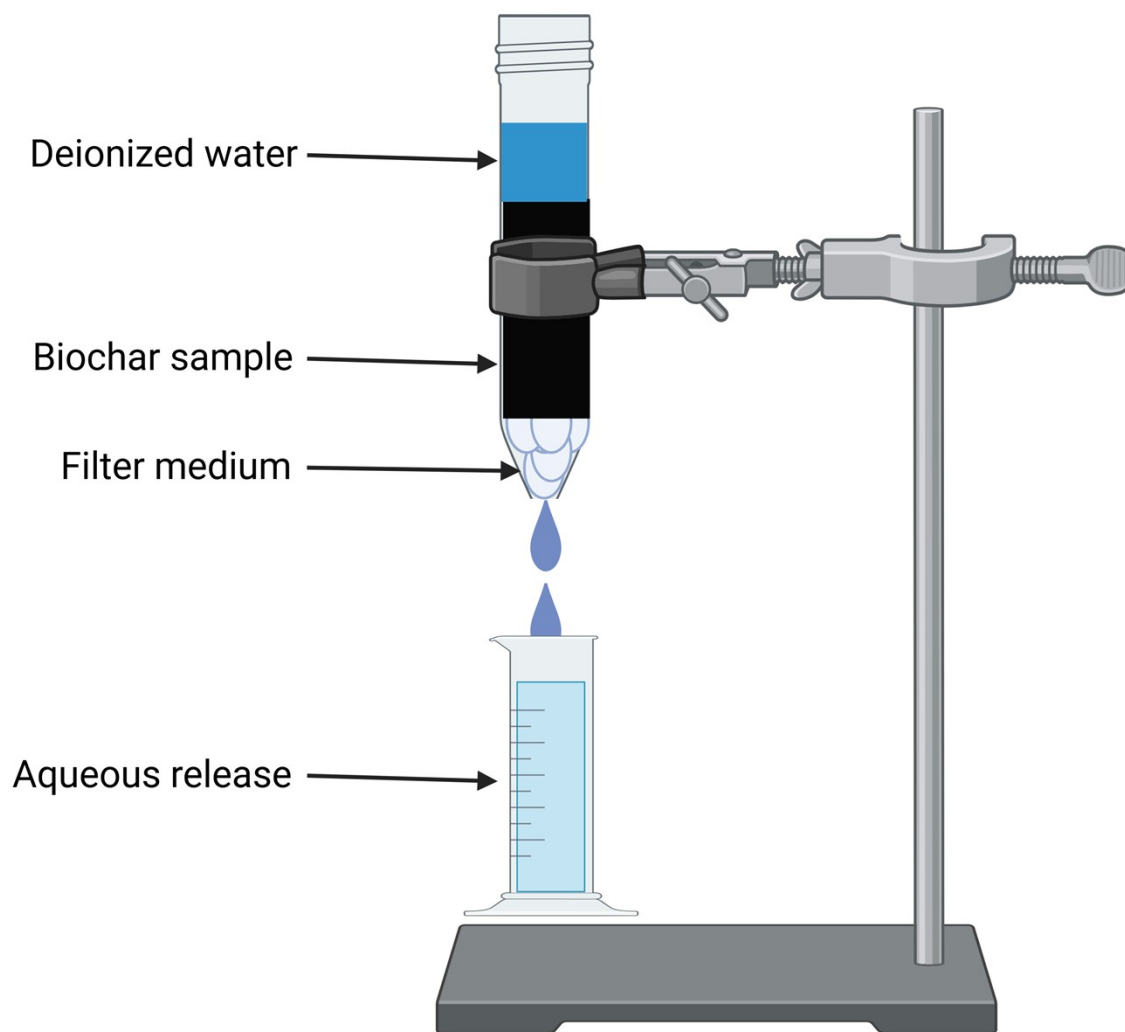


Supplementary data 1



Set up for BC aqueous nutrient release experiments

Supplementary data 2

Preparation of standard nitrate (NO_3^-) and ammonium (NH_4^+) solutions from ammonium nitrate (NH_4NO_3) salt.

