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Tuesday, September 19, 2023

Certification About the Accuracy of the Vietnam Field Test Results

The field tests summarised below have been translated from Vietnamese to English. The translation is accurate according to the results of the field tests, which were issued by the relevant Vietnamese provincial government authorities stated, which collected the field test data. The company stamp is placed below as a guarantee of this.

Farmers in Vietnam have been using the bio-fertilizers for about 30 years. We have many field test reports from 20 or more years ago, but nowadays we do keep records of their use because so many farmers are using the bio-fertilizers, and word-of-mouth is how the bio-fertilizers tend to be marketed nowadays.

Provincial governments in Vietnam buy many 20-foot containers from us each year. The bio-fertilizers are marketed under 4 brands in view of their popularity.

Because of the benefits of the bio-fertilisers for sugarcane about 80% of the sugar mills in the country only buy sugarcane grown with the bio-fertilizers. In addition, almost all rubber plantations use the bio-fertilizers. Rice and maize farming communities are major customers of ours.

Yours faithfully,



Peter S. McAlpine
Chief Marketing Officer
Artemis & Angel Co. Ltd.



Confirmation in 2009 by the Country Agent for Vietnam of the Effectiveness of Bio-Plant and Pro-Plant, 100% Organic Liquid Bio-fertilizers

We placed an order for a 20-foot container with 1,930 cases of Bio-Plant and Pro-Plant in May 2008. It was shipped to Vietnam in July 2008. We have contacted several of our agents about the effects of Bio-Plant and Pro-Plant. The results are very good and as a result our agents have many requests from ethanol factories, rice farmers, sugarcane farmers, and rubber plantations to buy more Bio-Plant and Pro-Plant. Here is a summary of the results we have from some agents.

Sugarcane

- In general, the farmers have increased their yield by 20% - 30% compared to when they used chemical fertilizers.
- Sugarcane crops grown in wet rice fields increased the yield by 40% - 50%.
- On normal land farmers increased normal yield of 50 tonnes per hectare to 70 tonnes.
- Bio-Plant and organic matter mixed together improve the soil. When flooded with water the sugarcane yield increased up to 100 tonnes. Where farmers use water system the yield increased up to 120 tonnes.
- They reduced their costs 30% - 35% compared to chemical fertilizers.
- Two sugarcane factories mix Bio-Plant with the filter cake waste of sugarcane, and the farmers increase their productivity 5% - 10% by using it to prepare the soil.
- Farmers that mix Bio-Plant with chemical fertilizer reduce the chemical fertilizer they use by half.

Rubber

- At one rubber plantation the growth of young trees is 20% - 25% faster than normal.
- At another plantation the trees produce more latex than when chemicals were used in the past. The latex is softer and flows easier.

Rice

- We hear that many rice farmers have stopped using Urea and NPK. Rice grown with Bio-Plant and Pro-Plant produces 15% - 30% more than with chemicals. More roots in rice plants. More grain on the heads of rice plants. Much fewer pest problems. Our agents say they have many more farmers wanting to change from chemicals to Bio-Plant and Pro-Plant next season.

Vietnamese Agricultural Association Field Tests Carried Out in 2004

To: The Tambol Agricultural Association Committees & The Tambol Agricultural Co-Operative Stores Committees

In the production season starting at the beginning of 2004 all the farmers in District Juengmee were highly successful in increasing production compared to the previous production season. It showed that the farmers were trying hard to increase their production. The Association of Co-operative Stores instructed all the farmers in District Juengmee about bio-fertilizer technology and about how to use the bio-fertilizers to grow various kinds of crops, such as rice, beans, tea, lychees, and vegetables.

At the Agricultural Association's seminar on 4th June 2004, the representatives of the Association concluded that after using the bio-fertilizer the crops were stronger and healthier, the seeds were tighter and heavier (loose rice was reduced to +5%), the total production had a better colour, there had been no need to use pesticides, the rice production increased by 24.5 %, Soya Bean production increased by 10%, expenses were reduced by 33.3%, and the increased revenue was 2-4.5 million Dong/hectare (US\$126,662 – US\$284,990).

