Supplementary materials

2_{III}^{5-2} fractional factorial design

Table S1. Control factors and level settings for substratum optimization.

	Control factor	Low (-1)	High (+1)
A	Peat	Black peat	White peat
B	Other organics	Coir pith	Wood fiber
C	Composted materials	Composted bark	Green waste compost
D	Inorganic materials	Perlite	Sand
E	Arabic gum ($kg.m^{-3}$)	1	5
F	Inoculum	C	S1–5

Table S2. The 2_{III}^{5-2} fractional factorial design extended with a sixth control factor F, bacterial community inoculums S1–5 compared to negative control C. The basic 2_{III}^{5-2} fractional factorial design is highlighted in gray.

Treatment	Control factors					
	A	**B**	**C**	**D**	**E**	**F**
S-M1	1	-1	-1	-1	-1	1
S-M3	-1	-1	-1	1	1	1
S-M4	1	-1	1	-1	1	1
S-M5	1	1	-1	1	-1	1
S-M7	-1	1	-1	-1	1	1
S-M8	-1	-1	1	1	-1	1
S-M9	1	1	1	1	1	1
S-M10	-1	1	1	-1	-1	1
C-M1	1	-1	-1	-1	-1	-1
C-M3	-1	-1	-1	1	1	-1
C-M4	1	-1	1	-1	1	-1
C-M5	1	1	-1	1	-1	-1
C-M7	-1	1	-1	-1	1	-1
C-M8	-1	-1	1	1	-1	-1
C-M9	1	1	1	1	1	-1
C-M10	-1	1	1	-1	-1	-1

Physicochemical properties of substrata

Table S3. Physicochemical properties of the experimental substrata (M1–10) and the commercial substratum (control M). Chemical properties: pH, EC ($\mu S.cm^{-1}$) and NO_3^-, NH_4^+, P_2O_5, K^+, Ca^{2+}, Mg^{2+}, SO_4^{2-}, Na^+, Cl^-, Fe^{2+}, and Mn^{2+} concentrations ($mg.L^{-1}$ substratum). Physical properties: dry matter content (DM; % FW), organic matter content (OM; % DW), ash content (% DW), bulk density (ρ_b; $g.L^{-1}$), shrinkage (% v/v), water capacity (WC; g.(100 g dry matter)$^{-1}$), air volume at water saturation point (V_a; % v/v), water volume at water saturation point (V_w; % v/v), total pore volume (TPV; % v/v), and water-filled porosity at water saturation point (WFP; % v/v). Letters show comparison of means per property. bdl = below detection limit.

Chemical	M1	M2	M3	M4	M5	M6	M7	M8	M9	M10	Control M
pH	6.62g ± 0.04	6.23d ± 0.02	5.94c ± 0.02	6.31de ± 0.03	6.52fg ± 0.06	6.40ef ± 0.17	5.73b ± 0.05	5.54a ± 0.03	6.29de ± 0.04	5.73b ± 0.01	5.88bc ± 0
EC	51.53a ± 1.95	72.43ab ± 9.87	207e ± 10.15	130.33c ± 3.06	51.47a ± 1.42	76.87b ± 6.52	193.33e ± 6.11	275.33f ± 9.71	170d ± 10.39	268f ± 6.24	310g ± 11.27
NO_3^-	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl	41.81 ± 5.87
NH_4^+	1.89a ± 1.81	1.50a ± 1.17	1.53a ± 0.63	0.47a ± 0.08	0.75a ± 0.05	0.75a ± 0.24	1.32a ± 0.08	1.30a ± 0.16	0.83a ± 0.44	1.27a ± 0.31	49.02b ± 1.40
P_2O_5	12.75abc ± 2.04	22.47cd ± 4.17	5a ± 0.71	46.65e ± 8.31	19.72bcd ± 2.01	20.25bcd ± 3.30	8.17ab ± 3.08	19.13bcd ± 1.95	56.85e ± 7.82	26.3d ± 4.58	51.88e ± 0.45
K^+	86.88ab ± 0.93	110.85bc ± 8.30	103abc ± 10.01	271.57e ± 12.77	84.72a ± 3.53	122.62c ± 3.53	94.5ab ± 5.77	255.83e ± 5.67	335.53f ± 15.37	281.75e ± 14.40	220.48d ± 2.64
Ca^{2+}	1113.5a ± 32.63	1016.8a ± 35.48	1700.62b ± 219.95	1191.22a ± 153.94	981.07a ± 49.34	1148.72a ± 38.03	1617.18b ± 48.74	1529.57b ± 43.71	1191.1a ± 74.55	1648.12b ± 111.69	1687.90b ± 35.53
Mg^{2+}	200.28b ± 6.35	206.33b ± 7.85	268.58d ± 29.42	223.62bc ± 11.34	203.65b ± 6.33	223.52bc ± 6.52	252.35cd ± 6.08	199.03b ± 7.98	230.30bc ± 10.32	235.17bcd ± 18.90	132.37a ± 2.03
SO_4^{2-}	94.73a ± 2.12	155.17ab ± 51.85	367.93c ± 30.36	177.33b ± 1.72	131.03ab ± 23.44	149.60ab ± 12.18	371.30c ± 16.23	376.57c ± 5.71	192.53b ± 19.81	389.10c ± 17.50	181.70b ± 6.66
Na^+	30.43a ± 0.45	29.30a ± 1.56	35.95ab ± 5.19	44.78c ± 1.63	28.95a ± 3.13	30.57a ± 0.40	35.78ab ± 4.03	40.02bc ± 3.06	46.72c ± 4.21	48.37c ± 2.23	42.77bc ± 0.98
Cl^-	36.23ab ± 2.03	42.27b ± 8.18	37.57ab ± 3.71	99.47e ± 2.08	43.30b ± 5.14	44.53b ± 5.65	27.23a ± 2.25	84.83d ± 1.14	115.37f ± 3.93	89.33de ± 0.76	64.40c ± 1.31

Fe^{2+}	0.75bc ± 0.09	1.05cd ± 0.09	0.35a ± 0.05	1.08cd ± 0.08	0.90cd ± 0	1.13d ± 0.16	0.38a ± 0.03	0.32a ± 0.08	1.70e ± 0.26	0.52ab ± 0.18	1.07cd ± 0.08
Mn^{2+}	5.53bcd ± 0.08	10.33h ± 0.55	5.27bc ± 0.95	5.02bc ± 0.38	9.03gh ± 0.31	6.23cde ± 0.10	8.43fg ± 0.28	4.72b ± 0.43	7.40ef ± 0.30	6.72de ± 0.88	2.40a ± 0
Physical											
DM	38b ± 0	50cde ± 0	46.67bcd ± 0.58	41.33bc ± 0.58	66.67f ± 0.58	58ef ± 0	38b ± 0	52.33de ± 10.12	65f ± 0	40.67b ± 0.58	22.33a ± 0.58
OM	81.67ef ± 1.15	82ef ± 1.73	45bc ± 1.73	64d ± 1	33.33a ± 0.58	37ab ± 1.73	78.33e ± 0.58	47.33c ± 9.24	30a ± 1.73	65.67d ± 1.53	90f ± 0
Ash	18.33ab ± 1.15	18ab ± 1.73	55de ± 1.73	36c ± 1	66.67f ± 0.58	63ef ± 1.73	21.67b ± 0.58	52.67d ± 9.24	70f ± 1.73	34.33c ± 1.53	10a ± 0
ϱ_b	93.33a ± 1.15	95.33ab ± 1.53	274.33g ± 1.15	106.67b ± 3.51	222e ± 3.46	214e ± 1.73	159c ± 1	279.67g ± 1.53	250.67f ± 11.37	183d ± 1.73	99.33ab ± 0.58
Shrinkage	25.33ab ± 0.58	24.67a ± 3.79	32c ± 0	29.33abc ± 3.06	24a ± 3.46	27.67abc ± 2.31	28abc ± 1.73	31.33bc ± 1.15	29abc ± 1	26abc ± 1.73	27.33abc ± 1.53
WC	769.33g ± 13.58	714f ± 16.52	267a ± 1	673e ± 14.93	315.33b ± 2.31	327b ± 1.73	463.33d ± 9.81	257.67a ± 4.04	267a ± 9.54	402.33c ± 3.79	805h ± 4.36
V_a	22.67f ± 0.58	26.33g ± 1.53	13a ± 0	22ef ± 1	19.33cd ± 0.58	20de ± 0	17bc ± 1	13.33a ± 0.58	21.33def ± 1.53	16b ± 0	11.33a ± 0.58
V_w	72cd ± 0	68ab ± 1.73	73.33d ± 0.58	72cd ± 1	69.67abc ± 0.58	70bc ± 0	73.67d ± 1.53	72.33cd ± 0.58	67a ± 1	74d ± 0	83e ± 1
TPV	94d ± 0	94d ± 0	86a ± 0	94d ± 0	89.33bc ± 0.58	90c ± 0	90c ± 0	85.67a ± 0.58	88.33b ± 0.58	89.67c ± 0.58	95d ± 0
WFP	76.60b ± 0	72.34a ± 1.84	85.27de ± 0.67	76.60b ± 1.06	77.99b ± 1.15	77.78b ± 0	81.85c ± 1.70	84.44cde ± 0.63	75.85b ± 1.58	82.53cd ± 0.53	87.37e ± 1.05

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Effect of bacterial community inoculum and substratum on shoot fresh weight

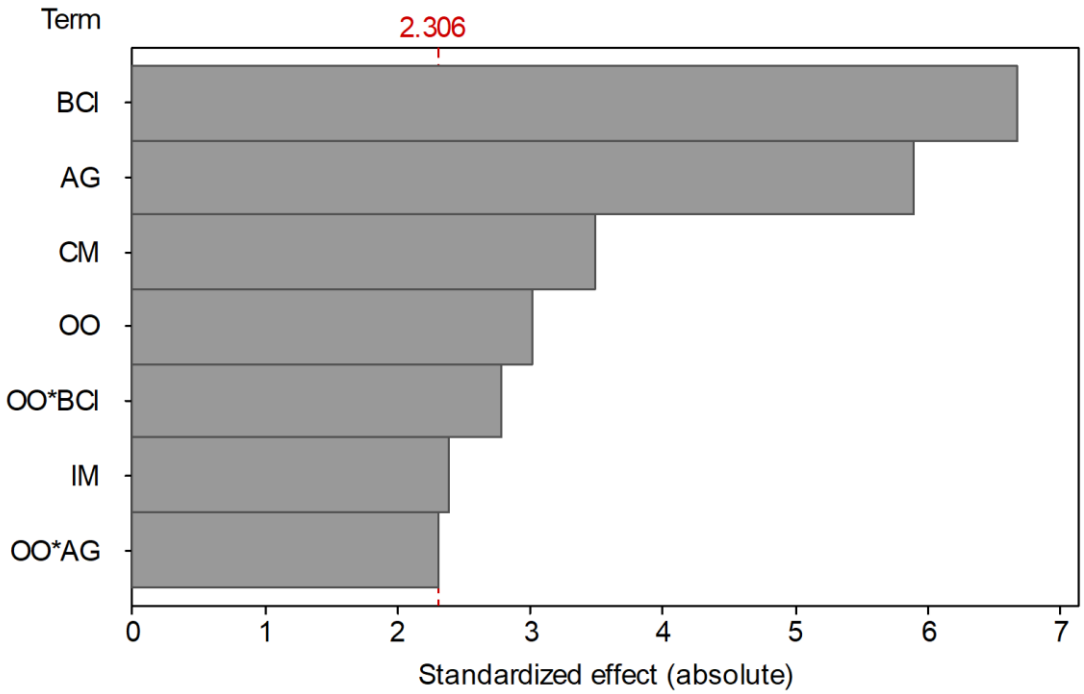


Figure S1. Pareto chart of the standardized effect (absolute) of the significant terms on shoot fresh weight (FW) under BCI S3 treatment. Terms are ordered from the largest to the smallest effect: BCI S3, Arabic gum (AG), composted materials (CM), Other organics (OO), OO*BCI interaction effect, inorganic materials (IM), and OO*AG interaction effect. The dashed reference line indicates the statistical significance of effects. Significance at $P < 0.05$.

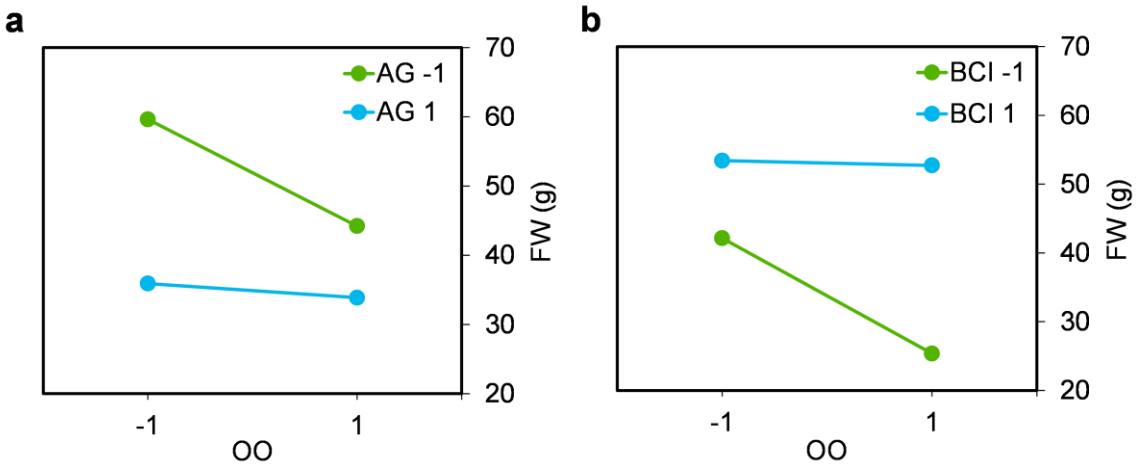
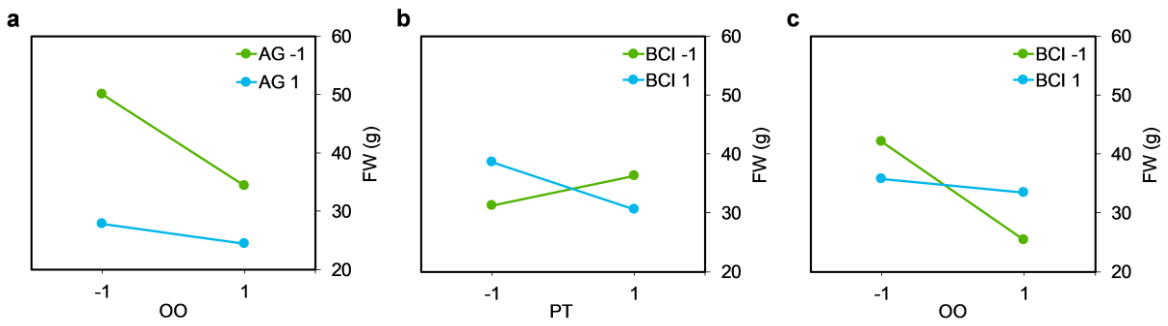


Figure S2. Interaction effects between substratum raw material groups on shoot fresh weight (FW; g) under BCI S3 treatment. (a) Other organics (OO; -1 = coir pith and 1 = wood fiber) and Arabic gum (AG; -1 = 1 $kg.m^{-3}$ and 1 = 5 $kg.m^{-3}$) ($P = 0.049$); (b) Other organics and BCI (-1 = C and 1 = S3) ($P = 0.024$).



