
The following are notes from informal studies conducted at two locations: one in India, where the unit was loaned to a professor through a colleague, and the other from a series of tests carried out by Akagi in Tokyo. These studies were internal evaluations performed during 2022–2023 to validate the potential value of MagWater. The findings contributed to the patent filing with Eckelberry, Howard, and Akagi. While the work conducted in Japan was rigorous, it is understood that these studies were not intended for public dissemination.

INDIA — Germination Studies (EA Water vs. Control) Pages 1–3 show pot-based germination trials at 15 and 21 days across wheat, lentil, and rice. The professor conducting the tests was so impressed he kept the unit. Visual comparisons show EA water plants visibly more vigorous, with fuller canopies and broader leaves in lentils especially.

JAPAN — Yukio Akagi / Electro-Aeration HHO Field & Hydroponics Reports (2022–2023)

Japan Study 1 — Open-Field Growth (Akagi, Apr 2022) Two plant varieties at 6 months:

- HHO plant height: 62 cm vs. tap water: 39 cm (+59%)
- Second specimen: HHO 45 cm vs. tap 43 cm (+5%), with visibly larger leaf size

Japan Study 2 — Hydroponics: Qing-geng-cai (Bok Choy), Aug–Oct 2022 45-day grow cycle:

- Stem length: HHO 19.8 cm vs. tap 17.3 cm (growth ratio +8.6% to +30.3% at peak periods)
- **Harvest yield: HHO 812.4g vs. tap 494.2g = 175% increase in yield/sales**
- ORP at generation: 350–400 mV; DO: 10–11 mg/L at 5 min generation

- Round 3 improvements: water temperature regulator + twice-daily foliar watering drove the best results

Japan Study 3 — Hydroponics: Komatsuna (Jul 2022)

- Stem length Jul 1: HHO 16.4 cm vs. tap 8.7 cm (Gap = 4.1 cm)
- Root length: HHO $\approx$ 16 cm vs. tap $\approx$ 11 cm
- Weight: HHO 9.8g vs. tap 3.8g
- HHO foliage was dark green; tap water pale
- Growth differences emerged 15–20 days after transplant; near-double difference by July 1

Japan Study 4 — Qing-geng-cai Growth Report (Sep 30, 2022)

- HHO stem length: 568 mm (23.7 mm/day) vs. tap: 518 mm (21.6 mm/day)
- HHO period growth rate: 123%; HHO/Tap composite growth rate: 110%; Tap growth rate: 132.53%
- Visual: HHO plants deep green and dense; tap plants yellow-green

Japan Study 5 — Farm Report: Potatoes, Edamame, Carrots (Jul 2022)

- **Potatoes:** HHO harvest = 53 units vs. tap = 28 units. Market-grade (3L/2L/L/M) share: HHO 60% vs. tap 43%. Sales value: HHO increases revenue by $\sim$ 2.6x
- **Edamame:** HHO yield 239g vs. tap 134g = **1.8x yield increase**. HHO maintained 8 plant shares vs. tap falling to 6 due to mid-growth poor development
- **Carrots:** Tap water mostly failed to germinate. HHO germinated 100%; 40% commercially viable, 60% processing grade

Japan Study 6 — Hydroponics: Spinach (Nov 2022–Feb 2023, Akagi) Multi-week fixed-point observation series:

- Sowing Nov 19; germination delayed by cold (80–90% germination rate)
- Growth difference trajectory (HHO vs. tap, cumulative):

Date	HHO/Tap Growth Differential
Jan 14	-0.7% (no difference yet)
Jan 20	+8.1%
Jan 27	+16.7%
Feb 3	+20.2%
Feb 10	+28.3%
Feb 17	+25.0%

- HHO stem length at Feb 17: 145 cm vs. tap 116 cm
- **Fresh weight (harvest): HHO avg 18.6g vs. tap 8.9g = 209.8% fresh weight advantage**
- HHO grew 5–7 days earlier to shipping grade (M = 25 cm stem length)
- Leaf size: HHO width 7.0 cm / length 11.5 cm vs. tap 6.0 cm / 8.5 cm
- Key environmental note: water temperature management (15–25°C optimal) was the critical success factor; extreme heat (30–40°C) suppressed advantages until temperature control was implemented

Japan Study 7 — Soybeans (open field)

- HHO growth difference: +4 cm height, ~7 days earlier to flower
- Carrots: HHO germinating and growing steadily; tap water failed to germinate

