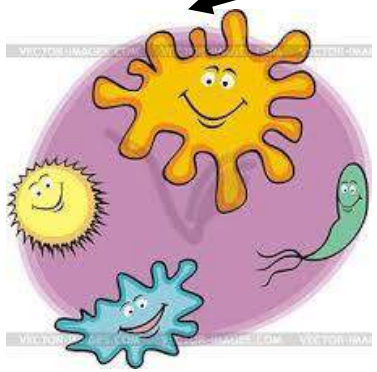

IBG®
(473365-H)
IBG Bio Fertilizer Series
Sustainable Agriculture through
Innovative Biotechnology

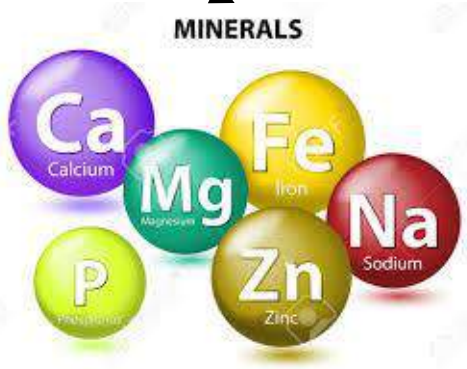
What is inside the natural soil?



Beneficial microbes.

Fungi, actinomycete, small insect.

Organic matter.



Macro and micro minerals.

Water.

What is inside the natural soil?

1. Microbe.
   - Decompose organic matter.
   - Nutrient recycle.
   - Humus formation.
   - Nitrogen fixing.
   - Promote plant’s growth.

2. Organic matter.
   - As a source of nutrient pool for plant.
   - As a source food for bacteria.
   - Recover soil nutrient.

What is inside the natural soil?

3. Macro and micro nutrient.

- Carbon, Hydrogen, Oxygen
- Nitrogen
- Phosphorus
- Potassium
- Calcium
- Magnesium
- Sulphur
- Manganese
- Copper
- Zinc
- Molybdenum
- Boron
- Chlorine
- Iron

Important for plant growth, food formation, etc.

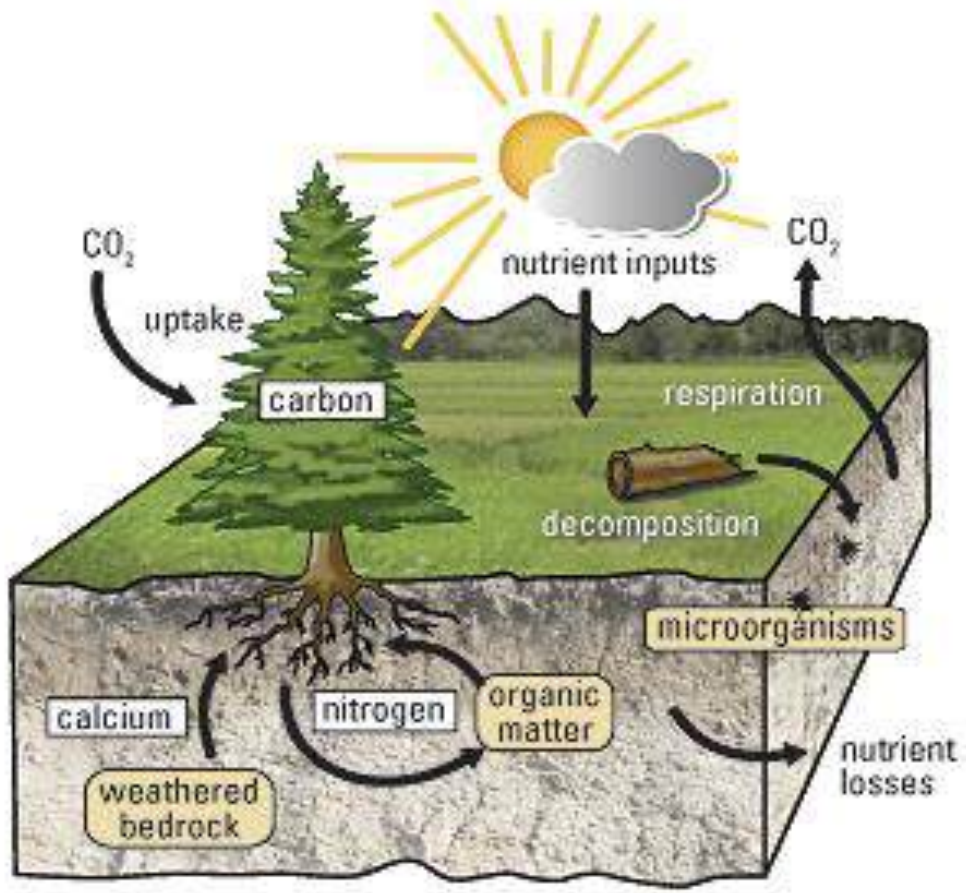
Why soil protection is important?

- Soil – provide moisture, nutrients, air and protection to the plant.
- Plant – Provide food and shelter to human.
- Human – but human provide non other than chemical fertilizer hence jeopardizing the soil health.

Why soil protection is important?

- When the soil was damaged due to acidification, its immune system will be weaken. An unhealthy soil will not produce a vibrant plant as the plant will suffered from a lot of disease. Hence the plant will not provide quality food to human. Therefore, soil recovery and human's quality life is important.

Virgin forest stage.



Plantation clearing stage

The importance of chemical fertilizer.

- Soils contain natural reserves of plant nutrients, but these reserves are largely in forms unavailable to plants, and only a minor portion is released each year through biological activity or chemical processes. This release is too slow to compensate for the removal of nutrients by agricultural production and to meet crop requirements. The plant require 16 nutrients in order to grow well, this causing mass nutrient removal from the soil from which the nutrient has to be replenish for the plant to survive.

Chemical fertilizer and soil health.

- Therefore, chemical fertilizers are designed to supplement the nutrients already present in the soil. The use of chemical fertilizer, organic fertilizer or biofertilizer has its advantages and disadvantages in the context of nutrient supply, crop growth and environmental quality.

Pros and cons of chemical fertilizer.

Initial use.

Pros.

- Crops grows fast and big.
- Adequate nutrient.
- Support plant growth.
- Increase harvest yields.

Pros and cons of chemical fertilizer.

<u>Cons.</u>

- Toxicity and pollution.
- Results in depleted soil, and results in acidity.
- Interfere with natural soil ecology.

Prolong use.

Damaged soil vs healthy soil.

Type of fertilizer.

Chemical fertilizer.

Medicine.

Effect fast, but a lot of disadvantages.

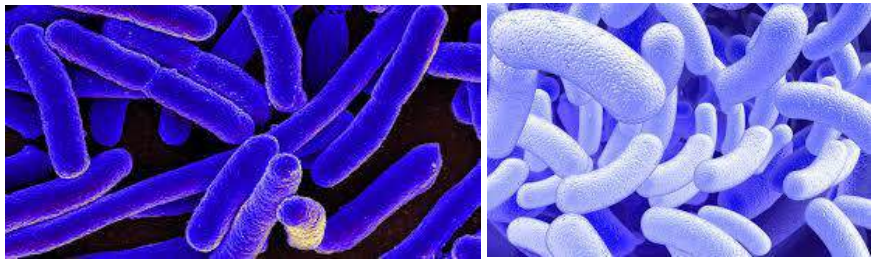
- Prolonged use of chemical fertilizer = Prolonged use of medicine = Although is fast and efficient but a lot of disadvantages.

Type of fertilizer.

Organic elements.

Traditional Medicine.

Effect slow, no disadvantages.



Microbes.

Health supplements.

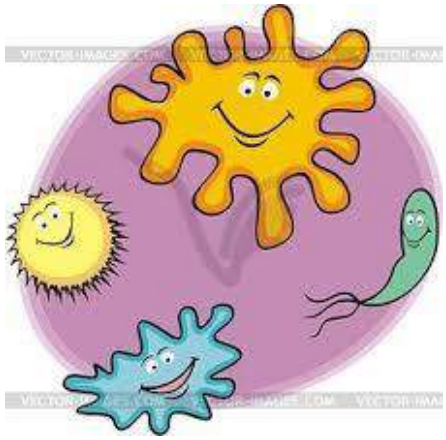
Relatively safe and reliable, long-term use is able repair and protect the soil.

What is IBG biofertilizer

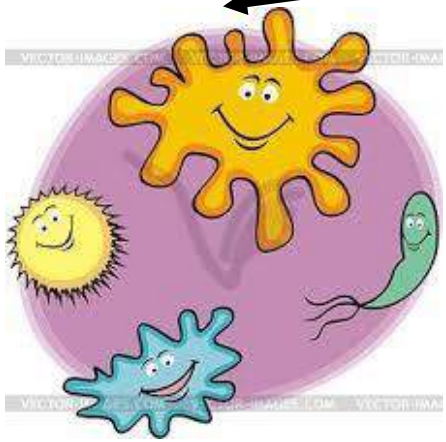
The best solution for soil recovery

Organic elements.

Microbes.



What is inside the IBG bio fertilizer?



Beneficial microbes of no less than 10^7 cfu/ml.

Aloe vera, seaweed extract, humic acid, amino acid, fish emulsify.

- Biofertilizer in the market has to contain minimum 1 million cfu/g bacteria in order to be classified as biofertilizer. With our technology, IBG biofertilizer has attain at least 10 million cfu/g of bacteria.

- Moreover, microbes cannot survive alone without organic matter. It has to be complemented with organic matter and macro and micro nutrient in order to efficiently recover the soil. Our perfect blend of organic matter will enable the microbes to live inside the soil.

- These two combination is equal to what is originally inside the soil. IBG biofertilizer is able to provide a holistic element for the plant to grow and absorb better.

IBG MANUFACTURING SDN. BHD. 199801017236 (473365-H)
No. 3, Jalan TPP 3, Taman Perindustrian Putra, 47130 Puchong, Selangor Darul Ehsan.
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IBG Manufacturing Sdn. Bhd. accredited by Standards Malaysia under accreditation number 494 for Chemical and Microbiology Tests

TEST REPORT

Customer: Production Department
IBG Manufacturing Sdn Bhd
No. 3, Jalan TPP 3,
Taman Perindustrian Putra,
47130 Puchong,
Selangor Darul Ehsan.

Lab Number : IBG-QC-02523
Date received : 10th July 2023
Date tested : 10th – 12th July 2023
Date reported : 12th July 2023

Page 1 of 1

Sample description : Liquid Biofertilizer
Sample marking : Durian 05/07/23 MAS-F030-2307-01

Test parameter	Method	Unit	Results
Total plate count, PCA @ 37°C for 48 hours	In House Method, TM-IBG-03-001, based on AS 1766.1.3, 1991	cfu/g	1.1×10^8
pH @ 23.0°C	In House Method, TM-IBG-02-004, based on pH meter	-	4.02
*Total Organic Matter	In House Method, TM-IBG-02-025, based on AOAC 967.05, MS 417: Part 2: 1994, Clause 3 & MS 417: Part 2: 1994, Clause 5	% w/w	55.10

* Not accredited

Total plate count: 10^7 cfu/g

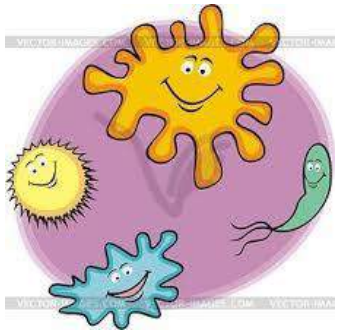
LEE CHOON HOONG
Senior Microbiologist
BSc (Hons) in Biomedical Science

Dr. LINDA NG YIAN YIAN
Chief Technical Officer
BSc (Hons), MSc, PhD, FMIC
(IKM No.: F/0100/1958/89/92/13)

The results reported relate only to the items tested as received.
This test report shall not be reproduced except in full without the approval of the laboratory

ISO/IEC 17025
SG08/01790

Content of IBG bio fertilizer.



Beneficial microbes - Improve absorption and decompose organic matter, no less than 10^7 cfu/ml.

Aloe vera, seaweed extract, humic acid, amino acid, fish emulsify - Improve soil organic matter content.

Application of IBG bio fertilizer.

Dosage.

Please do take note that IBG biofertilizer is applied as replacement 30% from chemical fertilizer. So your material cost does not change after using IBG biofertilizer.

70%

30%

Chemical fertilizer.

IBG bio fertilizer.

Why choose IBG bio fertilizer?

- Increase plant productivity.
- Provide an economically viable support.
- Soil health maintenance.
- Effective in helping plant to absorb nutrients.
- Reduces the dosage of chemical fertilizers.
- Reduces soil-borne root diseases of plants.
- Save on fertilizer storage capacity.

A healthy person will less likely to get any disease.

A healthy plant will less likely to get any disease.

After the soil was treated with IBG bio fertilizer, microbes can help in organic matter decomposition and soil mineralization. It release the Nitrogen and Phosphorus during decomposition and thus the N, and P fertilizer can be reduced.

International Journal of Microbiology Research, ISSN: 0975-5276, Volume 1, Issue 2, 2009, pp-23-31

Biofertilizers: A novel tool for agriculture

Boraste A.[1], Vamsi K.K.[2], Jhadav A.[3], Khairnar [illegible]
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Original scientific paper

The possible role of bio-fertilizers in agriculture

[illegible]ianna Marozsán[1], Szilvia Veres[2], Éva Gajdos[2], Nór

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Chapter 1

Potential and Possible Uses of Bacterial and Fungal Biofertilizers

Francesco Gentili
Ari Jumpponen

INTRODUCTION

During the past four decades we have witnessed the doubling of the human population and a concurrent doubling of food production (Vance, 2001). Plant nutrition has played a key role in this dramatic increase in demand for and supply of food. Increases in crop production have been made possible through the use of commercial man-made fertilizers. The use of nitrogen (N) fertilizer has increased almost ninefold and phosphorus (P) more than fourfold (Vance, 2001). The tremendous increase of N and P fertilization, in addition to the introduction of highly productive and intensive agricultural systems, has allowed these developments to occur at relatively low costs (Schultz et al., 1995; Vance, 2001). The increasing use of fertilizers and highly productive systems have also created environmental problems such as deterioration of soil quality, surface water, and groundwa
as air pollution, reduced biodiversity, and suppr
(Schultz et al., 1995; Socolow, 1999
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RESEARCH

EFFECTS OF BIOFERTILIZERS COMBINED WITH DIFFERENT SOIL AMENDMENTS ON POTTED RICE PLANTS

Arshad Javaid[1]*

International Journal of Agriculture: Research and Review. Vol., 2 (6), 699-704, 2012
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BIOFERTILIZER AFFECTS YIELD AND YIELD COMPONENTS OF WHEAT

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ABSTRACT: In order to study effects of biological fertilizers, chemical fertilizers and bacterial growth enhancers (PGRP) on yield and yield factors of wheat (*Triticum aestivum*) and to reduce chemical fertilizers and improve soil and plant nutrition, an experiment was carried out in research field of Agriculture and Natural Resources University of Ramin, Iran in crop year of 2009-2010. The experiment was performed in split plot-factorial design arranged in a complete randomized block design with three replications. In this study, chemical factor was the base plot in three levels (Control, half of local recommended and total local recommended) and the biological fertilizer (Nitroxin and bio-phosphor) were the secondary factors with three levels (Control, 0.5 and 1 liter per hectare). Results indicate that the use of biological fertilizers lead to significant differences in grain number per spike, grain weight, biological yield and harvest index. Combined treatments of microorganisms (Aztv bacteria and Pesudomonas fluorescent) and chemical fertilizers had the greatest impact on the studied traits. Analyze of variance suggest that highest yield of grain was achieved by complete use of all three fertilizers in recommended fertilizer rate compared to control treatment. Overall, the results showed that, biological fertilizers have a significant role in improving yield and yield components of wheat, and Bio-fertilizers with chemical fertilizers may be useful to increase the yield and reduce environmental pollution.

Key words: wheat, yield, yield components, Biofertilizer.