1 mole of NH_4NO_3 has a molar mass of **80.043g/mol**

Therefore:

80.043g of NH_4NO_3 contains **17.994g** of NH_4^+ and **62.049g** of NO_3^- .

To prepare a standard solution of NO_3^-

62.049g of NO_3^- will be in **80.043g** of NH_4NO_3

1g of NO_3^- will be in 1.29g of NH_4NO_3

0.1g (ie 100mg) of NO_3^- will be in 0.129g of NH_4NO_3

Hence to prepare **100mg/L** of NO_3^- solution, weigh **0.129g** of NH_4NO_3 salt and dissolve in 1 liter (**1,000ml**) de-ionized water.

(Note: to prepare 100mg/L in **100ml** of de-ionized water, then weigh **0.0129g** of NH_4NO_3).

Then, from this stock standard NO_3^- solution, **1:10** and **1:100** dilutions can be made to prepare solutions of **10mg/L** and **1mg/L** respectively.

To prepare a standard solution of NH_4^+

17.994g of NH_4^+ will be in **80.043g** of NH_4NO_3

1g of NH_4^+ will be in 4.448g of NH_4NO_3

0.1g (ie 100mg) of NH_4^+ will be in 0.4448g of NH_4NO_3

Hence to prepare **100mg/L** of NH_4^+ solution, weigh **0.4448g** of NH_4NO_3 salt and dissolve in 1 liter (**1,000ml**) de-ionized water.

(Note: to prepare 100mg/L in **100ml** of de-ionized water, then weigh **0.04448g** of NH_4NO_3).

Then, from this stock standard NH_4^+ solution, **1:5** dilution can be made to prepare a solution of **20mg/L**.

Supplementary data 3

Table showing statistical analysis of nutrient concentrations (ppm) in leachate samples ($\alpha=0.05$)

	Day 1	Day 2	Day 3	Day 4	Day 5	5-day Total
Sample	<i>ammonium-nitrogen concentrations</i>					
A1	14227±213 ^{a,b,A}	298±27 ^{a,B}	153±10 ^{a,B}	134±5 ^{a,B}	82±2 ^{a,B}	14,894
B1	14937 ±620 ^{b,A}	257±63 ^{b,B}	153±12 ^{a,B}	133±5 ^{a,B}	78±2 ^{a,b,B}	15,558
C1	11483±242 ^{a,c,A}	269±4 ^{b,B}	147±13 ^{a,B}	114±12 ^{a,b,B}	69±0 ^{b,B}	12,082
A2	10250±404 ^{c,A}	316±11 ^{a,B}	191±9 ^{b,B}	121±5 ^{a,B}	90±8 ^{a,B}	10,968
B2	23110±471 ^{d,A}	292±69 ^{b,B}	161±16 ^{b,c,B}	94±3 ^{b,c,B}	53±4 ^{c,B}	23,710
C2	25073±2712 ^{d,A}	351±69 ^{a,B}	159±10 ^{b,c,B}	92±9 ^{c,B}	51±2 ^{c,B}	25,726
Ctrl	15±2 ^{c,A}	10±1 ^{c,B}	6±1 ^{d,C}	5±0 ^{d,C}	4±1 ^{d,C}	40
Samples	<i>nitrate-nitrogen concentrations</i>					
A1	7347±163 ^{a,A}	322±24 ^{a,B}	274±2 ^{a,B}	207±2 ^{a,B}	161±6 ^{a,B}	8,311
B1	8503±185 ^{b,A}	238±9 ^{b,B}	243±18 ^{a,b,B}	208±22 ^{a,B}	171±11 ^{a,B}	9,363
C1	7173±41 ^{a,A}	257±17 ^{b,B}	259±13 ^{a,B}	199±21 ^{a,B}	187±18 ^{a,B}	8,075
A2	4685±101 ^{c,A}	330±3 ^{a,B}	314±6 ^{c,B}	265±7 ^{b,B}	223±7 ^{b,B}	5,817
B2	11355± 292 ^{d,A}	305±16 ^{a,B}	215±20 ^{b,d,B}	189±20 ^{a,B}	164±12 ^{a,B}	12,228
C2	11143±72 ^{d,A}	408±11 ^{c,B}	197±5 ^{d,C}	174±9 ^{a,C}	159±4 ^{a,C}	12,081
Ctrl	701±20 ^{c,A}	30±4 ^{d,B}	36±5 ^{e,B}	52±7 ^{c,B,C}	80±4 ^{c,C}	899
Samples	<i>phosphorus concentrations</i>					
A1	28.15±4.94 ^{d,e,C}	38.83±0.4 ^{e,D}	20.36±0.51 ^{d,B}	13.97±0.36 ^{d,A,B}	8.61±0.22 ^{d,A}	109.92
B1	20.45±2.49 ^{c,d,C}	35.17±0.46 ^{d,D}	19.76±0.51 ^{d,C}	13.82±0.32 ^{d,B}	8.47±0.24 ^{d,A}	97.67
C1	30.03±0.95 ^{d,e,D}	34.47±0.47 ^{d,E}	20.18±1.12 ^{d,C}	13.37±0.03 ^{d,B}	9.00±0.47 ^{d,A}	107.05
A2	32.06±0.24 ^{e,D}	44.15±0.55 ^{f,E}	29.40±0.36 ^{e,C}	17.94±0.17 ^{e,B}	11.75±0.16 ^{e,A}	135.3