Cross-Study Summary of HHO/EA Water Effects

CROP	SETTING	KEY RESULT
WHEAT (INDIA)	Pot germination, 15 & 21 days	Visibly stronger EA growth
LENTIL (INDIA)	Pot germination	Broader leaves, better canopy
RICE (INDIA)	Pot germination	Taller, denser EA plants
BOK CHOY (JAPAN)	Hydroponics, 45 days	+175% yield by weight
KOMATSUNA (JAPAN)	Hydroponics	~2x stem length, ~2.6x weight
SPINACH (JAPAN)	Hydroponics, 99 days	+209.8% fresh weight; 5–7 days earlier
POTATOES (JAPAN)	Open field	2.6x sales value; 60% market-grade vs. 43%
EDAMAME (JAPAN)	Open field	+1.8x yield
SOYBEANS (JAPAN)	Open field	+4 cm height, 7 days earlier
CARROT (JAPAN)	Open field	100% HHO germination vs. near-zero tap

15Day	Control	EA water
wheat		
Lentil		

rice		
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21 Days	Control	EA water
wheat		

Lentil	 A black plastic pot containing a lentil plant with several green stems and leaves. The plant is growing in a dark, indoor environment.	 A black plastic pot containing a lentil plant with several green stems and leaves. The plant is growing in a dark, indoor environment. A small white label is visible on the pot.
rice	 A black plastic pot containing a rice plant with several green stems and leaves. The plant is growing in a dark, indoor environment. A small white label is visible on the pot.	 A black plastic pot containing a rice plant with several green stems and leaves. The plant is growing in a dark, indoor environment. A small white label is visible on the pot.



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日本法人設立準備室長 赤木征夫

From Yukio Akagi
To Mr : Nicholas Eckelberry
CC
Date 26-Apr -22
Subject HHO growth



① Growth record of about 6 months from planting
Large (HHO) Plant Height 62cm
Small (tap water) Plant height 39cm
It grew rapidly in April, and the edge on the left side is visible.

② Growth record of about 6 months from planting
Right Side (HHO) Plant Length 45cm
Small (tap water) Plant height 43cm
It has grown at an accelerated rate since the end of March.
※The size of the leaf is clear, and the growth difference is remarkable

Part 1: Hydroponics Growth Report

Submission Date 7-Sep

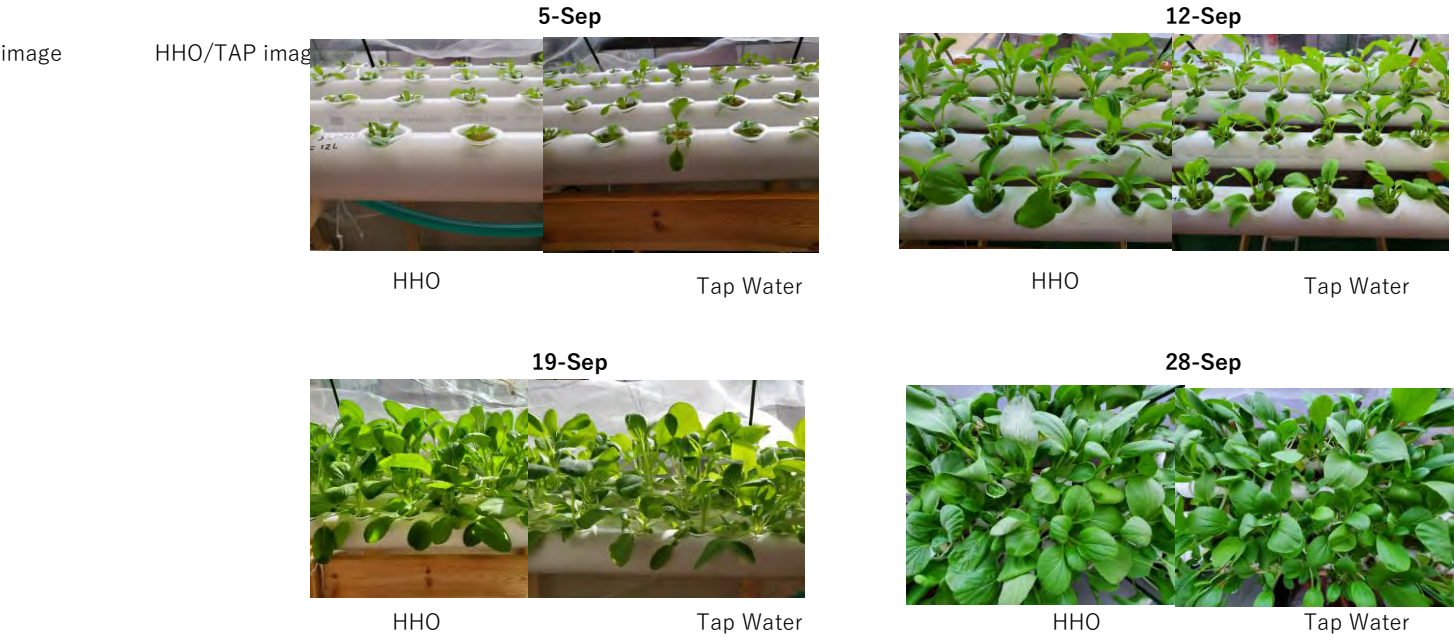
kind	Qing-geng-cai	
Growing environment	Growing season ~ Period	Aug. 22~Oct. 5
	date	
Growth process	Maximum temperature (° C)	period 45 days
	Stem length (cm)	Sep 1~2
	(under the neck) 1.5cm	Sep 3~12
	Stem length difference	10~16
	Stem length growth ratio	17~23
	Leaf count	24~30
		10/1~5
		29
		29.3
		30.2
		27
		28.1
		28.3
		2.5
		9.0
		13.9
		18.9
		19.8
		2.5
		9.0
		12.8
		14.5
		17.3
		0.0
		0.0
		1.1
		4.4
		2.5
		8.6%
		30.3%
		14.4%
		2
		4
		7

