

## Thoang Hydroponics-Synergy Trial Report

### 1. Summary:

This trial is conducted to test the performance of Synergy against another commercially available Bacillus Product(Control).

**Results: Our Bacillus Product(Synergy) has resulted in 6.6%(300kg) higher yield than the control over a two month period. And the block treated with Synergy displayed higher sugar levels for the leaves, higher chlorophyll content and longer shelf life.**

### 2. Date and Location of Trial:

Oct 2018-April 09, Geelong

### 3. Trial Protocol:

-Crop: Truss Tomato

Treatment: 1500m2	<b>Synergy</b>	300g monthly with second last irrigation (Rate:2kg/ha=300g/1500m2)
Control: 1500m2	<b>Another Commercially available Bacillus Product</b>	1L monthly with second last irrigation (Rate: 8L/ha=1L/1500m2)

### 4. Trial Result

#### Root Mass:



Tomato roots(Nov 22)

Synergy demonstrated larger and thicker root mass than the control.

## Yield:

Yield data are recorded for one tunnel(3 rows) at each pick, and the picking period recorded is Jan 29-Apr 09, 2019.

Treatment	Synergy(kgs)	Control(Kgs)
Total so far(kgs)	4764.15	4468.23

**So far Synergy has yielded 296kg more, which is equivalent to 6.6%.**

## Growth and Truss Set:

From December, 2018 to April 2019, we monitored the growth and truss set status of 10 plants from each treatment. The result is that the both block displayed similar growth and truss setting speed.

	Control		Synergy	
	Growth*(cm)	Truss Set*	Growth*(cm)	Truss Set*
Dec 11	35.55	6.54	35.61	6.82
Jan 09	80.3	10.28	83.1	10.56
Feb 13	103.86	15.2	98.2	15.54
Mar 12	76.76	18.42	73.97	18.53
Apr 10	67.69	21.7	67.11	21.71

Table: Average growth and truss set of 10 plants from each block

(\*Growth explained: The extra height the plant grown from the last measurement

\*Truss Set explained: Assume that each truss has 5 tomatoes set on it, each tomato equals to 0.2 truss)

## Chlorophyll content

Chlorophyll content	Synergy	Control
Unit: SPAD	38.43	37.82

We measured 10 leaves from 10 plants from each block using a hand-held chlorophyll meter.

**Leaves from the block synergy demonstrated high chlorophyll.** This could be due to the plants being able to uptake the Magnesium from Synergy and produce more chlorophylls.

## Brix Test(sugar level)

Brix Level	Synergy	Control
Unit: Bx	12.4	9.6

The above table is a brix test conducted from 5 grinded leaves from each block.

Synergy block demonstrated high sugar levels, which could be the bacillus enhanced nutrient utilisation and improved general plant metabolism and sugar production.

## Fruit quality and Color



Color, fruit quality & size looks similar.

## Shelf Life

We chilled 8 tomatoes from each treatment in the cold room for 3 weeks.

The result is that tomatoes from both treatment visually looked good, both had no rot or lesion present. This shows that Bacillus is able to improve nutrient levels in the fruits, which led to longer shelf life.





(3 weeks in cold room)



(3 weeks in cold room & 1 week in room temperature)

Synergy displayed firmer skin and larger cell wall strength than the control, which indicated that Synergy helped to move more nutrients to the fruit level.

## 5. Conclusion

Various parameters have shown that our product(synergy) have delivered good results comparing to the control. This is a product which is able to enhance microbial activity, making more nutrients available to plants and improve on the general health and yield.