The Process of Using Bio-Plant and Pro-Plant in the Rice Fields

1. 300 kgs. of organic fertilizer + phosphorus (10 kgs.) were ploughed into the field. After ploughing, Bio-Plant (20 ml.) + water (40 litres) were sprayed over the soil surface 3-5 days after preparing the soil with the organic fertilizer and phosphorus.
2. Put fertilizer on the soil 15-20 days after ploughing.
 - Put urea 2 kgs. On the soil.
 - 3 days after that, mix Bio-Plant (5 ml.) + Pro-Plant (10 ml.) + water (20 litres) and spray it on the rice plants.
 - 30 days after ploughing the rice will produce rice seeds.
 - Then apply 1 kg. of urea + 1 kg. of potassium.
 - 3 days after applying the chemical fertilizer, mix Bio-Plant (5 ml.) + Pro-Plant (20 ml.) + water (20 litres) and spray it all over the rice leaves.
3. While the rice is producing seeds:
 - 40-45 days after ploughing and planting the rice seeds in the soil, the rice will produce seeds.
 - Mix and spray Bio-Plant (5 ml.) + Pro-Plant (20 ml.) + water (20 litres) all over the rice crop and leaves.
4. When the seeds appear:
 - Mix and spray Bio-Plant (5 ml.) + Pro-Plant (20 ml.) + water (20 litres) all over the rice crop and leaves.
5. While the rice seeds are becoming hard:
 - Mix and spray Bio-Plant (5 ml.) + Pro-Plant (20 ml.) + water (20 litres) all over rice crop and leaves

Chieugmee Agricultural Committee Representative
Mr. Fum Suaug Tern

The Results Of Using The Bio-Fertilizers With Rice And Beans In Spring 2004

On 3rd March 2004 the District Association Committee of District Shieugmee, Hartai Province, conducted a seminar to discuss the test results on rice in each district of this District. Because the results had been so positive, at the end of March 2004 the Agricultural Association of District Shieugmee, Hartai Province, received a request from the Provincial Agricultural Association to conduct field tests using the bio-fertilizers, Bio-Plant and Pro-Plant, with several kinds of crops and vegetables during Spring 2004.

First Tests

- Tested on Rice: 6.25 Rai in Meeruaug and Tohdao districts.
- Tested on Soya Beans: 6.25 Rai in Jeugphu district.
- Tested on Green Tea: 7.95 Rai in Jauphu district.
- Tested on Lychees: 100 trees in Hvewan and Waugwhaytho districts.
- Tested on Daoruang Flowers: 5.3 Rai in Ngorbserug district.
- Tested on Cucumbers: 1 Rai in Daieau district.

Test Results 1: Rice

In spite of not being able to prepare the poor soil properly, after 3 months of testing on rice the production of rice had increased by 12% and 20%, depending on the variety. The rice was of a higher quality, healthier and stronger. No pesticides had been used. Costs were reduced by 34% compared to rice cultivation with chemical fertilizers. The revenue of the farmers was far higher than they had ever achieved before.

1.1 Soil Condition: The soil was sandy soil, close to the River Bui. Rubbish had been used before as organic fertilizer. The soil did not hold water well. There were few minerals in the soil.

1.2 Test Areas: Two farming families were chosen to test rice cultivation with the bio-fertilizers. The sizes of their pieces of land were 1.125 Rai and 0.9 Rai. Their land was called the Test Area. On another piece of land, 0.225 Rai in size, chemical fertilizers were used, namely Urea (7 kgs.) and Potassium (6 kgs.), This land was called the Comparison Area. Both test areas prepared the soil first by applying mixed fertilizer (300 kgs.) + phosphorus (10 kgs.) from a local fertilizer factory. The test started on 3rd March 2004 and finished on 15th May 2004, with harvesting on 5th June, 2004.