Water Quality	Water temperature (° C)	Use of water temperature regulator				
Environment	Maximum temperature (° C)	29.0	29.4	30.2	27.0	28.1
	Set water temperature	± 22°C				
	ORP	(1) When raw water is generated = 350 ~ 400 mV.				
		(2) Liquid fertilizer generation = approximately 200 mV.				
		(3) Liquid fertilizer exchange: 1 time/week				
	DO	(1) Generation time: 5Min 10~11mg/L				
	Foliar watering	Twice daily, morning and evening				

Harvest Achievement Table

water quality	Number of harvests	Gross Weight(g)	g/P
HHO	32	812.4	25.4
Tap	34	494.2	14.5

175%
HHO = 175% increase in sales



Overall review	Growing environment	(1) The growing period of green vegetables was the standard 45 days. (2) The stem length was standard, but the weight was smaller than that of open-field cultivation.
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Qing-geng-cai Growth Report

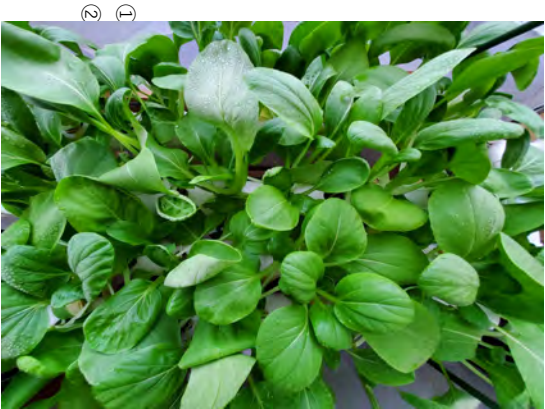
				(in mm)											
date		period		HHO		mm/day		Tap Waer		mm/day		Notes			
25-Sep-30		6		Stem length		568		23.7		Stem length		518		21.6	
30-Sep				33		17.21212				35		14.8			
Date of Reporting														(1) HHO stem length has become average, so growth is slowing down	
														(2) Since the stock book has started to gain weight, the stem length measurement will be discontinued this time	
														(3) HHO is expected to be harvested around next week. After that, TAP harvest is scheduled to be delayed by 7 days.	
														(4) Ultimately compare stem length, weight and growth potential.	
														(5) The stem length of the Tap will continue to be measured because there is still room for growth, but it will catch up within the next	

HHO period growth rate		HHO/Tap Growth Compost		TAP Growth	
growth rate		growth rate		growth rate	
123%		110%		132.53%	

HHO/TAP contrast image



HHO Top Image



TAP Top Image



(1) Photographed on July 7 (Overall image)

HHO Growth Images



(1) Photographed on July 7 (Overall image)

Tap Water Growth Images



7-Jul

Tao water

Stem length 9.4

Root length ≈ 11

Weight (net g)

4.1

Growth Gap

Unit (cm)

HHO

18.3 195%

≈ 17 154%

11.3 276%



Remarks

(1) HHO water has excellent performance, but it seems to be thin compared to normal growth.
Since it is possible that the cause was not the amount of water in the device was not appropriate, Part 2 improves.



