

## LEMBAGA INDUSTRI GETAH SABAH (SABAH RUBBER INDUSTRY BOARD)

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(Sila alamatkan surat kepada Pengurus Besar)

Rujukan : LIGS/KK(KPK)/300-0/9 Jld.6/(24)

Tarikh : 5 Jun 2020

### Kepada Pihak Yang Berkenaan

#### RINGKASAN ANALISIS PERCUBAAN PENGGUNAAN BAJA GROFIELD UNTUK POKOK GETAH OLEH LEMBAGA INDUSTRI GETAH SABAH (LIGS)

Merujuk kepada perkara di atas, LIGS telah menjalankan percubaan untuk penggunaan baja buatan tempatan, iaitu *Groyield Complete Nutritional Liquid Fertilizer* ("Baja Groyield").

2. Taklimat korporat baja Groyield kepada pihak pengurusan LIGS diadakan pada 11 September 2019; Percubaan rawatan pokok getah dimulakan pada 12 September 2019 bertempat di Plot Percubaan Unit Pusat Latihan LIGS, Tuaran dengan kepadatan 400 pokok getah.
3. Rekod pengamatan lengkap percubaan Baja Groyield bermula pada bulan Disember 2019 sehingga bulan Februari 2020. Percubaan terpaksa dihentikan berikutan 'Perintah Kawalan Pergerakan' pada Mac 2020.
4. Dalam tempoh tiga (3) bulan tersebut, percubaan ini menunjukkan bahawa penggunaan Baja Groyield telah;
  - a. meningkatkan pengeluaran getah antara 59% hingga 113% dengan purata 86%. Plot dengan penggunaan Baja Groyield mampu menghasilkan getah kentalan sebanyak 427 kg/200 pokok berbanding 235 kg/200 pokok dengan penggunaan Baja NPK dan kontrol.
  - b. pendapatan lebih yang dapat dijana melalui Baja Groyield adalah RM537.60/200 pokok berdasarkan harga getah semasa iaitu RM2.80/kg.
  - c. Kaedah pembajaan Baja Groyield adalah mudah dipraktikkan iaitu dengan menyapu terus ke panel torehan pada kadar sebulan sekali. Teknik ini telah memudahkan proses pembajaan berbanding dengan kaedah *broadcasting*.

2/...

Rujukan: LIGS/KK(KPK)/300-0/9 Jld.6/(24)

- d. Sehingga kini tidak ada laporan mengenai kejadian kulit pokok getah menjadi kering atau sebarang kesan negatif lain pada pokok. Sebaliknya beberapa pokok yang mengalami kekeringan kulit sebelum percubaan ini dimulakan telah sembuh dan mula menghasilkan susu getah setelah menggunakan Baja Groyield.
  - e. Keperluan penyimpanan baja adalah lebih menjimatkan ruang bagi baja Groyield yang hanya memerlukan ruang untuk 4.8 kilogram Baja Groyield berbanding 300 kilogram NPK bagi pembajaan satu hektar (400 pokok) ladang LIGS setahun.
5. Berdasarkan penelitian ke atas data yang dikumpulkan dalam tempoh tiga (3) bulan dari November 2019 sehingga Februari 2020, maka pihak LIGS berpandangan Baja Groyield boleh digunakan untuk menggantikan baja konvensional sebagai kaedah untuk meningkatkan produktiviti dan kecekapan penghasilan keluaran pokok getah .

Sekian dan terima kasih.

“BERKHIDMAT UNTUK NEGARA DENGAN BERSIH, CEKAP DAN AMANAH”

  
( **SABDIL BIN TANJONG** )  
Pengurus Besar  
Lembaga Industri Getah Sabah

ST/MRA/stph

*Lampiran: Efficacy Report of Liquid Fertilizer Usage Towards Rubber Trees at LIGS*

# **EFFICACY REPORT OF LIQUID FERTILIZER USAGE TOWARDS RUBBER TREES AT LIGS**

Rujukan : LIGS/KK(KPK)/300-0/9 Jld.6/(24)

Jointly Conducted By:



**LEMBAGA INDUSTRI GETAH SABAH**  
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Taman Industri Lembah Jaya,  
68000 Ampang, Selangor, Malaysia.