INTRODUCTION

Given the increasing world population, more than ever feel the need to increase food production. For this purpose, four solutions (increase in area under cultivation, yield per unit area, yield per unit
(Khavazi *et al.*, 2005). Yield per unit area

While utilize Bio-fertilizers importing a large population of effective microorganisms in the active field of root system,
developed countries and

Numerous researches shows that the use of bio fertilizer does assist in plant growth and overall sustainable soil conservation

Research done by Universiti Malaya and other universities published at 19th December 2020

processes

MDPI

Article

The Effects of Biofertilizers on Growth, Soil Fertility, and Nutrients Uptake of Oil Palm (Elaeis Guineensis) under Greenhouse Conditions

Aaronn Avit Ajeng [1], Rosazlin Abdullah [1,*], Marlinda Abdul Malek [2,*], Kit Wayne Chew [3], Yeek-Chia Ho [4,5], Tau Chuan Ling [1], Beng Fye Lau [1] and Pau Loke Show [6,*]

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Abstract: The full dependency on chemical fertilizers in oil palm plantation poses an enormous threat to the ecosystem through the degradation of soil and water quality through leaching to the groundwater and contaminating the river. A greenhouse study was conducted to test the effect of combinations of biofertilizers with chemical fertilizer focusing on the soil fertility, nutrient uptake, and the growth performance of oil palms seedlings. Soils used were histosol, spodosol, oxisol, and ultisol. The three treatments were T1: 100% chemical fertilizer (NPK 12:12:17), T2: 70% chemical fertilizer + 30% biofertilizer A (CF + BFA), and T3: 70% + 30% biofertilizer B (CF + BFB). T2 and T3, respectively increased the growth of oil palm seedlings and soil nutrient status but seedlings in oxisol and ultisol under T3 had the highest in almost all parameters due to the abundance of more efficient PGPR. The height of seedlings in ultisol under T3 was 22% and 17% more than T2 and T1 respectively, with enhanced girth size, chlorophyll content, with improved nutrient uptake by the seedlings. Histosol across all treatments has a high macronutrient content suggesting that the rate of chemical fertilizer application should be revised when planting using the particular soil. With the reduction of chemical fertilizer by 25%, the combined treatment with biofertilizers could enhance the growth of the oil palm seedlings and soil nutrient properties regardless of the soil orders.

Keywords: plant growth promoting rhizobacteria; oil palm seedlings nursery; biofertilizers; chemical fertilizer

1. Introduction

The agriculture sector is considered as one of the economy pillars in many developing nations [1]. However, continuous use of agrochemicals such as chemical fertilizers and pesticides in this sector is detrimental to human health such as infant methemoglobinemia [2] and which also cause ecological imbalance [3,4]. The use of chemical fertilizer will also cause air and ground water pollution resulting

The temperature ambience was 28–33 °C. The experiments were conducted in the Complete Block Design (CBD) with four replicates for each treatment in a single trial. Liquid biofertilizer A (BFA) (effective microorganisms: 1×10^7 CFU/mL) and biofertilizer B (BFB) (effective microorganisms: 1×10^6 CFU/mL) were purchased from local Malaysian manufacturers. BFA consists of *Bacillus* spp. such as *Bacillus cereus* JCM 2152, *Bacillus amyloliquefaciens* strain MPA 1034 and *Bacillus tequilensis* strain 10b *Lactobacillus* spp.; *Azospirillum* spp. and *Rhizobium* spp. Meanwhile, BFB consists of a very diverse group of microbes: Actinomycetes such as *Kocuria rhizophila*, *Arthrobacter methylotrophus*, *Bacillus* spp. such as *B. pumilus*, *B. subtilis* (subspecies Spizizenii), *B. vallismortis*, *B. Thurengiensis*, *B. mycoides*, *B. mucilaginosus*, *Brevibacillus reuszeri*, *Paenibacillus polymax*, and *Paenibacillus azoreducens*. *Azospirillum brasilense* and fungus such as *Aspergillus niger* and *Aspergillus awamori*; yeast such as *Saccharomyces cerevisiae* Hansen were also the beneficial microbes contained in the biofertilizer. The micro and macro nutrient with the organic matter of the biofertilizers were listed in Table 2. NPK blue with the formulation ratio of (12 N:12 P_2O_5:17 K_2O: 2 MgO + TE) was used as the chemical fertilizer. The experiment consists of three treatments: [T1] 100% of CF, [T2] 70% CF + 30% BFA, and [T3] 70% CF + 30% BFB. The amount and dose of fertilizers applied was listed in Table 3. Treatments were done for four rounds (every 30 days).

Table 1. Chemical properties of histosol, spodosol, ultisol, and oxisol.

Soil Properties	Histosol	Spodosol	Ultisol	Oxisol
pH	3.23	5.49	3.83	4.33
Total N (%)	0.61	0.34	0.10	0.12
Availlable P (mg/kg)	75.81	36.66	25.99	32.78
Exchangeable K (mg/kg)	455.2	487.93	358.33	471.1

Table 2. The micro and macro nutrient, and the organic matter of the biofertilizer A and biofertilizer B.

Micro and Macro Nutrients	Biofertilizer A	Biofertilizer B
N	7%	5–6%
P	6%	8–9%
K	9%	10–11%
Ca	2%	-
Mg	1%	0.5–1.0%
Su	1%	-
Bo	0.5%	0.9–1.1%
Fe	50 ppm	282 ppm
Cu	15 ppm	18.4 ppm
Mn	10 ppm	35.8 ppm
Zn	15 ppm	51.4 ppm
Mo	12 ppm	-
Organic matter	Aloe vera Seaweed extract Fulvic acid Amino acid Protein	Aloe vera Seaweed extract Humic acid Amino acid Fish emulsify

Biofertilizer B = IBG Biofertilizer

Table 3. Chemical fertilizer and biofertilizer application. The biofertilizer was diluted with 200 mL of distilled water before applied to a single seedling.

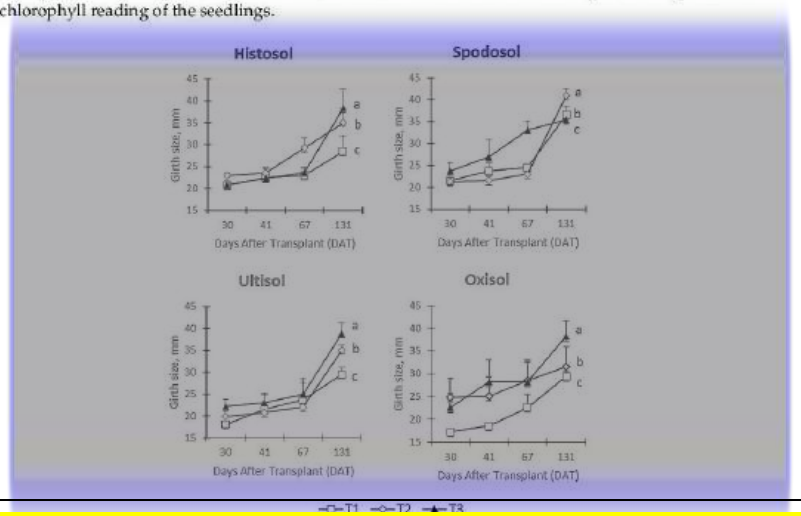
Month	Control Plot Dosage per Palm (g seedlings^{-1}) 100% Chemical Fertilizer	Treatment Plot (NPK 12-12-17-2 + TE) 75% Chemical Fertilizer	Biofertilizer (mL)
1	15	10	2
2	20	15	2
3	25	20	3
4	30	25	3

T1 = 100% chemical fertilizer

T2 = Biofertilizer A

T3 = Biofertilizer B = IBG Biofertilizer

st chlorophyll reading throughout the last two months of treatment period. The chlorophyll content of seedlings in T3 planted using histosol declined after 30 DAT but increased after 41 DAT and show a slight change from 67 and 131 DAT. Seedlings in ultisol under the same treatment reached the highest peak at 41 DAT with the chlorophyll content reading of 63.18 but decreased to 62.50 at 131 DAT. A steady increase in the chlorophyll content was seen in seedlings under oxisol but it remained the lowest reading throughout the last three months during the treatment period. The addition of biofertilizers seems also to have a positive impact on the chlorophyll reading of the seedlings.



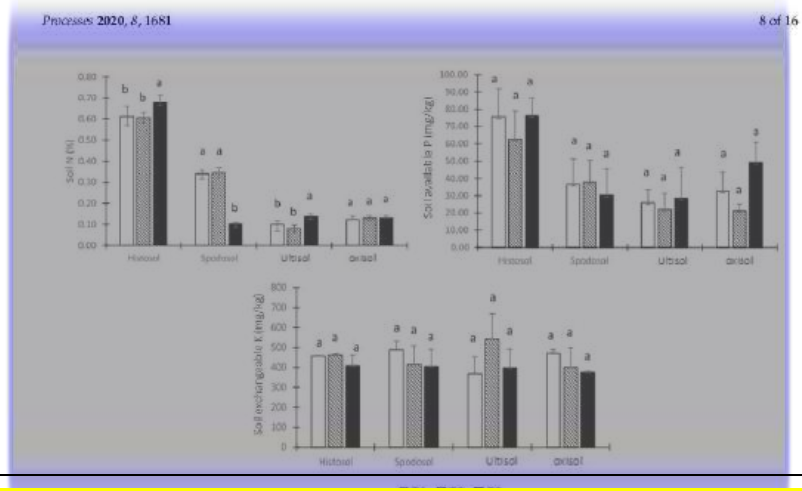
All seedlings in histosol, ultisol, and oxisol under T3 plots have the highest girth size

ne letter across treatments do not differ significantly at p-value ≤ 0.05.

l biomass (ABG) and root dry weight with ABG:root. Different letters represent significant differences in Tukey's HSD comparison. Means sharing the same letter across treatments do not differ significantly at p-value ≤ 0.05.

Soil	Treatment	ABG	Root	Root:ABG
Histosol	T1	57.97 ± 9.92b	16.22 ± 4.46a	0.28 ± 0.03a
	T2	62.07 ± 3.47a	16.10 ± 3.31a	0.26 ± 0.04ab
	T3	59.50 ± 17.47b	15.09 ± 3.61a	0.26 ± 0.04b
Spodosol	T1	49.62 ± 14.32b	14.25 ± 4.21a	0.29 ± 0.02a
	T2	63.48 ± 7.08ab	16.52 ± 0.92a	0.26 ± 0.02ab
	T3	64.53 ± 4.99a	15.84 ± 1.17a	0.25 ± 0.02b
Ultisol	T1	53.61 ± 3.80b	11.70 ± 0.68a	0.22 ± 0.01ab
	T2	66.34 ± 2.50ab	15.20 ± 1.26a	0.23 ± 0.02a
	T3	70.39 ± 7.98a	13.92 ± 1.60a	0.20 ± 0.00b
Oxisol	T1	65.97 ± 4.61b	15.55 ± 2.95a	0.24 ± 0.06ab
	T2	58.70 ± 11.13ab	14.30 ± 1.03a	0.25 ± 0.02a
	T3	78.21 ± 14.91a	16.44 ± 0.95a	0.22 ± 0.00b

The highest ABG dry mass was obtained from oil palms seedlings treated under T3 under oxisol and ultisol.



The nitrogen content was significantly higher across all treatments especially in the T3 plots.

deviation. Different letters represent significant differences in Tukey's HSD comparison. Means sharing

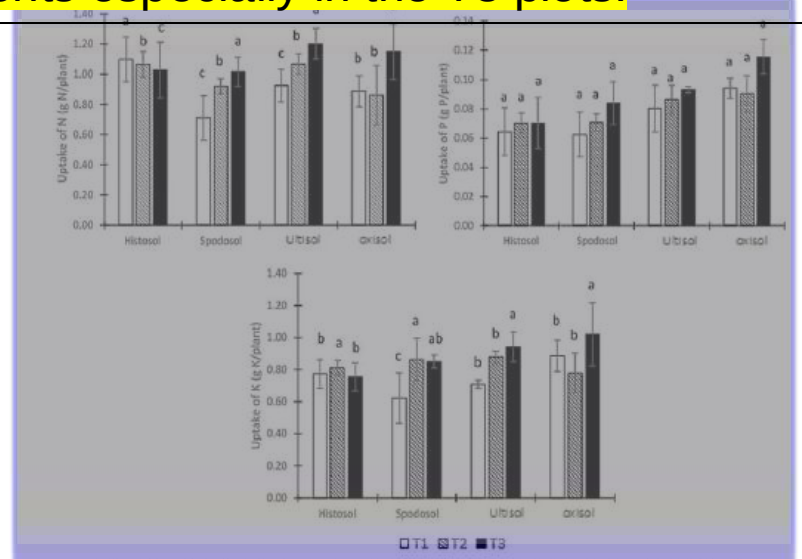


Figure 5. NPK uptake by the seedlings at time of harvest. Vertical bar represents the standard deviation. Different letters represent significant differences in Tukey's HSD comparison. Means sharing the same letter across treatments do not differ significantly at p-value ($p \leq 0.05$).

Overall, seedlings planted in ultisol under T3 have the highest NPK intake.

From the present study, the addition of biofertilizers alongside with chemical fertilizers have shown not only enhanced oil palm seedlings growth in terms of the height, girth size, and chlorophyll, it also improves the nutrient uptake of the seedlings and soil nutrient status at a reduced rate of chemical fertilizer. Reduction on the rate of the chemical fertilizer may be needed to avoid over-fertilization of the oil palm seedlings.

(Aaronn, Rosazlin A, Tau Chuan L, *et al*. (2020).

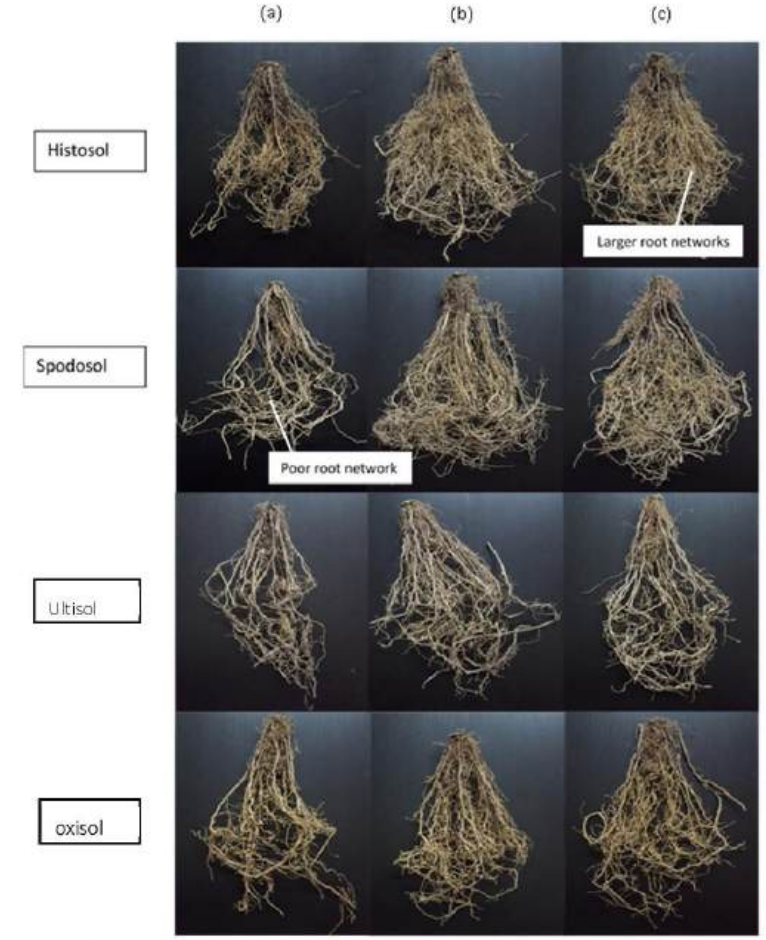


Figure 6. Roots of oil palm seedlings at the end of treatment. (**a**)T1, (**b**) T2, and (**c**) T3. The roots of oil palm seedlings treated with T3 were more in number, longer with more root hairs followed by seedlings in T2 then 100% T1 plots.

4. Discussion

4.1. Growth Performance of Fronds

FAO in 2011 states that about 175.5 million tons of chemical fertilizer is used in agriculture to achieve an optimum crop yield [29]. The enormous amount of chemical fertilizers deposited into soil causes a severe pollution of the river and groundwater which poses serious environmental

MEMORANDUM OF AGREEMENT

BETWEEN

MALAYSIAN PALM OIL BOARD

AND

IBG MANUFACTURING SDN BHD

ON

THE RESEARCH & DEVELOPMENT OF ENDOPHYTIC BACTERIA AS LIQUID FORMULATION FOR CONTROLLING *Ganoderma* AND OTHER PLANT DISEASES

MPOB
MALAYSIAN PALM OIL BOARD
MINISTRY OF PLANTATION INDUSTRIES AND COMMODITIES, MALAYSIA
www.mpob.gov.my

UNIVERSITI MALAYA

IBG (473365-H)

MEMORANDUM OF AGREEMENT

ON

RESEARCH COLLABORATION

BETWEEN

UNIVERSITI MALAYA

AND

IBG MANUFACTURING SDN. BHD.
COMPANY REGISTRATION NO.: 199801017236 (473365-H)

UPM
UNIVERSITI PUTRA MALAYSIA

IBG (473365-H)

MEMORANDUM PERSEFAHAMAN

ANTARA

UNIVERSITI PUTRA MALAYSIA

DAN

IBG MANUFACTURING SDN. BHD.
COMPANY REGISTRATION NO.: 199801017236 (473365-H)

XIAMEN UNIVERSITY MALAYSIA
厦門大學馬來西亞分校

APPROVAL ON AGREEMENT DRAFT

Project/Collaboration Title: Life Cycle Assessment for Biofertilizer to Field Application toward Carbon and Environmental Mitigation Resiliency for IBG Manufacturing Sdn. Bhd.	
Principal Investigator from XMUM: Name: Vincent Woon Kok Sin/ Tan Jian Ping School/Department: School of Energy and Chemical Engineering	
Collaborator(s): 1. [The first party, Xiamen University Malaysia] 2. [The second party, IBG Manufacturing Sdn. Bhd.]	
Project/Collaboration Duration: 36 months	**Amount of Grant:** RM 60,000
Commencement Date: 01/11/2023	**Completion Date:** 31/10/2026
Type of Document *(please tick [√])*	Letter of Agreement Research Agreement √ Memorandum of Agreement Others *(please specify)*:

Comment(s) from Head of Department

√ Approved Not Approved

Justification:

Support.