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29 **Figure S3.** Interaction effects between substratum raw material groups on shoot fresh weight (FW; g)
30 under BCI S5 treatment. (a) Other organics (OO; -1 = coir pith and 1 = wood fiber) and Arabic gum
31 (AG; -1 = 1 kg.m^{-3} and 1 = 5 kg.m^{-3}) (P = 0.021); (b) Peat (PT; -1 = black peat and 1 = white peat) and
32 BCI (-1 = C and 1 = S5) (P = 0.016); (c) Other organics and BCI (P = 0.011).

33 **Table S4.** Shoot fresh weight (FW; g) response optimization under each BCI treatment. Peat (PT; -1 =
34 black peat and 1 = white peat), other organics (OO; -1 = coir pith and 1 = wood fiber), composted
35 materials (CM; -1 = composted bark and 1 = green waste compost), inorganic materials (IM; -1 = perlite
36 and 1 = sand), Arabic gum (AG; -1 = 1 kg.m^{-3} and 1 = 5 kg.m^{-3}), and bacterial inoculum (BCI; -1 = C and
37 1 = S1–5 or PGPR).

BCI	Goal	Solution	Fit	SE fit	95 % CI
PGPR	Max FW	BCI -1	33.76	4.43	(24.26; 43.26)
S1	Max FW	OO -1; CM 1; AG -1	51.83	4.02	(43.07; 60.59)
S2	Max FW	OO -1; CM 1; AG -1	47.74	4.73	(37.44; 58.04)
S3	Max FW	OO -1; CM 1; IM -1; AG -1; BCI 1	73.78	4.09	(64.35; 83.21)
S4	Max FW	CM 1; AG -1	50.10	4.06	(41.32; 58.88)
S5	Max FW	PT 1; OO -1; CM 1; IM -1; AG -1; BCI -1	64.67	3.12	(57.03; 72.31)

38

Effect of bacterial community inoculum and substratum on lettuce head area

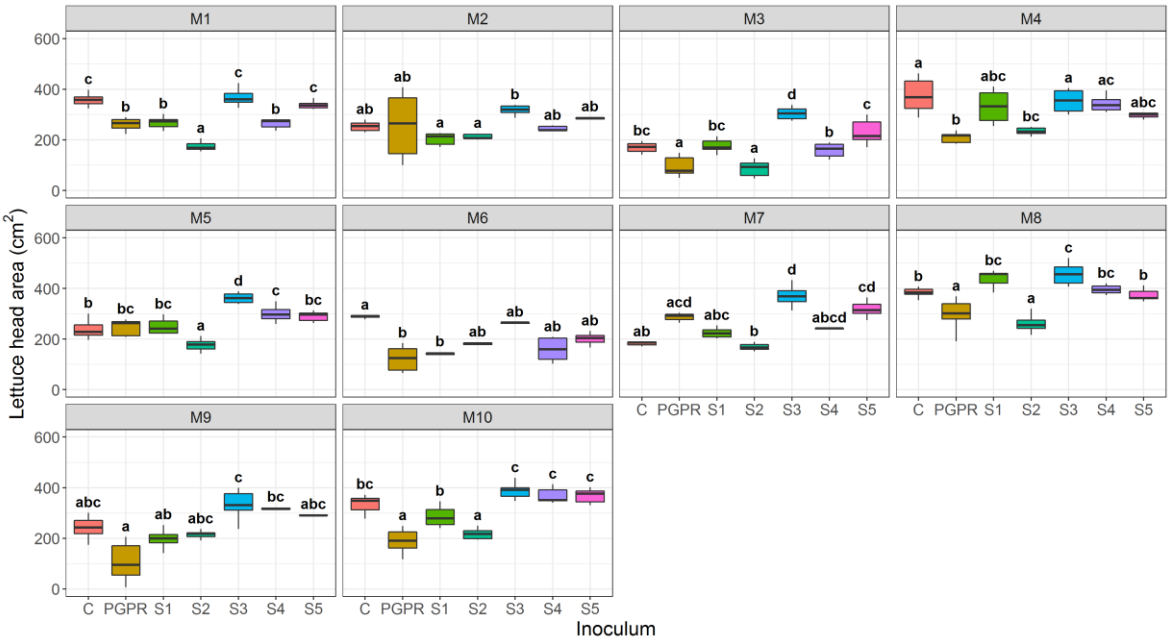


Figure S4. Boxplot of lettuce head area (LHA; cm^2) grouped per substratum. Letters show comparison of BCI means per plant growing medium at the 95 % confidence level. S indicates the bacterial community inoculum, M indicates the plant growing medium, C indicates the negative control treatment without addition of inoculum, and PGPR indicates the positive control treatment with a *Bacillus* sp. inoculum. Number of plants ≥ 3.

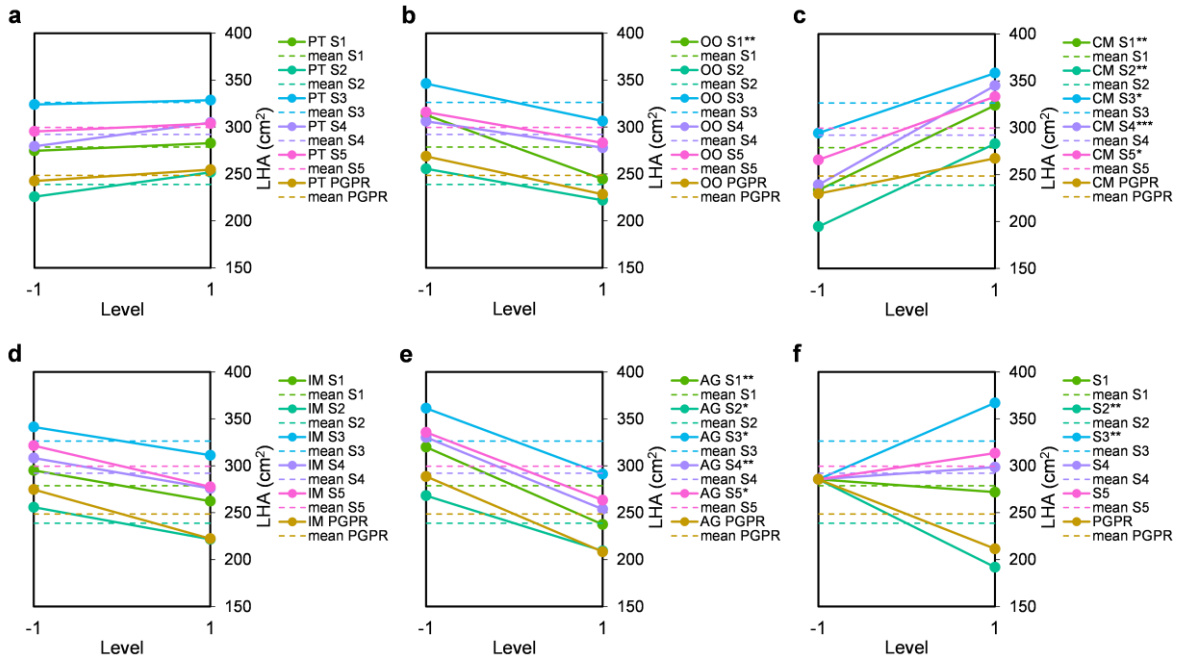


Figure S5. Main effects of substratum constituents on lettuce head area (LHA; cm^2) under different bacterial treatments (S1–5 and positive control PGPR). (a) Peat (PT; -1 = black peat and 1 = white peat); (b) Other organics (OO; -1 = coir pith and 1 = wood fiber); (c) Composted materials (CM; -1 = composted bark and 1 = green waste compost); (d) Inorganic materials (IM; -1 = perlite and 1 = sand); (e) Arabic gum (AG; -1 = 1 $kg.m^{-3}$ and 1 = 5 $kg.m^{-3}$); (f) Bacterial inoculum (BCI; -1 = C and 1 = S1–5 or PGPR). Dashed lines indicate mean levels of LHA for each bacterial treatment. Asterisks indicate level of significance: $P < 0.05$ (*), $P < 0.01$ (**) and $P < 0.001$ (***).

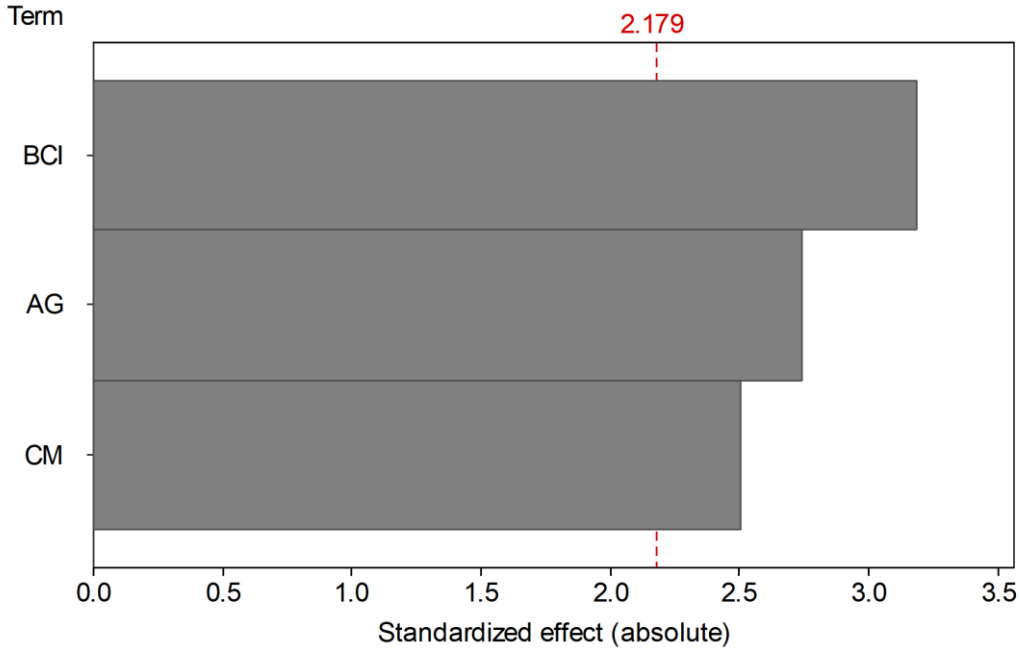


Figure S6. Pareto chart of the standardized effect (absolute) of the significant terms on lettuce head area (LHA) under BCI S3 treatment. Terms are ordered from the largest to the smallest effect: BCI S3, Arabic gum (AG), and composted materials (CM). The dashed reference line indicates the statistical significance of effects. Significance at $P < 0.05$.

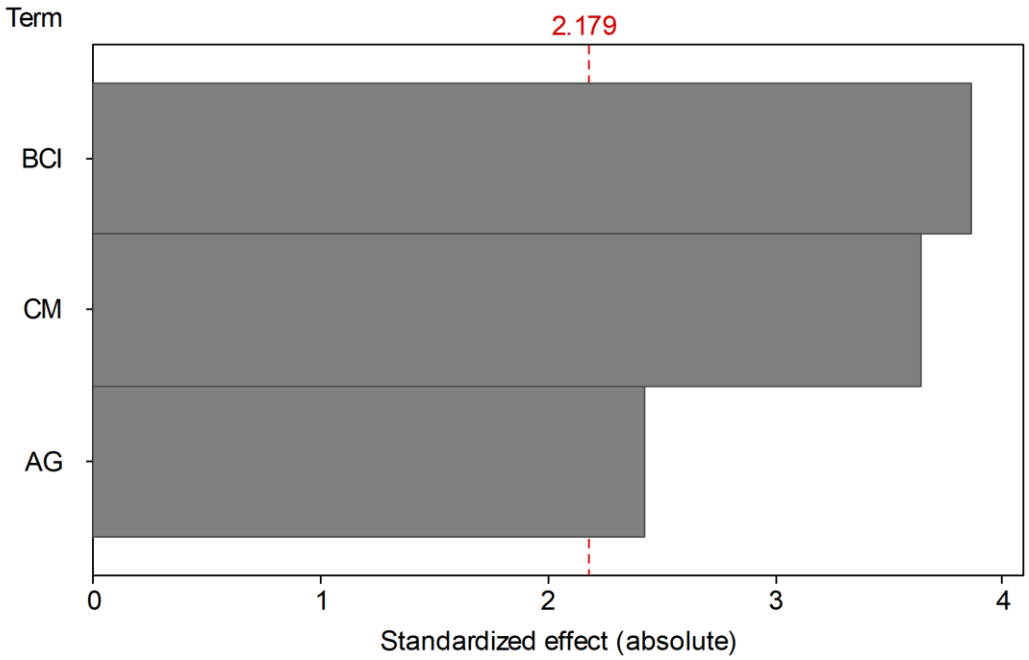


Figure S7. Pareto chart of the standardized effect (absolute) of the significant terms on lettuce head area (LHA) under BCI S2 treatment. Terms are ordered from the largest to the smallest effect: BCI S2, composted materials (CM), and Arabic gum (AG). The dashed reference line indicates the statistical significance of effects. Significance at $P < 0.05$.