Harvest Standards

JA Standards

Japan based on the Agricultural Cooperative Shipment Inspection Standards Table

Harvest Date

6-Jul

③Carrot			quality	Tap	Harvest Results	
grade		Large and small criteria			quantity	
	share	class	1 pcs weight		quantity	
A		3 L	300g~400g		0	
		2 L	230g~300g		1	
		L	170g~230g		1	

B		M	120g~170g		2	
		S	80g~120g		1	

- Harvest Assessment
- 1) Poor growth from germination, and Tap Watet mostly did not germinate.
- 2) HHO germinated 100%, but commercially available products accounted for 40% and processed 60%, and the EA effect was not exerted, and the growth method will be examined

Overall image 6 leaves

22-Jun Hydroponic Growing Scenery HHO



22-Jun Hydroponic germination scene



Overall image

1-Jul Hydroponic Growing Scenery HHO



1-Jul Hydroponic germination scene



Growth Gap



	22-Jun	Unit (cm)
	Tao water	HHO
Stem length	6.9	10.4

Growth Gap 3 Early in the day

Root length	≐ 11	≐ 9.0
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Weight (net)	2.8	3.8
	(g)	

Growth Gap



	1-Jul	Unit (cm)
	Tao water	HHO
Stem length	8.7	16.4

Growth Gap 4.1 Early in the

© Although it is 4 days in the calculation. Sensually ≐ 7 days	
Root length	≐ 11 ≐ 16

Weight (net)	3.8	9.8
	(g)	

Remarks Explanation of hydroponic cultivation environment

- | | | | | |
|----|------------------------|-------------|--------|------------------|
| 1) | sowing | 22-May | | |
| 2) | cotyledon | 1-Jun | | |
| 3) | True leaf | 4-Jun | | |
| 4) | Device transplantation | 5-Jun | | |
| 5) | Foliar watering | 6 a.m. | 7 p.m. | (One-sided only) |
| 6) | Water change | 5th~7th | | |
| 7) | Generation time | 4~5 minutes | | |

Kind Soybeans

HHO Water	comment	Tap water	comment
	Plant height		Plant height
	evaluation		
	Some are blossoming, The growth difference is about 4 cm, and HHO is about 7 days early Completion of fertilization and furrow raising		Evaluation ① 成長表現を検討したい ② I want to consider growth expressions

Kind Carrot

Kind Carrot

HHO Water	comment	Tap water	comment
	Plant height	Cancel	Plant height
			See display board
	evaluation		evaluation
	1 Growing steadily 2 . 下記		① Due to poor development. They do not germinate

Hydroponic Cultivation Report Spinach Final Report on Harvest

Shooting date February 24 Harvest

Fixed-point observation progress report

Growth rate Recording
and measurement date

① Jan 14 Report -0.7%



② Jan 20 Report 8.1%



③ Jan27 reported 16.7%



④ Feb 03 Report 20.2%



⑤ Feb 10 Report 28.3%



⑥ Feb 17 Report 25.0%



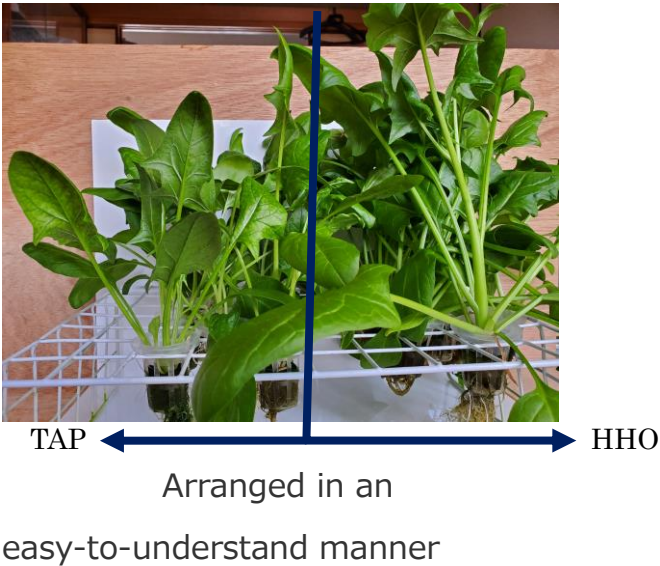
Growth record

O-4 EA Water + Liquid Fertiliz	8.5	7.3		Growth Difference			
20-Jan	10	10		118%	137%		127%
27-Jan	13	11		130%	110%		120%
3-Feb	16	12	14.5	123%	109%		116%
10-Feb	19	15	17.5	119%	125%	121%	121%
	23	24	24.5	121%	160%	140%	140%

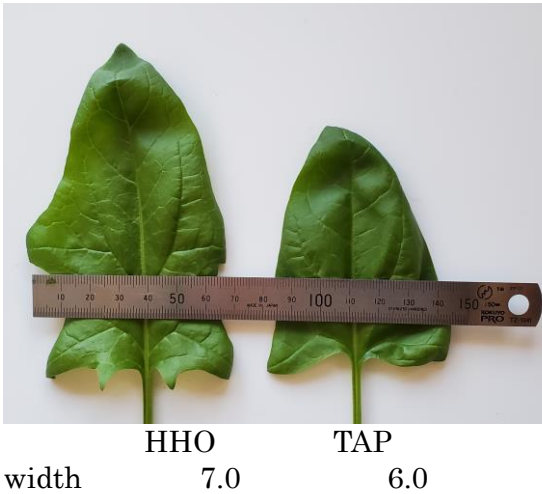
Growth

1月14	TAP	28.5	
	HHO	28.3	99.3%
1月20	TAP	34.5	
	HHO	37.3	108.1%
1月27	TAP	39	
	HHO	45.5	116.7%
2月3	TAP	44.5	
	HHO	53.5	120.2%
2月10	TAP	79.5	
	HHO	102	128.3%
2月17	TAP	116	
	HHO	145	125.0%