## 6. Pictures





## 7. Appendices

### Yield Data Record

Picking date	Synergy(kgs)	Control(Kgs)
29-Jan	501	413.5
2-Feb	492.5	496.5
6-Feb	312	287
12-Feb	151.52	161.1
17-Feb	226.84	233
20-Feb	349.38	330.8
24-Feb	297	286
27-Feb	94.53	52.7
3-Mar	251.7	241.7
5-Mar	168	129.68
10-Mar	375	392
13-Mar	212.78	180.84
17-Mar	206	216
19-Mar	136	131.5
23-Mar	228	226
26-Mar	122.8	105.5
30-Mar	180	128
2-Apr	48.6	53.01
6-Apr	186.5	196
9-Apr	224	207.4
Total so far(kgs)	4764.15	4468.23

## Growth and truss set data record:

Control			Synergy		
Plant	Growth(cm )	Truss Set	Plant	Growth(cm )	Truss Set
C1	27.5	6.2	S1	29.1	6.6
C2	36	5.4	S2	38	7.4
C3	27	6.4	S3	41	7.2
C4	41	6	S4	19	5.4
C5	47	6.4	S5	33	7
C6	30	7	S6	47	7.2
C7	46	7.6	S7	44	7.2
C8	36	7.2	S8	41	6.8
C9	32	7	S9	42	7.2
C10	33	6.2	S10	22	6.2
<b>4 Week Average</b>	<b>35.55</b>	<b>6.54</b>	<b>4 Week Average</b>	<b>35.61</b>	<b>6.82</b>
Plant	Growth(cm )	Truss Set	Plant	Growth(cm )	Truss Set
C1	74	10.2	S1	71	10.4
C2	80	9.2	S2	80	11.4
C3	73	10.4	S3	75	10.8
C4	90	9.8	S4	83	9.6
C5	91	9.4	S5	88	10.6
C6	80	10.6	S6	94	11.2
C7	80	11.4	S7	77	10.8
C8	82	10.8	S8	91	9.4
C9	82	11	S9	86	11
C10	71	10	S10	86	10.4
<b>4 Week Average</b>	<b>80.3</b>	<b>10.28</b>	<b>4 Week Average</b>	<b>83.1</b>	<b>10.56</b>
Growth			Growth		
Plant	Growth	Truss Set	Plant	Growth	Truss Set
C1	106	14.8	S1	90	15.4
C2	105	14.8	S2	98	16.4
C3	102	15.4	S3	103	15.8
C4	*Missing		S4	100	15
C5	*Missing		S5	94	15.6
C6	108	15.8	S6	107	15.8
C7	*Topped		S7	97	14.8

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C8	110	15.4	S8	90	14.6
C9	92	15.6	S9	103	16.2
C10	104	14.6	S10	100	15.8
5 Week Average	103.86	15.2	5 Week Average	98.2	15.54
Plant	Growth	Truss Set	Plant	Growth	Truss Set
C1	73	18	S1	64	18.2
C2	*Missing		S2	72	19.6
C3	67.5	18.4	S3	*Missing	
C4	78	18.8	S4	72.3	18
C5	76.5	17.8	S5	75	19
C6	85	19.2	S6	76	19
C7	76	19	S7	80	18
C8	80	18.6	S8	76	16.8
C9	78	18.6	S9	77.2	19.4
C10	76.8	17.4	S10	73.2	18.8
4 Week Average	76.76	18.42	4 Week Average	73.97	18.53
Plant	Growth	Truss Set	Plant	Growth	Truss Set
C1	62	21	S1	58	21.2
C2	65	20.8	S2	56.5	22.6
C3	66	21.6	S3	Missing	Missing
C4	70.2	22.4	S4	70.5	20.6
C5	72	21.4	S5	68	22.6
C6	79	22.6	S6	75	22.2
C7	60	22.2	S7	64	20.8
C8	67.7	21.8	S8	70	20.6
C9	68	22.6	S9	74	23
C10	67	20.6	S10	68	21.8
4 Week Average	67.69	21.7	4 Week Average	67.11	21.71

## Chlorophyll content Data Record:

Treatment	Chlorophyll content(SPAD)		
	Control	Synergy	Fruit Booster
	44.7	42.2	32.8
	45.3	38.7	30.7
	40.7	35.1	38.4
	33.1	39.5	34.8
	37	46.7	36.2
	36.4	37.3	40.9
	29.5	37.9	37
	37.1	34.3	43.3
	35	35.6	44.2
	39.4	37	43.3
Average of ten leaves	<b>37.82</b>	<b>38.43</b>	<b>38.16</b>