B2	17.97±4.95 ^{b,c,B}	25.33±0.12 ^{c,C}	16.93±0.86 ^{c,B}	9.44±0.66 ^{c,A}	5.42±0.47 ^{c,A}	75.09
C2	9.90±3.20 ^{b,B,C}	17.75±0.26 ^{b,D}	12.6±0.68 ^{b,C}	7.07±0.46 ^{b,A,B}	3.98±0.25 ^{b,A}	51.3
Ctrl	0.36±0.03 ^{a,B}	0.26±0.12 ^{a,A,B}	0.22±0.01 ^{a,A,B}	0.16±0.01 ^{a,A}	0.15±0.0 ^{a,A}	1.15
Samples	<i>potassium concentrations</i>					
A1	6994±200 ^{e,C}	452±10 ^{b,B}	245±3 ^{b,A,B}	196±2 ^{c,A,B}	141±1 ^{d,A}	8028
B1	6258±246 ^{d,B}	462±8 ^{b,A}	237±3 ^{b,A}	189±2 ^{c,A}	133±1 ^{c,A}	7279
C1	4941±180 ^{b,C}	441±5 ^{b,B}	257±12 ^{b,A,B}	199±1 ^{c,A,B}	144±1 ^{d,A}	5982
A2	5222±97 ^{b,c,D}	484±3 ^{b,C}	298±1 ^{c,B}	213±2 ^{d,A,B}	154±1 ^{e,A}	6371
B2	5484±62 ^{c,D}	453±47 ^{b,C}	240±10 ^{b,B}	154±6 ^{b,A,B}	102±5 ^{b,A}	6433
C2	5519±231 ^{c,C}	470±61 ^{b,B}	242±9 ^{b,A,B}	155±5 ^{b,A,B}	101±3 ^{b,A}	6487
Ctrl	15±2 ^{a,C}	8±0 ^{a,B}	5±0 ^{a,A,B}	4±0 ^{a,A}	3±0 ^{a,A}	35

Note 1: For daily leachate values across each column, no significant difference with values with same lower-case superscripts ($\alpha=0.05$)

Note 2: For each sample across each row, no significant difference with values with same UPPER-CASE superscripts ($\alpha=0.05$)

Legend:

A1: leachates from soil amended with leaf BC pyrolyzed for 30 min residence time

B1: leachates from soil amended with leaf BC pyrolyzed for 45 min residence time

C1: leachates from soil amended with leaf BC pyrolyzed for 60 min residence time

A2: leachates from soil amended with stem BC pyrolyzed for 30 min residence time

B2: leachates from soil amended with stem BC pyrolyzed for 45 min residence time

C2: leachates from soil amended with stem BC pyrolyzed for 60 min residence time

Ctrl: leachates from soil without BC amendment (control)