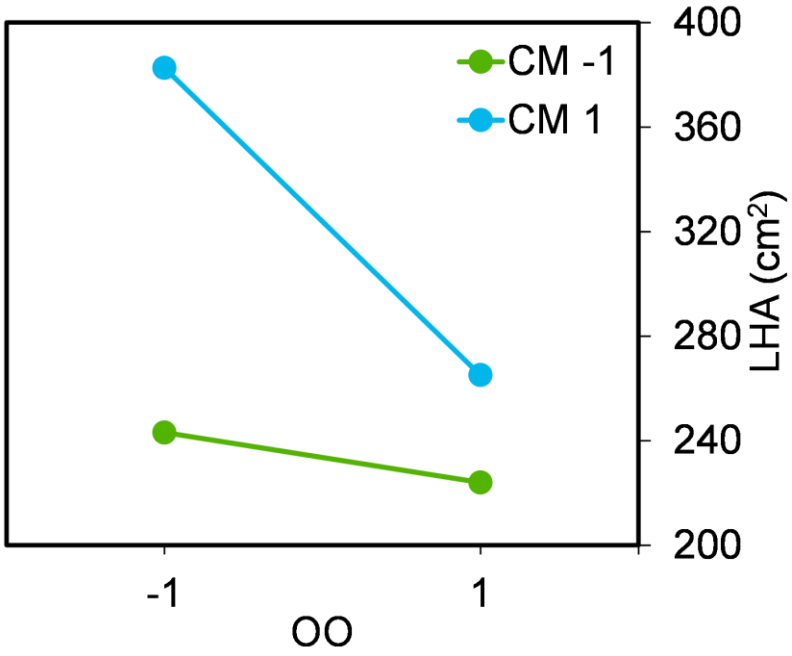


Figure S8. Interaction effect between other organics (OO; -1 = coir pith and 1 = wood fiber) and composted materials (CM; -1 = composted bark and 1 = green waste compost) on lettuce head area (LHA; cm^2) under BCI S1 treatment (P = 0.023).

Table S5. Lettuce head area (LHA; cm^2) response optimization under each BCI treatment. Peat (PT; -1 = black peat and 1 = white peat), other organics (OO; -1 = coir pith and 1 = wood fiber), composted materials (CM; -1 = composted bark and 1 = green waste compost), inorganic materials (IM; -1 = perlite and 1 = sand), Arabic gum (AG; -1 = 1 $kg.m^{-3}$ and 1 = 5 $kg.m^{-3}$), and bacterial inoculum (BCI; -1 = C and 1 = S1–5 or PGPR). n.s. = no significant effect of any control factor.

BCI	Goal	Solution	Fit	SE fit	95 % CI
PGPR	Max LHA	n.s.	/	/	/
S1	Max LHA	OO -1; CM 1; AG -1	423.9	20.9	(378.0; 469.8)
S2	Max LHA	CM 1; AG -1; BCI -1	359.2	24.3	(306.3; 412.0)
S3	Max LHA	CM 1; AG -1; BCI 1	434.1	25.6	(378.4; 489.8)
S4	Max LHA	OO -1; CM 1; AG -1; BCI -1	412.9	23.6	(360.5; 465.4)
S5	Max LHA	CM 1; AG -1	369.4	21.8	(322.3; 416.4)

Effect of bacterial community inoculum and substratum on root fresh weight

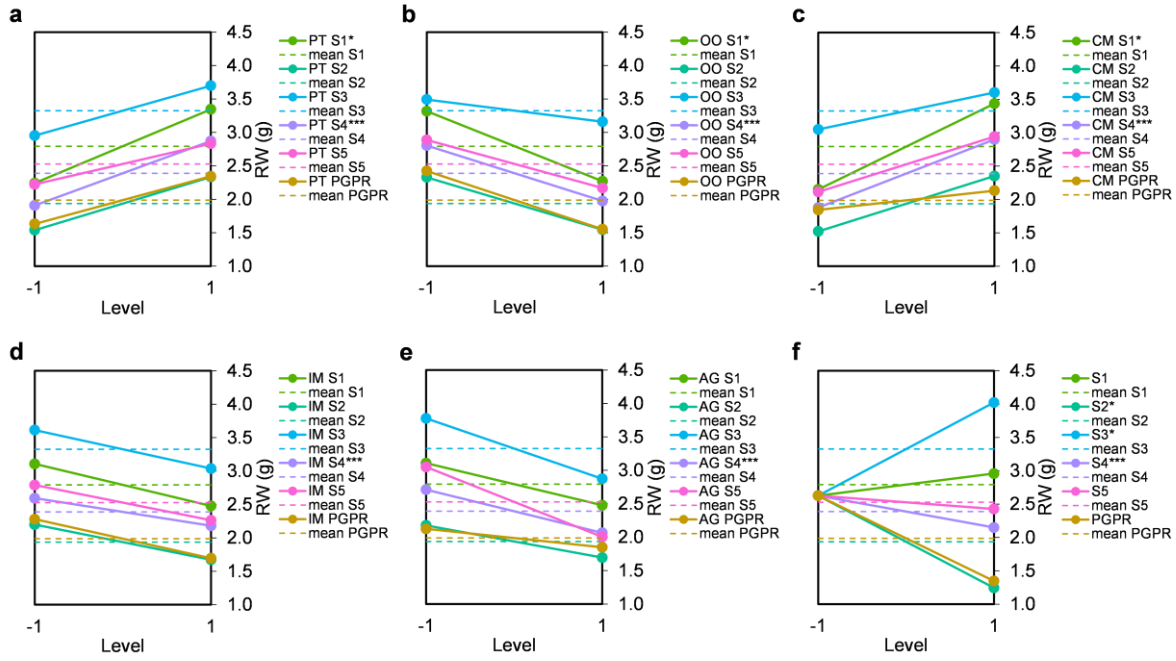


Figure S9. Main effects of substratum constituents on root fresh weight (RW; g) under different bacterial treatments (S1–5 and positive control PGPR). (a) Peat (PT; -1 = black peat and 1 = white peat); (b) Other organics (OO; -1 = coir pith and 1 = wood fiber); (c) Composted materials (CM; -1 = composted bark and 1 = green waste compost); (d) Inorganic materials (IM; -1 = perlite and 1 = sand); (e) Arabic gum (AG; -1 = 1 $kg.m^{-3}$ and 1 = 5 $kg.m^{-3}$); (f) Bacterial inoculum (BCI; -1 = C and 1 = S1–5 or PGPR). Dashed lines indicate mean levels of RW for each bacterial treatment. Asterisks indicate level of significance: $P < 0.05$ (*), $P < 0.01$ (**) and $P < 0.001$ (***).

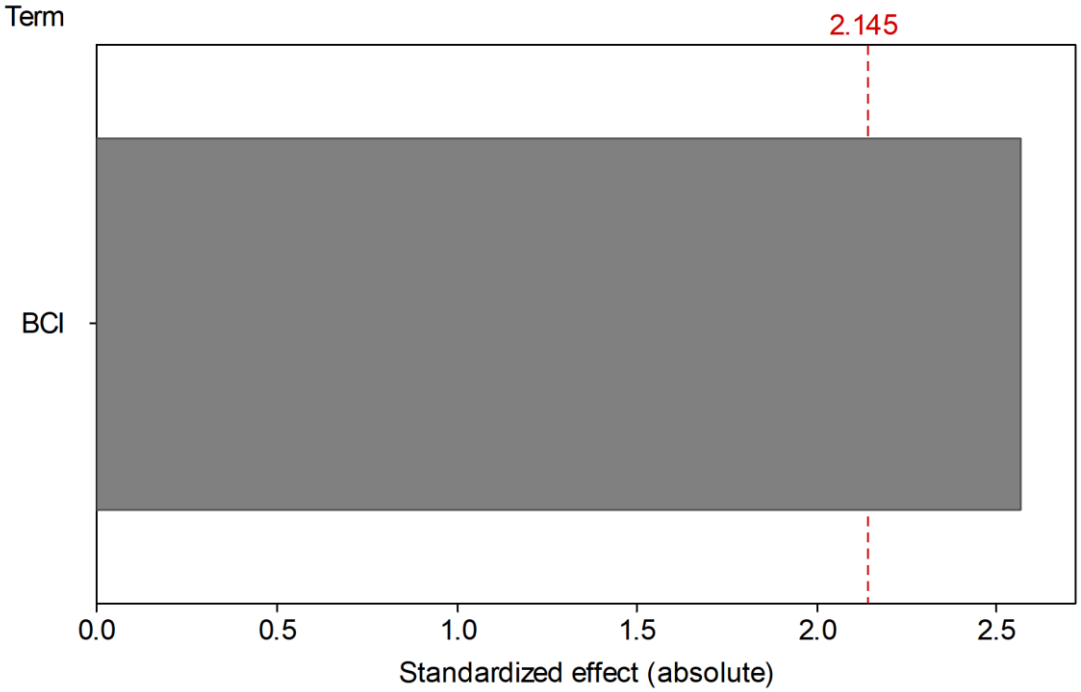


Figure S10. Pareto chart of the standardized effect (absolute) of the significant terms on root fresh weight (RW) under BCI S2 treatment. Terms are ordered from the largest to the smallest effect: BCI S2. The dashed reference line indicates the statistical significance of effects. Significance at $P < 0.05$.

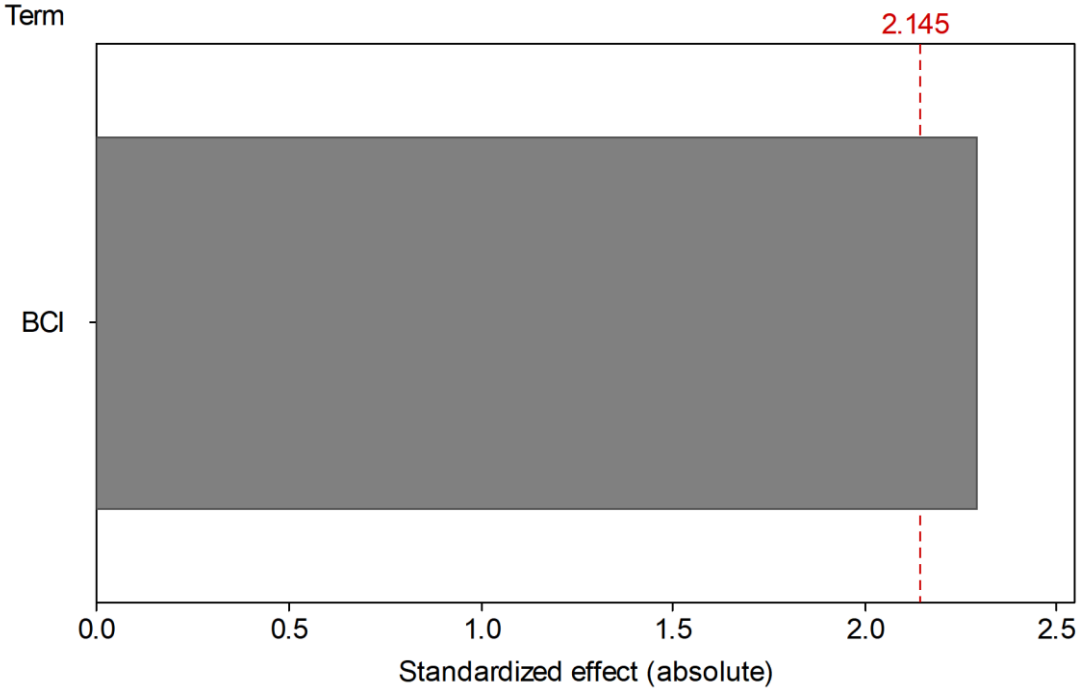


Figure S11. Pareto chart of the standardized effect (absolute) of the significant terms on root fresh weight (RW) under BCI S3 treatment. Terms are ordered from the largest to the smallest effect: BCI S3. The dashed reference line indicates the statistical significance of effects. Significance at $P < 0.05$.

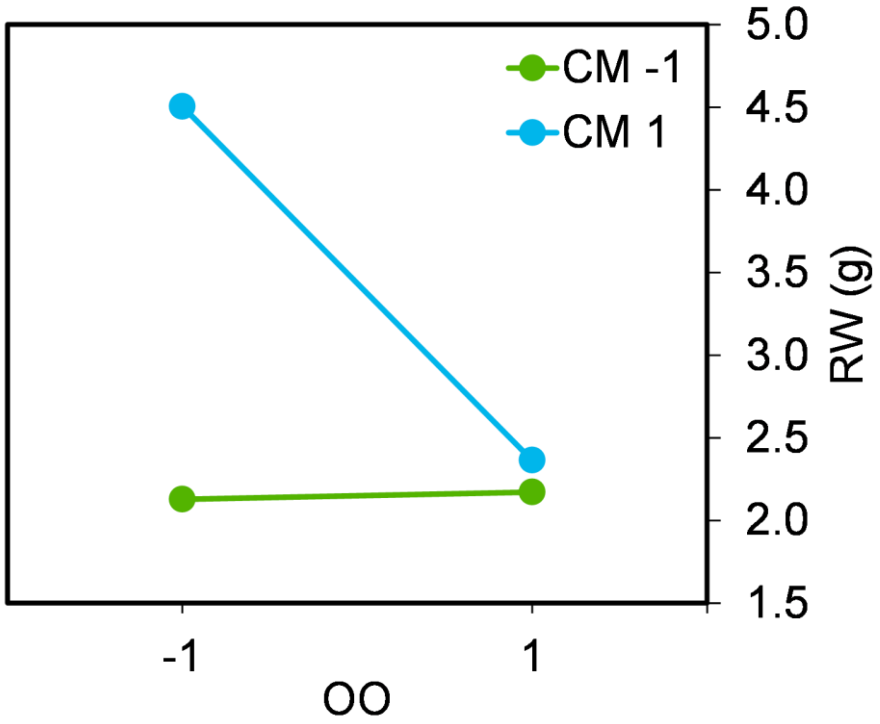


Figure S12. Interaction effect between other organics (OO; -1 = coir pith and 1 = wood fiber) and composted materials (CM; -1 = composted bark and 1 = green waste compost) on root fresh weight (RW; g) under BCI S1 treatment (P = 0.026).

