



**UNIVERSITI PUTRA MALAYSIA**

**EFFECTS OF MICRONUTRIENT COATED UREA ON GROWTH AND  
YIELD OF RICE**

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**FP 2015 114**

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SERDANG, SELANGOR**

**2015**

**EFFECTS OF MICRONUTRIENT COATED UREA ON GROWTH AND  
YIELD OF RICE**

BY

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A Project Report to Faculty Of Agriculture,  
University Putra Malaysia,

In Fulfilment Of The Requirement PRT 4999 ( Project ),

For The Award of The Degree Of Bachelor Of Agricultural Science

**DEPARTMENT OF LAND MANAGEMENT**

**FACULTY OF AGRICULTURE**

**UNIVERSITI PUTRA MALAYSIA**

**SERDANG, SELANGOR**

**2015**

## CERTIFICATION

This paper project entitle “Effects of Micronutrient Coated Urea on Growth, and Yield of Rice” is prepared by Khalida Binti Mohd Dali and submitted to the Faculty of Agriculture in the partial fulfilment or requirement of PRT 4999 (Project) for a Bachelor Degree of Agricultural Science.

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## Acknowledgements

First and foremost, my earnest thanks and gratitude to my supervisor, Prof Dr. Mohd Khanif Yusop for his care and attention, suggestions with adequate advices and encouragement in order to help me accomplish this project.

My deepest thanks goes to my devoted parents, Mohd Dali bin Mansor and Sabariah Baharom and to my sisters for their fully support, trust in me and be at my side in every situation.

My sincere thanks to Kak Umi, Kak Eira, Kak Ina and Kak Akma staffs and other students of Prof Dr. Khanif Yusop for their assistance, advices and supports in helping me to carry out the study.

Next appreciation is dedicated to Hana, Latifah, Aida, Carol, Aza, Kak Rika, Din and my fellow friends for their help during my project. They help in planting seedlings and others works that have been a major help in this project. Their also giving endless support and suggestion during this project conducted.

Last but not least, a very thankful to those that had help me during the project, named or unnamed for each single piece of my work. Thank you very much.

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## ABSTRACT

Fertilization is important in crop production. To make the plant grow well and healthy, fertilizer must be applied. The increase in rice production can be achieved by efficient and good agricultural practices, water and nutrients inputs. Fertilization provided nutrients for plants grow healthy and give a high yield. When fertilizer is applied to the plants, it will not take up the entire nutrient provided. Nitrogen is very soluble, so it can be easily leached from the soil. The presence of micronutrient deficiency, it is impossible for plant to gain maximum benefit from nitrogen, phosphorus and potassium fertilizer applications. This experiment was conducted to study the effects of micronutrients coated urea on rice and to investigate the performance of micronutrient coated urea on rice yield. The paddy variety MR219 was used in this study. After germination, the seedlings were transferred to glass house at Ladang 2, Universiti Putra Malaysia. In this experiment there were five treatments which is T1 is urea coated with copper, T2 is urea coated with zinc, T3 is urea coated with boron, T4 is urea coated with copper, zinc and boron and lastly T5 is solely urea. There were four replications and each treatment received the same amount of triple super phosphate and muriate of potash. All treatments were treated with different type of coated urea. Recorded data were height of plant, weight of plant and weight of grain. The result showed there were significant differences for all treatment. Hence the most recommended treatment for this study is T4.