## SUMMARY

This Joint trial is the treatment of using the local invented fertilizer, namely Groyield Complete Nutritional Liquid Fertilizer (“**Groyield Fertilizer**”). Analytical test results of Groyield Fertilizer was conducted by Malaysian Rubber Board (“**LGM**”), Kuala Lumpur on January 29, 2019. The onsite trial began at the Plot Percubaan Unit Pusat Latihan LIGS, Tuaran on September 12, 2019. This is a joint trial effort between Sabah Rubber Industry Board (“**LIGS**”) and Groyield Malaysia Sdn. Bhd.

Based on recommendation of LIGS the trial was initiated with the main objectives to observe the efficacy of using Groyield Fertilizer towards the costing, yielding and growth of rubber trees compared to normal fertilization, as well as control (no application).

The timestamp of trial is one year, which is one complete rotation of latex output starting from November/December 2019. Result as at this report, shows that the usage of Groyield Fertilizer recorded better latex yield than using normal fertilizer, as well as not using fertilizer.

The trial has shown encouraging result.

## INTRODUCTION

Groyield Fertilizer is a local invented fertilization technology agrochemical industry with the anticipation to reduce the use of chemical while able to maintain or enhance the yield production of, especially oil palm, rubber and fruit trees. It is also concocted to substitute the use of conventional soil fertilization and rubber yield stimulation system.

The objective of the trial is to validate the proposed effects of using Groyield Fertilizer as a complete solution for rubber plantation to achieve:

- (a) **Reduce cost:** Lesser agrochemical use including fertilizer, disease treatment, weed management, stimulant and etc.
- (b) **Enhance quality of latex:** Optimize the dry rubber content (DRC) percentage.

- (c) **Increase Yield:** Optimize quantity of rubber latex production.
- (d) **Reduce replanting:** Enhance tree health to extend tree production period.
- (e) **To treat diseases:** Cure and prevent diseases including the “Rubber Tree Cancer” which is commonly known as Tapping Panel Dryness or Brown Bast.
- (f) **Cleaner environment:** Reduce chemical use that lead to pollution of soil, ground water as well as air, which causes over-contribution of nitrous oxide to greenhouse effect.
- (g) **Streamline workmanship:** Simplify logistic and application method of fertilization in the form of conventional chemical or organic.

## THE TECHNOLOGY

Groyield Fertilizer is a Complete Nutritional Liquid Fertilizer, that is formulated to achieve the highest yield by providing adequate supply of all the required nutrient elements essential to rubber trees. Groyield Fertilizer will help to increase latex yield and at the same time, maintain and even increase the percentage of dry rubber content (DRC%). Latex yield increases gradually after using Groyield Fertilizer and can be observed within the first week of application. Method of application is by lace application @ 1.0 gm is brushed on evenly over the tree lace along the tapping cut and part of the tapping panel.

## PRODUCT CONTENT

Analytical test was conducted on Groyield Fertilizer by Malaysian Rubber Board, Kuala Lumpur on January 29, 2019. The results are shown in **Table 1**. ( The analytical test report is attached as **Appendix A**)

**TABLE 1: ANALYTICAL TEST RESULTS**

NUTRIENT	CONTENT
Nitrogen ( N )	1.72%
Phosphorus ( P )	0.69%
Potassium ( K )	1.19%
Calcium ( Ca )	0.21%

Magnesium ( Mg )	14 ppm
Sulfur ( S )	0.05%
Boron ( B )	3 ppm
Copper ( Cu )	0.03%
Iron ( Fe )	5 ppm
Manganese ( Mn )	2 ppm
Molybdenum	0.07 ppm
Zinc ( Zn )	3 ppm
2-CEPA (%)	Not Detected

### TRUNK APPLICATION FERTILISER

Groyield Fertilizer is used via trunk application method. The effectiveness and efficiency of Groyield Fertilizer replaces the use of conventional soil fertilization.