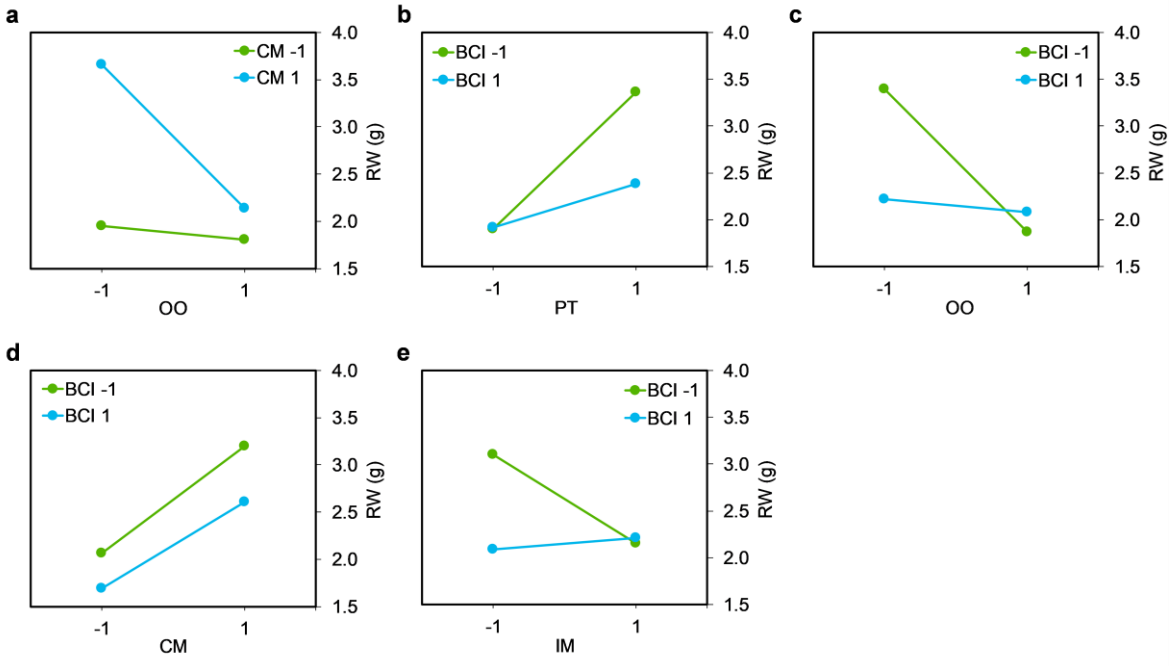


Figure S13. Interaction effects between substratum raw material groups on root fresh weight (RW; g) under BCI S4 treatment. (a) Other organics (OO; -1 = coir pith and 1 = wood fiber) and composted materials (CM; -1 = composted bark and 1 = green waste compost) (P < 0.001); (b) Peat (PT; -1 = black peat and 1 = white peat) and BCI (-1 = C and 1 = S4) (P < 0.001); (c) Other organics and BCI (P < 0.001); (d) Composted materials and BCI (P = 0.044); (e) Inorganic materials (IM; -1 = perlite and 1 = sand) and BCI (P < 0.001).

Table S6. Root fresh weight (RW; g) response optimization under each BCI treatment. Peat (PT; -1 = black peat and 1 = white peat), other organics (OO; -1 = coir pith and 1 = wood fiber), composted materials (CM; -1 = composted bark and 1 = green waste compost), inorganic materials (IM; -1 = perlite and 1 = sand), Arabic gum (AG; -1 = 1 $kg.m^{-3}$ and 1 = 5 $kg.m^{-3}$), and bacterial inoculum (BCI; -1 = C and 1 = S1–5 or PGPR). n.s. = no significant effect of any control factor.

BCI	Goal	Solution	Fit	SE fit	95 % CI
PGPR	Max RW	n.s.	/	/	/
S1	Max RW	PT 1; OO -1; CM 1	5.06	0.48	(4.01; 6.10)
S2	Max RW	BCI -1	2.63	0.38	(1.18; 3.45)
S3	Max RW	BCI 1	4.02	0.43	(3.10; 4.95)
S4	Max RW	PT 1, OO -1, CM 1, IM -1, AG -1, BCI -1	5.83	0.07	(5.65; 6.02)
S5	Max RW	n.s.	/	/	/

Effect of bacterial community inoculum and substratum on shoot dry weight

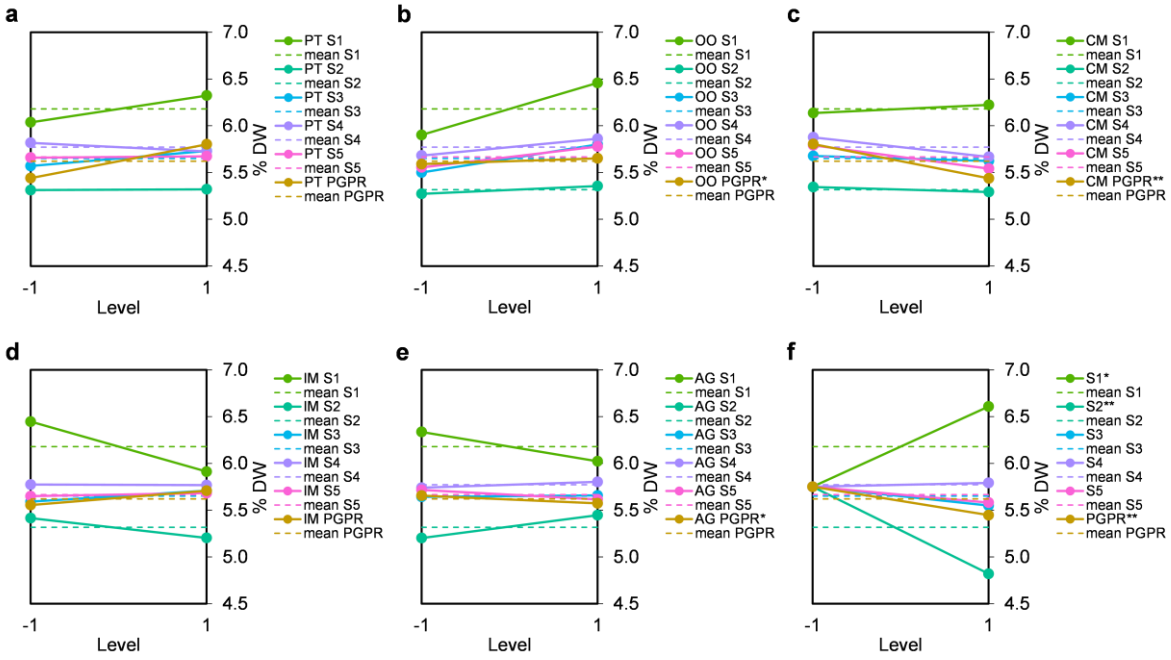


Figure S14. Main effects of substratum constituents on shoot dry weight (% DW) under different bacterial treatments (S1–5 and positive control PGPR). (a) Peat (PT; -1 = black peat and 1 = white peat); (b) Other organics (OO; -1 = coir pith and 1 = wood fiber); (c) Composted materials (CM; -1 = composted bark and 1 = green waste compost); (d) Inorganic materials (IM; -1 = perlite and 1 = sand); (e) Arabic gum (AG; -1 = 1 kg.m^{-3} and 1 = 5 kg.m^{-3}); (f) Bacterial inoculum (BCI; -1 = C and 1 = S1–5 or PGPR). Dashed lines indicate mean levels of DW for each bacterial treatment. Asterisks indicate level of significance: $P < 0.05$ (*), $P < 0.01$ (**) and $P < 0.001$ (***).

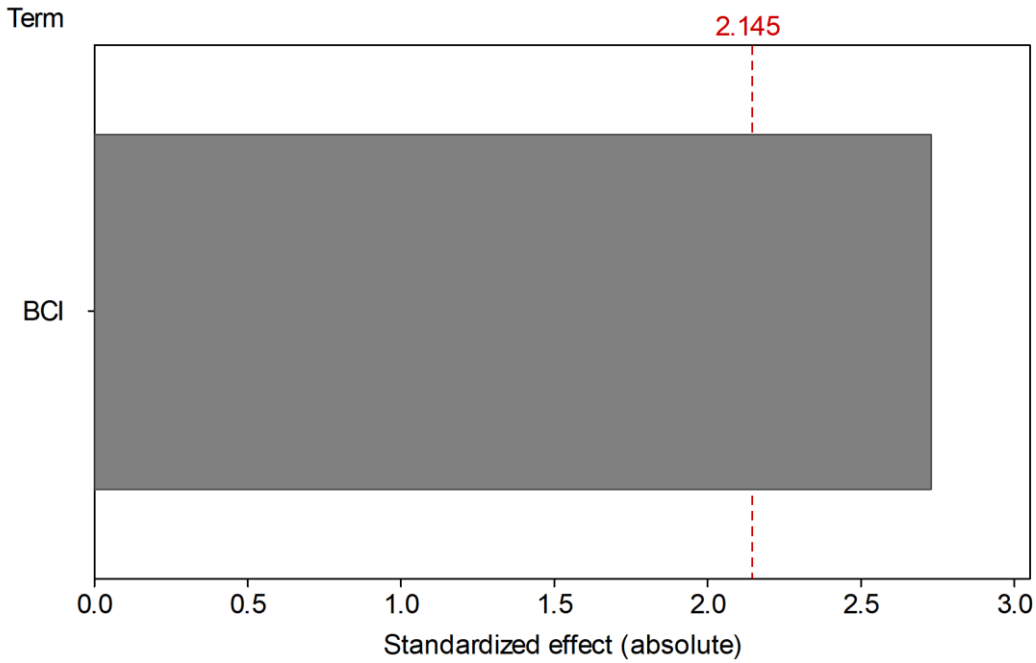


Figure S15. Pareto chart of the standardized effect (absolute) of the significant terms on shoot dry weight (DW) under BCI S1 treatment. Terms are ordered from the largest to the smallest effect: BCI S1. The dashed reference line indicates the statistical significance of effects. Significance at $P < 0.05$.

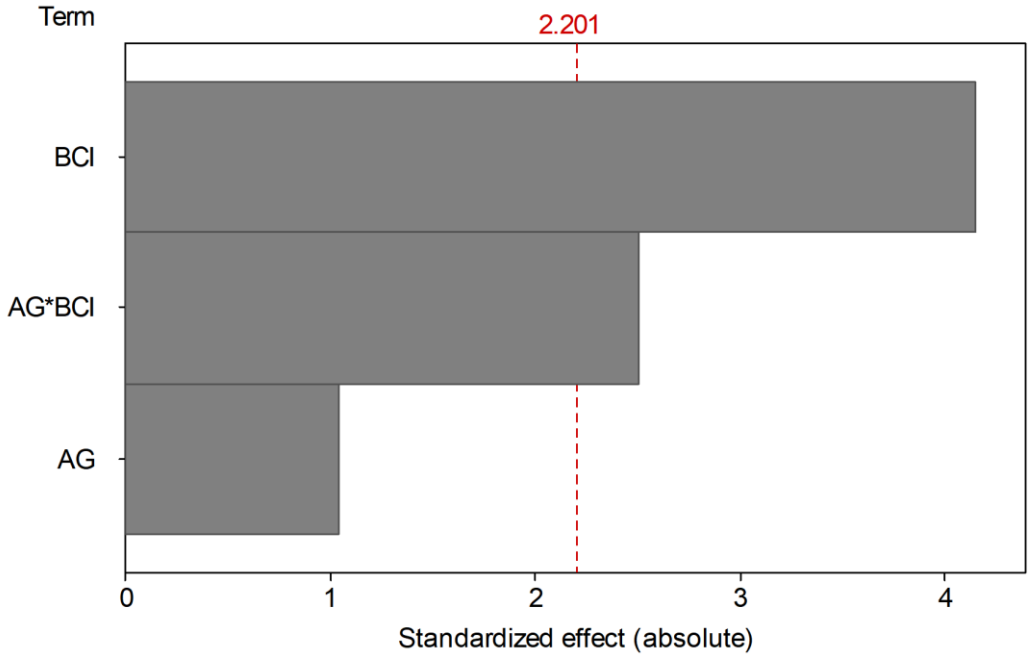


Figure S16. Pareto chart of the standardized effect (absolute) of the significant terms on shoot dry weight (DW) under BCI S2 treatment. Terms are ordered from the largest to the smallest effect: BCI S2, Arabic gum (AG), and AG*BCI interaction effect. The dashed reference line indicates the statistical significance of effects. Significance at $P < 0.05$.

Table S7. Shoot dry weight (DW; % DW) response optimization under each BCI treatment. Peat (PT; -1 = black peat and 1 = white peat), other organics (OO; -1 = coir pith and 1 = wood fiber), composted materials (CM; -1 = composted bark and 1 = green waste compost), inorganic materials (IM; -1 = perlite and 1 = sand), Arabic gum (AG; -1 = 1 $kg.m^{-3}$ and 1 = 5 $kg.m^{-3}$), and bacterial inoculum (BCI; -1 = C and 1 = S1–5 or PGPR). n.s. = no significant effect of any control factor.