## ABSTRAK

Pembajaan adalah penting dalam pengeluaran tanaman. Untuk membuat tumbuh tumbuhan dengan baik dan sihat, baja mesti digunakan. Peningkatan pengeluaran beras boleh dicapai dengan amalan pertanian yang cekap dan baik, air dan nutrien input. Pembajaan menyediakan nutrien untuk pokok membesar sihat dan memberikan hasil yang tinggi. Apabila baja digunakan kepada tumbuh-tumbuhan, ia tidak akan mengambil keseluruhan nutrien yang disediakan. Nitrogen adalah sangat larut, jadi ia mudah terlarut lesap dari tanah. Hadapan kekurangan mikronutrien, ia adalah mustahil untuk pokok untuk mendapatkan keperluan maksimum daripada nitrogen, fosforus dan aplikasi baja kalium. Eksperimen ini dijalankan untuk mengkaji kesan mikronutrien urea pada padi dan mengkaji prestasi mikronutrien urea disalut pada hasil padi bersalut. Kepelbagaian padi MR219 telah digunakan dalam kajian ini. Selepas percambahan, anak pokok dipindahkan ke rumah kaca di Ladang 2, Universiti Putra Malaysia. Dalam eksperimen ini terdapat lima rawatan iaitu T1 adalah urea bersalut dengan tembaga, T2 adalah urea disalut dengan zink, T3 adalah urea disalut dengan boron, T4 adalah urea bersalut dengan tembaga, zink dan boron dan T5 akhir sekali adalah semata-mata urea. Terdapat empat replikasi dan setiap rawatan menerima jumlah yang sama fosfat super triple dan muriate kalium. Semua rawatan telah dirawat dengan pelbagai jenis urea bersalut. Data direkod ialah ketinggian tumbuhan, berat loji dan berat gandum. Hasil kajian menunjukkan terdapat perbezaan yang signifikan bagi semua rawatan. Oleh itu rawatan yang paling disyorkan untuk kajian ini adalah T4.

# CHAPTER 1

## INTRODUCTION

### 1.0 Introduction

Nutrients are essential for humans and also for plants. To have healthy plant we need to give plants enough nutrients. This principle is very similar to human. To have better growth and productivity of plants, nutrients are important to them. Without nutrients, process of growth of plants can be disrupted. There are two types of nutrients: macronutrients and micronutrients. The examples of these macronutrients are nitrogen (N), potassium (K) and phosphorus (P). Nitrogen is widely leached in soils.

Urea is a common source of nitrogen which is used in agricultural practices. The usage of urea also has disadvantage for the farmer and agriculture sector. More than 40% of urea can be lost, during application. Urea is very soluble in water. So when it is dissolved in water, it will penetrate into the soil through leaching. Urea can be lost in many ways other than leaching such as denitrification and ammonia volatilization. Micronutrients are absorbed by plants in small amounts. But if plants do not have micronutrients, the process of plant growth will be difficult and hard to control. To avoid urea leaching, coating urea with micronutrients can be useful.

Micronutrients act as urease inhibitor. Other than that, micronutrients can help slow down the process of hydrolysis. Using micronutrients to coat urea, plants will slightly get the nutrients for their growth. Rice a common plant for Malaysia, since almost everyone here consumes rice every day. Rice has been the main dish for the Malaysian for a long time. Rice is largely planted in Malaysia but the productivity of rice is not enough for its

people due to high consumption of rice by Malaysian. Productions of rice are still not enough to feed the people.

### **1.1 Problem Statement**

In field, even we use large amount of fertilizer, the plants will not get 100% of the nutrients. The nutrients maybe leached through the soil. Furthermore, the fertilizer can be used by the pest around the field.

Every plant requires different amount of nutrient. Before planting, we need to know what and how much of nutrient is needed to have maximum growth and production. If we apply too much nutrient, time and money will be wasted. If we give them a little amount of nutrient, it will distort the growth and production.

Nitrous oxide is one the greenhouse gasses. The more Nitrogen release into the air, the more nitrous oxide produces. This gas can harm human when people inhale it.

### **1.2 Objective**

- I. To determine effects micronutrient coated urea on growth of rice
- II. To investigate the performance of micronutrient coated urea on rice yield

### **1.3 Hypothesis**

- I. The Nitrogen release will be slow so that plant take most of the Nitrogen
- II. Production of rice grain will be higher comparing with paddy that receive uncoated urea

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