1.3 Results of the Tests

A. By Size and Quantity

Variety of Rice	Areas	Height (cms.)	Rice Flowers / m ²	Seed Flour	Weight /1000 Seeds	Production (kgs./ 360 m ²)
Q5	Comparison Area	98	270	99.8	24	200.6
	Test Area	99	270	109.3	24.4	224.6
Sticky Rice 352	Comparison Area	98	270	90.4	23.2	195.8
	Test Area	99	300	102.4	24	243.8

B. Test Results after Harvesting

- Q5 (kgs./360m²)
 - Comparison Area 200.6 kgs.
 - Test Area 224.6 kgs.
Increasing in Production 24 kgs. (12%)
- Sticky Rice 352 (kgs./360m²)
 - Comparison Area: 195.8 kgs.
 - Test Area: 243.8 kgs.
Increase: 48 kgs. (19.7%)

C. Cost Comparison

- Comparison Area
 - Urea 7 kgs.: 3,600,000 (Dong/kg.) = 25,200,000 Dong.
 - Potassium 0.6 kgs.: 3,100,000 (Dong/kg.) = 18,600,000 Dong
 - Pesticide: = 7,000,000 Dong
 - Labor Cost: = 14,000,000 Dong
 - Total Cost = 64,800,000 Dong**
- Test Area
 - Bio-Plantv21 ml.
 - Pro-Plant 84 ml.
 - Labor Cost: = 14,000,000 Dong
 - Total Cost = 43,000,000 Dong**

Saving = 21,800,000 Dong (34%) US\$1 = 15,790 Dong

1.4 Method

- The bio-fertilizers were sprayed 7 times. Each time 2 full tanks were sprayed over an area of 360 m² using Bio-Plant (3 ml.) + Pro-Plant (12 ml.) mixed with 16 litres of water each time.
- When one compares the Test Area and the Comparison Area (both 360 m²), one sees that the farmers saved 21,000,000 Dong, while they increased their income by 2 million to 4.5 million Dong / hectare.

Test Results 2: Beans

2.1 The Test Area

- High sloping land with few minerals in the soil. The depth of the soil suitable for planting was 18.3 cm. from the surface as below that there were big stones. The soil did not hold water. The type of bean used was MD7.

2.2 Procedure

- 10 farming families were chosen, who had connecting farm land, and one family with 300 m² of land was chosen as the Comparison Area.
- The Test Area used organic fertilizer and the bio-fertilizers.
- The Comparison Area used mixed fertilizer (200 kgs.) + phosphorus (20 kgs.) + white silicate (20 kgs.) + urea (3 kgs.) + potassium (5 kgs.).
- The test period was from 10th March 2004 until 24th April 2004.

2.3 The Test Results

A. By Measuring and Counting

Plant Process	Height (cm.)	Roots/Seeds(m ²)	Seeds (qty/m ²)	Bean seeds (inside/m ²)	Weight (100 seeds/gr.)	Production (kgs./360m ²)
Comparison Area	48	442	264	528	38	107
Test Area	46	440	286	572	38	117

B. Results of Harvest (Area of 360 m²)

- The Comparison Area produced 107 kgs.
- The Test Area produced 117 kgs. (+9%)

C. Comparison of Costs

- Comparison Area: 85,000,000 Dong + labor 50,000,000 Dong = 135,000,000 Dong / 360 m² .
- Test Area: Mixed fertilizer 200 kgs. = 30,000,000 Dong + Bio-fertilizers 125 ml. + labor 40,000,000 Dong = 105,000,000 Dong/360 m²

When one compares the Test Area and the Comparison Area (both 360 m²) one can see that the farmers reduced their expenses by 30,000,000 Dong (29%), and increased their income by 63,000,000 Dong from the increase in crop productivity.

The beans produced revenue of 93,000,000 Dong, which equals 2.5 million Dong per hectare, which was a significant increase over what the farmers were used to producing.

