



Vegetables Research

**Highland Research and Development Institute
(Public Organization)**





Vegetables Research

Royal Project

- **Organic production**
- **Increase Productivity**
 - Trial of bio-products
 - Disease and pest
 - Nutrient
- **Postharvest**

Extension of Royal Project

- **Trial vegetables**
 - IPM
 - Safety
 - Cost saving

Bio-products

Controlled disease (bacteria)



B10



GAR1



B15



Metarhizium anisopliae

Beauveria bassiana

Paecilomyces tenuipe



trap



Bio-extract from herb

Controlled pest



สูตร 1

สูตร 2



สูตร 3

สูตร 4

Media for seedling

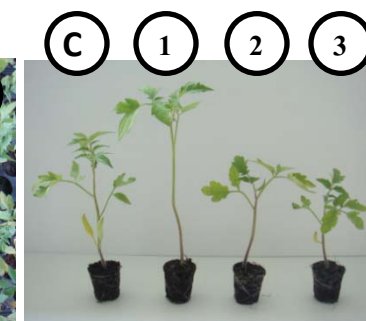
Media for seedling

Treatment	Germinated (%)	Diseased (%)	Height (cm.)	Root Length (cm.)	Fresh weight (g)	Dry weight (g)	Survival (%)
Formula 1	94.13a	0.00	6.12b	10.02bc	33.45a	0.12a	82.87a
Formula 2	93.65a	0.00	7.80a	11.08ab	37.77a	0.14a	82.87a
Formula 3	96.15a	0.00	6.96ab	9.37c	38.16a	0.14a	80.55a
Formula 4	94.71a	0.00	7.03a	10.17bc	39.29a	0.14a	81.02a
Formula 5	98.37a	100.00	1.63c	12.02a	11.05b	0.06b	77.31a
CV (%)	3.83	-	8.42	9.53	13.78	11.99	3.94
LSD	4.9015	-	0.9188	1.3448	8.1326	0.0262	6.0016



The trial effective Actinomycetes for control Root and Stem Rot in seedling

Treatment	Germinated (%)	Root and Stem Rot (%)	Height (cm.)	Root Length (cm.)	Fresh weight (g)	Dry weight (g)
Control	87.02	1.44	7.02	9.92	23.79	1.31
Actinomycetes 1	88.36	0.00	10.98	14.99	29.23	2.28
Actinomycetes 2	84.81	1.44	6.58	10.77	20.96	1.18
Actinomycetes 3	86.54	1.06	5.45	10.02	17.07	0.61



Controlling subterranean ant in Chinese Radish

Treatment	Productivity							
	Total		Grade 1		Grade 2		Grade U	
	Kg.	%	Kg.	%	Kg.	%	Kg.	%
Control	100.7	100	29.0	28.76	35.8	35.61	35.9	35.62
Metarhizium (ME)	120.9	100	43.1	35.64	44.8	37.04	33.0	27.31
Metarhizium (MS)	77.8	100	18.9	24.30	22.4	28.73	36.5	46.96
Stemona tuberosa (หนอนตายหยาก)	86.8	100	22.5	25.88	34.8	40.10	29.5	34.01



Stemona tuberosa



Controlling club root of pointed cabbage

Treatment	No. disease	Disease	Level of club root		
			1	2	3
Control	56.13	43.87	16.45	20.90	6.52
Fresh Trichoderma	73.39	26.61	4.68	20.78	1.15
Dust Trichoderma	26.48	73.52	18.85	43.87	10.80
BK33	33.03	66.97	39.29	16.82	10.86
B3	68.10	31.90	16.19	11.11	4.60
B6	44.69	53.79	41.15	10.82	3.33
Dolomite lime	88.70	11.30	6.70	4.60	0.00



The trial Tuba Root for control flea beetle in Mustard

Treatment	Insect Dissemination (%)	Productivity (Kg.)		Income (bath)
		Pre	Post	
Control	46.30	506.80	328.00	5,326
Bio-extract from Tuba Root	22.00	444.60	309.50	5,090
Fresh Tuba Root	12.00	510.40	350.00	5,638



Tuba Root



Increasing productivity organic baby corn

Primary productivity

Target Productivity

< 150 Kg.

> 200 Kg.



Process	Test	Control
Pre-planting		
1. Cowpea	✓	✗
2. Dolomite	32 bag /rai	8 bag /rai
Agonomy		
3. Spacing	50 x 40 cm.	50 x 35 cm.
4. Seed	3 seed /hole = 3 Kg.	3-5 seed /หลุม = 5 Kg.
5. Compost	1 hand /hole	1 hand / 4 hole
6. Irrigation	rain	rain
7. Fertilizer	1 hand /hole + spray bio-extract from egg	1 hand / 2 hole

Organic baby corn 26 Day



Test



Control



Organic baby corn 40 Day

Costs of produce organic baby corn and income (1 Rai)

Costs		Productivity (Kg.)		Income (bath)		Net Income (bath)	
Test	Control	Test	Control	Test	Control	Test	Control
4,985.08	5,715.44	220.30	219.50	7,490.20	7,463.00	2,505.12	1,747.56