Signature of **Head of Department**

Name: Chen Binghui
School/Department: SECE/CME
Date: 25 September 2023

Other studies

Title	University	Abstract
Elaeis guineensis phenotypic traits and non-enzymatic antioxidant responses to the combination of biofertilizer and chemical fertilizer in infertile soil	UM	Combination of 70% chemical fertilizer and 30% IBG biofertilizer has 15.8% increase in the seedling growth compared to 100% chemical fertilizer, in terms of higher fresh shoot, root weight, and root-to-shoot ratio. CF70+IBG30 also exhibited higher levels of relative chlorophyll, higher uptake of B and P compared with 100% chemical fertilizer. This combination also recorded highest antioxidants level (Aaronn Avit Ajeng et al., 2024).
Metabolites profiling of humid tropic simulated *Bungor* soil under biofertilizer application	UM	The IBG biofertilizer application led to notable changes in key metabolic pathways, including Glycerophospholipid metabolism and amino acid metabolism, indicating enhanced soil nutrient dynamics (Aaronn Avit Ajeng et al., 2024).
Biofertilizers for Sustainable Agriculture: A Life Cycle Assessment of Upstream Manufacturing to Carbon Reduction	Xiamen University Malaysia	Biofertilizer manufacturing, assessed via Life Cycle Assessment (LCA), shows significantly lower carbon emissions compared to other fertilizers. Electricity consumption (64.2%) is the primary source of emissions, driven by energy-intensive processes like bioreactor operations and machine use. Biofertilizers emit up to 23.2 times less carbon than nitrogen fertilizers, 10,666 times less than organic fertilizers, and 10 times less than microalgae-based biofertilizers. Emissions are comparable to phosphorous and potassium fertilizers but can replace nitrogen fertilizers, reducing global emissions (Mulya et al., 2024).

CONFIDENTIAL

COLLABORATION AGREEMENT

BETWEEN

MALAYSIAN AGRICULTURAL RESEARCH AND DEVELOPMENT INSTITUTE (MARDI)

AND

IBG MANUFACTURING SDN. BHD.

IN RELATION TO THE DEVELOPMENT OF IBG MULTIPURPOSE BIO FERTILIZER FOR RICE CULTIVATION

CONFIDENTIAL

FINAL REPORT ON

DEVELOPMENT OF IBG MULTIPURPOSE BIO FERTILIZER FOR RICE CULTIVATION

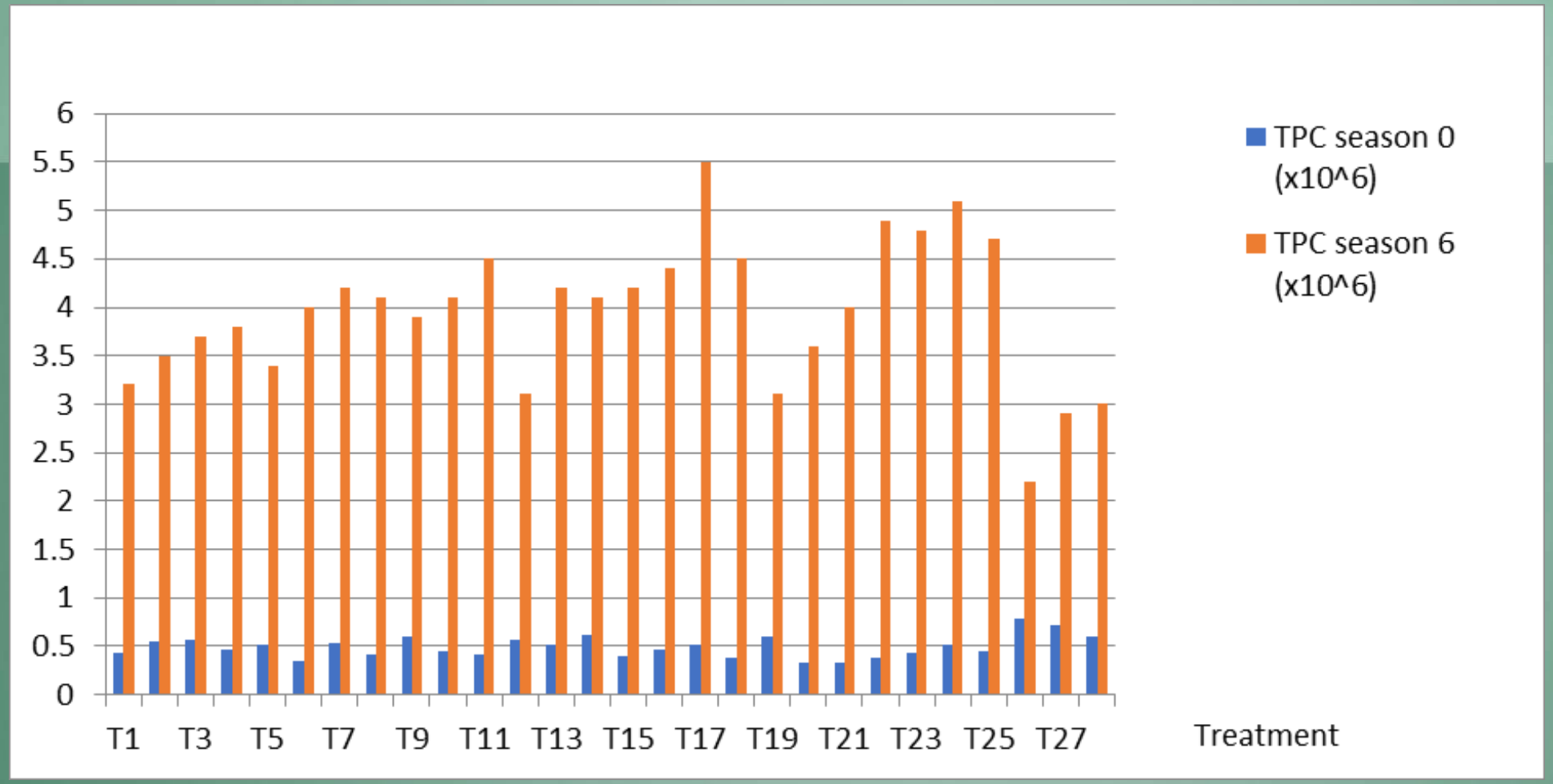
15th February 2017 – 30th May 2020 (6 Seasons)

Abstract

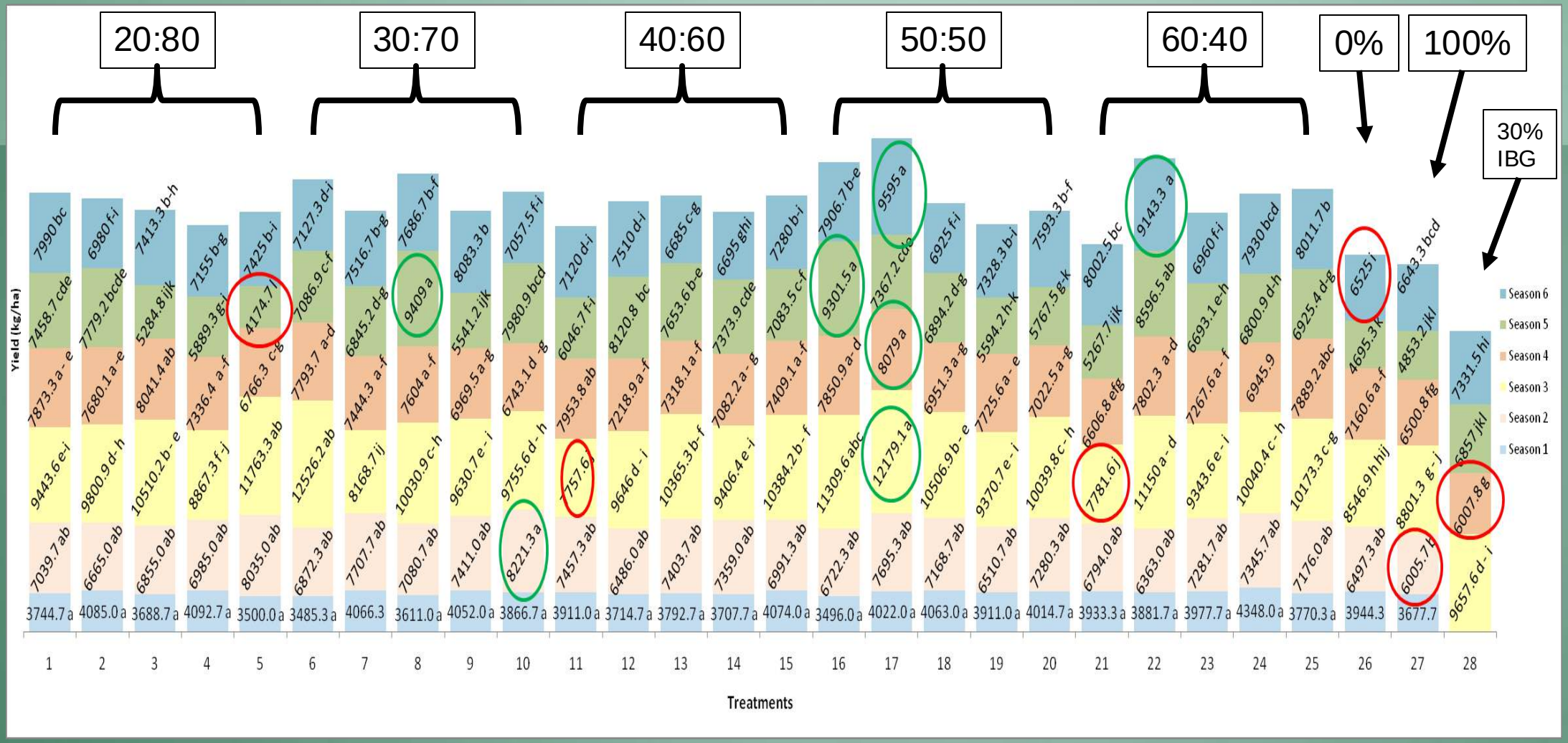
- A Collaboration Agreement to conduct research between MARDI and IBG Manufacturing Sdn. Bhd. was signed on 11 April 2017. The study was conducted at MARDI Tanjung Karang for 6 planting seasons over a period of 40 months. The main objective of this study was to determine the combination of IBG Multipurpose Bio Fertilizer and subsidized fertilizer for rice crop fertilization needs. Findings show that the application of T17 treatment (combination of 50:50 ratio (IBG: subsidized fertilizer) with a rate of 5 liters/ha is the best treatment because the yield trend is significantly highest in season 3, 4 and 6. The difference in yield increase for the 6th season (last season) was 40% compared to T26 (control plot 0% fertilizer).The number of stalks was also significantly affected by the treatment and had a positive correlation with yield. The use of IBG products was also found to increase the microbial population in the soil and had a positive effect on nitrogen, phosphorus, potassium and conductivity in the soil.

Treatments	pH (%)	Total C (%)	Total N (%)	C:N Ratio (%)	Total P (%)	Available P (%)	Exchangeable (%)				CEC (%)	Conductivity (%)
							K	Mg	Ca	Na		
T1	9.70	1.57	126.67	-55.19	581.31	1092.91	2073.68	-1.08	3.42	73.05	-0.86	2072.79
T2	13.82	-20.45	58.97	-49.96	398.77	1261.82	1418.26	23.12	2.33	56.71	-12.35	741.91
T3	10.00	-4.62	150.00	-61.85	714.79	1843.02	1587.30	-9.25	-29.12	44.08	-25.62	1745.97
T4	14.10	0.73	113.89	-52.90	575.36	2381.31	1570.99	15.47	0.83	119.89	4.46	1222.89
T5	10.92	-4.27	121.05	-56.69	510.59	1159.63	1140.35	-12.88	-40.93	11.28	-29.96	1251.22
T6	10.44	-13.33	81.82	-52.33	266.53	869.88	941.22	15.98	4.45	25.30	-11.20	373.36
T7	12.48	-9.81	128.57	-60.54	667.27	1438.54	1541.27	0.13	-5.68	81.41	-4.55	1359.66
T8	28.87	11.02	91.89	-42.14	611.53	1023.24	1466.19	24.60	87.85	89.22	-4.55	568.25
T9	-2.56	17.47	138.71	-50.79	658.46	1045.79	1355.63	42.50	-16.95	87.10	-2.04	469.23
T10	9.33	12.20	130.30	-51.28	521.93	1034.07	1199.24	0.12	-16.52	35.17	-18.95	739.53
T11	5.81	-3.97	59.46	-39.78	184.58	508.57	817.56	12.97	-11.12	55.25	1.21	922.29
T12	12.41	12.60	162.50	-57.10	520.15	1184.76	1285.14	0.00	-6.84	25.71	-2.86	960.87
T13	9.96	6.67	83.33	-41.82	482.20	958.97	709.47	0.53	-7.78	14.93	-5.62	724.38
T14	11.76	-13.08	43.90	-39.60	230.77	770.98	899.24	20.98	15.12	33.33	-16.54	421.08
T15	13.63	7.51	100.00	-46.25	399.82	747.89	827.45	-1.96	-13.13	9.52	-4.12	659.58
T16	8.57	-8.05	87.88	-51.06	358.06	1152.45	1113.49	8.09	-9.29	87.59	-10.04	1342.86
T17	8.75	-8.62	97.44	-53.72	388.42	1070.20	1433.80	-2.98	-17.30	26.50	9.55	971.57
T18	9.65	-8.93	50.00	-39.29	464.61	1608.87	1149.62	20.12	-1.34	108.00	1.82	1567.87
T19	9.16	8.08	75.00	-38.24	377.71	943.23	674.43	-3.41	-11.63	-0.78	-1.72	500.68
T20	17.51	-2.55	84.21	-47.10	638.92	1510.68	1456.35	18.29	5.57	69.72	-10.62	1085.19
T21	12.38	-2.85	81.58	-46.50	430.78	808.88	748.59	-10.40	-23.39	27.76	-3.98	633.22
T22	10.54	-8.96	75.68	-48.18	527.02	786.69	1064.29	9.79	-3.62	120.24	-19.60	1158.93
T23	17.11	0.39	102.86	-50.51	569.94	1552.84	971.62	-2.54	-3.81	47.85	-11.20	963.26
T24	11.61	-3.79	105.71	-53.23	595.70	1323.33	1452.50	14.23	-10.14	122.09	-2.18	1198.94
T25	10.17	0.35	68.42	-40.42	251.03	1134.51	1153.38	-2.01	-15.80	37.60	-8.43	845.80
T26	14.26	1.36	10.53	-8.30	43.88	135.09	-23.20	-19.71	-26.00	-18.07	8.61	-22.62
T27	0.56	-2.81	0.00	-2.81	-15.04	211.58	-32.11	-33.14	-41.56	-26.32	20.00	-42.47
T28	8.65	4.00	20.00	-13.33	56.00	66.49	-4.44	-3.74	-42.44	-3.16	6.52	-4.76
Average	10.86	-1.69	85.80	-44.93	414.99	1013.19	1069.49	4.01	-10.22	45.19	-5.88	806.40

Changes in pH probably induced changes in the microbial community structure and functionality which leads to the reduction in total soil carbon, total phosphate and available phosphate. The product which contains nitrogen fixation bacteria gave a great increased in total nitrogen and contributed to the changes in soil C:N ratio.



The 3 years (6 seasons) field trial using IBG biofertilizer revealed a significant increase in soil bacteria. This was reflected in Figure 1 where the trend revealed that the treated plots have much higher TPC than untreated plots (control plots).



- Combined season analysis suggests there is no significant difference in season 1 (Figure 8).
- As entry to season 2, a significant result as T10 contributed the highest significant yield compared to control.
- A trend can be observed in both season 3 and 4 as T17 contributed to highest significant yield. This may suggest the product application achieved stability in season 3.
- In season 5, T16 contributed to the highest yield. T16 is slightly lower concentration compared to T17.
- Finally, in season 6, T17 and 22 contributed to the highest significant yield compared to T26. The difference is at least 40%.