BCI	Goal	Solution	Fit	SE fit	95 % CI
PGPR	Max DW	PT 1; OO 1; CM -1; AG -1; BCI -1	6.70	0.10	(6.38; 7.01)
S1	Max DW	BCI 1	6.61	0.22	(6.13; 7.09)
S2	Max DW	AG -1; BCI -1	5.91	0.20	(5.46; 6.35)
S3	Max DW	n.s.	/	/	/
S4	Max DW	n.s.	/	/	/
S5	Max DW	OO 1; CM -1	6.08	0.16	(5.73; 6.43)

Effect of bacterial community inoculum and substratum on total phenolic content

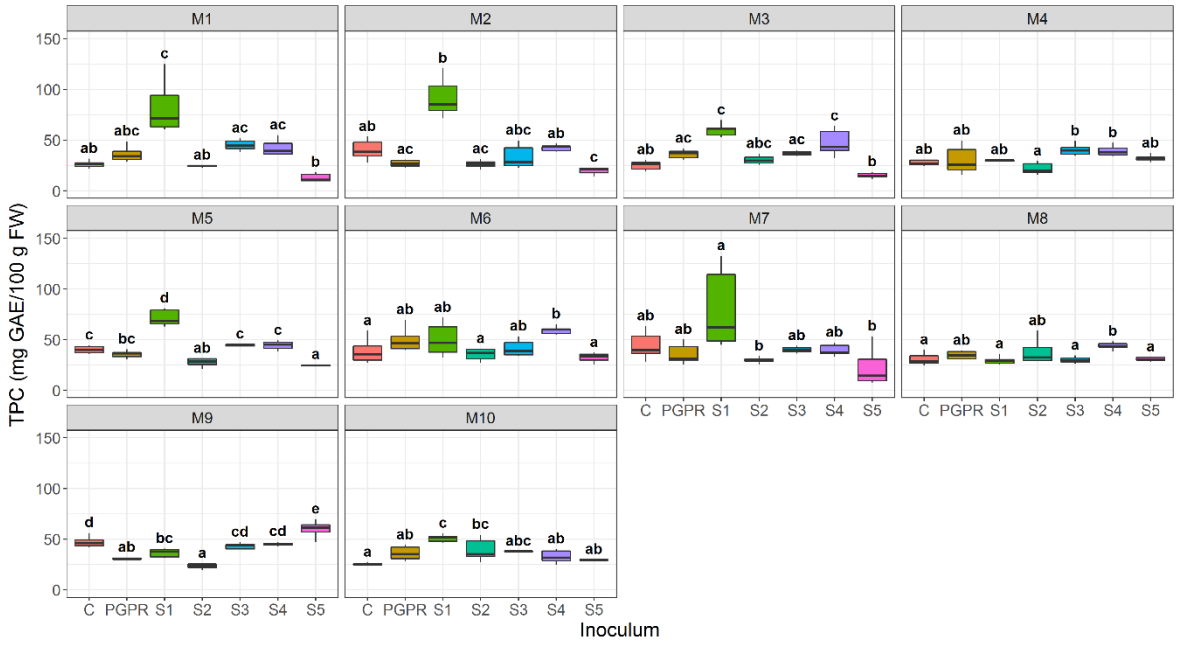


Figure S17. Boxplot of total phenolic content (TPC; mg GAE/100 g FW) grouped per substratum. Letters show comparison of BCI means per plant growing medium at the 95 % confidence level. S indicates the bacterial community inoculum, M indicates the plant growing medium, C indicates the negative control treatment without addition of inoculum, and PGPR indicates the positive control treatment with a *Bacillus* sp. inoculum. Number of plants ≥ 3.

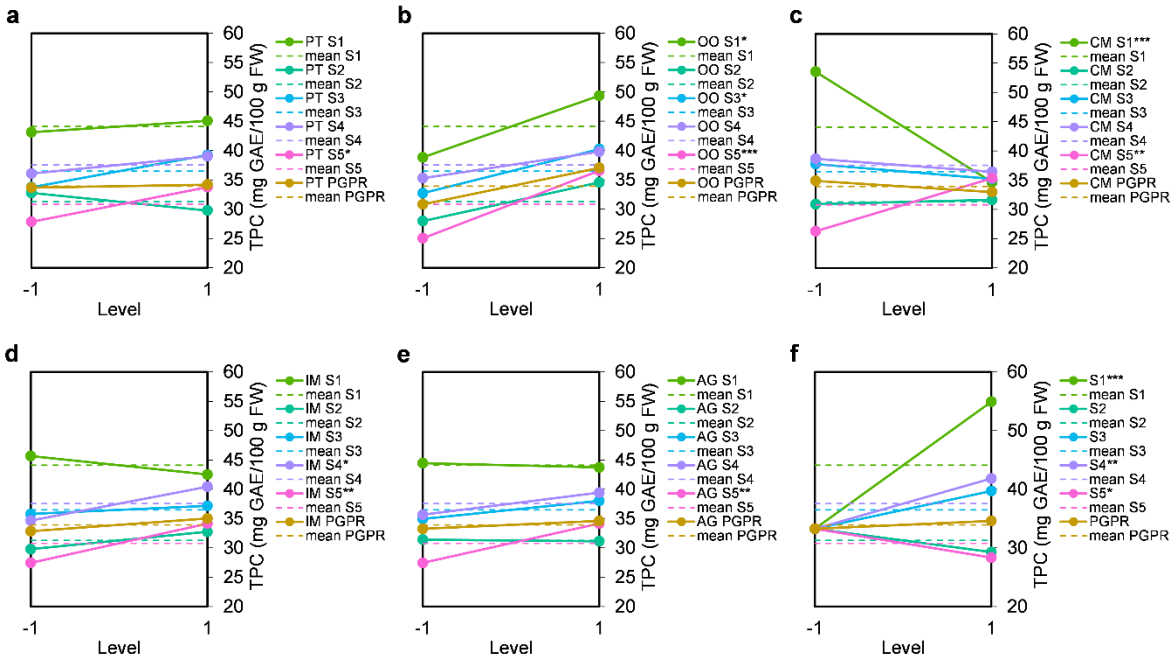


Figure S18. Main effects of substratum constituents on total phenolic content (TPC; mg GAE/100 g FW) under different bacterial treatments (S1–5 and positive control PGPR). (a) Peat (PT; -1 = black peat and 1 = white peat); (b) Other organics (OO; -1 = coir pith and 1 = wood fiber); (c) Composted materials (CM; -1 = composted bark and 1 = green waste compost); (d) Inorganic materials (IM; -1 = perlite and 1 = sand); (e) Arabic gum (AG; -1 = 1 $kg.m^{-3}$ and 1 = 5 $kg.m^{-3}$); (f) Bacterial inoculum (BCI; -1 = C and 1 = S1–5 or PGPR). Dashed lines indicate mean levels of total phenolic content for each bacterial treatment. Asterisks indicate level of significance: $P < 0.05$ (*), $P < 0.01$ (**) and $P < 0.001$ (***).

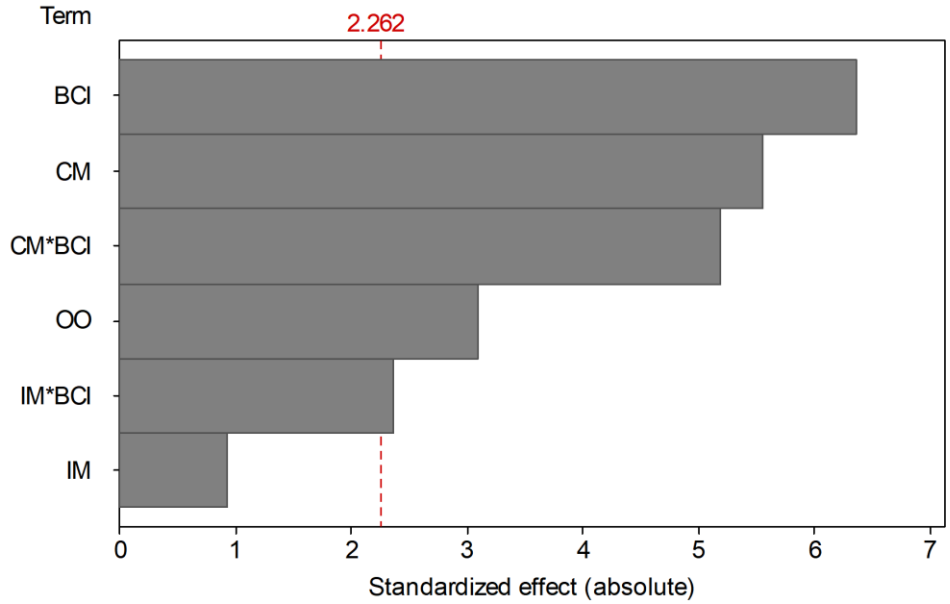


Figure S19. Pareto chart of the standardized effect (absolute) of the significant terms on total phenolic content (TPC) under BCI S1 treatment. Terms are ordered from the largest to the smallest effect: BCI S1, composted materials (CM), CM*BCI interaction effect, other organics (OO), inorganic materials (IM), and IM*BCI interaction effect. The dashed reference line indicates the statistical significance of effects. Significance at $P < 0.05$.

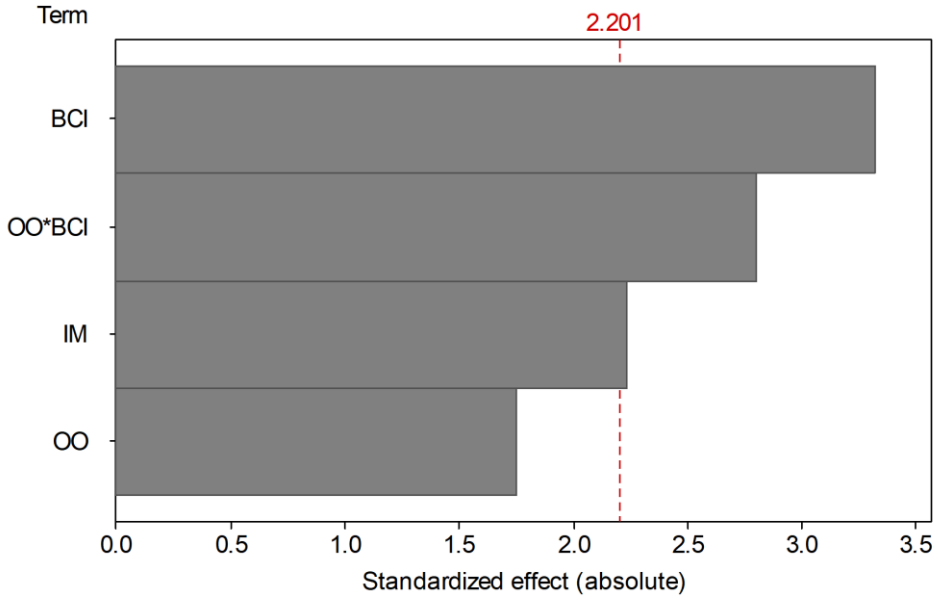
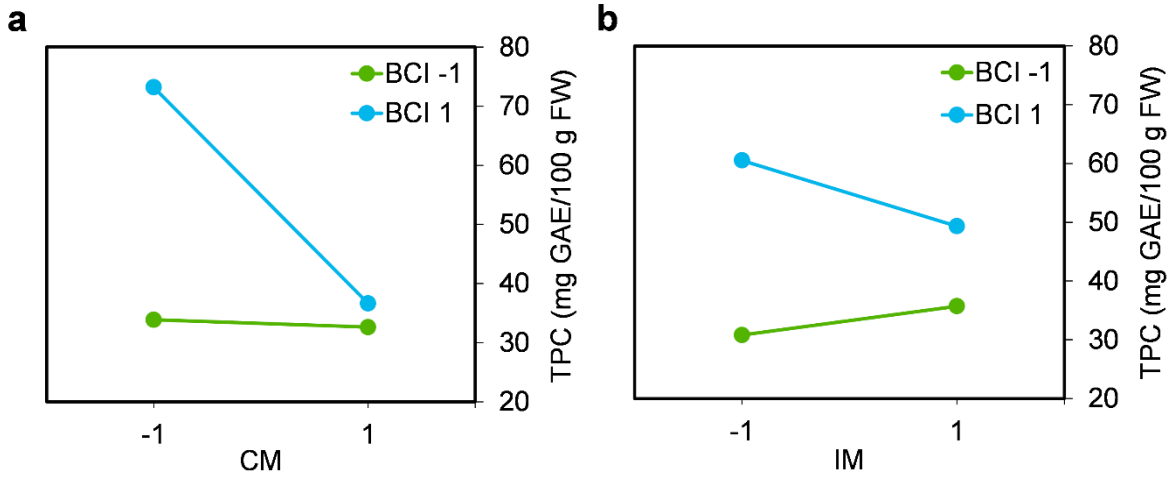
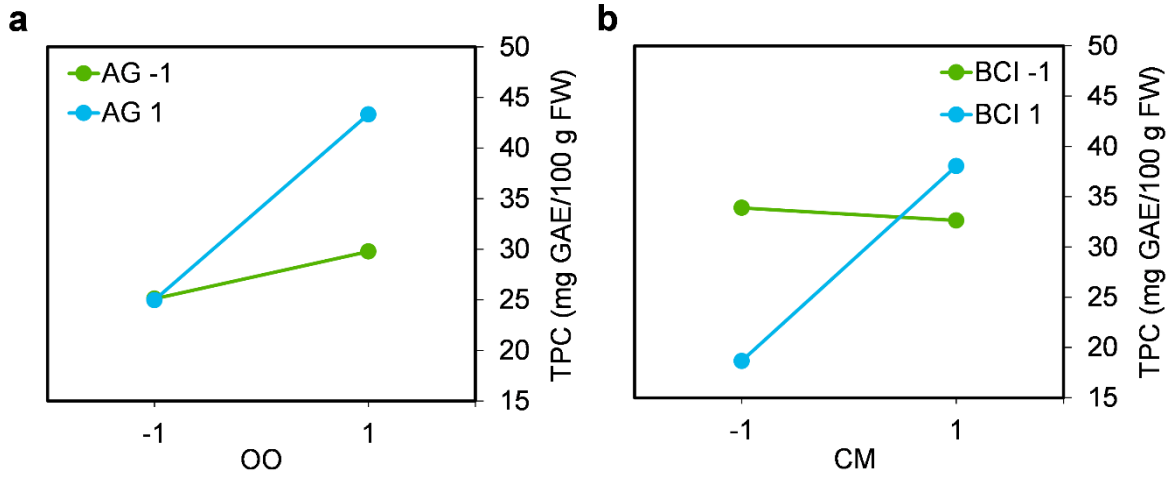


Figure S20. Pareto chart of the standardized effect (absolute) of the significant terms on total phenolic content (TPC) under BCI S4 treatment. Terms are ordered from the largest to the smallest effect: BCI S4, inorganic materials (IM), other organics (OO), and OO*BCI interaction effect. The dashed reference line indicates the statistical significance of effects. Significance at $P < 0.05$.



158

159 **Figure S21.** Interaction effects between substratum raw material groups on total phenolic content
160 (TPC; mg GAE/100 g FW) under BCI S1 treatment. (a) Composted materials (CM; -1 = composted bark
161 and 1 = green waste compost) and BCI (-1 = C and 1 = S1) (P = 0.001); (b) Inorganic materials (IM; -1 =
162 perlite and 1 = sand) and BCI (P = 0.042).



163

164 **Figure S22.** Interaction effects between substratum raw material groups on total phenolic content
165 (TPC; mg GAE/100 g FW) under BCI S5 treatment. (a) Other organics (OO; -1 = coir pith and 1 = wood
166 fiber) and Arabic gum (AG; -1 = 1 kg.m^{-3} and 1 = 5 kg.m^{-3}) (P = 0.006); (b) Composted materials (CM; -
167 1 = composted bark and 1 = green waste compost) and BCI (-1 = C and 1 = S5) (P = 0.001).