Fertiliser is defined as a substance that provides nutrients to plants for their growth to enable it to function well. Rubber respond favourably in terms of growth and yield to adequate and proper fertilizer application. The major nutrients for rubber are nitrogen (N), phosphorus (P), potassium(K) and magnesium (Mg). The main disadvantages of application of fertilisers through broadcasting are:

- (a) nutrients cannot be fully utilized by plant roots
- (b) the weed growth is stimulated all over the field
- (c) nutrients are fixed in the soil as they come in contact with a large mass of soils and
- (d) run off of nutrients through leaching

Groyield Fertilizer is a bark penetration surfactant designed for fast, uniform absorption when applied. The lenticels open and enables movement of the product into the plant's vascular transport system. It greatly reduces applicator exposure and don't need to treat surrounding soil. The important thing to remember is that a small amount of fertilizer used, actually increases the uptake in terms of total uptake by several fold over the amount of fertilizer applied.

## STIMULATION

With the usage of Groyield Fertilizer, any other kind of stimulation is NOT required.

The usage of stimulant for rubber plantations in the Malaysia began around 1970 as a chemical stimulator or growth booster. In 1990, the usage of the materials have been spread commercially to overcome the lack of rubber tappers issue. Applications of those materials have shown that some stimulants of boosters successfully increased the yield outputs and rubber tapper's earnings as well. Up until today those materials are still being used in rubber plantations alongside with the suggested tapping method.

Today, there are a lot of available stimulators and boosters for rubber tress in the market, but their effect towards increasing the total production need to be evaluated so that they don't cause any negative issues to the trees as well as to the operators specifically the 70,594 rubber planters: 51,949 plantation owners and 18,645 rubber tappers who have been registered with LIGS.

## **OBJECTIVE**

The objective of the trial was to evaluate the effectiveness as below:

- Effects of using Groyield Fertilizer toward latex yields
- Negative effects from using Groyield Fertilizer products to rubber trees
- Cost effectiveness of using Groyield Fertilizer

## **TREATMENT AND REPLICATE**

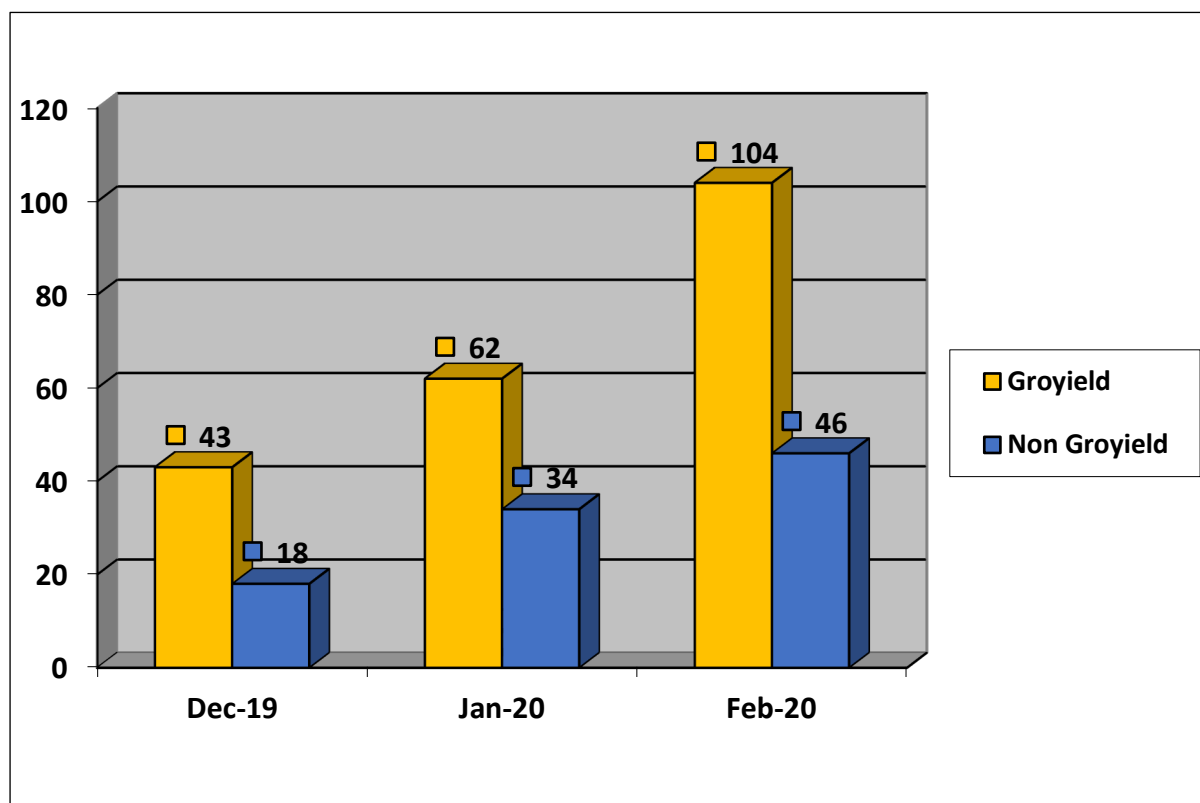
The trial treatment is the Groyield Fertilizer vs conventional fertilizer vs control (non-application). Groyield Fertilizer application is to apply on the tapping groove (tree bark) amount to one gram per tree and one application a month. Normal NPK Fertilizer is to be applied once a year. The last application of NPK Fertilizer was performed during January 2019. 4 plots were selected for the trial as per *Table 2*.

