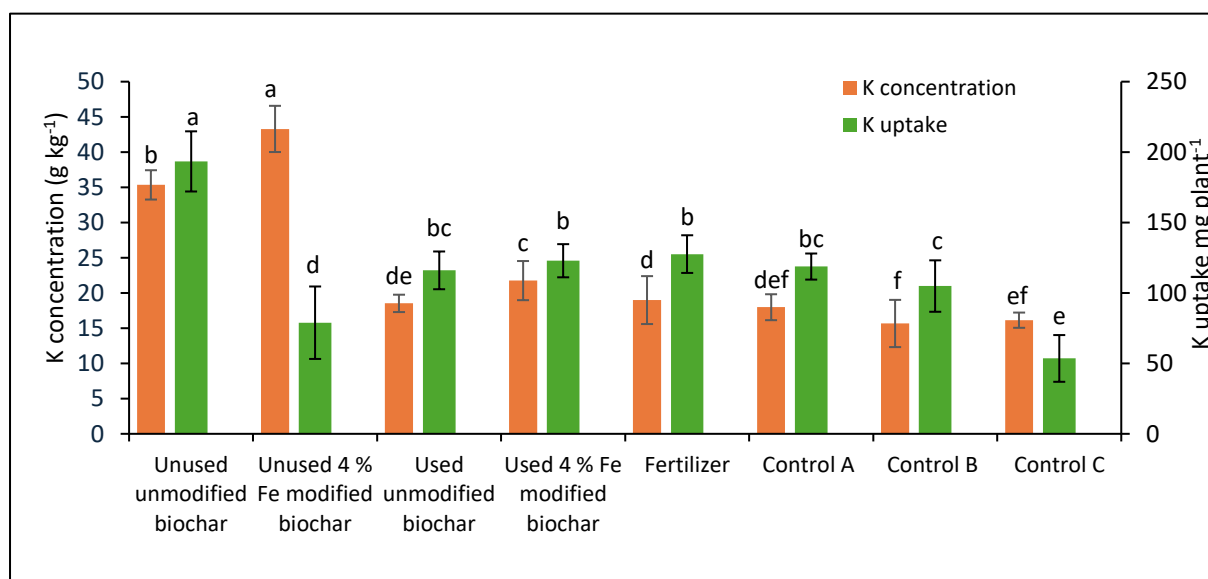
## Supporting Information Figures

### Availability of Recycled Nutrients on Biochar Reacted with Wastewater for Plant Growth

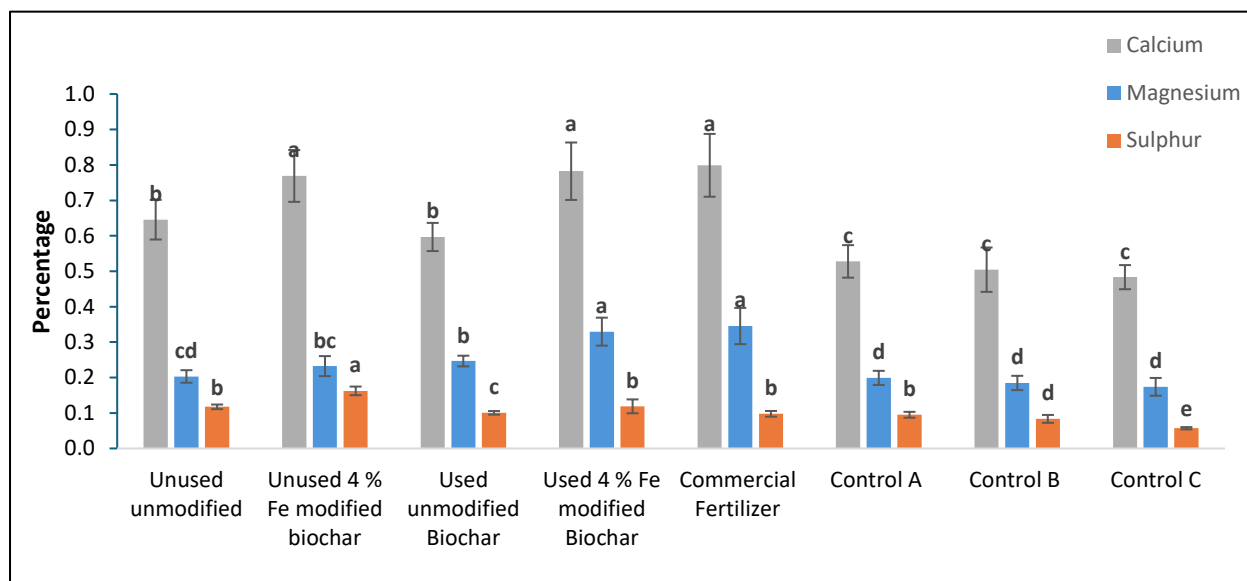
Kavya Laxmisagara Sagar, Daniel Strawn, Alex Crump, Martin Baker, Gregory Möller