2.4 Summary

- The tests showed that when using the bio-fertilizers the rice had a stronger core; tighter seeds; improved rice color; there was only 5% loose rice; the rice was a little taller; and the rice flour was long (as stated in the table).
- The soil in the Test Area was not prepared properly in advance because the rice farmers had already started to plough and plant the rice in the fields. Also, when planting Soya Beans (soya beans) the farmers did not prepare the soil with white silicate + phosphorus + the bio-fertilizers. This meant that less bio-fertilizer was applied to the soil than there should have been, so the number of times the rice plants were sprayed was increased. Also, the soil was in poor condition - grade 5 and 6 (low quality) – and there was no chance to extend the growing period.
- In spite of these problems, after harvesting, the crops grown with the bio-fertilizers increased their productivity by 12% - 20%, and the farmers reduced their expenses by about 34%, while increasing their income from 2 million Dong to 4.5 million Dong / hectare / season.
- There was no need to use chemicals to protect the crops against pests. The overall production was much better, especially of Lychees, and the taste was noticeably sweeter after using the bio-fertilizers.
- Using Bio-Plant and Pro-Plant increased the quality of the rice, reduced the production costs, and reduced all the normal crop growth problems. There was no need to use the usual harmful pesticides.

The Agricultural Committee Representative of
District Shieugmee
Mr. Fum Suaug Tern
12nd June 2004

Test Results 3: Tea

1. General Conditions

- On 9th June 2004 Bio-Plant and Pro-Plant were used to grow tea plants, and the effects were analyzed on 16th June 2004.
- The tea variety used was a local variety (green tea) and was grown from seed. It had been planted in the area since 1984. The soil had received very little fertilizer over this time.
- The soil condition was sandy soil mixed with stone. The height of the tea plant was 18 cm. The circumference of the tea leaves was 64.3 cm.
- At the end of 2003 no fertilizer had been applied to the soil.

2. The Test Process

- One farmer family was selected. The planting area was 1,800 m².
- The formula for using the bio-fertilizers was as follows:
 - A. Bio-Plant (5 ml.) + water (20 litres).
 - B. Bio-Plant (5 ml.) + Pro-Plant (10 ml.) + water (20 litres).
 - C. Bio-Plant (5 ml.) + Pro-Plant (20 ml.) + water (20 litres).
- The Comparison Area did not use the bio-fertilizers.

3. The Test Results

Formula	Length of Tea Leaves (Cms.)	Weight of 100 Leaves (Grams)	Quantity Of Leaves (Per M ²)	Produce (Grams Per M ²)	Weight Comparison (Grams)
Test Area Formula A	6.5	95	196	1.86	0.46
Test Area Formula B	7.1	100	232	2.32	0.92
Test Area Formula C	8.2	110	249	2.73	1.33
Comparison Area	5.4	80	116	1.40	-

4. Comments

- Using the bio-fertilizers, the growth rate was clearly faster and the tea leaves were thicker, longer, and greener.
- After using the bio-fertilizers for 7 days, tea-end leaves could be picked, but in the Comparison Area it took 15 days before this could be done.
- The cost of applying the bio-fertilizer was 7,000,000-10,000,000 Dong/360 m², and the production increased by 3-4 kgs. dry weight compared to the Comparison Area, and this added significant extra revenue for the farmers of 75,000,000 – 100,000,000 Dong.

**Hartai Provincial Agricultural Association,
District Juengmee**

Test Results 4: Chili Plants

The Use of Bio-Plant and Pro-Plant with Chili Plants at Eaurack Village, Tambol Kwaugjao, District Kwaugsuaug, Tauwha Province.