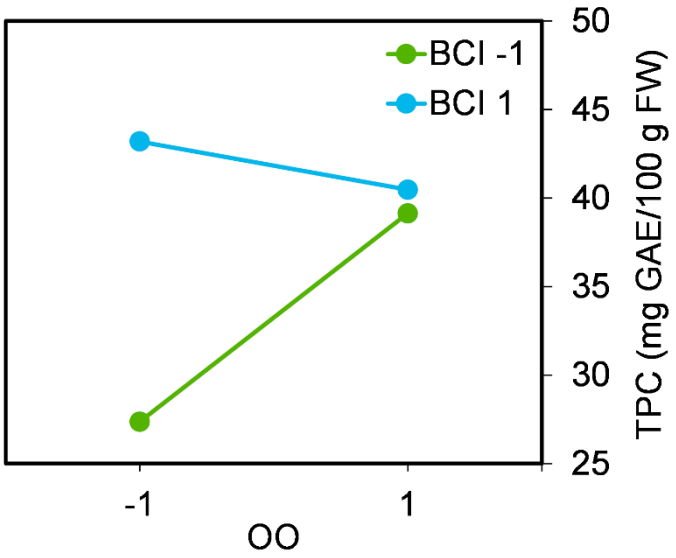


Figure S23. Interaction effect between other organics (OO; -1 = coir pith and 1 = wood fiber) and BCI (-1 = C and 1 = S4) on total phenolic content (TPC; mg GAE/100 g FW) under BCI S4 treatment (P = 0.017)

Table S8. Total phenolic content (TPC; mg GAE/100 g FW) response optimization under each BCI treatment. Peat (PT; -1 = black peat and 1 = white peat), other organics (OO; -1 = coir pith and 1 = wood fiber), composted materials (CM; -1 = composted bark and 1 = green waste compost), inorganic materials (IM; -1 = perlite and 1 = sand), Arabic gum (AG; -1 = 1 kg.m^{-3} and 1 = 5 kg.m^{-3}), and bacterial inoculum (BCI; -1 = C and 1 = S1–5 or PGPR). n.s. = no significant effect of any control factor.

BCI	Goal	Solution	Fit	SE fit	95 % CI
PGPR	Max TPC	n.s.	/	/	/
S1	Max TPC	OO 1; CM -1; IM -1; BCI 1	84.05	4.50	(73.87; 94.23)
S2	Max TPC	n.s.	/	/	/
S3	Max TPC	OO 1	40.24	2.47	(34.95; 45.53)
S4	Max TPC	OO -1; IM 1, BCI 1	46.08	2.89	(39.72; 52.44)
S5	Max TPC	PT 1; OO 1; CM 1; IM 1; AG 1; BCI 1	56.88	2.61	(50.71; 63.05)

Effect of bacterial community inoculum and substratum on nitrate content

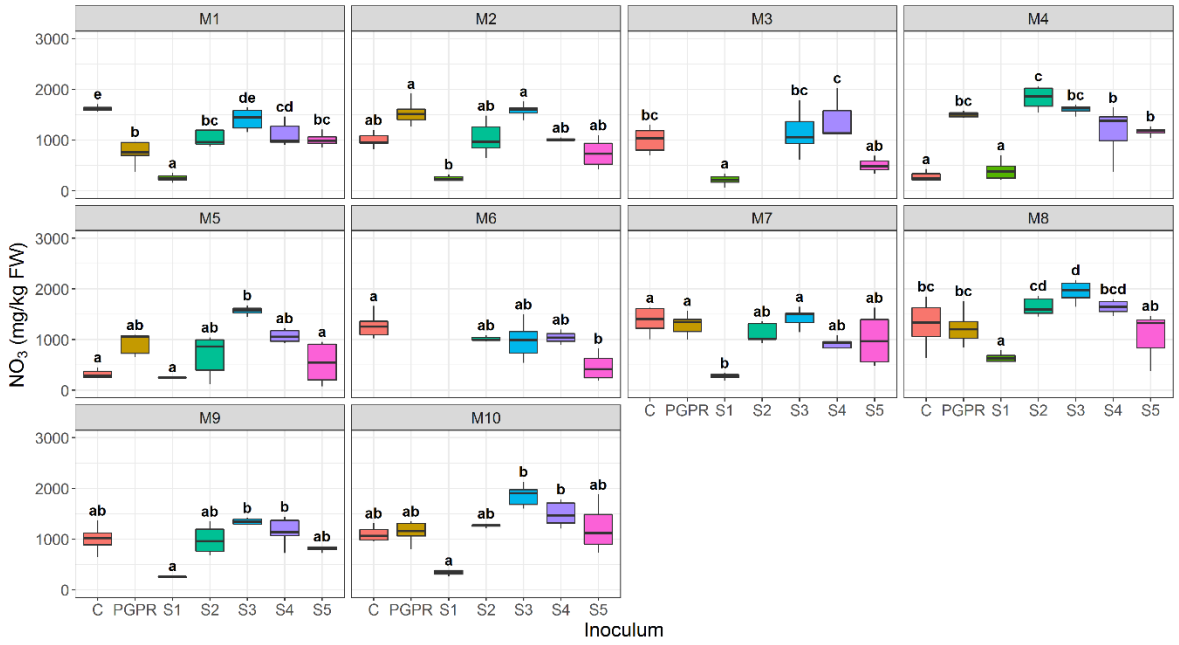


Figure S24. Boxplot of nitrate content (NO_3; mg/kg FW) grouped per substratum. Letters show comparison of BCI means per plant growing medium at the 95 % confidence level. S indicates the bacterial community inoculum, M indicates the plant growing medium, C indicates the negative control treatment without addition of inoculum, and PGPR indicates the positive control treatment with a *Bacillus* sp. inoculum. Number of plants ≥ 3.

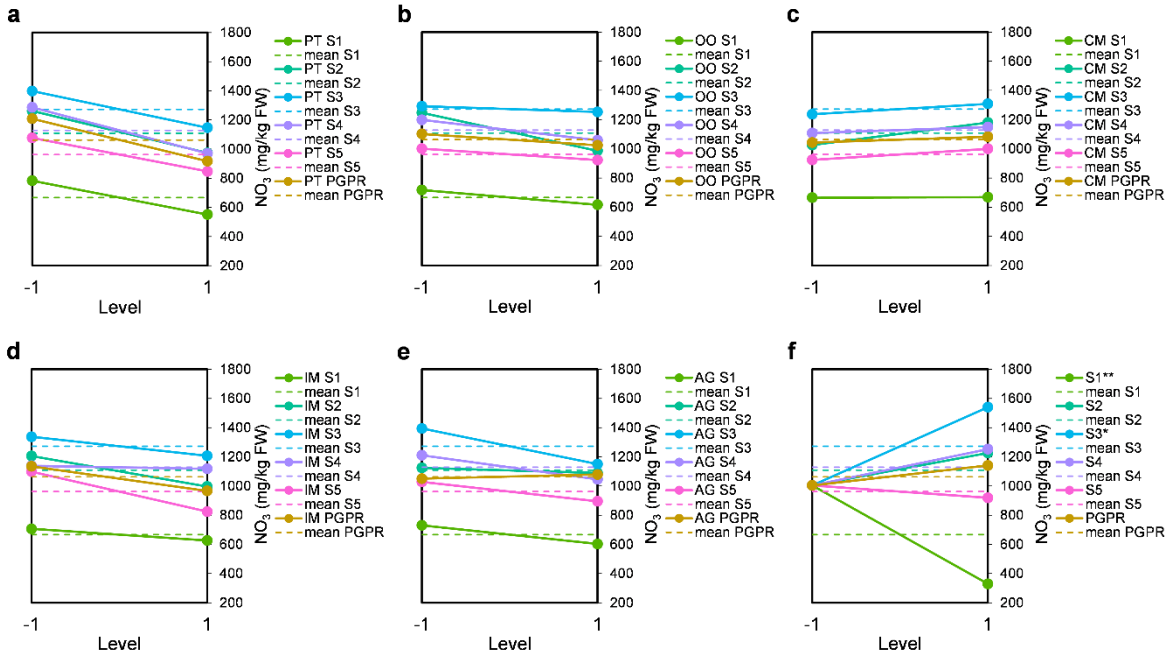


Figure S25. Main effects of substratum constituents on nitrate content (NO_3; mg/kg FW) under different bacterial treatments (S1–5 and positive control PGPR). (a) Peat (PT; -1 = black peat and 1 = white peat); (b) Other organics (OO; -1 = coir pith and 1 = wood fiber); (c) Composted materials (CM; -1 = composted bark and 1 = green waste compost); (d) Inorganic materials (IM; -1 = perlite and 1 = sand); (e) Arabic gum (AG; -1 = 1 kg.m^{-3} and 1 = 5 kg.m^{-3}); (f) Bacterial inoculum (BCI; -1 = C and 1 = S1–5 or PGPR). Dashed lines indicate mean levels of NO_3 for each bacterial treatment. Asterisks indicate level of significance: $P < 0.05$ (*), $P < 0.01$ (**) and $P < 0.001$ (***).

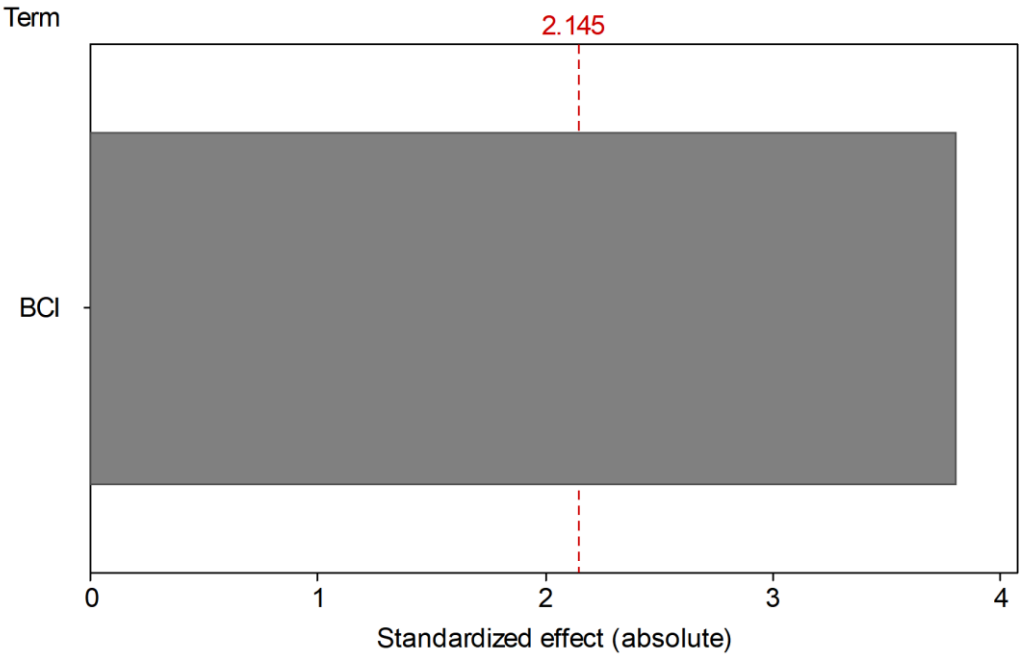


Figure S26. Pareto chart of the standardized effect (absolute) of the significant terms on NO_3-content under BCI S1 treatment. Terms are ordered from the largest to the smallest effect: BCI S1. The dashed reference line indicates the statistical significance of effects. Significance at $P < 0.05$.

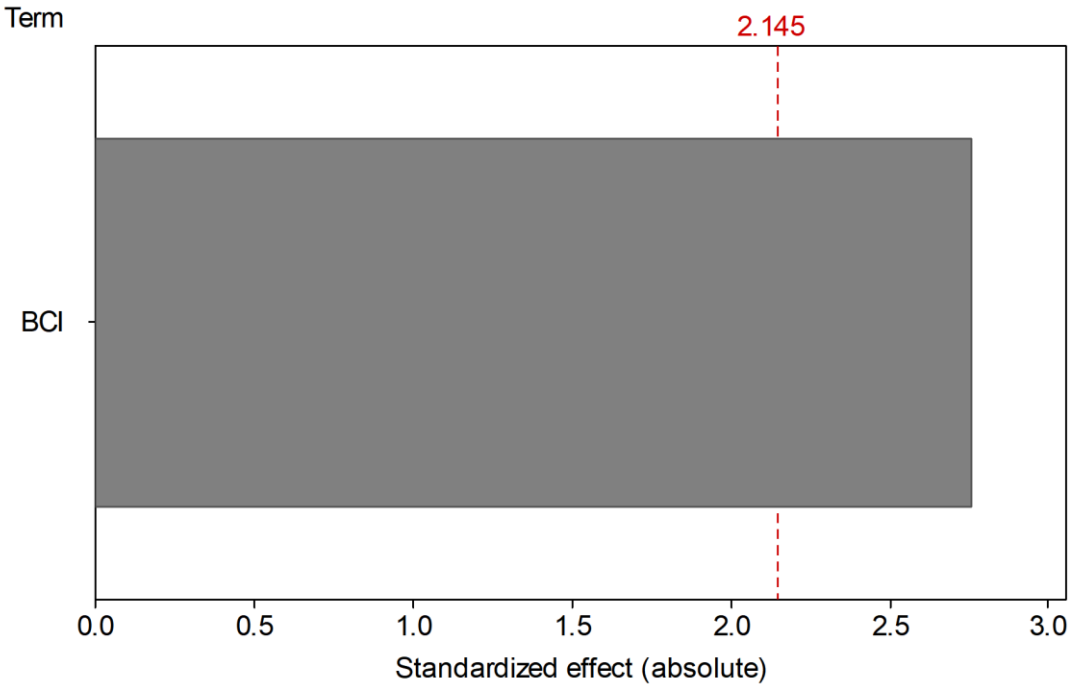


Figure S27. Pareto chart of the standardized effect (absolute) of the significant terms on NO_3-content under BCI S3 treatment. Terms are ordered from the largest to the smallest effect: BCI S3. The dashed reference line indicates the statistical significance of effects. Significance at $P < 0.05$.