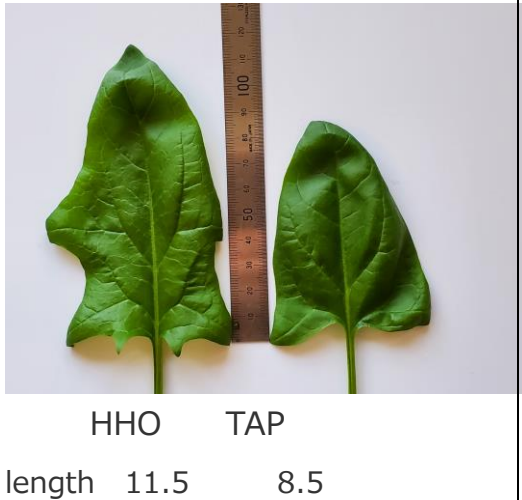
HHO/Tap Growth contrast (sideview)



Leaf width size



Leaf length size



Hydroponics Report Spinach

Shooting date: February 10

Fixed point observation date Feb-10	Growth Rate Comparison Table *HHO's growth differential from February 3 to 10 was plus 28.3%.
	① Jan 14 Report -0.7% ② Jan 20 Report 8.1% ③ Jan 27 reported 16.7% ④ Feb 03 Report 20.2% ⑤ Feb 10 Report 28.3%

成長記録

w/Q		A	B					
TAP	NO-1 Liquid fertilizer only	5.5	9		Growth rate			
	20-Jan	8	9		145%	100%		123%
	27-Jan	8.5	10.5		106%	117%		111%
	3-Feb	10	12	10	118%	114%		116%
	10-Feb	12	13.5	12	120%	113%	120%	118%
	NO-2 Liquid fertilizer only	7	7		Growth rate			
	20-Jan	9.5	8		136%	114%		125%
	27-Jan	10	10		105%	125%		115%
	3-Feb	11.5	11	13.5	115%	110%		113%
	10-Feb	14	13.5	14.5	122%	123%	107%	117%
HHO	O-3 EA Water + Liquid Fertiliz	5	7.5		Growth rate			
	20-Jan	8	9.3		160%	124%		142%
	27-Jan	9.5	12		119%	129%		124%
	3-Feb	12	13.5	14.5	126%	113%		119%
	10-Feb	15	18	17.5	125%	133%	121%	126%
	O-4 EA Water + Liquid Fertiliz	8.5	7.3		Growth rate			
	20-Jan	10	10		118%	137%		127%
	27-Jan	13	11		130%	110%		120%
	3-Feb	16	12	14.5	123%	109%		116%
	10-Feb	19	15	17.5	119%	125%	121%	121%

Hydroponics Report Spinach

- 1) As a result of consolidating germination and poor growth into 36 strains and 7 days have passed, growth has become noticeable.

Photo taken on January 20			
Germination fixed-point observation		Growth environment January 15~20	
	• Growth became noticeable See below. ※I'll delete this image from next time.	• water temperature 15℃ ~ 21℃ • House room temperature 13~21℃ • Outside temperature Morning 1℃~8℃ Day 8℃~13℃	• Temperature controller • AM6 : 30 ON PM 9 : 00 OFF • Night 1℃~5℃ • Average maximum temperature 10.1℃ • Average minimum temperature 3.8℃
		Fixed-point observation: January 20 	

Growth Rate Comparison Table

	w/Q		Fixed point				
			A	B			
			NO-1 Liquid fertilizer only	5.5	9	Growth rate	
		TAP	20-Jan	8	9	145%	100%
			27-Jan				
			NO-2 Liquid fertilizer only	7	7	Growth rate	
			20-Jan	9.5	8	136%	114%
			27-Jan				
			HHO	NO-3 EA Water + Liquid Fertilizer	5	7.5	Growth rate
		20-Jan		8	9.3	160%	124%
		27-Jan					
		NO-4 EA Water + Liquid Fertilizer		8.5	7.3	Growth rate	
		20-Jan		10	10	118%	137%

Remarks

1 . It is now possible to visually determine the overall growth.