The tests with the bio-fertilizers started on 26th May 2004. The bio-fertilizers were sprayed once as follows: Bio-Plant (8ml.) + Pro-Plant (30 ml.) + water (20 litres) on an area of 500 m². After applying the bio-fertilizers 5 times, the results were as follows:

- The chili plants that were grown with the bio-fertilizers had more fruit and flowers (about 140-200 seeds per chili plant) compared to the chili plants in the Comparison Area, which had 100-160 seeds per chili. Plant.
- The chili plants in the soil where the bio-fertilizers were used absorbed water better than the chili plants in the Comparison Area.
- The chili plants in the Test Area (500 m²) produced 300 kgs. of chilis in the area of 500 m² while in the Comparison Area (also 500 m²) only 220 kgs..
- The quality of the chilis in the Test Area lasted longer and had a fresher colour than the chilis in the Comparison Area.

The soil was sandy soil near the sea, and the test results were as follows;

A. Quantity of Bio-fertilizers Used

Times Sprayed	Period of Use	Trial on 500 m ² area			
		Bio-Plant (ml)	Pro-Plant (ml)	Total (ml)	Remarks
1st Time	26/5/2004	8	30	38	
2nd Time	1/6/2004	8	30	38	
3rd Time	6/6/2004	8	30	38	
4th Time	11/6/2004	8	30	38	
5th Time	16/6/2004	8	30	38	
	Total	40	150	190	

B. Comparison of Costs in the Test Area and Comparison Area (500 m²)

Item	Content	Comparison Area			Trial Area		
		Qty	Price/Unit(Dong)	Total(Dong)	Qty	Price/Unit	Total(Dong)
1	Seeds cost			50,000			50,000
2	Animal fertilizer	200 kg	100	20,000	20 kg.	100	20,000
3	NPK	60 kg	1300	78,000			
4	Bio-Plant				40 c.c.	278	11,120
5	Pro-Plant				150 c.c.	278	41,700
	Total			148,000			123,000

Comparison of the Results

1. Comparison Area

- Produced 220 kgs at a selling price of 30,000 Dong / kg. = 660,000,000 Dong / 500 m².
- Revenue minus expenses: 660,000,000 - 148,000,000 = **452,000,000 Dong** profit.

2. Test Area

- Produced 300 kgs. At a selling price of 30,000 Dong / kg. = 900,000,000 Dong / 500 m².
- Revenue minus expenses: 900,000,000 - 123,000,000 = **777,000,000 Dong** profit.

The profit for the farmers who used the bio-fertilizers was 58% higher.

Tester 1: Mr. Dowh Duek Kan
Tester 2: Professor Waugh Bui Dough
30th November 2004

Test Results 5: Vegetables

The Use of Bio-Plant and Pro-Plant with Vegetables at Tambol WaughTauh, District Waughsueug, Tauhwah Province, 28th June 2004

3 kinds of vegetables were tested: sweet lettuce, scented lettuce, and green lettuce. The growing area was 500 m².

The vegetables in the Comparison Area used the old system by Potassium (10 kgs.), Urea (20 kgs.), and Phosphorus (20 kgs.).

The Test Area used the bio-fertilizers as follows:

Times Sprayed	Period of Use	Testing on 500 m2 area			
		Bio-Plant(cc.)	Pro-Plant(cc)	Total	Remarks
1 time	Soil Adjusted	60	-	60	
2 time	After 10 days	8	30	38	
3 time	After 15 days	8	30	38	
4 time	After 20 days	8	30	38	
5 time	After 25 days	8	30	38	
6 time	After 30 days	8	30	38	
	Total	100	150	250	

The test period was from 24th May 2004 to 24th June 2004. Each vegetable was grown on an area of 500 m². The weather in Tauhwah was hot at 38 C. with south-west winds and heavy rain, which affected the growth of the vegetables significantly.

