

**The Use of Reduced Water in  
Hot-House Plants  
and  
Agricultural Crop Industry**

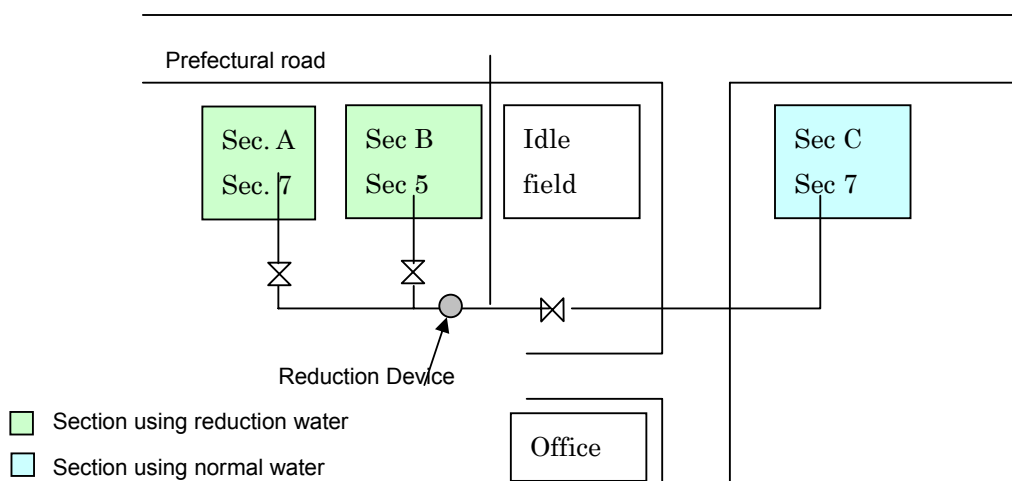


設置例



## Eggplant Hot-house plantation and reduction water

- (1) **Experiment location:** Kagoshima, Japan Kaseta Farm
- (2) **Experimented conducted by:** Yuji Kaseta  
Graduate of Kagoshima Agricultural University(1995)
- (3) **Device installed:** November, 3rd 1998
- (4) **Farm style:** Hot house plantation (automatic temperature control)
- (5) **Water source :** Irrigation pond
- (6) **Plant:** Eggplant <http://bejita.hp.infoseek.co.jp/nasubi3.html> "chikuyou"
- (7) **Test location summary**



### (8) Experiment summary:

Section	Date planted	Number planted	Supply water type
A	9/20/1998	819	Reduction water
B	Early planting		Reduction water
C	9/20/1998	761 + large eggplant	Regular water

### (9) Experiment method:

- Section B is not included in the test because it had been planted earlier.
- Section A and C were planted on the same day. A and C had 7% difference in the total number of plants. This difference is adjusted in the calculation (1.07) for the crop yield.
- Plants were Watered depended on the moisture content in the soil.
- Selected PRS-40 to fit pipe size 40A  
(a switch was used whenever section A and B were watered)
- Harvest method: Started from section C, the following day A and alternate.
- Harvest start day: November 13<sup>th</sup>.
  - Water supply method: A vinyl chloride pipe of 13Φ was installed under the roof. Water was sprayed accordingly to the soil environment.

The reason for this was that there was a Lenard effect (spray electrification, waterfall effect = reduction effect) in the spraying method. This method is the same as rain water so we changed the root water supply.

Unlike root water supply, we were concerned about molds caused by the increase in hot-house humidity. But we also took into consideration of the reduction effect.

(10) **Harvest count:** November 1998

Date	Week	Section A (819)		Section C (761)		
		Crop (kg)	Water (t)	Crop (kg)	Adjustment (kg)	Water (t)
3	T					
4	W					
5	T					
6	F					
7	S		8			8
8	S					
9	M					
10	T					
11	W					8
12	T					
13	F			2	2.2	
14	S	26				
15	S			40	43.0	8
16	M	34	8			
17	T			22	23.7	
18	W	20				8
19	T			20	21.5	
20	F	22				
21	S			30	32.3	
22	S	64				
23	M		8	96	103.3	
24	T	64				8
25	W			60	64.6	
26	T	124				
27	F			60	64.6	
28	S	80				
29	S			60	64.6	
30	M	74				
Total		508	24	390	419.6	40

(December 1998)

Date	Week	Section A (819)		Section C (761)		Water (t)
		Crop (kg)	Water (t)	Crop (kg)	Adjustment (kg)	
1	T			70	75.3	
2	W	100				
3	T			100	107.6	
4	F	60	8			8
5	S			58	62.4	
6	S	106				
7	M		8	80	86.1	
8	T	55				
9	W			42	45.2	8
10	T	60				
11	F			70	75.3	
12	S	100	8			
13	S			80	86.1	8
14	M	150				
15	T			100	107.6	
16	W	150				
17	T		8	80	86.1	
18	F	50				8
19	S			80	86.1	
20	S	140				
21	M			110	118.4	
22	T	140				
23	W			110	118.4	
24	T	166				
25	F			120	129.1	
26	S	140				
27	S			100	107.6	
28	M	100	8			
29	T			94	101.1	8
30	W	162				
31	T			120	129.1	
Total		1679	40	1414	1521.5	40

(January 1999)

Date	Week	Section A (819)		Section C (761)		Water (t)
		Crop (kg)	Water (t)	Crop (kg)	Adjustment (kg)	
1	F	146				
2	S			104	111.9	
3	S	120				
4	M			90	96.8	
5	T	130	8			
6	W			80	86.1	8
7	T	120				
8	F			95	102.2	
9	S	80				
10	S			96	103.3	
11	M	90				
12	T					
Total		686	8	465	500.3	8

Grand total		2873	72	2269	2441.4	88
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(11) **Comment on the result**

I was honestly surprised that the freshness and the crop yield have increased by just letting the water run through the device. This device was installed around blooming. The hot-house section showed evidence of disease so I started watering with reduction water. I was relieved to see the disease disappeared. With such an obvious difference, I will be using this reduction water in all sections next year.

Yuzo Kaseto at Kaseto Plantion.,

(12) **Experiment result: Crop yield**

	Section A (819)		Section C (761)			Crop yield comparison / $\times 100$	Water comparison / $\times 100$
	Crop (kg)	Water (t)	Crop (kg)	adjustment (kg)	water (t)		
<b>November</b>	508	24	390	419.6	40	121.07	60.00
<b>December</b>	1679	40	1414	1521.5	40	118.74	100.00
<b>January</b>	686	8	465	500.3	8	137.12	100.00
<b>Grand total</b>	2873	72	2269	2441.4	88	126.62	81.82
<b>Per plant</b>	3.51		2.98			17.78%	

Crop yield per plant increased by 17.78% (calculated in Kg). Regarding the quality of the eggplant, its skin was thin and soft. When it was pressed firmly the mark of the fingerprint was left on the eggplant. The filed has produced a thick fruit of appropriate firmness and better flavor. One could also eat it raw and detected moisture in the fruit.

When you compare the produce of sections A and C, A has thinner skin, thicker fruits and tasted better. Normally fertilizer ingredients affect produce differently in leaf, fruit, and root. For example, nitrogen fertilizer is good for leafy vegetables, phosphorus is good for fruits and potash is good for root vegetables. However with reduction water, all sections using the same fertilizer had bigger leaves, thicker fruits, and large roots covering the soil which gave us the impression that the eggplant was healthy and thriving. Incorporating the reduction effect for plants enabled biological balance and better absorption in nutrition just like with other creatures. We believe that future tests based on freshness preservation, sugar, water content and ingredient comparison with number values must be conducted.