INSTITUT PENYELIDIKAN DAN KEMAJUAN PERTANIAN MALAYSIA
Malaysian Agricultural Research and Development Institute
MARDI Seberang Perai
Beg Berkunci No. 203
Pejabat Pos Kepala Batas
13200 Kepala Batas, Pulau Pinang
MALAYSIA

Tel: 04-575 7930 / 8920 / 8402
Faks: 04-575 1725
Laman Web: www.mardi.gov.my
Email : amar@mardi.gov.my

Rujukan Kami : MDI/PR2/PA/29-02
Tarikh : 11 Disember 2020

Ketua Pegawai Eksekutif
IBG MANUFACTURING SDN BHD
No.3 Jalan TPP 3,Taman Perindustrian Putra,
47130 Puchong,Selangor

UP: Dato' Yeat Siaw Ping

Melalui

Pengarah
Pusat Penyelidikan Padi dan Beras
Ibu Pejabat MARDI
43400 Serdang
Selangor Darul Ehsan

DR. ASFALIZA BT. RAMLI
Pengarah
Pusat Penyelidikan Padi & Beras
MARDI

YBrs Dato'

Laporan Akhir Projek Kolaborasi MARDI-IBG MANUFACTURING SDN BHD

Adalah dimaklumkan, surat dari pihak MARDI MDI/PR2/PA/29-02 adalah dirujuk.

2. Setelah perbincangan dan pembentangan laporan hasil kajian, dengan ini pihak MARDI telah memenuhi obligasi 6.1 dan 10.1 seperti termaktub dalam perjanjian kolaborasi bertarikh 11 April 2017 dan bersama-sama ini disertakan laporan akhir kepada pihak IBG MANUFACTURING SDN BHD.

3. Kerjasama pihak YBrs Dato' didahului dengan ucapan ribuan terima kasih

(DR.HARTINEE BINTI ABBAS)
Timbalan Pengarah
Program Agronomi dan Sistem Pengeluaran, (PR2)
Pusat Penyelidikan Padi dan Beras
MARDI Pulau Pinang

Ringkasan Laporan Kajian

Satu Perjanjian Kolaborasi untuk menjalankan kajian di antara MARDI dan IBG Manufacturing Sdn. Bhd. telah dimeterai pada 11 April 2017. Kajian ini dilaksanakan di MARDI Tanjong Karang selama 6 musim penanaman dalam tempoh jangkamasa 40 bulan. Objektif utama kajian ini ialah untuk menentukan kombinasi IBG Multipurpose Bio Fertilizer dan baja subsidi untuk keperluan pembajaan tanaman padi. Dapatan kajian menunjukkan aplikasi rawatan T17 (kombinasi nisbah 50:50 (IBG:baja subsidi) dengan kadar 5 liter/ha merupakan rawatan yang terbaik kerana trend hasil yang tertinggi secara ketara pada musim 3, 4 dan 6. Perbezaan peningkatan hasil bagi musim terakhir iaitu ke-6 adalah sebanyak 40% berbanding dengan T26 (plot kawalan tiada pembajaan). Bilangan tangkai turut dipengaruhi secara ketara oleh rawatan dan mempunyai kolerasi positif dengan hasil. Penggunaan produk IBG juga didapati turut meningkatkan populasi mikrob di dalam tanah yang turut mempengaruhi peningkatan positif terhadap nitrogen, fosforus, kalium dan konduktiviti di dalam tanah.

PRODUCT COMMERCIALIZATION AGREEMENT

BETWEEN

MALAYSIAN AGRICULTURAL RESEARCH AND DEVELOPMENT INSTITUTE (MARDI)

AND

IBG MANUFACTURING SDN. BHD. (REG. NO.: 199801017236 (473365-H))

****

IN RELATION TO THE IBG PADDY BIO FERTILIZER

****

This Product Commercialization Agreement dated 8th September 2021 (hereinafter referred to as this "Agreement").

BETWEEN

MALAYSIAN AGRICULTURAL RESEARCH AND DEVELOPMENT INSTITUTE a statutory body incorporated in Malaysia under the Malaysian Agricultural Research and Development Institute Act 1969 [*Act 11*] and having its headquarters office at MARDI Headquarters, Persiaran MARDI-UPM, 43400 Serdang, Selangor Darul Ihsan, (hereinafter referred to as "MARDI") of the one part;

AND

IBG MANUFACTURING SDN. BHD. (Company Registration No.: 199801017236 (473365-H)) a business registered under the law of Malaysia and having its registered address at Suite 9-13A, Level 9, Wisma UOA II, Jalan Pinang, 50450, Kuala Lumpur, Wilayah Persekutuan and its business address at No. 3, Jalan TPP3, Taman Perindustrian Putra Puchong, 47130, Selangor (hereinafter referred to as "the Company") on the other part.

MARDI and the Company are hereinafter referred to as "the Parties" collectively and each as "the Party".

WHEREAS:

A. MARDI and the Company has entered into the Collaboration Agreement in relation to the "Development of IBG Multipurpose Bio Fertilizer for Rice Cultivation" dated 11 April 2017 (hereinafter referred to as the "Collaboration Agreement"). Pursuant to Clause 13 of the Collaboration Agreement, the Parties agree that any future commercialization of IBG Multipurpose Bio Fertilizer in relation to the rice cultivation shall be formalized and secured in a separate written agreement detailing the rights and responsibilities of the Parties, including any financial commitments (if any).

B. Pursuant to the above, the Company is desirous to produce, market, distribute and sell the IBG Multipurpose Bio Fertilizer for rice cultivation in any territory / country in the world and MARDI agrees for the Company to lead the commercialization of the IBG Multipurpose Bio Fertilizer subject to the terms and conditions as stated in this Agreement.

C. For the purpose of the Company commercializing the IBG Multipurpose Bio Fertilizer pursuant to this Agreement, both Parties agree to name and commercialize the IBG Multipurpose Bio Fertilizer for rice cultivation as "IBG Paddy Bio Fertilizer" (hereinafter referred to as "the Product") subject to the terms and conditions hereinafter set forth in this Agreement.

Kilang Beras Rakyat Sekinchan Sdn. Bhd.

May, 2022 7.84 mt/ha
November, 2022 8.27 mt/ha

RM 420 million

…use less nitrogen-based fertilizer

Bayer bets on agro-biotech

It will jointly develop biological solutions to use less nitrogen-based fertiliser

BY P J HUFFSTUTTER

CHICAGO: Germany's Bayer AG, one of the world's biggest agricultural chemical companies, is joining a US$100 million (RM420 million) bet that the next big breakthrough in crop fertilisers will be found inside a biological Petri dish.

Its Bayer LifeScience Center division, along with biotech firm Ginkgo Bioworks, is forming a start-up to focus on developing biological solutions to reduce the use of nitrogen-based fertiliser, or make farmers' use more efficient, company officials said this week.

The venture will be backed via a Series A investment from the two companies and hedge fund Viking Global Investors LP. The funding round closed on Wednesday. Bayer and Ginkgo Bioworks officials declined to discuss financial details or individual investment amounts.

The still unnamed business will focus on plant-based microbes, particularly finding ways for microorganisms to help plants and the soil assimilate nitrogen molecules from the air or other sources, Gingko Bioworks chief executive officer (CEO) Jason Kelly said in an interview.

The effort is part of a broader push in agricultural research to harness the microorganisms in plants and soil and, among other things, use them to improve crop yields or allow plants to thrive on lower amounts of fertiliser.

Reducing the amount of nitrogen fertiliser needed to feed plants could ease environmental concerns over water contamination from nitrogen fertiliser run-off and related greenhouse gas emissions, company officials said.

Michael Miille, a vice-president at Bayer Crop Science's biologics group, said launching this venture as a start-up was intended to keep it more nimble.

"Everything is designed for speed," said Miille, who will serve as interim CEO. — *Reuters*

IN BRIEF

VW CEO says has no plans to divide up the group

FRANKFURT: Volkswagen (VW) has no plans to follow local rival Daimler in considering changing the group's legal structure, its chief executive officer (CEO) said, even as the company undergoes the biggest transformation in its history. The world's largest vehicle maker by sales said on Monday it was stepping up the pace on its electric-car programme, announcing more than €20 billion (RM100 billion) of new investments over the next 12 years. Asked by reporters at the Frankfurt auto show whether he could imagine following rivals in looking at changing the group's structure, CEO Matthias Mueller said: "Others are always faster than

DISTINCTIVE ADVANTAGES

1. Improve soil organic matter utilization, thus reduce soil erosion
2. Improve transportation of nutrients by roots' natural secretion of growth factor elements by microbes
3. Minimize losses caused by run-off through the Phosphorus and Potassium Releasing Bacteria
4. Enhances plant growth
5. Increase inflorescence rate and the female ratio
6. Increase fruit weight and quality
7. Provide non-acidic nitrogenous fertilizer

All the effects above can be seen in 3 months - 3 years after application

IBG Manufacturing Sdn. Bhd.

IBG Manufacturing Sdn. Bhd. has its plant setup in Malaysia since 1998. IBG Manufacturing paid up capital is RM 2 million.

Our philosophy :

"Innovative Biotechnology for Green world will ultimately benefit to our human kind "

AWARDS & CERTIFICATIONS

CI•TEX
International Invention, Innovation, Industrial Design & Technology Exhibition
[formerly known as MINDEX / INNOTEX]

Certificate of Award

This is to certify that a

GOLD

Medal has been awarded to
YEAT SEW CHUONG OF

for the invention

MULTI - PURPOSE LIQUID FERTILIZER

in the

Invention and Design Competition

Held on 23rd – 26th SEPTEMBER 1999

Minister of Science, Technology and the Environment | President, Malaysian Invention and Design Society | President & Chief Executive, SIRIM Berhad

Gold Medal Award in ITEX99' (Malaysia International Invention, Innovation & Industrial Design 1999) for the invention of Bio Fertilizer**.**

Perbadanan Harta Intelek Malaysia
Intellectual Property Corporation of Malaysia
(Diperbadankan)
MyIPO

CERTIFICATE OF FILING

APPLICANT : DATUK YEAT SEW CHUONG
APPLICATION NO : PI 20062236
REQUEST RECEIVED ON : 15/05/2006
FILING DATE : 15/05/2006
AGENT'S/APPLICANT'S FILE REF. : SD/PAT 2921278/ZRS/SDM/SR

Please find attached, a copy of the Request Form relating to the above application, with the filing date and application number marked thereon in accordance with Regulation 25(1).

Date : 23/05/2006

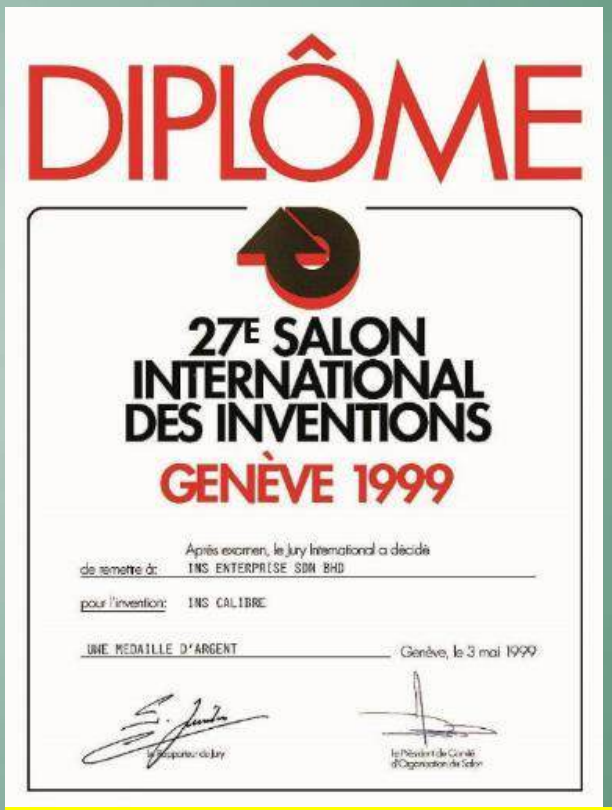
(NOOR MOHAMAD HAZMAN B. HAMID)
For Registrar of Patents

To : ZARAIHAN BT. SHAARI,
C/O SHEARN DELAMORE & CO.,
7TH FLOOR, WISMA HAMZAH-KWONG HING,
NO. 1, LEBOH AMPANG,
50100 KUALA LUMPUR,
MALAYSIA.

RECEIVED
25 MAY 2006

FF 09

First Bio fertilizer Inoculants patent filling in Malaysia ***PI20062236***



DIPLÔME

27E SALON INTERNATIONAL DES INVENTIONS

GENÈVE 1999

Après examen, le jury International a décidé
de remettre à: INS ENTERPRISE SDN BHD
pour l'invention: INS CALIBRE

UNE MEDAILLE D'ARGENT

Genève, le 3 mai 1999

Le Rapporteur du Jury | Le Président du Comité d'Organisation du Salon

Silver Medal Award in 27th Geneva International Exhibition of Agricultural Invention & New Techniques 1999.

AWARDS & CERTIFICATIONS

Our reference: CSSD/BNX-100437/LOA/sz

14 January 2009

Mr. Yeat Siaw Ping
Chief Executive Officer
IBG Manufacturing Sdn Bhd
No. 3, Jalan TPK 1/3
Taman Perindustrian Kinrara
47100 Puchong
Selangor

Tel: 03-80704797
Fax: 03-80704161

Dear Mr. Yeat,

LETTER OF AWARD OF BIONEXUS STATUS AND TAX INCENTIVE TO IBG MANUFACTURING SDN BHD (473865-H) ("the Company")
BioNexus Ref. No. : BNX-100437

We refer to the following documentation submitted by the Company to our Client Support Services Division:

(a) the completed BioNexus Status application form dated 24 March 2008 applying for BioNexus Status;
(b) the final business plan, financial projections and relevant documents; and
(c) all agreed variations or modifications to the above mentioned documents in paragraph (b) above pursuant to letter/ meetings (if any),

collectively to be referred to as the "Application Documents".

We are pleased to inform you that the Minister of Finance, in concurrence with the recommendation made by Malaysian Biotechnology Corporation Sdn Bhd, has APPROVED your Company's application for the BioNexus Status and 100% tax exemption of the statutory income for a period of ten (10) years under Income Tax (Exemption) (No. 17) Order 2007 [P.U. (A) 371/2007] on 27 March 2008 ("Effective Date"). Kindly take note that the Company has been conferred the BioNexus Status and tax exemption subject to its acceptance of such status and full compliance with the attached Terms and Conditions:

a) **Qualifying Activities.**
The Company must conduct only the following Qualifying Activities:
Research, development and production of bio-fertilizers.

b) **Location of Operations.**
The Company must conduct the Qualifying Activities at the following location:
No. 3, Jalan TPK 1/3
Taman Perindustrian Kinrara
47100 Puchong
Selangor
Malaysia

MALAYSIAN BIOTECHNOLOGY CORPORATION SDN BHD

BIONEXUS – Obtained from **Malaysian Biotech Corporation** – IBG certified as an industry player within the national biotechnology focus zone. ***Entitled to enjoy a 10 year 100% tax exemption.***

Silver Award in Bio Technology Asia 2006 (3rd International Biotechnology Trade Exhibition, Conference & Awards)

ISO 9001 certified UKAS SGS; ISO 17025 Accredited Laboratory (For Chemical and Microbiology Laboratory).

AWARDS & CERTIFICATIONS

2011 International Standard Quality Award for **Quality Product**

企业白金奖
PLATINUM
BUSINESS AWARD 2016

2016 Outstanding Achievers Award in **Platinum Business Award – in SME Malaysia**

星洲企業楷模獎
Sin Chew Business Excellence Awards 2016
Innovation · Transformation · Sustainability

2016 Product & Services Excellent Award in **Sin Chew Business Excellence Award**

2018 Outstanding Fertilizer Quality Product Award in **4th Malaysia Agro Excellence Award.**

2018 Model of Entrepreneurs Awards.

2020 Philippine Halal certificate

2023 Malaysia Technology Expo Gold Award. (Collaborate with MPOB)

Manufacturing and fermentor – certified with ISO 9001

Manufacturing and fermentor – certified with ISO 9001

Laboratory – certified with ISO/IEC 17025

RESEARCH AND DEVELOPMENT

IBG Manufacturing Sdn Bhd has built the most hi-tech R & D Centre to back its strong R & D initiatives. The R & D centre focuses on cutting edge technology, from extensive research to the development of world-class biofertilizer products with self-owned intellectual property rights and great marketing potential.