**TABLE 2: PLOTS TRIAL INFORMATION**

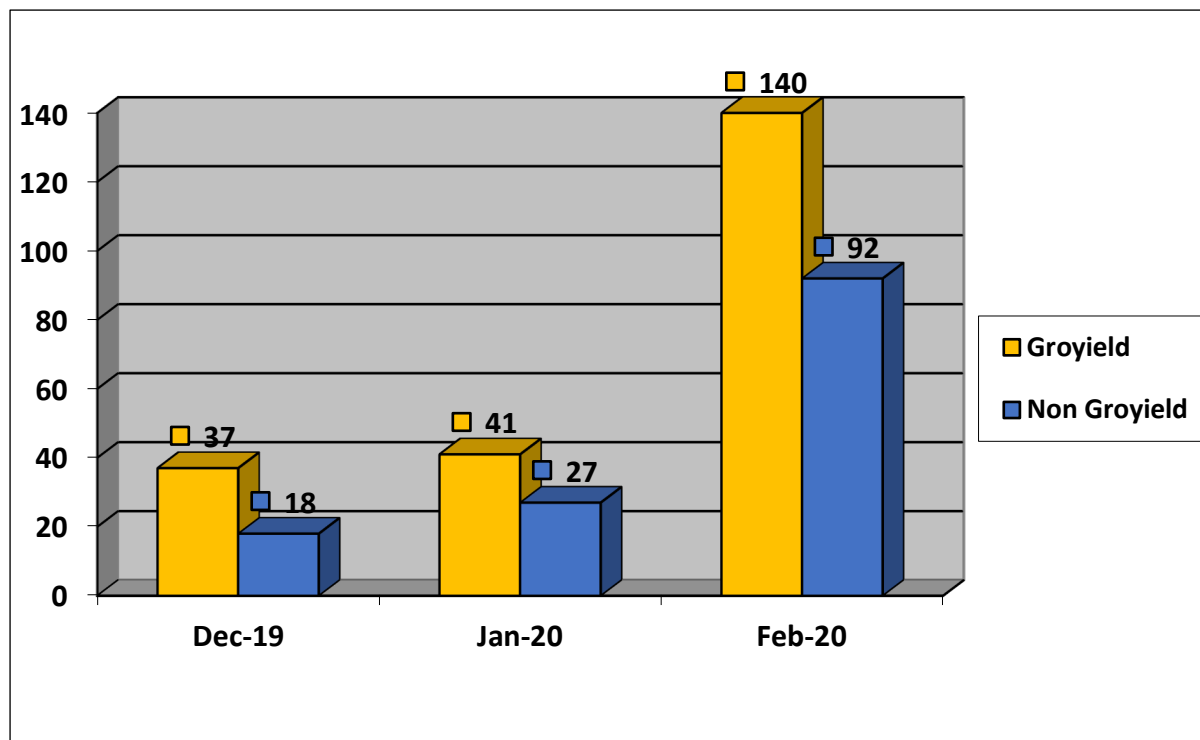
PLOTS	NO OF TREE	TAPPING	WEIGHING	GROYIELD	FERTILIZER NPK 15:15:6:4
A(1)	100	d2	Once a month	Apply (Once/tree/Month/1Brush)	Non Apply
A(2)	100	d2	Once a month	Non Apply	Non Apply
B(1)	100	d2	Once a month	Apply (Once/tree/Month/1Brush)	Non Apply
B(2)	100	d2	Once a month	Non Apply	750g/tree/Year