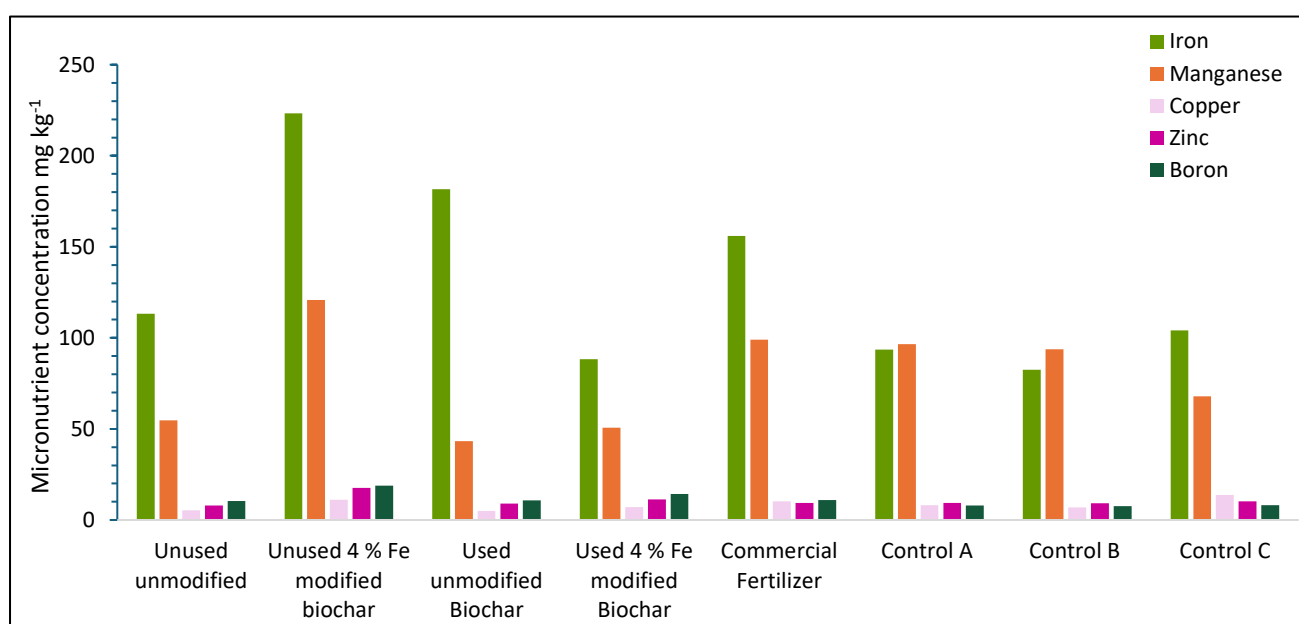
**Figure S1.** The effects of biochar and fertilizer treatment on SPAD chlorophyll content. Columns marked by different letters are significantly different ( $p = 0.05$ ). Error bars are standard deviations.