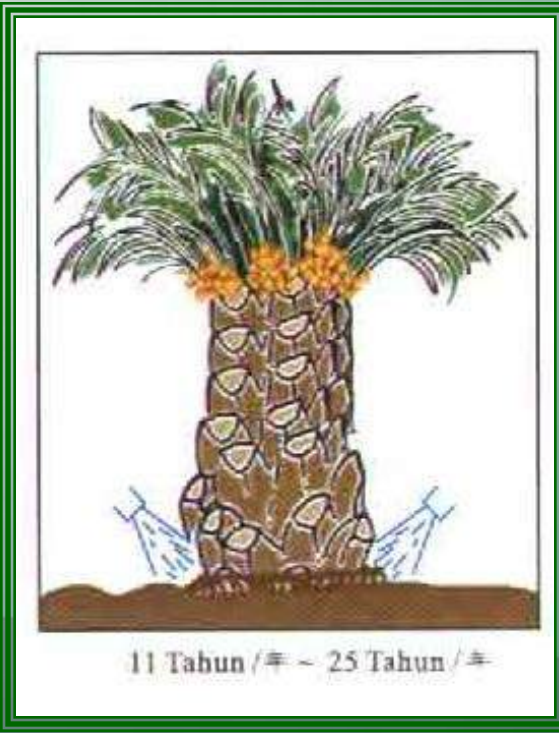
We have established experiment fields as an effort to ensure continuous products upgrade and innovations.

Method of application for Oil Palm

Oil Palm

6 Mths – 3 Yrs

3 Yrs – 11 Yrs



11 Yrs – 25 Yrs

IBG Bio-Fertilizer Application Method

Labor Cost Analysis:
One worker 7 working hours able to cover about 2.5 hectare (324 palms)

< Kiri

Semburan akar dan batang. Pastikan semburan cukup basah pada kadar 1 lit./ pokok dan semburan pada paras 1 kaki dari paras tanah. Semua bahagian akar atau dicelah pertemuan antara tanah dan batang pokok disembur cukup basah.
Bagi Pam CKS 16 lit. semburan untuk 16 pokok sahaja.

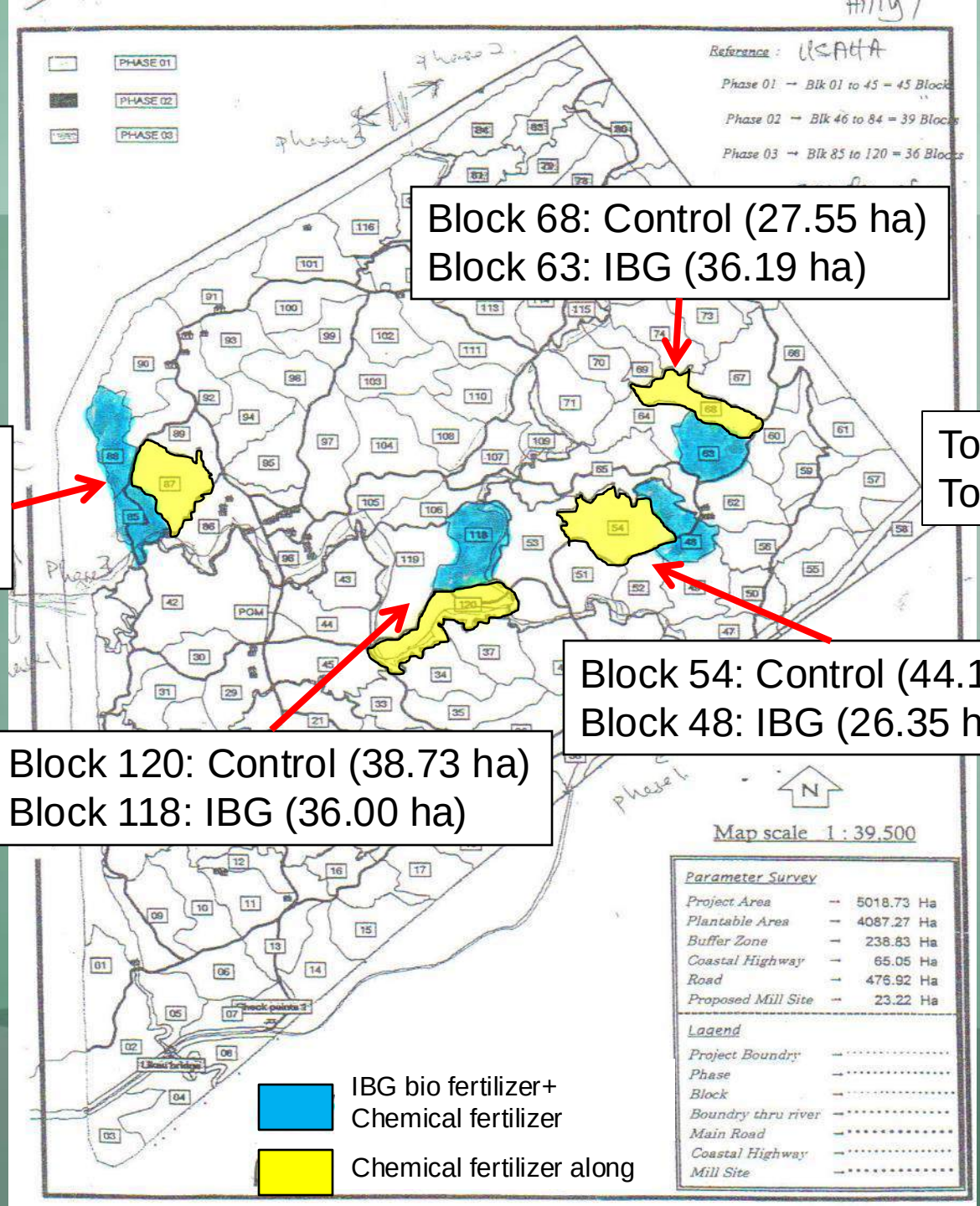
Measure by measurement container to measure number of stroke per liter.

Woodman
OIL PALM
PLANTATION
Yield Performance
Applying
IBG Bio Fertilizer

Inland Soil
Usaha Sepadan Estate

- 4,000 hectare
- Planted on 2001 to 2002
- Harvesting Interval : 12 to 14 days
- Rainfall : 3,200 to 3,500 mm
- Soil Variety: Sandy, sandy clay, sandy loam, sandy lateritic, hardpan coral etc
- IBG Bio Fertilizer application since 2002

Block 87: Control (35.83 ha)
Block 85 & 88: IBG
(20.29 ha & 34.12 ha)



Total block Control: 146.30 ha
Total block IBG: 152.95 ha

Cost Comparison between Conventional Manuring Program & IBG Bio Fertilizer Manuring Program of Usaha Sepadan Estate

IBG bio fertilizer (4 L)	RM 345
SOA	RM 750
RP	RM 1,550
MOP	RM 2,100
Kieserite	RM 460
Borate	RM 3,800
Urea	RM 1,400
8:8:8	RM 5,100
7:4:34	RM 2,250

Conventional Manuring Program				
No.	Fertilizer	Dosage	Cost/palm	Cost/ha (130 palms)
1	SOA	1.50 kg	RM 1.13	RM 146.25
	MOP	1.50 kg	RM 3.15	RM 409.50
2	RP	2.00 kg	RM 3.10	RM 403.00
3	SOA	1.50 kg	RM 1.13	RM 146.25
	MOP	1.50 kg	RM 3.15	RM 409.50
4	Kieserite	1.00 kg	RM 0.46	RM 59.80
5	Borate	0.10 kg	RM 0.38	RM 49.40
6	SOA	1.50 kg	RM 1.13	RM 146.25
	MOP	1.50 kg	RM 3.15	RM 409.50
	Total	12.10 kg	RM 16.77	RM 2,179.45

IBG Bio Fertilizer Manuring Program				
No.	Fertilizer	Dosage	Cost/palm	Cost/ha (130 palms)
1	IBG bio fertilizer (4 L)	40 ml	RM 3.45	RM 448.50
2	SOA	0.75 kg	RM 0.56	RM 73.13
	MOP	2.00 kg	RM 4.20	RM 546.00
3	RP	1.30 kg	RM 2.02	RM 261.95
	Kieserite	0.70 kg	RM 0.32	RM 41.86
4	Borate	0.100 kg	RM 0.38	RM 49.40
5	SOA	0.75 kg	RM 0.56	RM 73.13
	MOP	2.00 kg	RM 4.20	RM 546.00
	Total	7.60 kg + 40 ml	RM 15.69	RM 2,039.96
	Total cost saving/palm		RM 1.07	

Usaha Sepadan Estate's Yield Data Collected since 2004 – 2007.

Trial 1	DOP	Stand/ha	mt/ha				
			28 to 39 months	40 to 51 months	52 to 63 months	64 to 75 months	
			2004	2005	2006	2007 Est	
Treatment (Blk 48) (26.35 ha)	1-Jun	132	8.67	12.60	19.77	25.00	
Chemical (Blk 54) (44.19 ha)	1-Jun	135	6.75	10.43	17.97	23.00	Average
Yield variance			1.92	2.17	1.80	2.00	1.97
Trial 2	DOP	Stand/ha	mt/ha				
			27 to 38 months	39 to 50 months	51 to 62 months	63 to 74 months	
			2004	2005	2006	2007 Est	
Treatment (Blk 63) (36.19 ha)	1-Jul	132	8.23	11.78	18.19	24.00	
Chemical (Blk 68) (27.55 ha)	1-Jul	130	5.77	9.35	15.91	21.00	Average
Yield variance			2.46	2.42	2.28	3.00	2.54
Trial 3	DOP	Stand/ha	mt/ha				
			25 to 29 months	30 to 41 months	42 to 53 months	54 to 65 months	
			2004 Aug to Dec	2005	2006	2007 Est	
Treatment (Blk 118) (36.00 ha)	2-Apr	114	1.88	5.55	10.48	18.00	
Chemical (Blk 120) (38.73 ha)	2-Apr	109	1.56	4.79	9.92	16.00	Average
Yield variance			0.32	0.76	0.56	2.00	0.91
Trial 4	DOP	Stand/ha	mt/ha				
			25 to 33 months	34 to 45 months	46 to 57 months	58 to 70 months	
			2004 April to Dec	2005	2006	2007 Est	
Treatment (Blk 85 & 88) (54.41 ha)	1-Dec	110	5.42	7.83	18.82	24.00	
Chemical (Blk 87) (35.83 ha)	1-Dec	105	4.17	6.21	12.41	20.00	Average
Yield variance			1.25	1.63	6.41	4.00	3.32

Mean increment: 2.19 mt/ha

IBG bio fertilizer has been fully used on year 2006, but the trial was still maintained until 2007.

Conclusion

Control		
Fertilizer	Cost/palm	Cost/ha (130 palms)
12.10 kg	RM 16.77	RM 2,179.45
Round/year	Labour cost/round/ha	6 round/ha
6	RM 8	RM 48
	Total cost/ha	RM 2,227.45

Treatment		
Fertilizer	Cost/palm	Cost/ha (130 palms)
Chemical fertilizer 7.60 kg	RM 12.24	RM 1,591.46
IBG 40 ml	RM 3.45	RM 448.50
Round/year	Labour cost/round/ha	6 round/ha
5	RM 8	RM 40
	Total cost/ha	RM 2,079.96

Extra yield (mt) /ha	2.19
Average price/mt	RM 700.00
Revenue	RM 1,533.00
Cost variance /ha	RM 147.49
Extra earning /ha	RM 1,680.49

Yield data of Usaha Sepadan

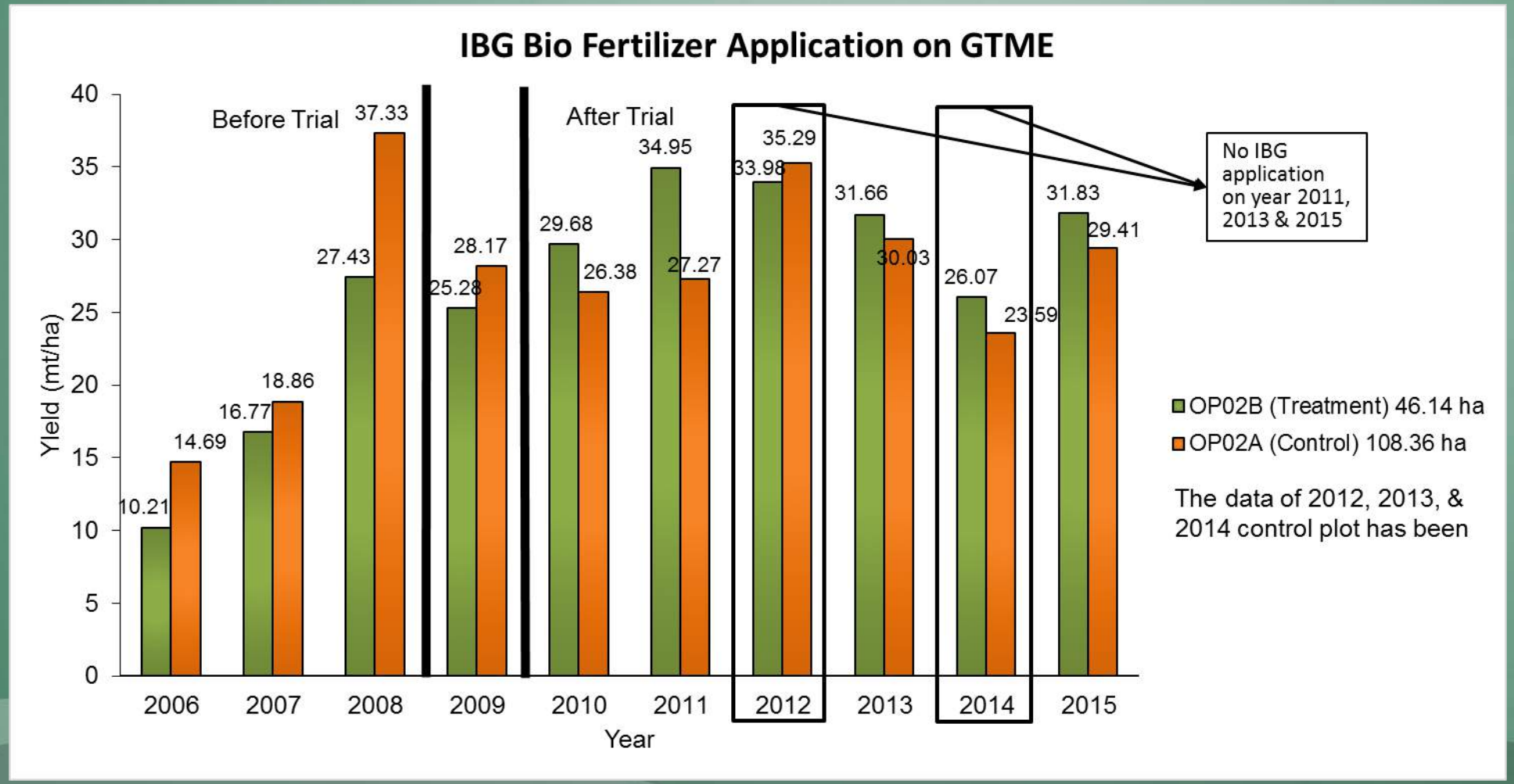
			ABW			Bunch/palm			Yield/HA			Yield/130palms		
Phase	HA	Date Planted	M05–A06	M06–A07	M07–A08	M05–A06	M06–A07	M07–A08	M05–A06	M06–A07	M07–A08	M05–A06	M06–A07	M07–A08
Phase 1	1,591.36	Jan01 to Apr01	6.00 Kg	7.65 Kg	8.56 Kg	18.74	19.51	24.59	13.74 Mt	18.24 Mt	27.47 Mt	14.62 Mt	19.42 Mt	27.35 Mt
Phase 2	1,302.43	Apr01 to Nov01	5.86 Kg	7.87 Kg	8.56 Kg	18.83	19.31	26.60	12.32 Mt	16.98 Mt	27.84 Mt	14.35 Mt	19.77 Mt	29.60 Mt
Phase 3	1,193.42	Nov01 to Apr02	5.38 Kg	6.93 Kg	8.28 Kg	14.69	17.50	24.44	7.89 Mt	12.11 Mt	22.34 Mt	10.27 Mt	15.76 Mt	26.30 Mt
Total	4,087.21		5.82 Kg	7.55 kg	8.49 kg	17.72	18.93	25.19	11.58 Mt	16.05 Mt	26.09 Mt	13.40 Mt	18.58 Mt	27.79 Mt

IBG Trial application on Usaha Sepadan estate has started since year 2003. Since year 2003 – 2006, the average yield improvement is 2.19 mt/ha. At year 2006, IBG Bio Fertilizer has been fully used on the estate.