On 13th June 2004 the rain was heavy and the growing area had no roof cover. The result was that the vegetables in the Comparison Area all died so it was very difficult to make a comparison, but nevertheless there were some points to compare, as follows:

- While the vegetables were blooming, those grown with the bio-fertilizers bloomed 10% more than those in the Comparison Area.
- The vegetables grown with the bio fertilizers were more resistant to the bad weather conditions. By 13th June 2004 nearly all the vegetables in the Comparison Area had died, but much fewer had died in the Test Area. After 2 days the vegetables in the Test Area were recovering and started to look fresh again, and certainly looked much fresher than in the Comparison Area.
- The Test Area vegetables were more resistant to pesticides and had no dark spots on the leaves and roots.
- The taste of the vegetables grown with the bio-fertilizers was better, and the vegetables were crispier than those in the Comparison Area.

Limitation Point

Spraying the bio-fertilizers on an area the size of 500 m² took 1 hour, but using chemicals diluted with water took only 30 minutes.

Summary

The vegetables grown with the bio-fertilizers were more resistant to the weather; they did not need any pesticides; and they tasted better.

In spite of the limited test period, and the adverse growing conditions, the Agricultural Co-Operative Stores of Tambol Waughtauh was impressed with the results and decided to use Bio-Plant and Pro-Plant next season.

Consultant/Expert
Mr. Farmh Suaug Tauh

Evaluator
Mr. Wiaugh Soon Jao
Head of the Agricultural Co-operative Store
Tambol Waughtauh

Test Results 6: Non-Toxic Vegetables Grown Out of Season

For Non-Toxic Vegetables, Grown Out of Season At Tambol Waughjin , District Waughwah, Tauwah Province.

The Test Area was the farm of Mr. Hah Wan Kee, Jingar Village, Tambol Waughjin, District Waughwah, Tauwah Province. The testing started on 18th July 2004 and continued until 27th August 2004. The process of planting seeds started on 18th July 2004.

A. Test Procedure

- 4 types of vegetables were grown out of season, i.e. scented lettuce, Chinese lettuce, nun (a Vietnamese vegetable) and Theelar (a Vietnamese vegetable). They all have a growing cycle of 30-40 days.
- The area of land was 500 m².
- There was a slanted cloth roof to protect the crops from the sun and rain.

The test steps were as follows:

- Organic fertilizer was created by mixing fermented fertilizer (400 kgs.) + NPK fertilizer (8-10-5-13) (10 kgs.)+ Bio-Plant (60 ml.). This was applied to the soil and left to ferment for 5 days to adjust the soil condition before seeding for 2 days.

Time of spraying	Period of use	Test area 500 m2			
		Bio-Plant(cc)	Pro-Plant(cc)	Total(cc)	Remarks;
1 time	12 days after seeding	3	10	13	
2 time	19 days after seeding	5	20	25	
3 time	26 days after seeding	8	30	38	
4 time	31 days after seeding	8	30	38	
	Total	24	90	114	

B. Expenses

Item	Contents	Unit	QTY	Price/unit(Dong)	Total Dong
1	Fertilizer				
	Fermented fertilizer	kg.	400	100	40,000
	NPKS fertilizer	kg.	10	1600	16,000
	Bio-Plant/Pro-Plant	c.c.	214	278	59,000
Total = 115000					
2	Expenses for sun roof				
	Slant	m2	500	1,400	700,000
	Support post 2.5 m.	pcs	42	5,000	210,000
	Wire	kg.	20	11,000	220,000
	Labour	wage	6	20,000	120,000
Total = 1250000					
3	Seed cost				100,000
4	Labour cost	wage	20	20,000	400,000
Total					1,865,000

C. Profit

- Vegetables (Market price at that time)
 - Scented lettuce (350 m²) 450 kgs. (4,500 Dong/kg.) = 2,025,000 Dong
 - Theera (75 m²) 50 kgs. (10,000 Dong/kg.) = 500,000 Dong
 - Nun (25 m²) 15 kgs. (20,000 Dong/kg.) = 300,000 Dong
 - Chinese lettuce (50 m²) 10 kgs. (20,000 Dong/kg.) = 200,000 Dong
- The 4 crops earned 3,025,000 Dong.
- Profit after expenses 3,025,000 – 1,865,000 = 1,160,000 Dong

During the 40 days from seeding to the harvested crop, deducting all the expenses, the result was a profit of 1,160,000 Dong, even with the slanted roof included as part of the expenses. This expense would not be included in the future.