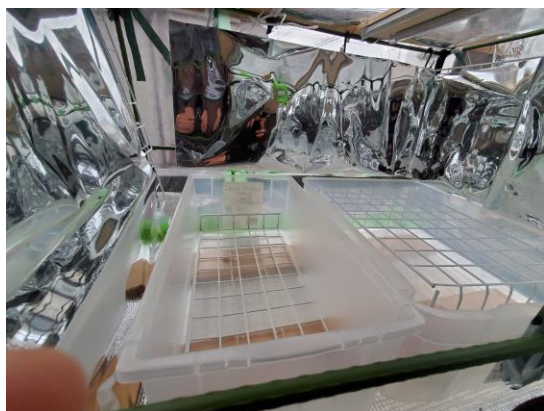
2. HHO is growing by about **4%** compared to TAP

※The results of the next few observations will clarify the changes due to water quality.

New hydroponic varieties	Microgreens = Italian parsley, basil, romaine lettuce
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Internal Images

※Aluminum film around



LED

Features ※Observed growth difference between EA generated water (HHO) and tap water purpose

LED hydroponics is widespread. Japan Antarctic research expedition eats preserved food unchanged for six months to a year.

If you eat fresh green and yellow vegetables grown by hydroponics on ocean voyages and observation bases, and if you can see changes in the growth process and greenery, you will be able to live a healthy research life both physically and mentally.

Photo taken on January 8			
Germination fixed-point observation		Growing environment: January 3~January 8	
	1 . Grows to 7~9cm	• Water temperature 17°C~21°C • House room temperature 13~22°C • Outside temperature 1°C~3°C in the morning • Daytime 10°C~11°C	• Temperature controller AM 6 : 30 ON PM 9 : 30 OFF • night 1°C~3°C • Average maximum temperature 10.3°C • Average minimum temperature 1.5°C
	⇐ • Left figure: 50% of products with good growth potential Growing environment 1 . Growth became noticeable from the second half of December. 2 . Upper row of the left figure device = liquid fertilizer only : Bottom row = EA produced water + liquid fertilizer 3 . In the future, we will observe growth differences due to water quality.		

Hydroponics Report Varieties and spinach

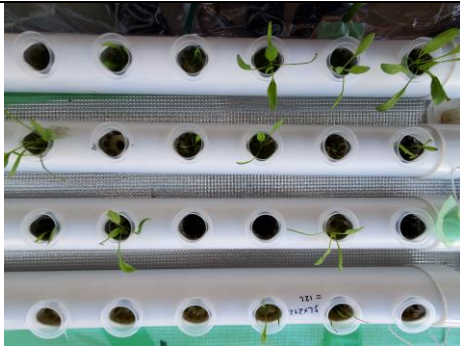
※Germination was delayed due to low-temperature cultivation in winter, but both types sprouted 80~90%. (・Resistant to cold・Jiromaru)

◎About 20% do not germinate, so remove it from the pot.

※From this week, we have been observing only EA generated water and tap water, but there is no growth difference.

※As pointed out by Nick, the DO concentration of EA produced water is 9~10ppm.

Photo taken on Jan2			
Germination fixed-point observation		Mature environment Dec 26 ~ Jan 2	
	1. Only this place has grown to about 5~6cm, but the others are only a few cm.	- Water temperature 17°C~21°C - House room temperature 13~22°C (by solar radiation)	- Turn on the temperature controller at 6:30 a.m. 9:30 p.m. -2°C~1°C at night
	2. 20~25% growth rate	- Outside temperature -2°C~1°C in the morning - Daytime 6°C~15°C	- Average high temperature 9.1°C 1°C Average minimum temp 1°C



- Roughly 80% germinated, but on average Jiromaru grows well.
- Variety = [resistant to cold] has a germination rate of about 5% lower.

Growing environment

1. Suitable temperature is 10~20°C
2. It can withstand -10~-15°C, but root elongation stops at 0°C.
3. The accumulated temperature is about 650~700°C.
※The cumulative temperature from December is estimated to be 245°C. According to desk calculations, it will take about two months to harvest.

Hydroponics Report Spinach

Shooting date February 17

Fixed point observation date February 17	Growth Rate Comparison Table※From February 10 to 17, HHO growth difference is plus
	① January 14 Report -0.7% ② January 20 Report 8.1% ③ January 27 Report 16.7% ④ February 03 Report 20.2% ⑤ February 10 Report 28.3% ⑥ February 17 Report 25.0%

Hydroponics Report Spinach

Shooting date: February 10

Fixed point observation date Feb-10	Growth Rate Comparison Table *HHO's growth differential from February 3 to 10 was plus 28.3%.
	① Jan 14 Report -0.7% ② Jan 20 Report 8.1% ③ Jan 27 reported 16.7% ④ Feb 03 Report 20.2% ⑤ Feb 10 Report 28.3%