GENTING TANAH MERAH ESTATE

- LOCATION: Tanah Merah, Johor
- HECTAREAGE: Control plot – 108.36 ha
  Treatment plot – 46.14 ha
- YEAR OF PLANTING : 2002
- IBG biofertilizer application since 2008

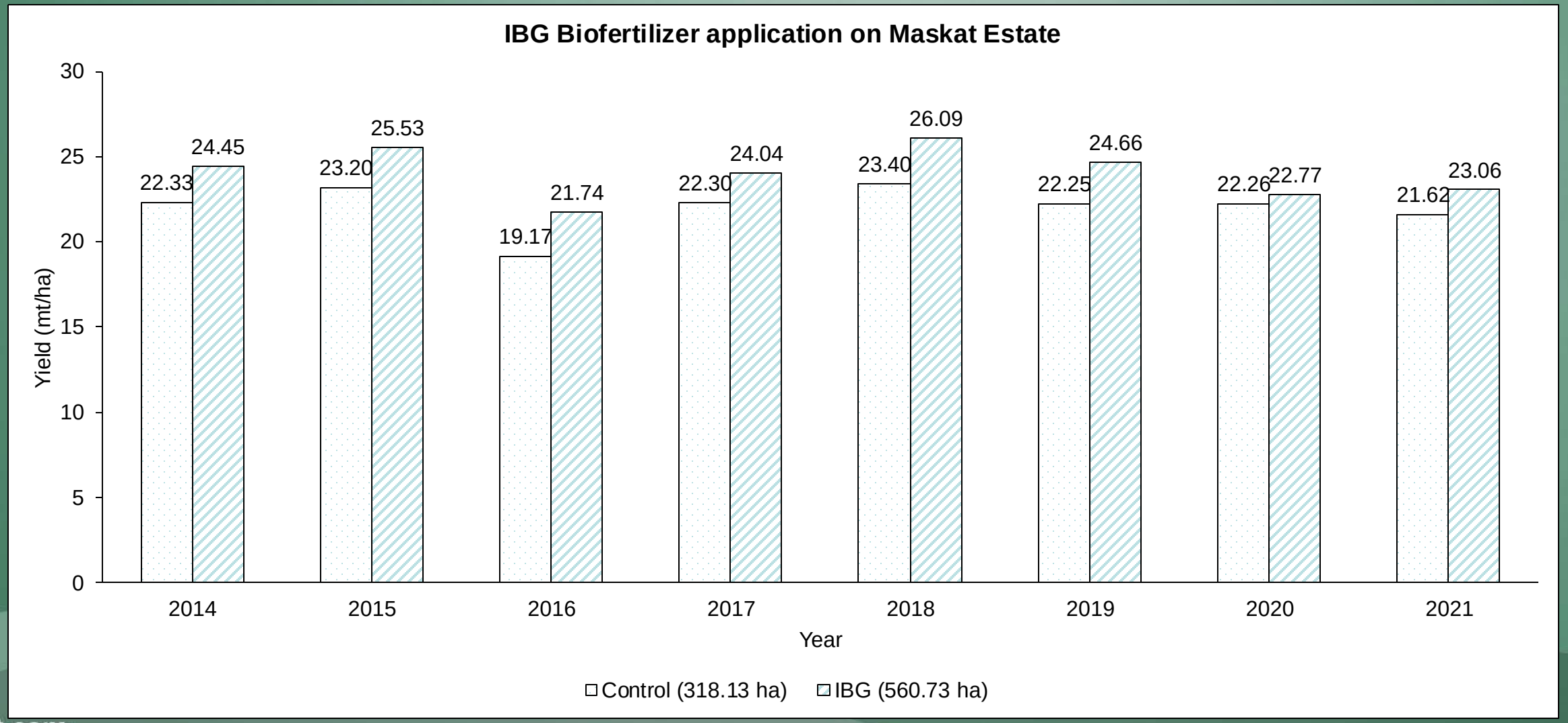
IBG biofertilizer application at GTME



BORNEO AGRO RESOURCES SDN. BHD.

- LOCATION: Maskat estate, Bintulu, Sarawak.
- HECTAREAGE: Control Plot: 403.63 ha – 2018; 318.13 ha – 2021
  Treatment Plot: 339.57 ha – 2018; 560.73 ha – 2021
- YEAR OF PLANTING : 2003 - 2005
- IBG biofertilizer application since July 2014

IBG biofertilizer application at Borneo Agro Resources



PHOENIX PERKS SDN. BHD.

(Subsidiary company of Ngan & Ngan Holdings.)

- LOCATION: Bintulu, Sarawak.
- HECTAREAGE : Treatment plot – 1,395.55 ha
- YEAR OF PLANTING : Various
- IBG biofertilizer application since August 2022, dosage is 100 ml IBG/palm/year. Standard IBG application is 50 ml IBG/palm/year.

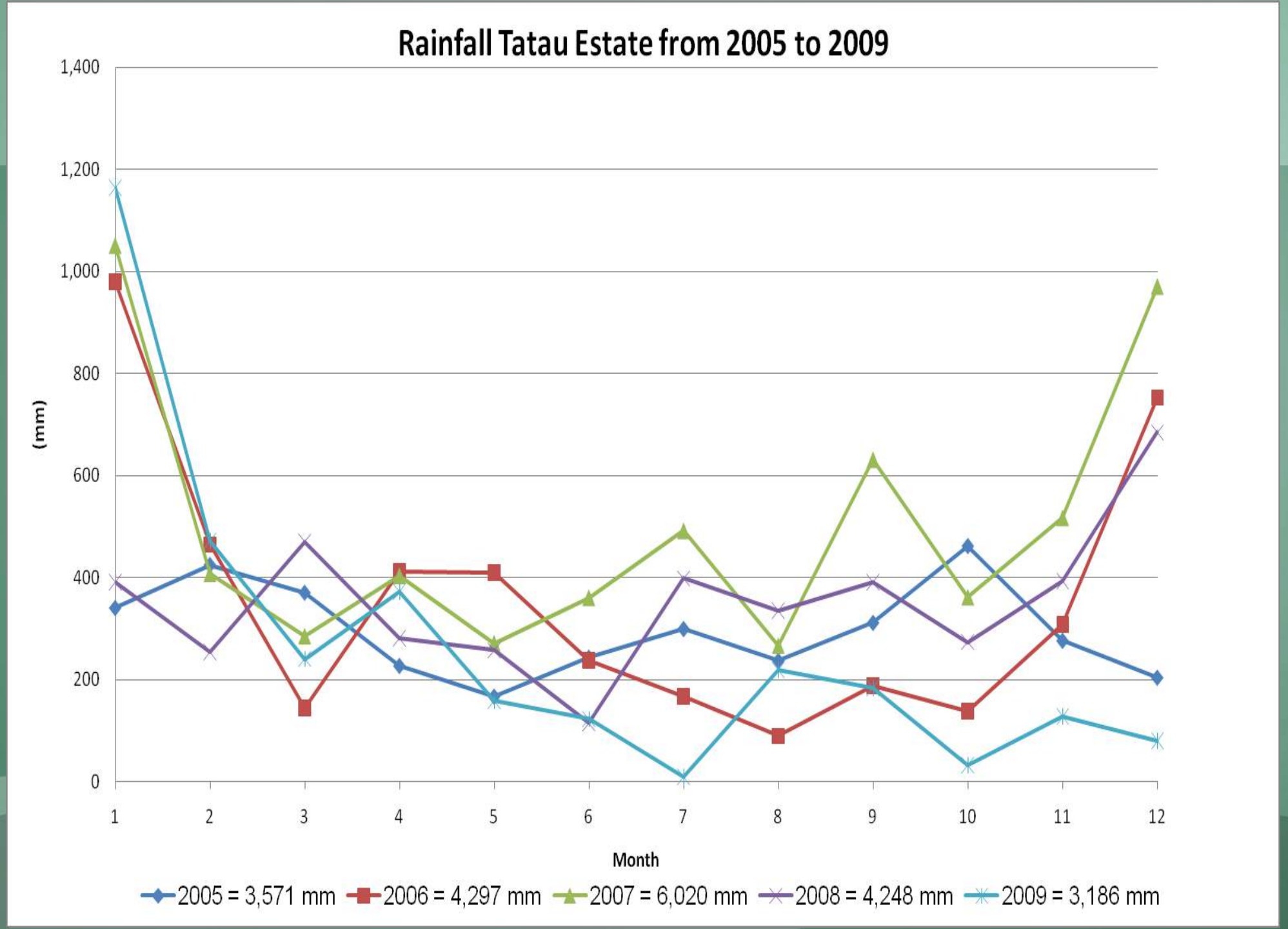
Year	Total mt	Total ha	Total mt/ha
2017	802.87	1,395.55	0.58
2018	10,789.06	1,395.55	7.73
2019	21,845.30	1,395.55	15.65
2020	24,975.68	1,395.55	17.90
2021	36,158.67	1,395.55	25.91
2022 (start using IBG at August - September 2022)	30,574.61	1,395.55	21.91
2023	39,227.73	1,395.55	28.11
2024 (Expected)	**41,866.50**	**1,395.55**	**30.00**

PHOENIX PERKS SDN. BHD.

(Subsidiary company of Ngan & Ngan Holdings.)

Peat Soil

- Tatau Estate (5,600 ha planted since 2004)
- Semanok Estate (2,700 ha planted since 2004)
- Tamar Estate (4,000 ha planted since 2001 to 2002 with 1,300 ha of Alan Batu)
- IBG Bio Fertilizer application on these estates have been started at year 2007 after the appealing result from Usaha Sepadan estate.


Rainfall Tatau Estate from 2005 to 2009
1,400
1,200
1,000
800
600
400
200
0
(mm)
1
2
3
4
5
6
7
8
9
10
11
12
Month
2005 = 3,571 mm
2006 = 4,297 mm
2007 = 6,020 mm
2008 = 4,248 mm
2009 = 3,186 mm

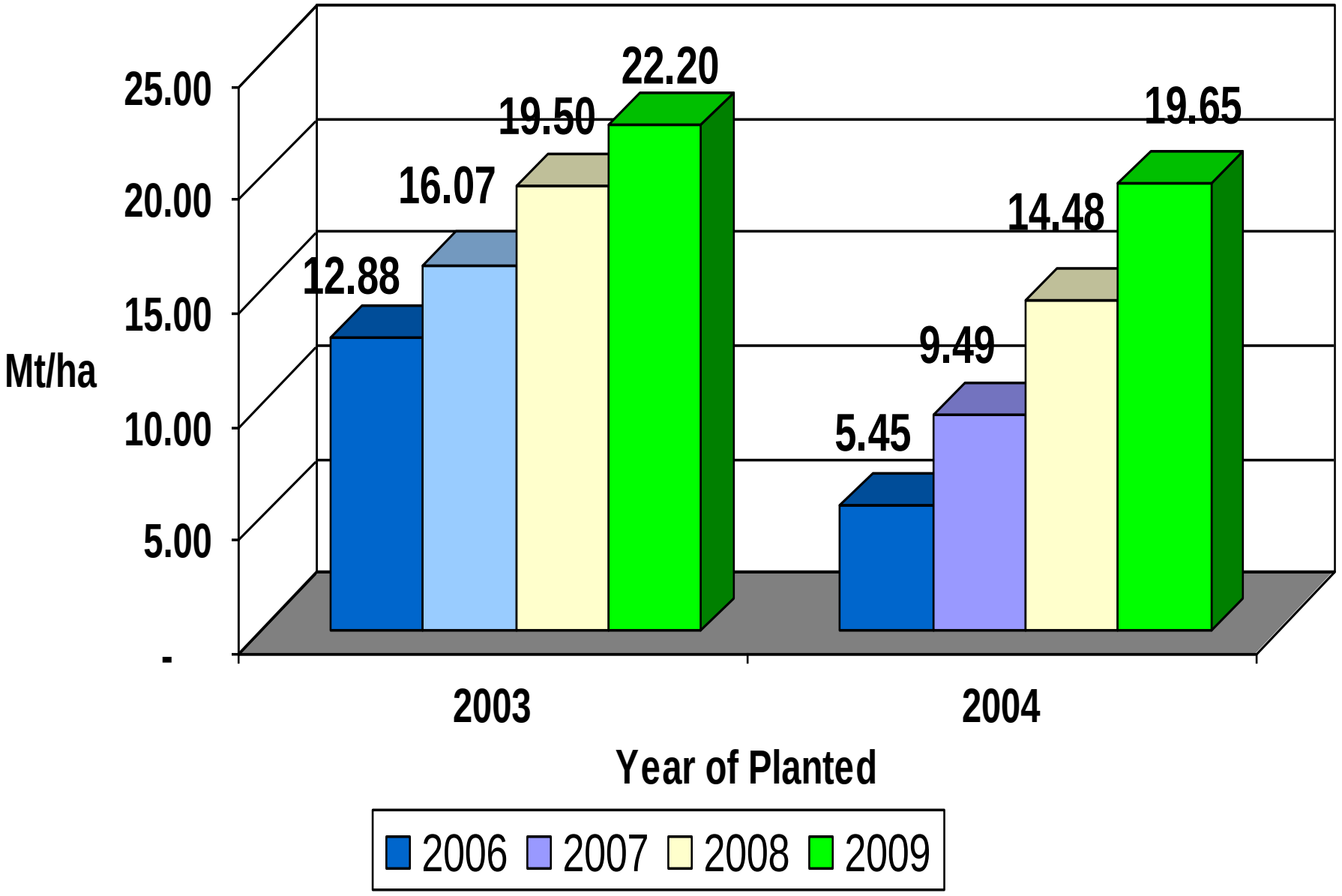
Cost Comparison between Conventional Manuring Program & IBG Bio Fertilizer Manuring Program of Tatau Estate

IBG bio fertilizer (4 L)	RM 345
SOA	RM 750
RP	RM 1,550
MOP	RM 2,100
Kieserite	RM 460
Borate	RM 3,800
Urea	RM 1,400
8:8:8	RM 5,100
7:4:34	RM 2,250

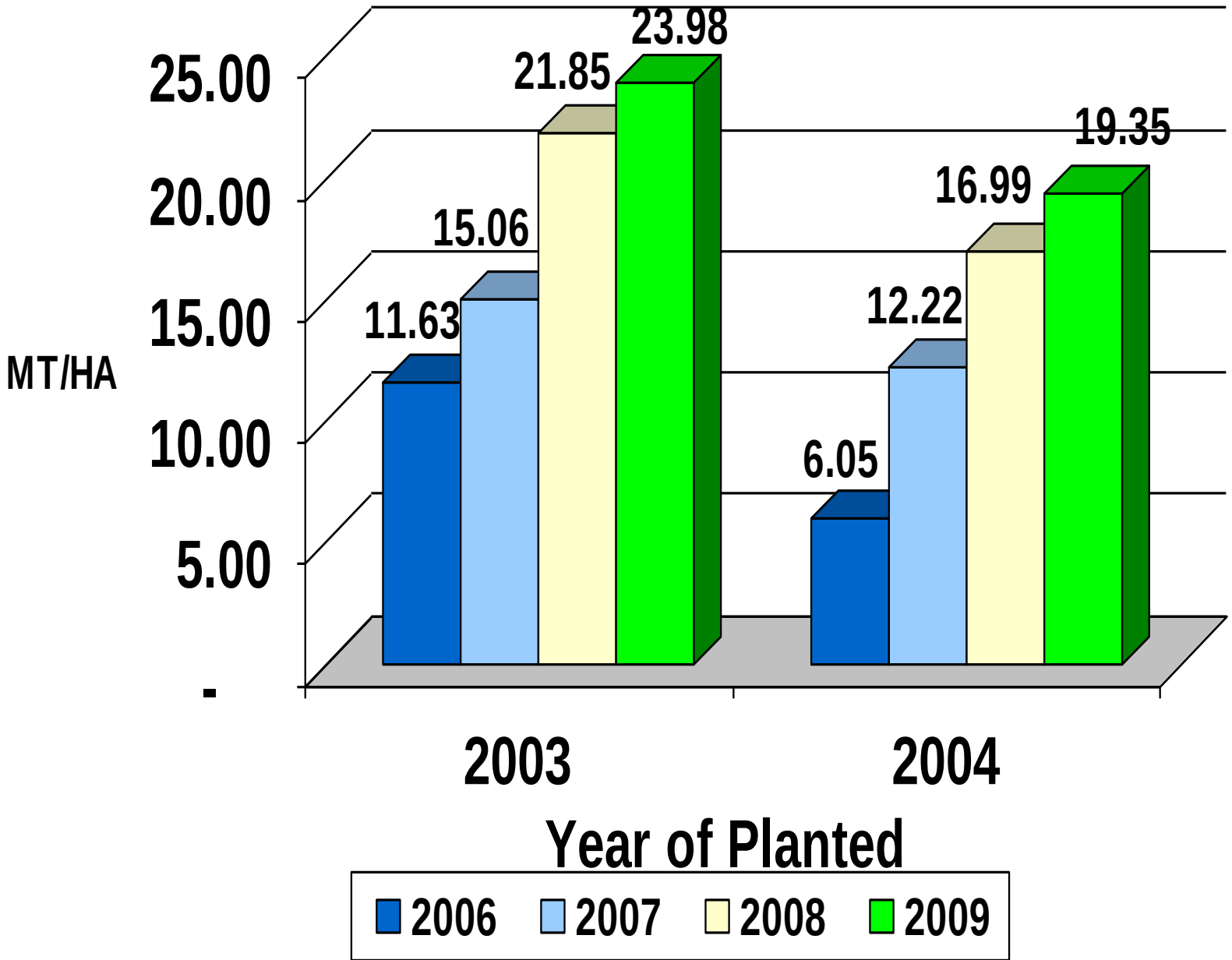
Conventional Manuring Program				
No.	Fertilizer	Dosage	Cost/palm	Cost/ha (150 palms)
1	Urea	0.50 kg	RM 0.70	RM 105.00
	MOP	2.00 kg	RM 4.20	RM 630.00
2	Urea	0.50 kg	RM 0.70	RM 105.00
	MOP	2.00 kg	RM 4.20	RM 630.00
3	RP	1.00 kg	RM 1.55	RM 232.50
4	ZnCu	0.125 kg	RM 0.64	RM 95.63
	Borate	0.15 kg	RM 0.57	RM 85.50
5	Urea	0.50 kg	RM 0.70	RM 105.00
	MOP	2.00 kg	RM 4.20	RM 630.00
	Total	8.78 kg	RM 17.46	RM 2,618.63

