



(a)



(b)



Figure S1. Apparatus and substrate samples for physical properties determination: (a) lignite substrate sample (b) Eijkelkamp sand block (c) mineral wool substrate sample.

Table S1. Contents of macro- and microelements in cucumber leaves

Parameter	Unit	MW/control EC	L/control EC	MW/high EC	L/high EC
N	% DM	4.95 ± 0.2 a	4.57 ± 0.20 a	5.06 ± 0.3 a	4.58 ± 0.2 a
P	mg·kg ⁻¹ DM	4761.7 ± 387.7 ab	4611.7 ± 247.6 ab	5160.0 ± 233.2 a	4053.3 ± 90.7 b
K		35252.0 ± 1347.3 b	31741.7 ± 992.4 b	42275.0 ± 751.4 a	34358.3 ± 657.3 b
Ca		5878.3 ± 9535.0 b	65008.3 ± 9521.9 a	52841.7 ± 8180.9 b	62133.3 ± 7904.4 ab
Mg		8420.0 ± 961.5 c	8301.7 ± 657.2 c	10137.5 ± 1172.1 a	9429.2 ± 529.9 b
S-SO ₄		8733.0 ± 471.5 b	12093.0 ± 1030.6 a	8079.8 ± 281.8 b	11574.6 ± 848.4 a
Fe		105.2 ± 7.0 c	539.2 ± 66.6 b	87.0 ± 4.4 c	938.6 ± 152.9 a
Mn		69.8 ± 3.5 c	194.0 ± 4.9 b	128.1 ± 7.1 bc	324.1 ± 10.7 a
Cu		18.6 ± 0.2 a	8.4 ± 0.1 b	9.9 ± 0.1 b	6.7 ± 0.1 b
Zn		34.6 ± 2.6 b	53.1 ± 1.8 a	37.0 ± 4.0 b	53.2 ± 3.8 a
B		67.4 ± 6.7 b	212.3 ± 31.4 a	90.9 ± 4.6 b	268.3 ± 28.6 a

Average values marked with the same letters within the same row are not significantly different within the analysed parameter at $p < 0.05$. Values with the prefix ± represent standard deviation. Abbreviations: ns, not significant.

Table S2. Chosen morphological characteristics of cucumber grown hydroponically (two-year average for the substrates and the nutrient EC)

	Shoot length increase per week	Leaf number per week	Shoot diameter	Leaf length	Leaf width	Leaf area	Petiole lenght
Unit	cm	pcs plant ⁻¹	mm	cm		cm ²	cm
Average values for cucumber plants	59.4 ± 2.1	4.0 ± 0.05	7.0 ± 0.69	22.7 ± 2.5	27.4 ± 3.61	629.8 ± 148.9	15.8 ± 2.1

Values with the prefix ± represent standard deviation.

Table S3. Chosen yield characteristics of cucumber grown hydroponically, in the period of 8 weeks after planting until the 35th week of the year (two-year average for the substrates and the nutrient EC)

	Total yield	Marketable yield	Unmarketable yield	Number of aborted fruit
Unit	g plant ⁻¹			pcs plant ⁻¹
Average values for cucumber plants	5963.3 ± 1008.0	5205.7 ± 1568.0	730.7 ± 569.7	3.4 ± 3.2

Values with the prefix ± represent standard deviation.

Table S4. Chosen quality characteristics of hydroponically grown cucumber fruit (two-year average for the substrates and the nutrient EC)

	Firmness		CIE Lab		Dry matter	TSS	β-carotene	Lutein	Nitrates
Unit	HPE	C*	H*	a */ b *	%	%	mg 100 g ⁻¹ FW		mg NO ₃ kg ⁻¹ FW
Average values for cucumber plants	63.1 ± 0.9	13.75 ± 1.0	124.3 ± 2.8	-0.58 ± 0.02	4.2 ± 0.4	4.1 ± 0.2	0.3 ± 0.05	0.4 ± 0.09	44.7 ± 32.5

Values with the prefix ± represent standard deviation.