## RESULTS

For treatments that uses Groyield Fertilizer, *Table 3* and *Table 4* shows the summarized data obtained from the plantation operator of LIGS , which records a higher yield production than the plot that uses other types of treatment.

**TABLE 3: PLOT A YIELD IN KG /PLOT/MONTH RESULT FROM DIFFERENT TREATMENT**



**TABLE 4: PLOT B Yield in KG /Plot/Month Result from Different Treatment**

## COST EFFICIENCY

The cost for utilizing Groyield Fertilizer is 14.02% lower compared to conventional soil fertilization, which is RM1.41/tree/year to RM1.64/tree/year. The price of Groyield Fertilizer in larger scale plantation level usage may further be reduced subject to supply arrangement as RM95/kg of Groyield Fertilizer is the retail price as per demonstrated in *Table 5*.

Usage of soil fertilization in LIGS is NPK 15:15:6:4 750 gram/tree/year. For the meantime with trunk application method, usage of Groyield Fertilizer for one tree is 1 gram/tree/year. For one hectare (400 trees) total amount of fertilization agrochemical usage each year is 300 kilogram of NPK against 4.8 kilogram of Groyield Fertilizer. This equals to a reduction of 98.4% of chemical usage.

Due to significant reduce of agrochemical usage with Groyield Fertilizer, tapper will be able to streamline fertilization process and operation. There are also difference cost factors that can be reduced such logistic, warehouse, pollution management, disease treatment, stimulation and weed management.

**TABLE 5: COSTING COMPARISON BETWEEN USAGE OF NPK FERTILIZER AND GROUYIELD FERTILIZER**

	<b>FERTILIZER NPK 15:15:6:4</b>	<b>FERTILIZER GROYIELD</b>
<b>FERTILIZER</b>		
Quantity / application	0.75 kilogram	0.001 kilogram
Cost / kilogram	RM 2.00	<i>RM 95<sup>*1</sup></i>
Application / year	1 X	12 X
<b>Total</b>	<b>RM 1.50</b>	<b>RM 1.14</b>
<b>MANPOWER</b>		
<i>Info: Cost / person / day = RM 55    1 hectare = 400 trees</i>		
Logistic & Application Capability / person / day	1 person <b>1 hectare</b> <b>(400 trees)</b>  0.75kg x 400 trees x 1 ha = <b>300kg</b>	1 person <b>6 hectares</b> <b>(2,400 trees)</b>  0.001kg x 400 trees x 6 ha = <b>2.4kg</b>
Cost / tree	RM55 ÷ 400 trees = RM0.137	RM55 ÷ 2400 trees = RM0.022
Average application / year	1 X	12 X
<b>Total</b>	<b>RM0.137</b>	<b>RM0.264</b>
<b>TOTAL COST / TREE / YEAR</b>	<b>RM1.64</b>	<b>RM 1.41</b>
<b>TOTAL COST / TREE / MONTH</b>	<b>RM0.14</b>	<b>RM0.12</b>
Other cost factors to consider	<ul style="list-style-type: none"> <li>• Warehousing</li> <li>• Logistic</li> <li>• Waste handling</li> <li>• Pollution management</li> <li>• Disease treatment</li> <li>• Weed management</li> </ul>	