IBG Bio Fertilizer Manuring Program				
No.	Fertilizer	Dosage	Cost/palm	Cost/ha (150 palms)
1	Packed MOP Subsoil	5.00 kg	RM 10.50	RM 1,575.00
2	IBG bio fertilizer (4 L)	20 ml	RM 1.73	RM 258.75
3	ZnCu	0.125 kg	RM 0.64	RM 95.63
	Borate	0.15 kg	RM 0.57	RM 85.50
4	IBG bio fertilizer (4 L)	20 ml	RM 1.73	RM 258.75
	Total	5.28 kg + 40 ml	RM 15.16	RM 2,273.63
	Total cost saving/palm		RM 2.30	

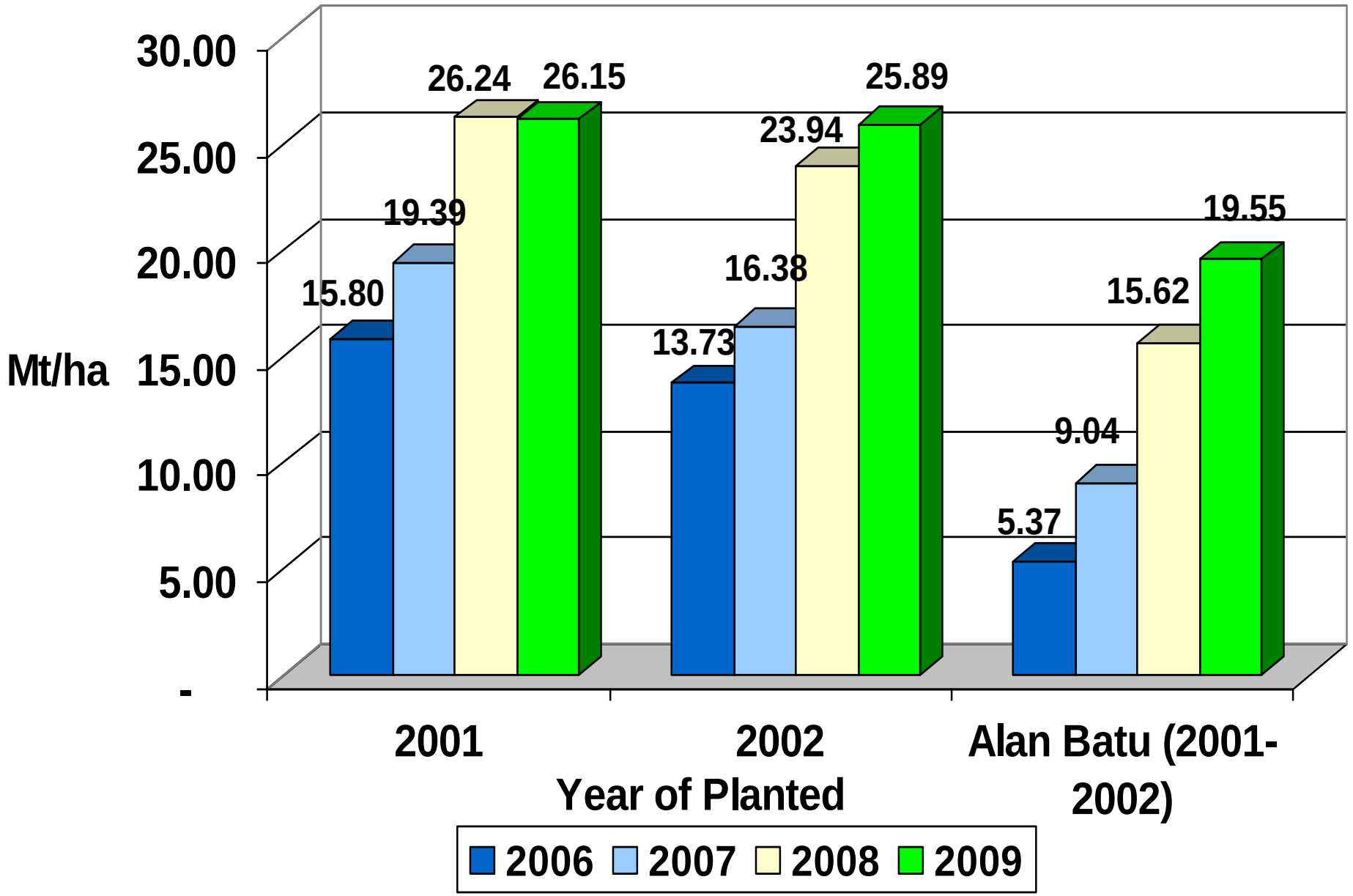
Tatau Yield Production 2006 to 2009



SEMANOK YIELD PRODUCTION 2006 TO 2009



Tamar Yield Production 2006 to 2009



Conclusion

Control		
Fertilizer	Cost/palm	Cost/ha (150 palms)
8.78 kg	RM 17.46	RM 2,618.63
Round/year	Labour cost/round/ha	6 round/ha
5	RM 8	RM 40
	Total cost/ha	RM 2,658.63

Treatment		
Fertilizer	Cost/palm	Cost/ha (150 palms)
Chemical fertilizer 5.28 kg	RM 11.71	RM 1,756.13
IBG 40 ml	RM 3.45	RM 517.50
Round/year	Labour cost/round/ha	6 round/ha
4	RM 8	RM 32
	Total cost/ha	RM 2,305.63

Extra Yield (mt) /ha	2.19
Average price/mt	RM 700.00
Revenue	RM 1,533.00
Cost Variance /ha	RM 353.00
Extra earning /ha	RM 1,886.00

WOODMAN KUALA BARAM ESTATE SDN. BHD.

(616631-U)

Lot 306, Jalan Krokop, P. O. Box 1437, 98008 Miri, Sarawak.
Tel: 085-419321 (8 Lines) Fax: 085-435470 / 416759 / 420145

DATE : 25th May 2010

To Whom It May Concern:

This serve to certify that the IBG Microorganism Bio Fertilizers is a high technology product which Woodman Group Of Companies are using such as Usaha Sepadan Estate on mineral soil. Tamar Estate, Tatau Estate and Semanok Estate are on peat area for several years, area coverage approximately **18,000 Ha** since 2003 till at present.

After using this IBG-BIO Fertilizers product, it is proven that this product really benefits us through cost saving at 20% generally, maintain and improve its productivity, reducing labour cost, improve the soil structure and maintain adequate soil moisture without extra cost where the quantity of micro-organism in the soil create healthy natural environment for the palm growth where we reduce our chemical cost at 30% generally.

We do not hesitate to recommend any clients or company to use this product where it is mutual benefit for long term purposes.

Thank you,

Yours truly,
WOOMAN KUALA BARAM ESTATE SDN. BHD.

WOODMAN KUALA BARAM ESTATE SDN BHD (616631-U)

MR. ANTHONY JAU
Senior Plantation Manager

JOBENAR RAYA SDN. BHD.

(Subsidiary company of Mafrica Maytrading Sdn. Bhd.)

- LOCATION: Ladang Jobenar Raya Sdn. Bhd., Bintulu, Sarawak.
- HECTAREAGE: Control Plot – 64.90 ha
  Treatment Plot – 91.10 ha
- SOIL SERIES: Anderson 3 (Deep Peat)
- YEAR OF PLANTING: 2001

Comparison of yield production (2006 - 2008) conducted at Jobenar Raya Estate.

Plot	Total Ha	mt/ha		
		2006	2007	2008
Control	64.90	14.91	16.61	18.93
Treatment	91.10	17.66	22.91	26.40
Difference		2.75	6.30	7.47

Cost Comparison between Conventional Manuring Program & IBG Bio Fertilizer Manuring Program of Jobenar Raya Sdn. Bhd.

IBG bio fertilizer (4 L)	RM 345
SOA	RM 750
RP	RM 1,550
MOP	RM 2,100
Kieserite	RM 460
Borate	RM 3,800
Urea	RM 1,400
8:8:8	RM 5,100
7:4:34	RM 2,250

Conventional Manuring Program				
No.	Fertilizer	Dosage	Cost/palm	Cost/ha (148 palms)
1	7:4:34	5.00 kg	RM 11.25	RM 1,665.00
2	Urea	1.00 kg	RM 1.40	RM 207.20
3	MOP	2.00 kg	RM 4.20	RM 621.60
4	Chelated ZnCuB	0.15 kg	RM 0.77	RM 113.22
	Total	8.15 kg	RM 17.62	RM 2,607.02

IBG Bio Fertilizer Manuring Program				
No.	Fertilizer	Dosage	Cost/palm	Cost/ha (148 palms)
1	IBG OP**	50 ml	RM 4.31	RM 638.25
2	7:4:34	3.00 kg	RM 6.75	RM 999.00
3	MOP	2.50 kg	RM 5.25	RM 777.00
4	Chelated ZnCuB	0.15 kg	RM 0.77	RM 113.22
	Total	5.65 kg + 50 ml	RM 17.08	RM 2,527.47
	Total cost saving/palm		RM 0.54	

Conclusion

Control		
Fertilizer	Cost/palm	Cost/ha (148 palms)
8.15 kg	RM 23.42	RM 2,607.02
Round/year	Labour cost/round/ha	6 round/ha
4	RM 8	RM 32
	Total cost/ha	RM 2,639.02

Treatment		
Fertilizer	Cost/palm	Cost/ha (148 palms)
Chemical fertilizer 5.65 kg	RM 12.77	RM 1,889.22
IBG 50 ml	RM 4.31	RM 638.25
Round/year	Labour cost/round/ha	6 round/ha
4	RM 8.00	RM 32
	Total cost/ha	RM 2,559.47

Extra Yield (mt) /ha	5.51
Average price/mt	RM 700.00
Revenue	RM 3,857.00
Cost Variance /ha	RM 79.55
Extra earning /ha	RM 3,936.55

PALM GROUP HOLDINGS SDN.BHD. (462042 - M)
(Member of Mafrica Group of Companies)
25.1-25.2,Level 25,Wisma Sanyan,
No.1,Jalan Sanyan, 96000 Sibu,Sarawak,Malaysia
Telephone.+ 6084-332155 / 0198277155,Fax.+ 6084-332153

28th Aug 2010

TO WHOM IT MAY CONCERN

Ladang Jobenar Raya Sdn Bhd commenced using IBG Oil Palm Bio Fertilizer combined with Chemical Fertilizer for oil palm growth and sustainable yield improvement in 2006 until now.

Over the past 4 1/2 years of usage of IBG Bio- Fertilizer, the average yield increase was 18.25% as compared over the control blocks.

For sustainable palm oil production, integrated use of chemical and bio-fertilizer has shown to have a significant improvement in sustaining soil health through earthworm cast formation on the soil surface for oil palm production, reduction dosage of NPK by positive improvement in terms of foliar nutrients level,cost saving and good yield improvement by about 20% over the complete usage of conventional fertilizers.

Currently, our group of eight peat and mineral soils oil palm estates covering a hectarage of 18,885 10 hectares is using the IBG Bio Fertilizers on a large and commercial scale.

For best results, IBG Bio-Fertilizer should be integrated with mineral fertilizers and the latter can be reduced by 20 - 30%

Yours faithfully,

CHAN WING SAN
Operations General Manager

PALM GROUP HOLDINGS SDN. BHD. (462042-M)

2015 IBG BIO FERTILIZER USAGE IN MAFRICA

Company	Planted Ha	Phase	Date of Planting	IBG Bio Fertilizer Usage/palm/year	IBG Bio Fertilizer Used
Palmcol Sdn. Bhd	5,190.20	5	2007 - 2010	50 ml	6,647 bottles
Jobenar Raya Sdn. Bhd.	2,832.07	4	2000, 2004 - 2005	50 ml	5,890 bottles
Jobenar Balingian					1,614 bottles
Rosebay Enterprise Sdn. Bhd. (Rosebay 2)	2,507.97	2	2005 - 2006	50 ml	3,574 bottles
Palmraya Pelita Sikat Platation	1,736.00	2	2007 - 2010	50 ml	3,002 bottles
Palmraya Pelita Meruan Plantation	4,820.07	6	2000 - 2010	50 ml	7,404 bottles
Victoria Square Development Sdn. Bhd.	3,657.30	2	2008 - 2010	50 ml	2,698 bottles
Saradu Plantations Sdn. Bhd	Phase 1: 2,000 ha				4,297 bottles
Worldsign Harvest Sdn. Bhd.	6,000.00				5,763 bottles
Palmraya Pelita Sepapa Oya Plantation Sdn. Bhd.					1,468 bottles
Titasa Sdn. Bhd.					152 bottles
Total	40,000.00				42,509 bottles

2016 IBG BIO FERTILIZER USAGE IN MAFRICA

Company	Planted Ha	Phase	Date of Planting	IBG Bio Fertilizer Usage/palm/year	IBG Bio Fertilizer Used
Palmcol Sdn. Bhd	5,190.20	5	2007 - 2010	50 ml	6,888 bottles
Jobenar Raya Sdn. Bhd.	2,832.07	4	2000, 2004 - 2005	50 ml	3,440 bottles
Jobenar Balingian					5,040 bottles
Rosebay Enterprise Sdn. Bhd. (Rosebay 2)	2,507.97	2	2005 - 2006	50 ml	3,574 bottles
Palmraya Pelita Sikat Platation	1,736.00	2	2007 - 2010	50 ml	2,880 bottles
Palmraya Pelita Meruan Plantation	4,820.07	6	2000 - 2010	50 ml	7,544 bottles
Victoria Square Development Sdn. Bhd.	3,657.30	2	2008 - 2010	50 ml	4,296 bottles
Saradu Plantations Sdn. Bhd	Phase 1: 2,000 ha				6,704 bottles
Worldsign Harvest Sdn. Bhd.	6,000.00				7,802 bottles
Palmraya Pelita Sepapa Oya Plantation Sdn. Bhd.					2,364 bottles
Titasa Sdn. Bhd.					120 bottles
Total	40,000.00				50,152 bottles

2017 IBG BIO FERTILIZER USAGE IN MAFRICA

Company	Planted Ha	Phase	Date of Planting	IBG Bio Fertilizer Usage/palm/year	IBG Bio Fertilizer Used
Palmcol Sdn. Bhd	5,190.20	5	2007 - 2010	50 ml	6,808 bottles
Jobenar Raya Sdn. Bhd.	2,832.07	4	2000, 2004 - 2005	50 ml	4,632 bottles
Jobenar Balingian					5,668 bottles
Rosebay Enterprise Sdn. Bhd. (Rosebay 2)	2,507.97	2	2005 - 2006	50 ml	3,022 bottles
Palmraya Pelita Sikat Platation	1,736.00	2	2007 - 2010	50 ml	3,066 bottles
Palmraya Pelita Meruan Plantation	4,820.07	6	2000 - 2010	50 ml	3,792 bottles
Victoria Square Development Sdn. Bhd.	3,657.30	2	2008 - 2010	50 ml	2,402 bottles
Saradu Plantations Sdn. Bhd	Phase 1: 2,000 ha				6,660 bottles
Worldsign Harvest Sdn. Bhd.	6,000.00				6,836 bottles
Palmraya Pelita Sepapa Oya Plantation Sdn. Bhd.					1,064 bottles
Titasa Sdn. Bhd.					0 bottle
Total	40,000.00				43,964 bottles

PRIORITY POTENTIAL SDN. BHD.

(Subsidiary company of Golden Agro Sdn. Bhd.)