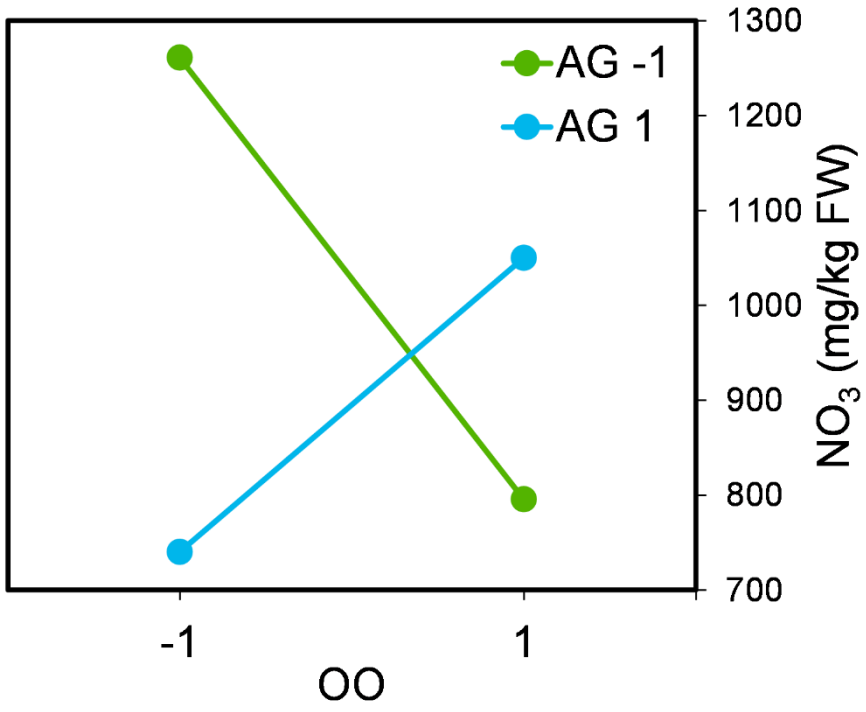


Figure S28. Interaction effect between other organics (OO; -1 = coir pith and 1 = wood fiber) and Arabic gum (AG; -1 = 1 $kg.m^{-3}$ and 1 = 5 $kg.m^{-3}$) on NO_3-content (mg/kg FW) under BCI S5 treatment ($P = 0.047$).

205 **Table S9.** NO_3-content (mg/kg FW) response optimization under each BCI treatment. Peat (PT; -1 =
206 black peat and 1 = white peat), other organics (OO; -1 = coir pith and 1 = wood fiber), composted
207 materials (CM; -1 = composted bark and 1 = green waste compost), inorganic materials (IM; -1 = perlite
208 and 1 = sand), Arabic gum (AG; -1 = 1 $kg.m^{-3}$ and 1 = 5 $kg.m^{-3}$), and bacterial inoculum (BCI; -1 = C and
209 1 = S1–5 or PGPR). n.s. = no significant effect of any control factor.

BCI	Goal	Solution	Fit	SE fit	95 % CI
PGPR	Min NO_3	n.s.	/	/	/
S1	Min NO_3	BCI 1	329	125	(61; 598)
S2	Min NO_3	n.s.	/	/	/
S3	Min NO_3	BCI -1	1004	137	(709; 1299)
S4	Min NO_3	n.s.	/	/	/
S5	Min NO_3	OO -1; AG 1	740	175	(358; 1122)

210

Effect of bacterial community inoculum and substratum on chlorophylls

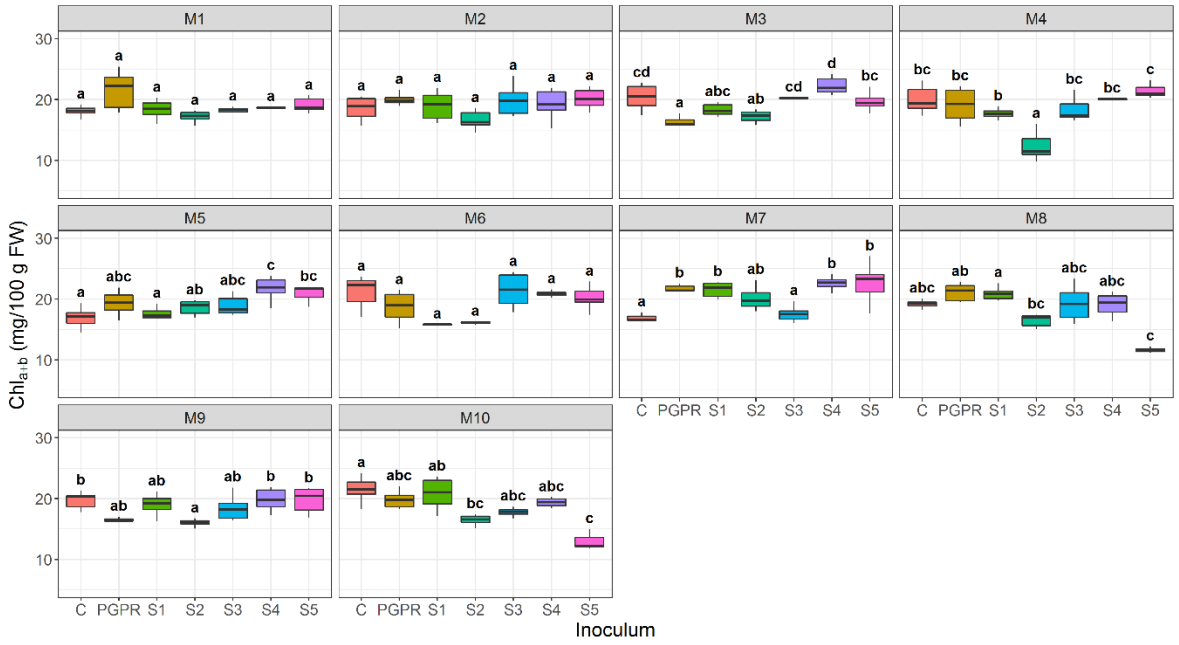


Figure S29. Boxplot of chlorophyll a+b (Chl_{a+b}; mg/100 g FW) grouped per substratum. Letters show comparison of BCI means per plant growing medium at the 95 % confidence level. S indicates the bacterial community inoculum, M indicates the plant growing medium, C indicates the negative control treatment without addition of inoculum, and PGPR indicates the positive control treatment with a *Bacillus* sp. inoculum. Number of plants ≥ 3.

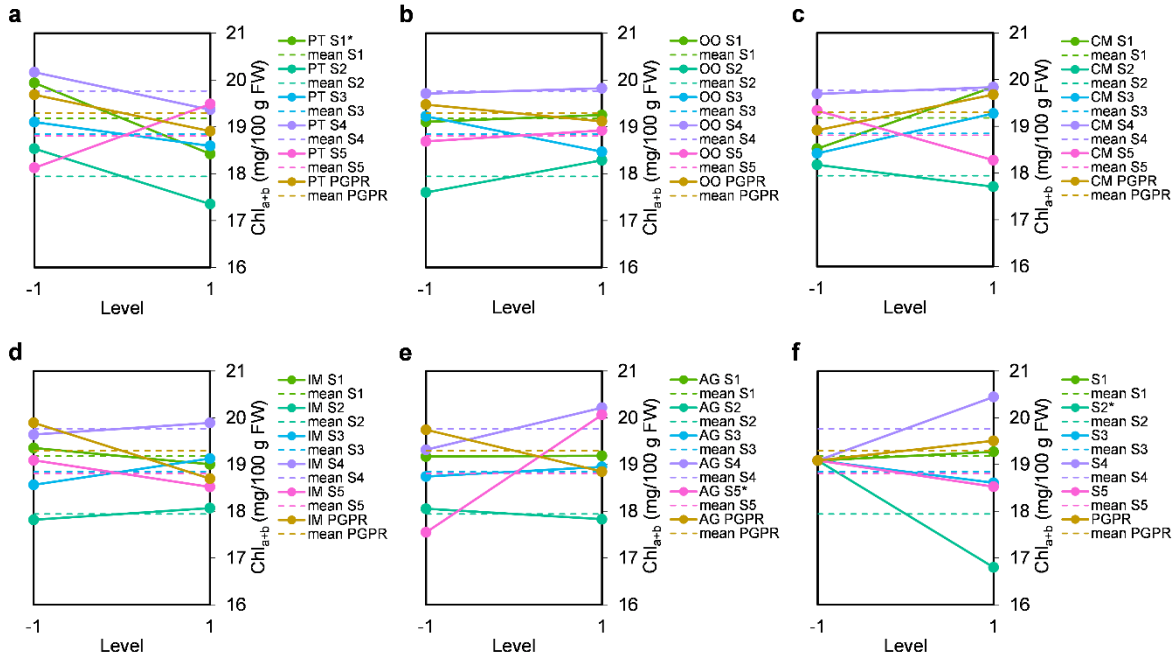


Figure S30. Main effects of substratum constituents on chlorophyll a+b content (Chl_{a+b}; mg/100 g FW) under different bacterial treatments (S1–5 and positive control PGPR). (a) Peat (PT; -1 = black peat and 1 = white peat); (b) Other organics (OO; -1 = coir pith and 1 = wood fiber); (c) Composted materials (CM; -1 = composted bark and 1 = green waste compost); (d) Inorganic materials (IM; -1 = perlite and 1 = sand); (e) Arabic gum (AG; -1 = 1 kg.m^{-3} and 1 = 5 kg.m^{-3}); (f) Bacterial inoculum (BCI; -1 = C and 1 = S1–5 or PGPR). Dashed lines indicate mean levels of Chl_{a+b} for each bacterial treatment. Asterisks indicate level of significance: $P < 0.05$ (*), $P < 0.01$ (**) and $P < 0.001$ (***).

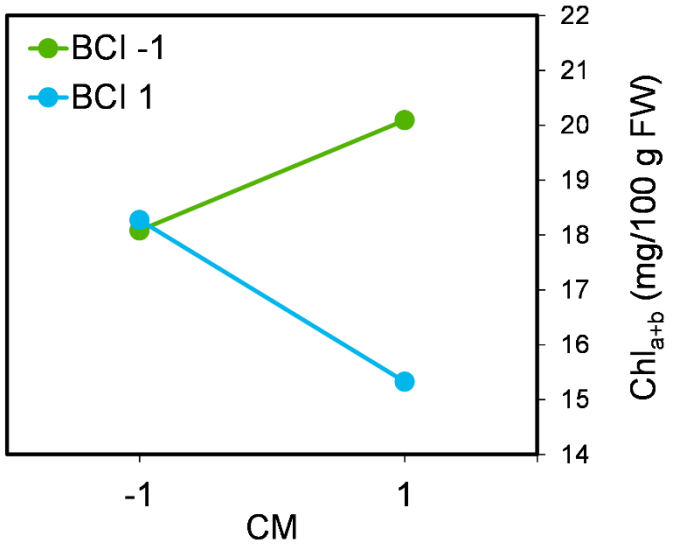


Figure S31. Interaction effect between composted materials (CM; -1 = composted bark and 1 = green waste compost) and BCI (-1 = C and 1 = S2) on chlorophyll a+b content (Chl_{a+b}; mg/100 g FW) under BCI S2 treatment ($P = 0.008$).

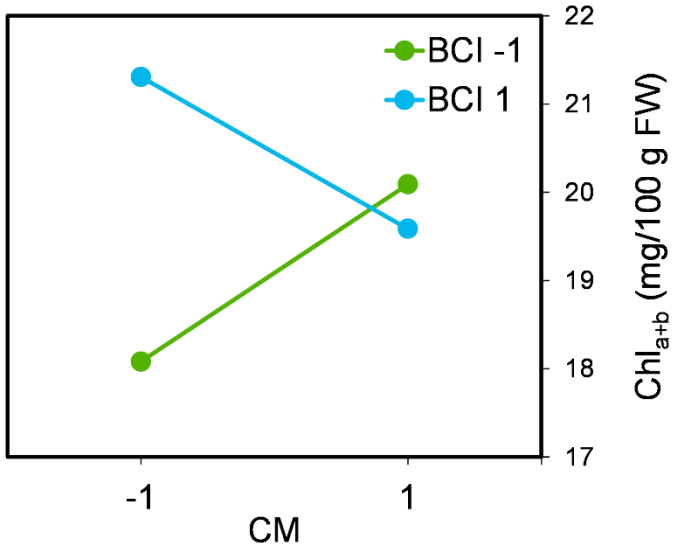


Figure S32. Interaction effect between composted materials (CM; -1 = composted bark and 1 = green waste compost) and BCI (-1 = C and 1 = S4) on chlorophyll a+b content (Chl_{a+b}; mg/100 g FW) under BCI S4 treatment (P = 0.016).

Table S10. Chlorophyll a+b content (Chl_{a+b}; mg/100 g FW) response optimization under each BCI treatment. Peat (PT; -1 = black peat and 1 = white peat), other organics (OO; -1 = coir pith and 1 = wood fiber), composted materials (CM; -1 = composted bark and 1 = green waste compost), inorganic materials (IM; -1 = perlite and 1 = sand), Arabic gum (AG; -1 = 1 kg.m^{-3} and 1 = 5 kg.m^{-3}), and bacterial inoculum (BCI; -1 = C and 1 = S1–5 or PGPR). n.s. = no significant effect of any control factor.