<sup>\*1</sup> RM95 is retail price of Sabah & Sarawak as at September 2019

REVENUE EFFICIENCY

Based on the performance in Plot Percubaan Unit Pusat Latihan LIGS, Tuaran, usage of Groyield Fertilizer has increased the revenue from the increment of yielding and reduction of cost.

**TABLE 6: COMPARISON OF REVENUE AFTER COST OF FERTILIZATION**

	<i>Remarks</i>	<b>Non-Groyield (KG)</b>	<b>Groyield (KG)</b>
Plot A (200 trees)	<i>December</i>	18	43
	<i>January</i>	34	62
	<i>February</i>	46	104
Plot B (200 trees)	<i>December</i>	18	37
	<i>January</i>	27	41
	<i>February</i>	92	140
<b>TOTAL KG</b>		<b>235</b>	<b>427</b>
Price Average	<i>RM2.04 - Kentalan Gred 1</i> <i>RM2.12 (price in Feb 2020)</i> <i>RM1.96 (Price in Mar 2020)</i>	479.40	871.08
Bantuan Kerajaan Negeri	<i>RM0.30 - Kentalan Gred 1</i>	70.50	128.10
Bantuan LIGS	<i>RM0.06 - Kentalan Gred 1</i>	14.10	25.62
<b>TOTAL REVENUE</b>		<b>564.00</b>	<b>1024.80</b>
DEDUCTION: Cost of fertilization	<i>Refer TABLE 4</i>	RM0.14 x 400 trees = RM56	RM0.12 x 400 trees = RM48
<b>TOTAL GROSS REVENUE</b>		<b>RM508.00</b>	<b>RM976.80</b>

## **SIDE EFFECT ON TREES**

To date there has been zero report regarding any dry barks or negative effects on trees of using the Groyield Fertilizer.

Dry bark trees are reported to healed and begin to produce latex after using Groyield Fertilizer.

Dry rubber content measured by Metrolac device was reported to be 34% after using Groyield Fertilizer.

## **RESEARCH REVIEW**

The result from study of using Groyield Fertilizer have increased productions. The results may be differed or affected due to these cases:

- I. Clone - different and mixed up cloning resulted in different response in using the product.
- II. Plantation maintenance - Good maintenance also create good growth of trees and vice versa. Unhealthy trees give out less outputs.
- III. Weather - Such as heavy downpour with high numbers of rainy days can also disrupt the process of collecting the latex and during the tapping sessions. Heavy rain washes away the applied products on trees.
- IV. Extreme heat condition that appeared also can affect the productions.
- V. Quality of tapping affects the latex productions such as shallow grooves, wounds and time of tapping do affect the productions as well.

## CONCLUSION





Usage of Groyield Fertilizer has recorded increment of the latex productions of the trial location. To date, usage of the product delivered an increase of productions ranging from 59% up to 113% averaging around 86%.

Based from collected data in 3 months, Groyield Fertilizer was able to land a total of 427kg/200trees compared to using NPK Fertilizer and control, with only 235kg/200trees.

After deduction of total cost, and with the increased total of 189kg/200trees/quarter Groyield Fertilizer compared to control, the excess income that could be generated through Groyield Fertilizer is RM468/200trees/quarter.

With the encouraging reports concerning the usage of Groyield Fertilizer based on the research, hence the product can be used as an alternative to the fertilizers in the markets as a method to have more efficient production for rubber plantation.