Control	Test
seed 5 Kg.	seed 3 Kg. (decrease 40 %)
productivity 219.5 Kg.	productivity 220.3 Kg.
costs 5,715.44 bath	4,985.08 bath (decrease 12.77 %)
Income 1,747.56 บาท	2,505.12 bath (increase 43.35 %)

Pod 1



Pod 2



Pod 3



Trial nutrient management in Kale

Treatment	Product (kg) / 24 m ²			
	No. 1		No. 2	
	pre	post	pre	post
1. Control	61.4	24.8	115.5	49.2
2. Bio-extract from egg rate 1:1,000	104.7	42.2	122.2	54.9
3. Fermented chicken manure rate 1:200	89.7	36.6	117.7	50.7
4. Bio-extract from egg / Fermented chicken manure	121.5	47.0	146.4	63.3



The trial postharvest for reduce losing

Vegetable	Treatment	Shelf life
Mustard	1. Water (control) 2. Wash Water+Chlorine 100 ppm 3. Wash Water+Chlorine 200 ppm	4. Wipe Water+Chlorine 100 ppm 5 Day
Pak-choi	4. Wipe Water+Chlorine 100 ppm 5. Wipe Water+Chlorine 200 ppm	5. Wipe Water+Chlorine 200 ppm 3 Day



Extending shelf life by Vacuum cooling

Vegetable	Treatment	Shelf lief
Mustard 8 mb. 5 minute	1. Control (RT) 2. Control (7 °C) 3. Vacuum+Bulk (RT)	Vacuum+Pack (7 °C) 8.78 Day
Pak-choi 6 mb. 15 minute	4. Vacuum+Pack (RT) 5. Vacuum+Bulk (7 °C) 6. Vacuum+Pack (7 °C)	Vacuum+Pack (7 °C) 16 Day



Pak-choi 3 Day (7 °C)



Pak-choi 3 Day (RT)

The study postharvest in chili

- Treatment 1 Soak sweet flag rate 15 ml/ 20 L 30 minutes
- Treatment 2 Soak fresh tuba root 1,000 ml/ 20 L 30 minute
- Treatment 3 Soak Bio-extract D3 (tubar root + Stemona tuberosa) 20 ml/20 L
- Treatment 4 Steam at 65 °C 15 minutes
- Treatment 5 Scalded with boiling water 15 minutes
- Treatment 6 Soak water 30 minutes
- Treatment 7 Control



Method

- Pack in bag 70 g.
- Storage at room temperature and check insect pest every month



Drying chili



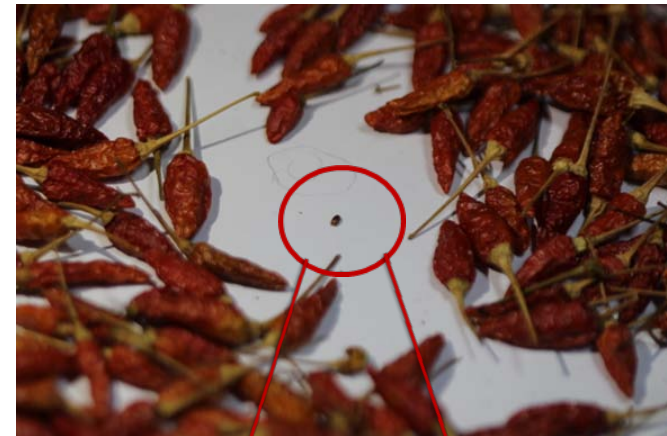
Normal bag



Vacuum bag

Results

Treatment	Package	Insect pest (%)
Control	Plastic bag	20
	Vacuum bag	-
Sweet flag	Plastic bag	20
	Vacuum bag	-
fresh tuba root	Plastic bag	60
	Vacuum bag	-
Bio-extract D3	Plastic bag	20
	Vacuum bag	-
Steam 65 °C	Plastic bag	-
	Vacuum bag	-
Scalded 15 minute	Plastic bag	-
	Vacuum bag	-
Soak water 30 minute	Plastic bag	20
	Vacuum bag	-



The trial Equipment dried chili

Results



1



2



3



4



5

Treatment	Humidity (%) (peduncle)	Humidity (%) ()
1. Equipment dried chili 1	3.60	5.60
2. Equipment dried chili 2	5.20	6.10
3. Solar Oven	2.70	4.60
4. On the ground	5.50	6.90
5. On the roof	7.25	8.25



The Lettuce Trail

Vegetable	Area (m ² .)	Costs (bath)	Productivity (Kg.)	Price (bath)	Income (bath)	Net Income (bath)
1. Cos	36	147.00	62.00	30.00	1,860.00	1,713.00
2. Green Oak	36	147.00	40.00	30.00	1,200.00	1,053.00
3. Red Oak	36	147.00	46.00	30.00	1,380.00	1,233.00
4. lettuce red coral	36	147.00	42.00	30.00	1,260.00	1,113.00
Total	144	588.00	190.00		5,700.00	5,112.00



**Thank you
for your attention**



Sweet flag