BCI	Goal	Solution	Fit	SE fit	95 % CI
PGPR	Max Chl_{a+b}	CM -1; IM -1; AG -1; BCI 1	21.89	0.78	(19.72; 24.06)
S1	Max Chl_{a+b}	PT -1	19.94	0.49	(18.88; 21.00)
S2	Max Chl_{a+b}	CM 1; BCI -1	20.09	0.78	(18.39; 21.79)
S3	Max Chl_{a+b}	n.s.	/	/	/
S4	Max Chl_{a+b}	CM -1; BCI 1	21.31	0.67	(19.85; 22.76)
S5	Max Chl_{a+b}	PT 1, CM -1; AG 1, BCI 1	24.72	1.06	(22.27; 27.17)

Effect of bacterial community inoculum and substratum on carotenoids

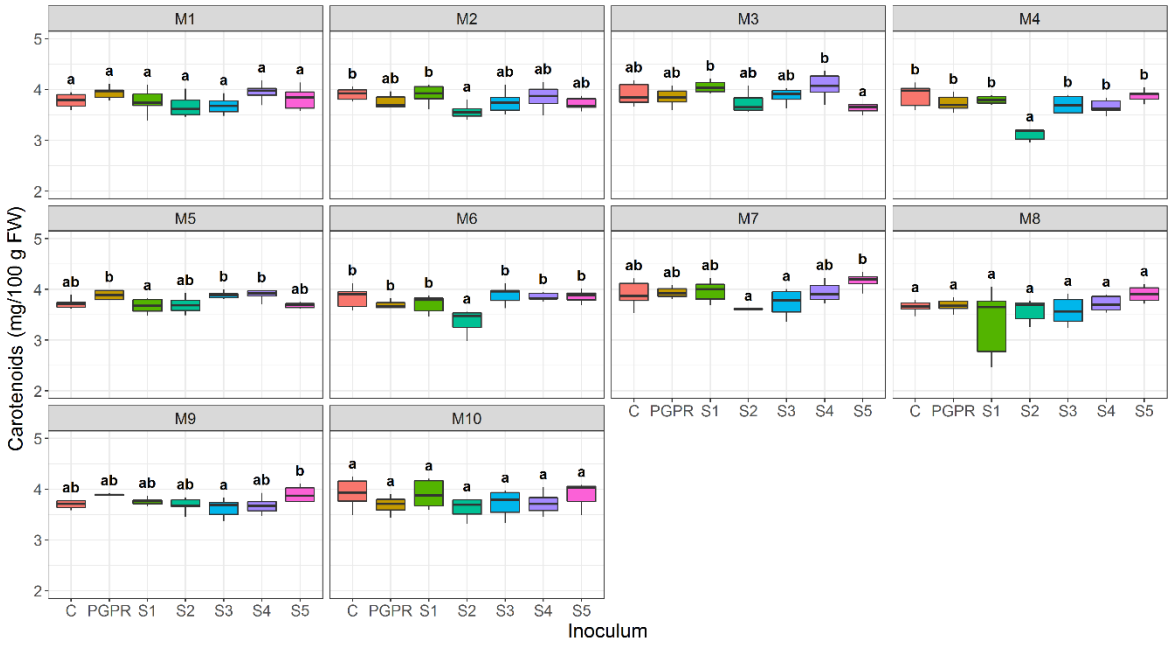


Figure S33. Boxplot of carotenoid content (mg/100 g FW) grouped per substratum. Letters show comparison of BCI means per plant growing medium at the 95 % confidence level. S indicates the bacterial community inoculum, M indicates the plant growing medium, C indicates the negative control treatment without addition of inoculum, and PGPR indicates the positive control treatment with a *Bacillus* sp. inoculum. Number of plants ≥ 3.

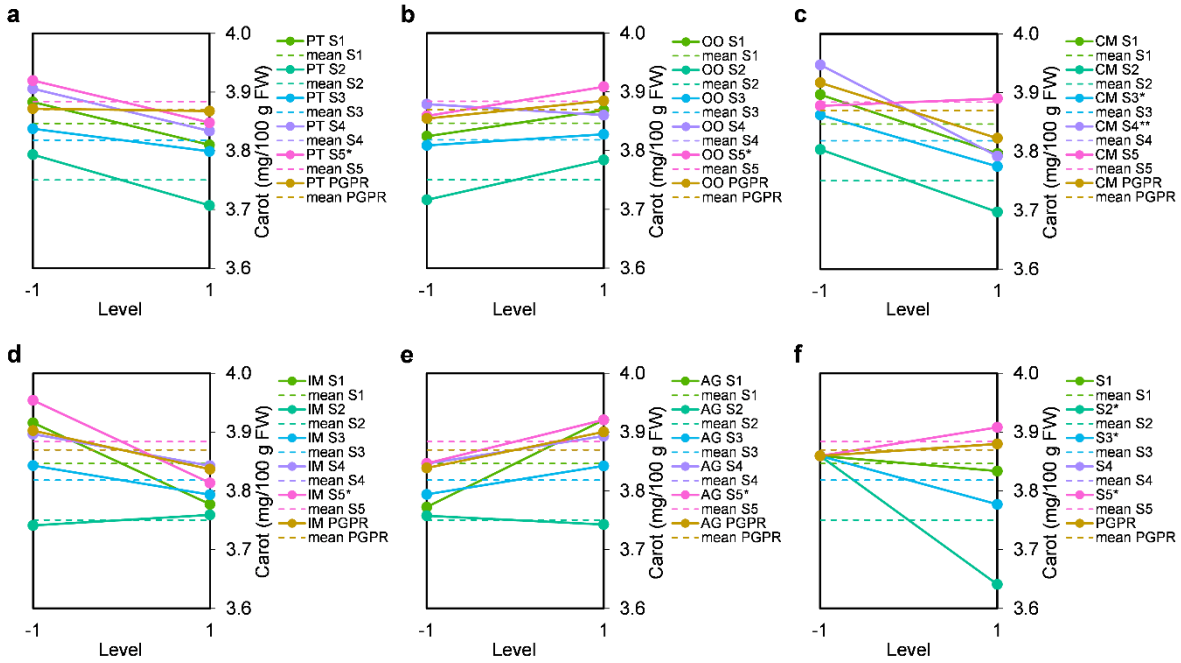


Figure S34. Main effects of substratum constituents on carotenoid content (mg/100 g FW) under different bacterial treatments (S1–5 and positive control PGPR). (a) Peat (PT; -1 = black peat and 1 = white peat); (b) Other organics (OO; -1 = coir pith and 1 = wood fiber); (c) Composted materials (CM; -1 = composted bark and 1 = green waste compost); (d) Inorganic materials (IM; -1 = perlite and 1 = sand); (e) Arabic gum (AG; -1 = 1 kg.m^{-3} and 1 = 5 kg.m^{-3}); (f) Bacterial inoculum (BCI; -1 = C and 1 = S1–5 or PGPR). Dashed lines indicate mean levels of carotenoids for each bacterial treatment. Asterisks indicate level of significance: $P < 0.05$ (*), $P < 0.01$ (**) and $P < 0.001$ (***).

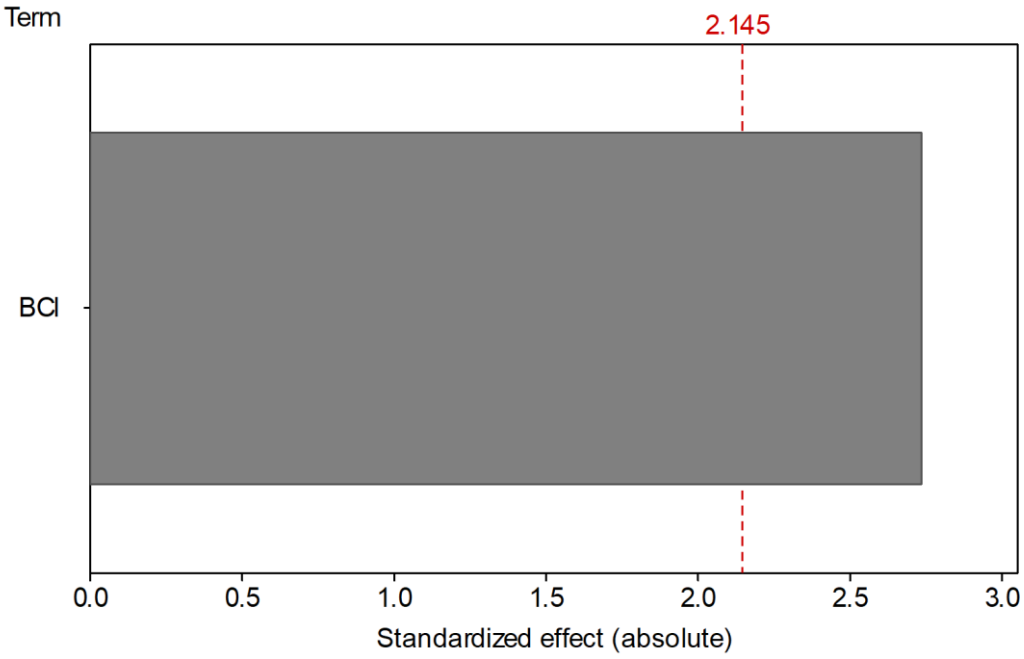


Figure S35. Pareto chart of the standardized effect (absolute) of the significant terms on carotenoid content under BCI S2 treatment. Terms are ordered from the largest to the smallest effect: BCI S2. The dashed reference line indicates the statistical significance of effects. Significance at $P < 0.05$.

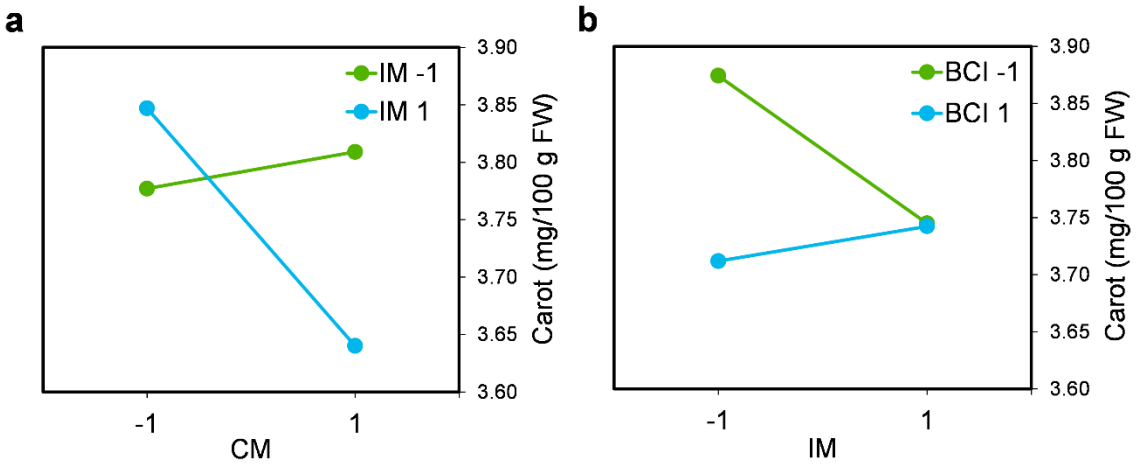


Figure S36. Interaction effects between substratum raw material groups on carotenoid content (mg/100 g FW) under BCI S3 treatment. (a) Composted materials (CM; -1 = composted bark and 1 = green waste compost) and inorganic materials (IM; -1 = perlite and 1 = sand) (P = 0.004); (b) Inorganic materials and BCI (-1 = C and 1 = S3) (P = 0.030).

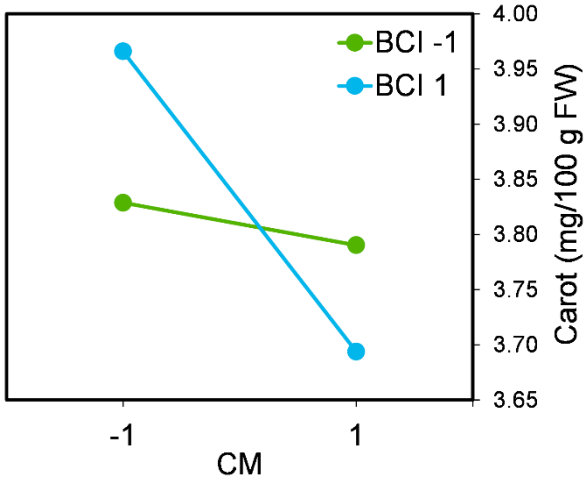


Figure S37. Interaction effect between composted materials (CM; -1 = composted bark and 1 = green waste compost) and BCI (-1 = C and 1 = S4) on carotenoid content (mg/100 g FW) under BCI S4 treatment (P = 0.025).

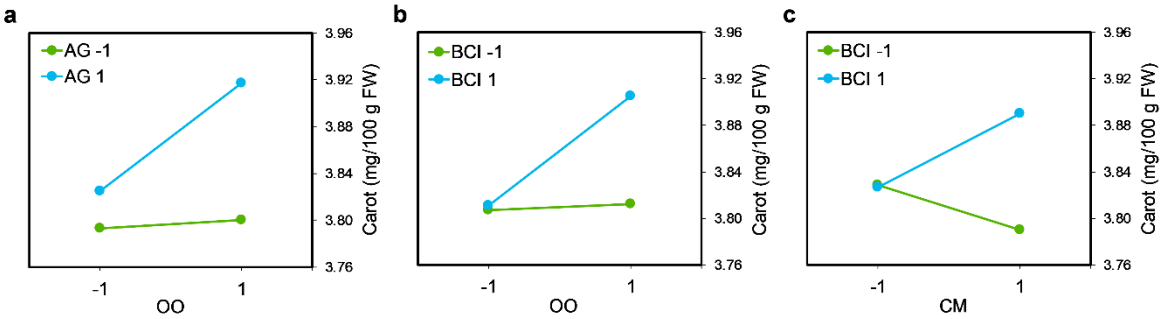


Figure S38. Interaction effects between substratum raw material groups on carotenoid content (mg/100 g FW) under BCI S5 treatment. (a) Other organics (OO; -1 = coir pith and 1 = wood fiber) and Arabic gum (AG; -1 = 1 kg.m^{-3} and 1 = 5 kg.m^{-3}) (P = 0.049); (b) Other organics and BCI (-1 = C and 1 = S5) (P = 0.047); (c) Composted materials (CM; -1 = composted bark and 1 = green waste compost) and BCI (P = 0.041).

Table S11. Carotenoid content (mg/100 g FW) response optimization under each BCI treatment. Peat (PT; -1 = black peat and 1 = white peat), other organics (OO; -1 = coir pith and 1 = wood fiber), composted materials (CM; -1 = composted bark and 1 = green waste compost), inorganic materials (IM; -1 = perlite and 1 = sand), Arabic gum (AG; -1 = 1 $kg.m^{-3}$ and 1 = 5 $kg.m^{-3}$), and bacterial inoculum (BCI; -1 = C and 1 = S1–5 or PGPR). n.s. = no significant effect of any control factor.

BCI	Goal	Solution	Fit	SE fit	95 % CI
PGPR	Max Carot	n.s.	/	/	/
S1	Max Carot	n.s.	/	/	/
S2	Max Carot	BCI -1	3.81	0.06	(3.69; 3.93)
S3	Max Carot	CM 1; IM -1; BCI -1	3.89	0.04	(3.80; 3.98)
S4	Max Carot	CM -1; BCI 1	3.97	0.05	(3.87; 4.07)
S5	Max Carot	PT -1, OO 1, CM 1, IM -1, AG 1, BCI 1	4.23	0.01	(4.15; 4.31)