IRON ACCUMULATION IN OIL PALM CULTIVATION AREA UNDER FLOODED CONDITION AND ITS REDUCTION BY BIOCHAR

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Final Year Project Report Submitted in

Partial Fulfilment of the Requirement for the

Degree of Bachelor of Science (Hons.) (Plantation Management and Technology)

In the Faculty of Plantation and Agrotechnology

Universiti Teknologi MARA

JULY 2016

ACKNOWLEDGEMENTS

ACKNOWLEDGEMENTS

TABLE OF CONTENT

LIST OF ABBREVIATIONS

ABSTRACT/ABSTRAK

ABSTRACT

Transport of iron (Fe) in soil is mainly occurs in forms dissolved in the soil solution, water being it main of transport when flood occur. Sources of Fe that cause a sedimentation to the soil are from ex-mining pond that exist along the cultivation area. Anaerobic condition may also causes in reduction process that transforming Fe from less soluble form into soluble form that cause increasing in Fe concentration in soil. In this context, the aim of study is to determine the effect of flood on Fe sedimentation in soil and the ability of biochar to reduce the Fe content on soil. Fe sedimentation lead to P fixation that may affect soil fertility in oil palm cultivation area. Rice husk biochar (RH) were tested in order to measure the sorption capacity. Biochar also have an ability to increase soil pH that may results in precipitation of Fe in soil which cause reducing in soil Fe concentration. There are three different rates of biochar were tested excluding control which comprised of 0, 0.01, 0.02 and 0.03g. Overall, the sorption experiment in water soluble method showed that 0.01 g of RH can adsorb 1.665 mg/kg of Fe compared to other rate.

Keywords: Iron, sedimentation, reduction, rice husk biochar, sorption

CHAPTER 1

INTRODUCTION

1.1 Background of study

It is generally agreed that the oil palm originated from West Africa where it grows in the tropical rain forest in wild condition and after that it was developed into the agriculture crop. It has a high potential in economics importance due to high-yielding sources of edible and technical oils. In Malaysia, the first planting area took place in Selangor since 1917 and been increase in cultivation are on early 1960 (MPOC, 2012).

Recently, Malaysia are well known as one of largest producer and exporter of oil palm in the world, which have 4.49 million hectares of land that been cultivate oil palm that able to produce 17.73 million tons of palm oil and 2.13 tons of palm kernel oil which had covered 11% of world's oil and fat production (MPOC, 2012).

Malaysia is the second largest country in oil palm cultivation, due to the scarcity of land problem compare to the largest oil palm cultivation country which is Indonesia. However, in order to maintain competition with other country, Malaysia need to control and maintain the quality of produce. There are several main causes that able to effect the quality of the product which is physical, chemical or biological factors. However, those factor are commonly have a relationship such as changing in biological factor may also affect the physical factor in term of the favorability of plant.

Nowadays, the biggest problem that faced by most plantation in Malaysia are unpredictable weather condition either drought season or rain season. Unstable