Summary about the Test Area Vegetables

- The soil was looser and not rusty after rain (In the area which did not have a roof and used chemical fertilizer there was thick rust, which made the crops grow less well.
- The vegetables that were grown with the bio-fertilizers did not need pesticides, unlike the crops grown in the Comparison area.

Reported by Agricultural Tambol Waughjin

Date: 27th August 2004

Tester: Mr.Hah Wan Kee

Test Results 7: Mulberry

The Use of Bio-Plant and Pro-Plant on Mulberry at Tambol Teaohdo, District Teaohwah, Tauwah Province 27th July 2004

1. Mulberry

Test Area: 10 villages in Tambol Teaohdo, District Teaohdo, Tauwah Province.

1. Test Type I: Using Fertilizer While The Mulberry Is Growing

Size of Test Areas

- The Test Area using the bio-fertilizers was 2,000,000 m².
- The Comparison Area was 500 m².

Cost of Fertilizer

- The Comparison Area used urea (20 kgs.) costing 4,000,000 Dong/kg. = 80,000,000 Dong.
- The Test Area used the bio-fertilizers (Bio-Plant + Pro-Plant) 4 times. Each time 38 cc. was used at a cost of 278 Dong/cc = 42,400 Dong.

Use

- Bio-Plant (8 cc) + Pro-Plant (30 cc) + water (30 litres) was sprayed over the 500 m² area 4 times: 3 times every 21 days and again at harvesting time.

Results

- The Test Area using bio-fertilizer produced 215 kgs. of mulberry leaves at a selling price of 10,000 Dong/kg. = 215,000 Dong. Deducting the expenses - 215,000 - 42,400 = 172,600 Dong profit over an area of 500 m².
- The Comparison Area produced 200 kgs. of mulberry leaves at a selling price of 10,000 Dong/kg. = 200,000 Dong. Deducting the expenses - 200,000 - 80,000 = 120,000 Dong over an area of 500 m².
- As a result, over the area of 500 m², the Test Area using the bio-fertilizers had a higher profit of 52,000 Dong in comparison with the Comparison Area, which used the old system of chemical fertilizers. This represents an increase in profit of 70%.

Summary of the Test Results

- Mulberry grew faster and produced more leaves compared to the Comparison Area.
- The mulberry plants grown using the bio-fertilizers grew 10-20 new leaves each, but the mulberry in the Comparison Area grew only 9-10 new leaves. Also, the mulberry grown with the bio-fertilizers produced thicker and larger leaves.
- The mulberry grown with the bio-fertilizers were more resistant to pests and there were fewer weeds.
- The mulberry grown with the bio-fertilizers produced more leaves than in the Comparison Area.
- There was no need to separate the mulberry leaves for the silk worms to eat, but the leaves of the mulberry grown with urea had to be separated after 10 days.
- The silk worms that ate the mulberry leaves on the plants grown with the bio-fertilizers had 7% more to feed on than those in the Comparison Area.

2. Test Type 2: Before using the bio-fertilizers, the mulberry plants were cut to 90 cm. in the Test Area of 500 m².

- In the Comparison Area (500 m²) chemical fertilizers were used, i.e. NPK (5-8-5) 50 kgs.
- In the Test Area, the bio-fertilizers were used without cutting the mulberry plants. The average height of the mulberry plants was 2.4 m.

The Test Area Used the Bio-fertilizers as follows:

- 1st time (16 Aug, 2004): NPK (5-8-5) (20 kgs.) + Bio-Plant (60 cc) were sprayed over the mulberry plants.
- 2nd time (21 Aug, 2004): Bio-Plant (8 cc) + Pro-Plant (30 cc) were sprayed over the mulberry plants.
- 3rd time (26 Aug, 2004): Bio-Plant (8 cc) + Pro-Plant (30 cc) were sprayed over the mulberry plants.