- LOCATION : Priority Potential estate, Mukah, Sarawak.
- HECTAREAGE : Control plot – 156.78 ha
  Treatment plot – 253.24 ha
- YEAR OF PLANTING : 2012 - 2013
- IBG biofertilizer application since January 2017

IBG biofertilizer application at Priority Potential

			mt/ha											
BLOCK	YOP	HA	Jan-17	Feb-17	Mar-17	Apr-17	May-17	Jun-17	Jul-17	Aug-17	Sep-17	Oct-17	Nov-17	Dec-17	Total
K1 (Control)	Nov-12	16.00	0.34	0.20	0.40	0.30	0.27	0.57	0.80	0.81	0.76	0.78	0.74	0.82	6.78
K2 (Control)	Nov-12	15.97	0.56	0.39	0.80	0.59	0.47	0.73	1.21	1.40	1.04	1.04	1.02	1.04	10.29
K9 (Control)	Jan-13	19.97	0.34	0.28	0.39	0.42	0.49	0.86	0.69	1.20	0.83	0.99	0.92	0.93	8.35
L1 (Control)	Nov-12	23.56	0.59	0.31	0.59	0.78	0.76	1.01	1.14	1.68	1.43	1.48	1.11	1.12	12.00
L8 (Control)	Nov-12	20.00	0.39	0.28	0.30	0.55	1.31	1.03	0.72	1.31	1.20	1.48	1.06	0.72	10.33
L9 (Control)	Dec-12	20.00	0.46	0.38	0.33	0.45	1.22	0.88	0.70	0.94	1.00	1.51	0.79	1.20	9.86
L10 (Control)	Dec-12	20.00	0.48	0.36	0.34	0.44	0.78	1.44	0.73	1.48	1.07	1.18	1.99	0.91	11.20
N6A (Control)	Sep-12	6.30	0.61	0.58	0.50	0.82	0.64	1.63	1.30	2.45	1.52	1.81	1.50	0.92	14.27
N8 (Control)	Sep-12	14.98	0.65	0.51	0.39	0.62	0.60	1.40	1.29	2.23	1.67	1.39	1.50	0.73	12.98
Average			0.49	0.37	0.45	0.55	0.73	1.06	0.95	1.50	1.17	1.30	1.18	0.93	10.67
K3 (IBG)	Dec-12	15.94	0.48	0.31	0.64	0.56	0.50	0.88	1.37	1.57	1.13	1.15	1.07	1.05	10.70
K4 (IBG)	Jan-13	15.94	0.50	0.30	0.68	0.52	0.49	1.00	1.30	1.80	1.17	1.28	1.07	1.22	11.33
K5 (IBG)	Jan-13	15.90	0.46	0.28	0.65	0.67	0.68	1.06	1.57	2.11	1.20	1.24	1.16	1.28	12.36
K6 (IBG)	Jan-13	20.80	0.66	0.40	0.91	0.75	0.70	1.07	1.40	1.90	1.25	1.26	1.16	1.47	12.93
K7 (IBG)	Jan-13	20.00	0.73	0.45	1.13	1.14	1.19	2.03	1.62	2.17	1.57	1.57	1.55	1.58	16.72
K8 (IBG)	Jan-13	20.04	0.39	0.29	0.35	0.43	0.52	1.17	0.72	1.28	1.08	1.24	1.27	1.22	9.97
L2 (IBG)	Nov-12	23.56	0.89	0.82	0.95	1.12	0.99	1.26	1.42	1.42	1.52	1.78	1.18	1.31	14.65
L3 (IBG)	Nov-12	23.56	0.86	0.68	0.98	0.87	1.18	1.61	1.43	1.75	1.48	1.66	1.10	1.32	14.93
L4 (IBG)	Nov-12	23.56	0.73	0.60	0.86	0.49	1.53	1.62	1.43	1.78	1.51	1.64	1.14	1.26	14.60
L5 (IBG)	Nov-12	23.56	0.68	0.64	0.91	0.50	1.81	1.62	1.39	1.90	1.48	1.80	1.27	1.14	15.14
L6 (IBG)	Nov-12	20.00	0.58	0.53	0.74	0.45	1.52	1.36	1.32	1.97	1.50	1.71	1.34	1.26	14.28
L7 (IBG)	Nov-12	20.00	0.57	0.45	0.94	0.61	1.82	1.45	1.39	1.82	1.43	1.93	1.27	0.81	14.49
N7 (IBG)	Aug-12	10.38	0.74	0.75	0.74	1.34	1.06	1.97	1.79	2.56	1.71	1.97	1.58	0.92	17.13
Average			0.64	0.50	0.81	0.73	1.08	1.39	1.40	1.85	1.39	1.56	1.24	1.22	13.79

…20,000 ha

…15 years…

…28 – 29 mt/ha…

…improvement of soil's quality and structure…*Ganoderma* infection less than 2%…

We encourage any customer or company to use this product for long term benefits.

TAMACO PLANTATION SDN. BHD.
P.O. Box 60486,
91114, Lahad Datu Sabah.

Date: 26th January 2022

To whom this may concern,

Truthfully, we have been struggling finding the right supplement for the palms to grow healthily through sustainable ways. When the IBG was introduced back in the days, the effects were seen. Result were observable might vary due to the condition and type of the soil. Make it in three years supervision, if the sustainability of the plantation is maintained, why don't we give a try proceeding its usage? It resembles a good definition of bio-friendly product that will help a lot planters to move forward with legit mission and vision.

Thank you.

Sr. Regional Manager (Sabah)
Hadrawi Mohd Arip

TAMACO PLANTATION SDN. BHD.
P.O. Box 60486,
91114, Lahad Datu Sabah.

Date: 26th January 2022

To whom this may concern,

Tamaco Plantation Sdn. Bhd. has been using IBG biofertilizer since year 2006 until now in the oil palm plantation in Bintulu and Lahad Datu with a total hectarage of about 20,000.

More than 15 years after using the IBG biofertilizer, the main effects we had seen is that the oil palm yield has been increased and maintained at 28 – 29 mt/ha when compared with non-treatment oil palm. We had witnessed the recovery and improvement of the soil's quality and structure. While our neighboring estates suffering from high infection of Ganoderma, the infection in our estate has remained low in relative, less than 2% only.

Besides, with the improvement of soil chemical and biological properties, the palm's physiology has been ameliorated. The frond pruning and bunch harvesting had become easier than before using IBG biofertilizer, thus the cost of the palm and soil's health maintenance and the cost of chemical fertilizer application has been reduced drastically. Also, it is easy to apply in the field.

These effects can only be seen after 3 months – 3 years application of IBG biofertilizer depending on the soil type condition.

Hereby, we encourage any customer or company to use this product for long term benefits.

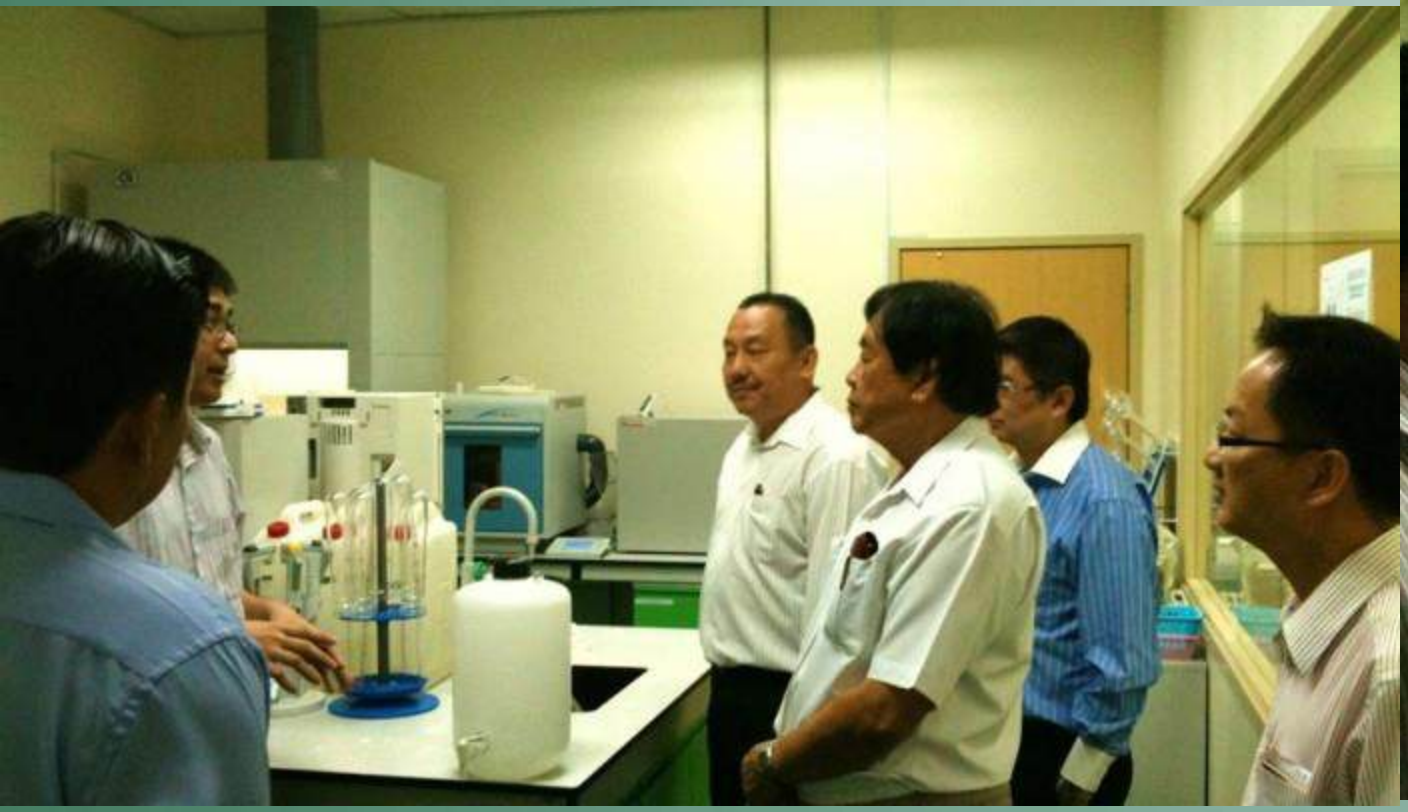
Thank you.

Sr. Regional Manager (Sabah)
Hadrawi Mohd Arip

Corporate visit from Genting Plantations Berhad

Corporate Visit from H.E. General Hing Bun Hieng, Cambodia

Corporate visit from Rimbunan Hijau Group
Tan Sri Datuk Sir Tiong Hiew King



1hb Jun 2016, Wednesday, visit from DG MARDI Datuk Dr. Sharif, DG DOA Dato' Ahmad Zakaria, BOD NAFAS Tuan Haji Ahmad

6hb Disember 2016, Tuesday, visit from Chairman NAFAS Dato' Seri Saipol

Visit from MD Golden Star Ace (Rimbunan Hijau Group) Mr. Kevin Ko Yeu Ying

9th August 2019, Friday, visit from Ministry of Plantation Industries and Commodities

14th October 2019, Monday, visit TAMACO with MPOB

9th July 2020, Thursday, visit from Secretory General Ministry of Agriculture and Food Industries Dato' Zainal Azman Bin Abu Seman

13th & 27th October 2021, visit from CEO MADA corp Mr. Mohamad Anuar Bin Pir Mohamad and Chairman MADA YB Ahmad Tarmizi Bin Sulaiman

13th October 2021, Rabu, visit from Universiti Malaya Prof. Ling Tau Chuan and Dr. Rosazlin Abdullah

18th October 2021, Monday, visit from DG MPOB Datuk Dr. Ahmad Parveez Hj Ghulam Kadir, Director of Biology & Sustainability Research Division MPOB, Dr. Idris Abu Seman, Head of Plant Pathology And Biosecurity, Dr. Mohd. Hefni bin Rusli

2nd November 2021, Tuesday, visit from Kwantas CEO Mr. Alvin Kwan Ngen Wah, PC Mr. Sri Renganathan S. Muthiah

8th April 2022, Friday, visit from Minister for Modernisation of Agriculture & Regional Development, Sarawak, YB Dato Sri Dr. Stephen Rundi Utom

26th July 2022, Tuesday, visit from SALCRA top management team

7th September 2022, Wednesday, visit from Nottingham University Professor Dr. Lam Hon Loong

7th October 2022, Friday, visit from Sime Darby Plantation Research Sdn. Bhd. Dr. Sim Choon Cheak and Dr. Teh Chee Keng

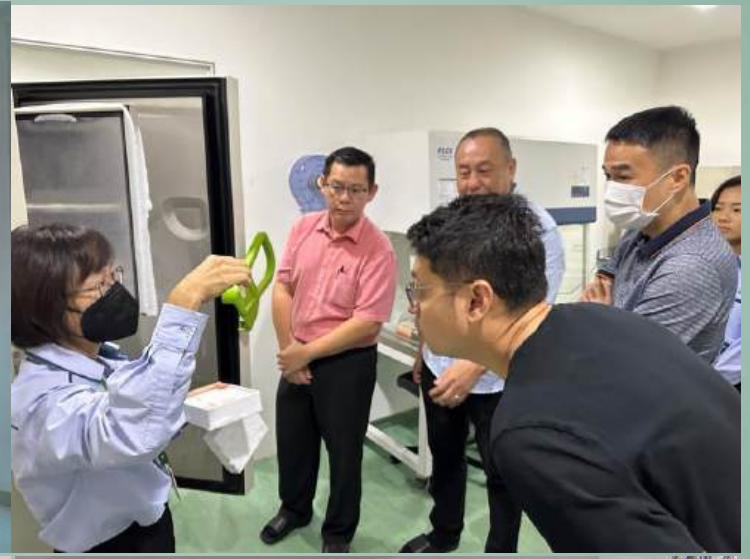
27th October 2022, Thursday, visit from United Malacca Berhad CEO Mr. Young, PC Mr. Low and MPOB

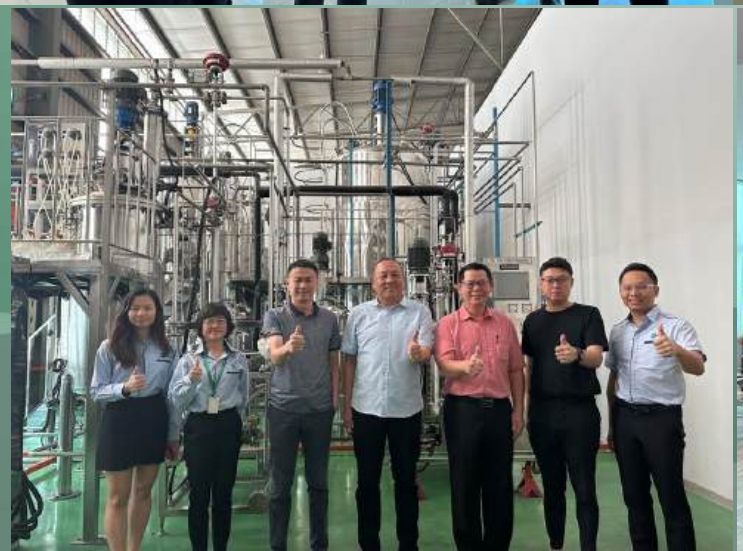
19th December 2022, Monday, Sawit Kinabalu Group MD Datuk Bacho Jansie

3rd January 2023, Tuesday, visit TAMACO with Sawit Kinabalu Group MD Datuk Bacho Jansie

30th January 2023, Monday, visit from Director of Fertilizer Technology Programme, Soil Science, Water & Fertilizer Research Centre, Dr. Rosliza Binti Jajuli, Deputy Director Dr. Ganisan Krishnen, and Director of Paddy and Rice Research Centre, Dr. Mohd. Syaifudin Bin Abdul Rahman

3rd May 2023, Wednesday, visit from Yuwang Group





6th June 2023, Tuesday, visit from FGV, lead by Head of Agronomy & Strategic Crops, Dr. Then Kek Hoe

16th July 2023, Sunday, visit Sawit Kinabalu controller of plantation advisory & agri business Khairul Azhan Othman




2nd August 2023, Wednesday, visit from KLK CEO TSDS Lee Oi Hian, group plantation director Patrick Ng, AAR director Mr. Tey Seng Heng, deputy director Dr. Tasren

19th October 2023, Thursday, visit from FGV Fertilizer lead by CEO En. Hamdan

12th January 2024, Friday, visit from IOI Group MD and CEO Dato' Lee Yeow Chor

19th January 2024, Friday, visit from IOI Research top management

7th February 2024, Friday, visit from FIC Supplies (Felda trading arm) Ir. Ts Adzharulnizzam Alwi

26th February 2024, Monday, visit from Sawit Kinabalu top management

27th February 2024, Tuesday, visit from SDPRC chief R&D officer Dr. David Ross

18th – 20th March 2024, Mon - Wed, visit to IOI Gemencheh, Paya Lang and Bahau

28th March 2024, Thursday, visit to UMB lead by Deputy Minister YB Datuk Chan Foong Hin Ministry Of Plantation And Commodities with MPOB

6hb June 2024, Khamis, visit from lab service division, department of agriculture

20 – 21st August 2024, Tuesday - Wednesday, visit to Sawit Kinabalu Mawao and Langkon

21st August 2024, Wednesday, visit to KLK Batu Lintang

Thank you

IBG Manufacturing Sdn. Bhd.

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