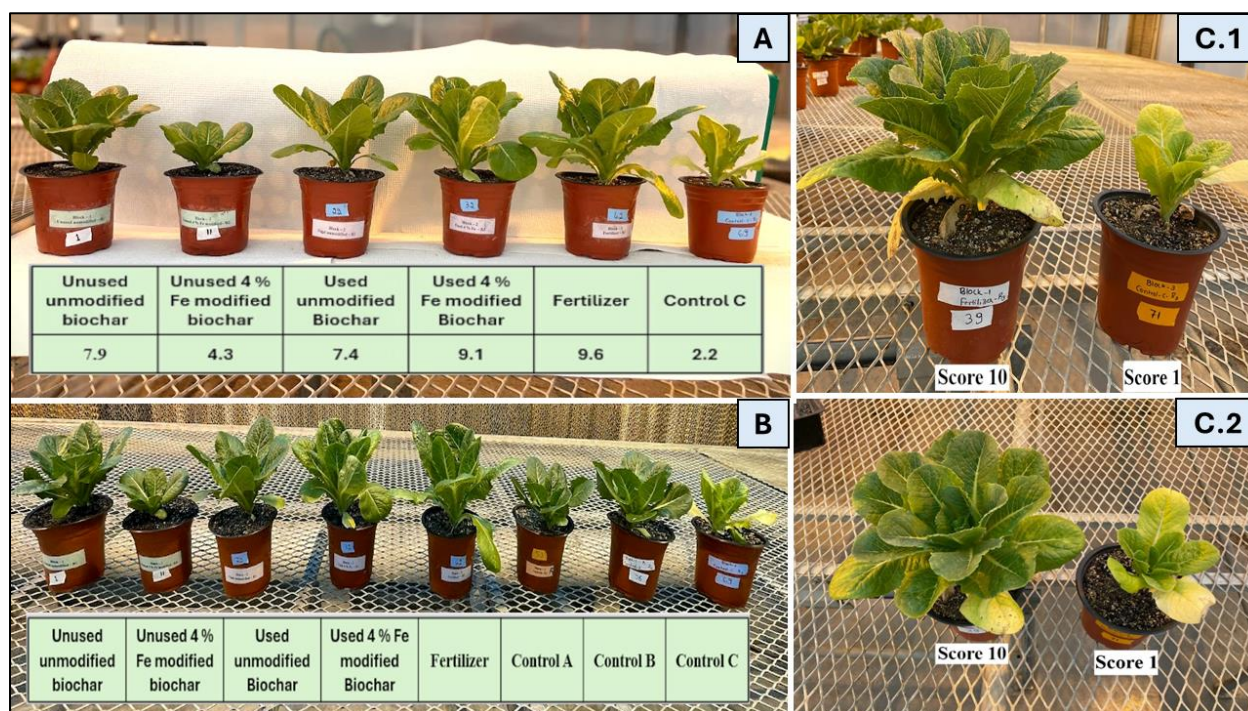
**Figure S2.** The effect of biochar treatments on potassium uptake in lettuce shoots. Columns marked by different letters are significantly different ( $p = 0.05$ ). Error bars are standard deviations.



**Figure S3.** The impact of biochar treatments on the secondary nutrient percentage content of lettuce Columns marked by different letters are significantly different ( $p = 0.05$ ). Error bars are standard deviations.



**Figure S4.** The impact of biochar treatments on the concentration of micronutrients in lettuce shoots.



**Figure S5.** Effects of biochar treatments on lettuce growth at the maturity stage. (A) Biochar treatment names and respective plants, along with their mean scores at the maturity stage of lettuce. (B) The growth of lettuce plants in response to biochar treatments on the harvest date. (C.1) and (C.2) represent the highest and lowest visual scores, based on the overall growth and health of the plants. For clarity, the brightness of the photos was adjusted, and the images were cropped.

