



**UNIVERSITI PUTRA MALAYSIA**

**EFFECT OF EMPTY FRUIT BUNCH COMPOST ON THE PERFORMANCE  
OF TOMATOES (*Lycopersicon esculentum*) GROWN ON BUNGOR  
SERIES**

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**BY**

**ABDUL HAZIQ QAYYUM BIN OTHMAN**

**A project report submitted to the Faculty of Agriculture  
Universiti Putra Malaysia**

**In fulfillment of the requirements PRT 4999 (Project)  
For the award of degree of Bachelor of Agriculture Science**

**FACULTY OF AGRICULTURE  
UNIVERSITI PUTRA MALAYSIA**

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**CERTIFICATION**

This project report entitled the **EFFECT OF EMPTY FRUIT BUNCH COMPOST ON THE PERFORMANCE OF TOMATOES (*Lycopersicon esculentum*) GROWN ON BUNGOR SERIES** is prepared by Abdul Haziq Qayyum Bin Othman and submitted to the Faculty of Agriculture in fulfillment of the requirement of PRT 4999 (Project) for the reward of **Bachelor of Agriculture Science**

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## ABSTRACT

Empty Fruit Bunch (EFB) originates from an oil palm industry as a by-product, and used widely as EFB compost in soil amendment practices. EFB compost contains macro-micro nutrients (N, P, and K) that are beneficial to crops; therefore, the main objectives of this study were: i) to evaluate tomato growth performance under Bungor Series with different rate of EFB and, ii) to evaluate the optimum rate of EFB compost in tomato cultivation. In this study, tomatoes (*Lycopersicum esculentum*) from Serdang 2 variety was planted at Ladang 2, Universiti Putra Malaysia in a polybag (12cm × 20cm) under a shaded area. The experiment was conducted in Latin Square Experimental Design (LS) with four replication and four treatment (EFB compost rates) thus, a total of 16 experimental unit. The rates of EFB that were applied are 0 g (control), 20 g, 40 g, and 60 g. Each treatment was given the same amount of NPK fertilizers that consists of urea, rock phosphate and muriate of potash. Before EFB compost was mixed in the field of study, 16 soil samples were collected for determination of physical and chemical properties. In vegetative stage and after harvest of tomato, soil samples were taken to see the differences after applying EFB compost. The observation of tomato growth were monitored for 2 months, and it was found that 40 g of EFB compost gave the highest yield with good tomato growth. Significant correlation of the soil pH, CEC and macro-micronutrients values suggest that EFB compost is suitable to improve the yield tomatoes.

## ABSTRAK

*Kompos Tandan Buah Kosong (EFB) adalah salah satu kompos yang digunakan pada masa kini. EFB berasal dari industri kelapa sawit dan dianggap sebagai produk bahan buangan dari ladang, Namun, EFB juga mengandungi pelbagai unsur makro dan mikro-nutrient yang diperlukan oleh tanaman. Guna semula EFB ini juga boleh dianggap sebagai cara atau alternatif lain selain pembakaran. Jadi, objektif utama kajian ini adalah :i) mengenalpasti gaya pertumbuhan pokok tomato dan kesuburan di tanah Siri Bungor dengan menggunakan kadar yang berbeza oleh tandan buah kosong kelapa sawit (EFB) dan ii) mengenalpasti kadar penggunaan kompos EFB yang optimum dalam penanaman tomato. Dalam kajian ini, tomato (*Lycopersicon esculentum*) dari variety Serdang 2 telah ditanam di Ladang 2, Universiti Putra Malaysia sebagai tempat eksperimen di dalam polibeg (12cm × 20cm) di bawah tempat teduhan. Latin Square telah digunakan untuk rekabentuk eksperimen ini dengan mempunyai empat treatment dan empat replikasi. Kadar EFB yang telah digunakan adalah 0 g, 20 g, 40 g, and 60 g. Semua pokok telah diberikan baja NPK dengan jumlah yang sama. Sebelum kompos diletakkan di setiap polybag, 16 sampel tanah telah di ambil untuk mengenalpasti unsur fizikal dan kimia. Sampel tanah juga diambil semasa penanaman dan selepas penuaian pokok dilakukan untuk mengenalpasti perbezaan selepas penggunaan EFB. Tumbesaran pokok tomato dipantau selama 2 bulan. Daripada kajian ini, dijangkakan kompos EFB dapat membantu menyuburkan tanah melalui pengambilan nutrient dan pertumbuhan tomato. Setelah melaksanakan kajian ini, didapati bahawa kompos EFB dapat membantu untuk pertumbuhan pokok tomato dan kadar optimum yang paling sesuai adalah pada kadar 40 g. Pada kadar ini dapat dilihat perkembangan dan pertumbuhan tomato yang baik dengan hasil yang tinggi*

## CHAPTER 1

### INTRODUCTION

Empty Fruit Bunch (EFB) is mostly used by the farmers as a substitute to a mineral fertilizer by direct application in the field and in some cases, they applied EFB after incineration and sometimes after composting. In fact, the fresh EFB help to return the minerals and improve organic matter content in the soil and helps to maintain soil fertility. According to the MPOB journal on EFB (2004), oil palm bunches processed in an oil mill generate between 20% and 25% EFB, the ligno-cellulose fibrous medium left after bunch stripping. A mill with a capacity of 60 tons fresh fruit bunch (FFB) per hour will thus produce almost 83,000 tons EFB per year. These considered as a very large amount of waste that are continuously produced thus, required an effective removal procedures adapted to the nature of the byproducts.

Empty fruit bunch (EFB) also becoming a popular source of fuel for renewable energy (RE) power generation. The rapid depletion of fossil fuel in most developed nations is pursuing the development of biomass as an alternative method for power generation. Malaysia has a ready source of biomass in empty fruit bunch (EFB) conveniently collected and available for exploitation in all palm oil mills.

As one of the biggest producer and exporters of palm oil and palm oil products, the palm oil industries in Malaysia generates a huge quantities of biomass in the form of EFB. EFB also serve as an organic fertilizers in oil palm plantation. It is used as mulch



that help to reduce competition from weeds and also help to keep soil moisture. In addition, 1 tons of EFB is equivalent to 7 kg of urea, 2.8 kg of rock phosphate, 19.3 kg muriate of potash and 4.4 kg kieserite (Singh et al., 1999). According to Christopher et al. (2010), EFB also a source of organic matter which increases soil aggregation, aggregate stability and water infiltration that will reduces soil erosion.

The aim of this work was to observe or establish the effect of using empty fruit bunch (EFB) compost towards the growth of tomato with different rates that grown on Bungor Series.

Therefore, the specific objectives in this study were:

- i) To evaluate tomato growth performance and soil fertility under Bungor Series with the different rate of empty fruit bunch compost (EFB)
- ii) To evaluate the optimum rate of EFB compost in tomato cultivation

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