成長記録

w/Q		A	B					
TAP	NO-1 Liquid fertilizer only	5.5	9		Growth rate			
	20-Jan	8	9		145%	100%		123%
	27-Jan	8.5	10.5		106%	117%		111%
	3-Feb	10	12	10	118%	114%		116%
	10-Feb	12	13.5	12	120%	113%	120%	118%
	NO-2 Liquid fertilizer only	7	7		Growth rate			
	20-Jan	9.5	8		136%	114%		125%
	27-Jan	10	10		105%	125%		115%
	3-Feb	11.5	11	13.5	115%	110%		113%
	10-Feb	14	13.5	14.5	122%	123%	107%	117%
HHO	O-3 EA Water + Liquid Fertiliz	5	7.5		Growth rate			
	20-Jan	8	9.3		160%	124%		142%
	27-Jan	9.5	12		119%	129%		124%
	3-Feb	12	13.5	14.5	126%	113%		119%
	10-Feb	15	18	17.5	125%	133%	121%	126%
	O-4 EA Water + Liquid Fertiliz	8.5	7.3		Growth rate			
	20-Jan	10	10		118%	137%		127%
	27-Jan	13	11		130%	110%		120%
	3-Feb	16	12	14.5	123%	109%		116%
	10-Feb	19	15	17.5	119%	125%	121%	121%

Hydroponics Report Spinach

Shooting date: February 3

Fixed point observation date February 03



Growth rate vs.

※HHO/TAP growth differential from 28 to 3 February plus 20.2%

- ① Jan 14 Report -0.7%
- ② Jan 20 Report 8.1%
- ③ Jan 27 Report 16.7%
- ④ Feb 03 Report 20.2%

Growth record

w/Q	Fixed point				
	A	B			
TAP	NO-1 Liquid fertilizer only		5.5	9	Growth rate
	20-Jan		8	9	145% 100% 123%
	27-Jan		8.5	10.5	106% 117% 111%
	3-Feb		10	12	118% 114% 116%
	NO-2 Liquid fertilizer only		7	7	Growth rate
	20-Jan		9.5	8	136% 114% 125%
HHO	27-Jan		10	10	105% 125% 115%
	3-Feb		11.5	11	115% 110% 113%
	O-3 EA Water + Liquid Fertiliz		5	7.5	Growth rate
	20-Jan		8	9.3	160% 124% 142%
	27-Jan		9.5	12	119% 129% 124%
	3-Feb		12	13.5	126% 113% 119%
	O-4 EA Water + Liquid Fertiliz		8.5	7.3	Growth rate
	20-Jan		10	10	118% 137% 127%
	27-Jan		13	11	130% 110% 120%
	3-Feb		16	12	123% 109% 116%

成長差

1月14	TAP	28.5	
	HHO	28.3	99.3%
1月20	TAP	34.5	
	HHO	37.3	108.1%
1月27	TAP	39	
	HHO	45.5	116.7%

Hydroponics Report Spinach

- 1) As a result of consolidating germination and poor growth into 36 strains and 7 days have passed, growth has become noticeable.

Photo taken on January 20			
Germination fixed-point observation		Growth environment January 15~20	
	• Growth became noticeable See below. ※I'll delete this image from next time.	• water temperature 15℃ ~ 21℃ • House room temperature 13~21℃ • Outside temperature Morning 1℃~8℃ Day 8℃~13℃	• Temperature controller • AM6 : 30 ON PM 9 : 00 OFF • Night1℃~5℃ • Average maximum temperature 10.1℃ • Average minimum temperature 3.8℃
		Fixed-point observation: January 20	
			

	w/Q		Fixed point				
			A	B			
			NO-1 Liquid fertilizer only	5.5	9	Growth rate	
		TAP	20-Jan	8	9	145%	100%
			27-Jan				
			NO-2 Liquid fertilizer only	7	7	Growth rate	
			20-Jan	9.5	8	136%	114%
			27-Jan				
			HHO	NO-3 EA Water + Liquid Fertilizer	5	7.5	Growth rate
		20-Jan		8	9.3	160%	124%
		27-Jan					
		NO-4 EA Water + Liquid Fertilizer		8.5	7.3	Growth rate	
		20-Jan		10	10	118%	137%

Remarks

1 . It is now possible to visually determine the overall growth.

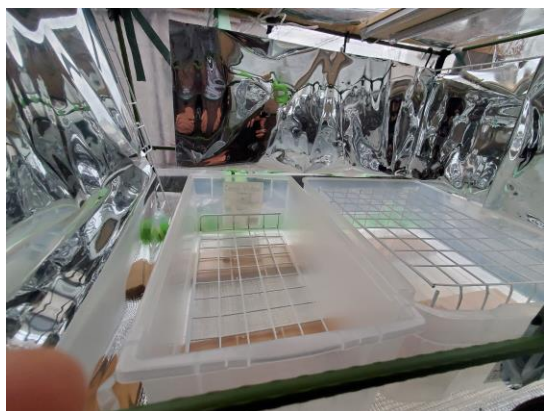
2. HHO is growing by about **4%** compared to TAP

※The results of the next few observations will clarify the changes due to water quality.

