

**UNIVERSITI TEKNOLOGI MARA**

**COMPARATIVE STUDY ON PRODUCTION OF  
BIOETHANOL FROM OIL PALM EMPTY  
FRUIT BUNCH (EFB) VIA ACID HYDROLYSIS**

**DARLIS BIN SAHRI**

**BACHELOR OF SCIENCE (HONS.)  
PLANTATION TECHNOLOGY  
AND MANAGEMENT  
FACULTY OF PLANTATION AND  
AGROTECHNOLOGY  
DECEMBER 2014**

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BIOETHANOL FROM OIL PALM EMPTY  
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**DARLIS BIN SAHRI**

Final year project report submitted partial fulfilment of the  
requirements for the  
**Bachelor of Science (Hons.) Plantation Technology  
and  
Management**

**Faculty of Plantation and Agrotechnology**

**December 2014**

## CANDIDATE'S DECLARATION

I declare that the work in this Final Year Project was carried out in accordance with the regulations of Universiti Teknologi MARA. It is original and is the result of my own work, unless otherwise indicated or acknowledged as referenced work. The Final Year Project report has not been submitted to any academic institution or non-academic institution for any degree or qualification.

In the event that my Final Year Project is found to violate the conditions mention above, I voluntarily waive the right of conferment of my bachelor degree to be subjected to the disciplinary rules and regulations of Universiti Teknologi MARA.

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Programme : Bachelor of Science (Hons.) Plantation  
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Faculty : Plantation and Agrotechnology

Title : Comparative Study on Production of  
Bioethanol from Oil Palm Empty fruit Bunch  
(EFB) via Acid Hydrolysis

Signature of Candidate : \_\_\_\_\_

Date : 25th January 2015

## APPROVAL SHEET

This Final Year Project Report entitled “**Comparative Study on Production of Bioethanol from Oil Palm Empty fruit Bunch (EFB) via Acid Hydrolysis**” was submitted by **Darlis Bin Sahri**, in partial fulfilment of the requirements for the Degree of Bachelor of Science (Hons.) Plantation Technology and Management, in the Faculty of Plantation and Agrotechnology, and was approved by

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## ABSTRACT

Oil Palm empty fruit bunch (EFB) has been identified as a potential biomass that can be used to produce bioethanol. Bioethanol can be synthesized from cellulose and hemicellulose that originated from many sources of biomass. This study focused on the production of bioethanol from oil palm empty fruit bunch via acid hydrolysis followed by fermentation using *Saccharomyces cerevisiae*. The main objective of this study is to study the effect of different acid on glucose production through the acid hydrolysis and also to compare the bioethanol production of glucose yield from acid hydrolysis by fermentation. The bioethanol in this experimental work was synthesized from two-stage production method; in first stage, the hydrolysate of EFB was treated with two different type of acid. In the second stage ensued, fermentation with *Saccharomyces cerevisiae* carried out. The result demonstrates that the different acid treat can affect the glucose yield at the end of acid hydrolysis. Moreover, the different concentration of glucose that obtained from acid hydrolysis also affects the total of bioethanol produce after 48 hours fermentation using *Saccharomyces cerevisiae*. The maximum bioethanol yield obtained from this study is 2.07% (v/v) at the glucose concentration of 10985.10  $\mu\text{g/ml}$ , which obtained from acid hydrolysis.