**Appendix A: Groyield Fertilizer Analytical Test Results by Malaysian Rubber Board**

	<b>LEMBAGA GETAH MALAYSIA</b> <b>MALAYSIAN RUBBER BOARD</b> <b>RUBBER RESEARCH INSTITUTE OF MALAYSIA</b> <b>Global Testing and Consultancy for Rubber (G-TACR)</b> Malaysian Rubber Board, 47000 Sungai Buloh, Selangor. Tel: (6)03-61459471 Fax: (6)03-61412907 Email: gtacr@lgm.gov.my Website: http://www.lgm.gov.my/gtacr	 A Service by MRB GLOBAL TESTING AND CONSULTANCY FOR RUBBER   MS ISO/IEC 17025 TESTING/CALIBRATION SAMM NO.008
Our Ref	: LGM/BKPT/G-TACR/5.10/CM/1901/0301	
Your Ref	:	
	14 <sup>th</sup> February, 2019	
	Alan Chong, Gro Marketing Sdn. Bhd, No. 52-G & 52-1, Jalan LJ 3, Taman Industri, Lembah Jaya, 68000 Ampang, Selangor.	
	<b><u>ANALYTICAL TEST RESULTS</u></b>	
	We report the following results:	
Your letter dated	: 26/01/2019	
Date of sample received	: 29/01/2019	
Date of testing	: 30/01 – 14/02/2019	
Samples	: Therapeutic Nutritional Supplement	
Lab. No.	CM/1901/0301	Test Method
Sample Ref.	Groyield, Therapeutic Nutritional Supplement For Rubber Tree	
Nitrogen (N) %	1.72	UPB/P/045
Sulfur (S) %	0.05	
Phosphorus (P) %	0.69	UPB/P/058
Potassium (K) %	1.19	
Calcium (Ca) %	0.21	
Magnesium (Mg) ppm	14	
Boron (B) ppm	3	
Copper (Cu) %	0.03	

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G-TACR/TRI/Issue No.1





**LEMBAGA GETAH MALAYSIA**  
**MALAYSIAN RUBBER BOARD**  
**RUBBER RESEARCH INSTITUTE OF MALAYSIA**

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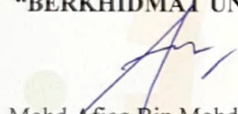
Our Ref : LGM/BKPT/G-TACr/5.10/CM/1901/0301

Your Ref :

Lab. No.	CM/1901/0301	Test Method
Sample Ref.	Groyield, Therapeutic Nutritional Supplement For Rubber Tree	UPB/P/058
Iron (Fe) ppm	5	
Manganese (Mn) ppm	2	
Molybdenum (Mo) ppm	0.07	
Zinc (Zn) ppm	3	

The test result produced based on the sample received.

**“BERKHIDMAT UNTUK NEGARA”**

  
 Mohd Afieq Bin Mohd Tajudin  
 (IKM No:M/3985/6263/12/14)  
 Research Officer  
 Malaysian Rubber Board



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**Global Testing and Consultancy for Rubber (G-TACR)**

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Our report no. : **LGM/BTK/UPB/5.10/CM/1901/0300**  
 Your reference :

13<sup>th</sup> February 2019

**Gro Marketing Sdn. Bhd.**  
**Attn: Alan Chong**  
**No 52-G & 52-1,**  
**Jalan LJ 3, Taman Industri Lembah Jaya,**  
**68000 Ampang,**  
**Selangor Darul Ehsan**

**Fax No:-**

ANALYTICAL TEST REPORT

Analysis has been carried out as per your request. We report the following results:

Your letter dated : 26/01/2019  
 Sample received : 29/01/2019

Sample reference : **Groyield, Therapeutic Nutritional Supplement for Rubber Tree**

No.	Test Parameters	Results	Test Method	Date Tested
1.	2-CEPA (%)	ND*	UPB/M/025	12/02/2019

\*Note: ND-Not detectable

The test result produced based on the sample received.

**"BERKHIDMAT UNTUK NEGARA"**  
**"KREATIF, INOVATIF, PROGRESIF"**

**Ruhida Ab. Rahim**  
**IKM No.A 254/5226/07**  
**Research Officer**  
**Materials Characterization Unit**  
**MALAYSIAN RUBBER BOARD**  
**for Director-General**

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