New hydroponic varieties	Microgreens = Italian parsley, basil, romaine lettuce
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Internal Images

※Aluminum film around



LED

Features ※Observed growth difference between EA generated water (HHO) and tap water purpose

LED hydroponics is widespread. Japan Antarctic research expedition eats preserved food unchanged for six months to a year.

If you eat fresh green and yellow vegetables grown by hydroponics on ocean voyages and observation bases, and if you can see changes in the growth process and greenery, you will be able to live a healthy research life both physically and mentally.

Hydroponics Report Varieties and spinach

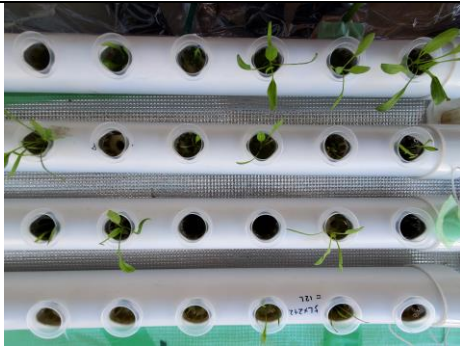
※Germination was delayed due to low-temperature cultivation in winter, but both types sprouted 80~90%. (・Resistant to cold・Jiromaru)

◎About 20% do not germinate, so remove it from the pot.

※From this week, we have been observing only EA generated water and tap water, but there is no growth difference.

※As pointed out by Nick, the DO concentration of EA produced water is 9~10ppm.

Photo taken on Jan2			
Germination fixed-point observation		Mature environment Dec 26 ~ Jan 2	
	1. Only this place has grown to about 5~6cm, but the others are only a few cm.	- Water temperature 17°C~21°C - House room temperature 13~22°C (by solar radiation)	- Turn on the temperature controller at 6:30 a.m. 9:30 p.m. -2°C~1°C at night
	2. 20~25% growth rate	- Outside temperature -2°C~1°C in the morning - Daytime 6°C~15°C	- Average high temperature 9.1°C 1°C Average minimum temp 1°C



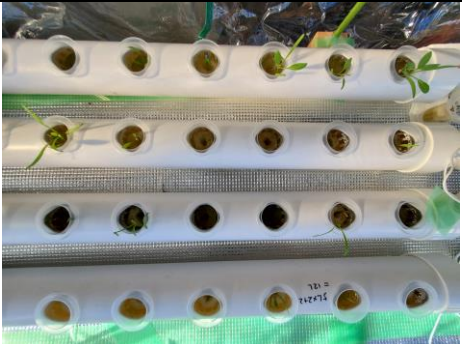
- Roughly 80% germinated, but on average Jiromaru grows well.
- Variety = [resistant to cold] has a germination rate of about 5% lower.

Growing environment

1. Suitable temperature is 10~20°C
2. It can withstand -10~-15°C, but root elongation stops at 0°C.
3. The accumulated temperature is about 650~700°C.
 - ※The cumulative temperature from December is estimated to be 245°C. According to desk calculations, it will take about two months to harvest.

Stage 4: Hydroponics Report
Varieties spinach

- ※Germination was delayed due to low-temperature cultivation in winter, but both types sprouted 80~90%. (・ Resistant to cold ・ Jiromaru)
- ◎Both types have a germination rate of 80% or more, so they are abbreviated.
- ※From this week, we will observe only EA generated water and tap water.

Photo taken on Dec 24			
Germination fixed-point observation	Growth environment Dec 16~25		
	※Only this place has grown to about 4~5cm, but others are only a few cm.	・ 水温 Water temperature 17°C~21°C ・ House room temperature 13~22°C ・ Outside temperature 0°C~5°C in the morning Intraday 8°C~14°C	・ Temperature controller on 6:30 AM 9:30 p.m. ・ -2°C~5°C at night ・ Average high temperature 10.7°C ・ Average minimum temperature 2.5°C
	※Roughly 80% germinated, but there is uneven growth. ※The two types of germinated compost are still ahead.		

Kind Soybeans

HHO Water	comment	Tap water	comment
	Plant height		Plant height
	evaluation		
	① Some are blossoming, ② The growth difference is about 4 cm, and HHO is about 7 days early ③ Completion of fertilization and furrow raising		Evaluation ① 成長表現を検討したい ② I want to consider growth expressions

Kind Carrot

Kind Carrot