The result was that the mulberry plants produced many more fresh leaves and branches; the leaves were thicker and a fresher green; and there was more shadow than in the Comparison Area where the leaves were yellowish and grew slowly. In the Test Area there were 15 leaves per branch while in the Comparison Area there were 10 leaves per branch. Also the soil in the Test Area absorbed more water.

Test Results 8: Rice

The Use of Bio-Plant and Pro-Plant on Mulberry and Rice at Tambol Teaohdo, Amlplur Teaohwah, Tauwah Province 27th July 2004

1. Basic Information About the Tests

- The test took place at Tambol Teaohdo, District Teaohwah on 30th June 2004 during the rice growing season.
- The bio-fertilizers were used with rice **CL9** of the Agricultural Spore Research Institute, and it was conducted by Mr. Wiauh Hueh Hung and Mr. Ngeauh Ngok Tungh.
- Test Area (using bio-fertilizer) was 1,000 m² in size.
- The Comparison Area (using chemical fertilizers) was 500 m² in size.

2. Test Area Fertilizer Use

- In the Test Area, the committee decided to use 50% of the amount of chemicals used in the Comparison Area. The use of the bio-fertilizers was as follows:

Time of Spraying	Period of using Fertilizer	Area 500 m2			Support fertilizer (kg.)
		Bio-Plant	Pro-Plant	Total	
1 time	Adjust soil condition	60 cc.	0	60 cc.	manure 500 kg NPK 20 kg.
2 time	After putting rice seed 10days	8 cc.	30 cc.	38 cc	urea 3 hg. K fertillizer 3 kg.
3 time	After putting rice seed 20 days	8 c.c.	30 c.c.	38 c.c.	urea 3 kg.

3. Costs

- Bio-Plant /Pro-Plant 250 cc at a cost of 278 Dong per cc. = 69,500 Dong
- NPK (5-8-5) 20 kgs. at a cost of 1,300 Dong per kg. = 26,000 Dong
- Urea 7 kgs. at a cost of 4,000 Dong per kg. = 28,000 Dong
- Potassium 5 kgs. at a cost of 4,000 Dong per kg. = 20,000 Dong
- Total Cost = 143,500 Dong**

4. Comparison Area Fertilizer Use

Chemical fertilizers were used as follows:

Step	Period of using fertilizer	Area 500 m2			
		manure	Urea	Phosphorus	Pottassium
1	living	500	10	35	0
2	After putting rice seeds 10 days	0	5	0	5
3	After putting rice seeds 45 days	0	0	0	5
	Total	500	15	35	10

5. Costs

• Pesticides		=	15,000 Dong
• Phosphorus	35 kgs. at a cost of 1,100 Dong per kg.	=	38,500 Dong
• Urea	35 kgs. at a cost of 4,000 Dong per kg.	=	60,000 Dong
• Potassium	10 kgs. at a cost of 4,000 Dong per kg.	=	40,000 Dong
Total Cost		=	153,000 Dong

6. Summary

- The cost of the fertilizers was not much different.
- The soil where the bio-fertilizers were used was softer than in the Comparison Area where it was quite hard.
- The rice grown with the bio-fertilizers grew better and was greener than the rice in the Comparison Area.
- In the Test Area the rice plants had more stems in a bunch than in the Comparison Area.
 - Test Area: a bunch had on average 9 stems.
 - Comparison Area: a bunch had on average 8 stems.
- There were much fewer weeds in the Test Area.
- The rice in the Test Area was more resistant to pests than in the Comparison Area.
- On 18th August 2004, it was necessary to apply pesticides in the Comparison Area, but pesticides were not needed at all in the Test Area.
- In the Test Area the rice produced seeds 3-4 days before the Comparison Area.

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