UNIVERSITI PUTRA MALAYSIA

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YIELD AND QUALITY RESPONSES OF HYBRIMAS SWEET CORN TO DIFFERENT COMBINATION OF ORGANIC AND INORGANIC FERTILIZERS

BY

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A project report submitted to Faculty of Agriculture, Universiti Putra Malaysia, in fulfillment of the requirement of PRT 4999 (Final Year Project) for the award of degree of Bachelor of Agriculture Science.

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CERTIFICATION FORM

This project report entitled **"Yield and Quality Responses of Hybrimas Sweet Corn to Different Combination of Organic and Inorganic Fertilizers"**, prepared by Muzhafar Mohamad and submitted to the Faculty of Agriculture in fulfillment of the requirement of PRT4999 (Final Year Project) for the award of degree of Bachelor in Agriculture Science.

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ABSTRACT

Zea mays or locally known as corn is the third most important crop in the world production cereal crops. In Malaysia, sweet corn production is insufficient to meet the domestic demand. In order to help the farmer to increase the corn production in Malaysia, this experiment was conducted to determine the suitable proportion of organic and inorganic fertilizers for sweet corn for growth and yield production of sweet corn. This experiment was conducted at Ladang 10, University Putra Malaysia. The experimental design used was Randomize Completely Block Design (RCBD) with five treatments and each treatment consists of eight replications of corn tree. The treatment were 100% organic fertilizers (T1), 70% organic fertilizers and 30% inorganic fertilizers (T2), 50% organic fertilizers and 50% inorganic fertilizers (T3), 30% organic fertilizers and 70% inorganic fertilizers (T4) and 100% inorganic fertilizers (T5). Split fertilized application was done before planting and on 30 and 35 days after planting for inorganic fertilizers and organic fertilizers respectively. The parameters that measured in this experiment were plant height, number of leaves, leaves size, day of flowering, day of tasseling, wet weight of corn with husk, dry weight of corn with husk and dry weight of corn without husk.

ABSTRAK

Zea mays atau jagung merupakan tanaman ketiga paling penting dalam pengeluaran tanaman bijirin di dunia. Di Malaysia, pengeluaran jagung manis tidak mencukupi untuk memenuhi permintaan domestik. Dalam usaha untuk membantu petani meningkatkan pengeluaran jagung di Malaysia, eksperimen ini telah dijalankan untuk menentukan kombinasi yang sesuai bagi baja organik dan bukan organik untuk pertumbuhan dan pengeluaran hasil jagung manis. Eksperimen ini telah dijalankan di Ladang 10, Universiti Putra Malaysia. Reka bentuk eksperimen yang digunakan adalah Rekabentuk Blok Rawak Lengkap (RCBD) dengan lima rawatan dan setiap rawatan mengandungi lapan replikasi pokok jagung. Rawatan tersebut adalah 100% baja organik tanpa baja bukan organik (T1), 70% baja organik dan 30% baja bukan organik (T2), 50% baja organik dan 50% baja bukan organik (T3), 30% baja organik dan 70% baja bukan organik (T4) dan 100% baja bukan organik (T5). Aplikasi pembajaan dibuat sebelum dan pada 30 dan 35 hari selepas penanaman benih untuk baja bukan organik dan baja organik. Terdapat lapan parameter yang telah diukur dalam eksperimen ini iaitu tinggi pokok, bilangan daun, panjang daun, masa berbunga, masa berbuah, berat basah tongkol jagung dengan kulit, berat kering tongkol jagung dengan kulit dan berat kering tongkol jagung tanpa kulit.

CHAPTER 1

INTRODUCTION

Corn (*Zea mays*) is one of the grain type crops that belong to family Poaceae. Corn is the most important cereal after wheat and rice (Schrimpf, 1965). Corn spread to the rest of the world because of its ability to grow in diverse climates. Sugar-rich varieties called sweet corn are usually grown for human consumption, while field corn varieties are used for animal feed and chemical feed stocks. The world largest producer of corn is United States and about 40% of world corn production come from here (Kim *et al*., 2004).

The corn plant is often 2.5 m in height, though some natural strains can grow 12 m .The stem has the appearance of a bamboo cane and is commonly composed of 20 internodes of 18 cm length. A leaf grows from each node, which is generally 9 cm. They are various colors of corn that are blackish, bluish-gray, purple, green, red, white and yellow. When ground into flour, corn yields more flour with much less bran than wheat. It lacks the protein gluten of wheat and, therefore, makes baked goods with poor rising capability.

Corn was introduced into Malaysia during the Portuguese occupation. In 2012, the areas in Perak, Terengganu and Selangor were involved in sweet corn production. The planted area in Malaysia was 28 000 hectares mainly with sweet corn, and the production was 100 000 metric tons, while the imported amount was 3.1 million metric tons. There are two types of maize normally cultivated in Malaysia, namely sweet corn and grain corn. Sweet corn is used for human consumption meanwhile grain corn mainly used for animal feed. Sweet corn is the most important crop in Malaysia because it can easily adapt with the environment as long as the soil has good aeration, drainage and irrigation.

Corn is a highly nutritious crop and it contain very important source of fiber, minerals, sucrose and vitamins. Eating corn help lower the cholesterol levels, reduce heart attack risks and reduce the risks of colon cancer. Corn fiber is good for digestive system, stabilizing the blood sugar and also provide energy even under stress. The development of corn involved complex physiological and biochemical processes which are influenced by the crop environment in ways that are still inadequately understood. Corn plant need good amount of macro and micro nutrient elements for good growth and development. To increase nutrient in the soil, fertilizer is added to the soil to supply the elements that is needed by the corn plant for growth and development. The macro nutrients need by the corn are nitrogen, phosphorus, and potassium while the micro nutrients needed are sulfur, magnesium, manganese, calcium, iron, zinc, copper, molybdenum and boron.

Fertilizer is very important to enhance the fertility of the soil or replace the nutrient in the soil that is loss because of leaching, erosion or agriculture activity. Artificial fertilizer are inorganic fertilizer formulated in appropriate concentration and combination of three main macronutrients: nitrogen, phosphorus and potassium. Meanwhile, organic fertilizer are the waste come from animal itself that contain macro and micro nutrients. Nitrogen promotes leaves growth and forms protein and chlorophyll. Phosphorus contributes to root growth, flower and fruit development. Potassium contributes to metabolism of the plant and synthesis of proteins

Different combination of organic and inorganic fertilizers was used to access the growth and yield of the corn. Nutrient is the most important requirement for corn growth after water. The corn needs exact amount of nutrient to grow properly. Using exact amount of nutrient will reduce the risk of plant being stunted and this will ensure good yield of the corn. For the experiment, urea, muriate of potash and triple superphosphate were used for inorganic fertilizer. Chicken dung is used for organic fertilizer. With proper cultivation and management technique, it will increase the corn yield and its quality. Therefore, the project was carried out with the following objectives:

1. To determine the effect of different combination of organic and inorganic fertilizers on yield and growth performance of Hybrimas sweet corn.
2. To determine the optimum level of organic and inorganic fertilizers on yield of Hybrimas sweet corn.

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