## Supplemental Information Tables

### Availability of Recycled Nutrients on Biochar Reacted with Wastewater for Plant Growth

Kavya Laxmisagara Sagar, Daniel Strawn, Alex Crump, Martin Baker, Gregory Möller

**Table S1.** Selected properties of Blacklite Pure biochar form Pacific Biochar Inc. (Santa Rosa, CA,USA).\*

Property	Value	Unit
Bulk density	98.0	kg/m <sup>3</sup> (dry)
Particle size	<0.635	cm
EC	0.022	S/m
Liming potential	5.7	% CaCO <sub>3</sub> equivalent
Carbon content	>85	% by weight
Ash content	4-8	% by weight
pH	8.13	
H:C	0.2	

\*Properties are from Pacific Biochar website: <https://pacificbiochar.com/products/>

**Table S2.** Soil treatments used for lettuce growth trials. P added in biochar treatments was all from the biochar amendments. In biochar treatments, total N added was from biochar and urea fertilizer.

Treatment	Description	Greenhouse Soil Amendments		
		Biochar (g pot <sup>-1</sup> )	Total P (g pot <sup>-1</sup> )	Total N (g pot <sup>-1</sup> )
Used Fe-modified biochar	Fe-modified biochar was used as a filter aid at a municipal WWTP	27.25	0.043	0.066
Used unmodified biochar	Unmodified biochar was used as a filter aid at a municipal WWTP	27.25	0.025	0.066
Fertilizer	100% lettuce N and P requirements added from inorganic fertilizer <sup>1,2</sup>	0	0.043	0.066
Unused unmodified biochar	Biochar was used as received	27.25	0.022	0.066
Unused Fe-modified biochar	Fe-modified biochar was not used as a filter aid	27.25	0.021	0.066
Control A	N fertilizer <sup>1</sup> added in 3 aliquots	0	0	0.066
Control B	N fertilizer <sup>1</sup> was added in 1 aliquot	0	0	0.066
Control C	Nothing added to the soil	0	0	0

<sup>1</sup> N from urea fertilizer.

<sup>2</sup> P from triple super phosphate fertilizer.

**Table S3.** Soil pH and EC. Different letters in post-harvest soils are significantly different ( $p = 0.05$ ).

Soil Treatments	pH	Std. dev.	EC (mS/cm)	Std. Dev.
<b>Pre-plant soil</b>				
Unused unmodified biochar	7.28	0.02	756	24.9
Unused 4 % Fe modified biochar	6.11	0.04	898	8.3
Used unmodified biochar	6.82	0.02	631	26.6
Used 4 % Fe modified	6.54	0.02	491	13.6
Fertilizer	6.04	0.01	491	14.3
Control A, B, and C	6.1	0.03	453	9.4
<b>Post harvest soils</b>				
Unused unmodified	7.85 <sup>a</sup>	0.131	136 <sup>a</sup>	51.2
Unused 4 % Fe modified	7.06 <sup>d</sup>	0.110	132 <sup>a</sup>	56.4
Used unmodified	7.59 <sup>b</sup>	0.149	79 <sup>b</sup>	22.3
Used 4 % Fe modified	7.55 <sup>b</sup>	0.110	46 <sup>c</sup>	11.7
Fertilizer	7.32 <sup>c</sup>	0.082	44 <sup>c</sup>	5.7
Control A	7.42 <sup>c</sup>	0.121	62 <sup>bc</sup>	26.5
Control B	7.60 <sup>b</sup>	0.093	48 <sup>c</sup>	14.9
Control C	7.62 <sup>b</sup>	0.077	39 <sup>c</sup>	4.4

**Table S4.** Visual scoring of plant overall quality on a scale of 1 to 10

Treatments	Scoring	Std. Dev
Unused unmodified	7.94	0.28
Unused 4 % Fe-modified	4.33	0.71
Used unmodified	7.39	0.57
Used 4 % Fe-modified	9.05	0.44
Fertilizer	9.61	0.46
Control A	6.72	0.53
Control B	6.67	0.53
Control C	2.22	0.82