A REVIEW ON THE POTENTIAL OF TISSUE CULTURE TECHNIQUE IN PRODUCING AN ELITE OIL PALM CLONE AS COMPARED TO CONVENTIONAL PROPAGATION

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Final Year Project Report Submitted in Partial Fulfillment of the Requirements for the Degree of Bachelor of Science (Hons.) Technology and Plantation Management in the Faculty of Plantation and Agrotechnology, University of Technology MARA

JULY 2016

ACKNOWLEDGEMENTS

Bissmilahirrahmanirrahim,

Alhamdulillah. Thanks to Allah SWT, whom with His willing giving me the opportunity to complete this final year project report. This report was prepared for course Final Year Project (FPA690), basically for student in part six of degree to complete the undergraduate program that leads to the degree of Bachelor of Science (HONS) in Technology and Plantation Management, Universiti Teknologi MARA (UiTM). This report is based on the methods given by the university.

Firstly, I would like to express my deepest thanks to, Dr. Asmah Awal, act as supervisor for course Final Year Project (FPA690) in UiTM, for giving me an opportunity to do the report work and also providing me all support and guidance which made me complete report on time. And also for the continuous given her patience, motivation, enthusiasm, and immense knowledge to me.

Besides that, I would like to express my deepest thanks to, Madam Wan Natashya Wan Ahmed act as coordinator for course Final Year Project (FPA690) in UiTM, for giving me an opportunity to do the report work and also providing me all support and guidance which made me complete report on time. She gives me sources about knowledge of plantation management by providing us all support and guidance which made us complete report on time.

Next, I also want to thanks to all staffs of UiTM staff that involve either indirect or direct in finishing the Final Year Project (FPA690) in UiTM, which would to share their knowledge and experience in plantation sector and biotechnology. Deepest thanks and appreciation to our parents, family, and others for their cooperation, encouragement, constructive suggestion and full of support for the report completion, from the beginning till the end. Also thanks to those that have been contributed by supporting our work and help during the report progress till it is fully completed.

Thank you very much.

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TABLE OF CONTENTS

ABSTRACT

Propagation of oil palm will enhance the production of planting materials to fulfill the demand. This can be done through modern propagation or conventional propagation. The modern propagation through plant tissue culture will use explant that will undergo several processes with controlled or aseptic condition, while conventional propagation will use seed. However, each types of propagation have their own advantages and disadvantages. But, the main objectives of both types propagation remain the same. This review was done to identify deeply about the potential of types propagation in producing an elite oil palm (seedling or plantlets) and other special characteristics within given period. Through narrative reviews methodology, the tissue culture technique has highly potential in producing large quantity of elite oil palm planting materials as compared with conventional propagation. Due to non-limited source of material to undergo propagation, high rate of planting material production per source material, several techniques were used to produce high rate of planting material productions under controllable condition, the potential yield and uniformity growth is high, the economic lifespan lead to much longer and also operation cost tend to reduce in future. The tissue culture propagation embraced by producer to be implemented as their technique in produce large scale of planting materials of oil palm.

Keywords: Tissue culture, conventional propagation, elite oil palm clonal, seedling, large scale of planting material.

CHAPTER 1

INTRODUCTION

Elaeis guineensis Jacq.(also known as oil palm) become popular because it gives several benefits to human daily life, either in terms of source nutrient (food), energy (fuel) or also human settlement (Mahat, 2012; Verheye, 2010). Oil palm family is *Palmae* that closely similar with coconut, dates and other ornamental plant (Verheye, 2010). The oil palm's history in Malaysia began as ornamental plant in early 1870's, and became commercial planting on 1917 until now (Mahat, 2012). This oil palm tree can produce edible oil (palm oil), that known as crude palm oil (CPO) and kernel palm oil (KPO) (Hai, 2002). The oil palm needs to undergo with various stages of growth development, agronomic practice and also germinating or preparing the planting materials as well as due to produce vegetative oil. The palm oil gives high production compared to vegetative oil, like soy bean, rapeseed, etc. It became the effective plant, because it can produce high content oil palm by using small input (Basiron, 2007). The good planting materials tend to produce the good palm oil production as well.

Recently, the human population in the world became greater. Through that, the demands to palm oil product also increase. Due to that, it led to the producers or smallholders to expand their planting land and also producing more of oil palm seedling or plantlets as planting materials to fulfill the demand from the consumers (Abdullah & Wahid, 2010). Through that, have several efforts or cooperation between producers and smallholder with Agriculture Parties or Department of Malaysia or researcher of universities to discover the new procedures that used to