



**UNIVERSITI TEKNOLOGI MARA
CAWANGAN TERENGGANU**

MEC299

**DESIGN AND FABRICATION OF OIL
PALM FRUIT COLLECTOR**

MOHAMAD HAFIZ AMINUDDIN BIN

MOHD ROZI

2020860446

SUPERVISOR:

EN MATZAINI BIN KATON

SEM MARCH AUGUST 2022

ABSTRACT

The presence of oil palm loose fruits (LF) on the ground is one of the indicators that the Fresh Fruit Bunch (FFB) are ready to be harvested. LF are also present when bunch fall to the ground during the cutting operation, and they need to be collected together to maximise the oil content during processing. Even after a century since this crop was first planted commercially in Malaysia, no major changes have been made in terms of how LF are being collected in the plantation. The collection is done manually by hand picking or by using a raking device and the LF are eventually placed into a bag or directly into a container or trailer. This activity involves frequent bending movement which causes backache to the worker. To minimise this problem and to increase the collection productivity, various tools and machines, from using a simple mechanical picking mechanism to vacuum-type collecting machines were developed.

TABLE OF CONTENTS

1.0	INTRODUCTION.....	6
1.1	Problem Statement.....	6
1.2	Objectives.....	6
1.3	Scope of The Project	7
1.4	Expected Result.....	7
2.0	LITERATURE REVIEW.....	8
	CHAPTER 3.....	11
3.0	METHODOLOGY	11
3.1	Flowchart.....	11
3.2	Preliminary Results	12
3.3	House Of Quality.....	12
3.4	Product design Specificattion.....	13
3.5	Concept Of Genertaion.....	14
3.6	Morphological Table.....	15
3.7	Pugh Method	20
3.8	Gantt Chart	21
4.0	REFERENCES (APA FORMAT).....	22

CHAPTER 1

1.0 INTRODUCTION

Since 1917, when oil palm was first cultivated as a commercial crop in Malaysia, it has grown to 5.85 million hectares. The RM 67.74 billion industry, particularly in the plantation sector, continues to rely heavily on foreign labour. Mechanizing field operations appears to be the greatest way to reduce reliance on foreign labour while increasing productivity per hectare.

The main objective of the research is to design and fabricate an oil palm fruit collector in order to facilitate the work of farmers in oil palm plantations to collect oil palm fruits scattered on the ground.

1.1 Problem Statement

This product should be available in every company related to oil palm plantations to make it easier for their employees to collect the scattered oil palm seeds. This product can reduce the risk of back pain among oil palm plantation workers. This product can be widely used in this field of agriculture.

Despite rising worldwide demand for palm oil, most activities in oil palm farms, such as fresh fruit bunch (FFB) harvesting and loose fruit (LF) gathering, still rely mainly on human labour. As a result of their everyday job routines, harvesters and/or collectors are at risk of developing musculoskeletal disorders (MSD) due to awkward, severe, and repeated posture.

By closely observing the weaknesses and problems, it is possible to rectify the weaknesses and hence design and develop a new machine. Achieving optimum field performance standards and incorporating safety and comfort features are of paramount importance besides multiple uses and machine maneuverability to the extensive reach. In addition, a safe, efficient and ergonomic use with less labor force, are desirable factors for maximizing the use and extreme productivity of field harvesting of oil palm.

1.2 Objectives

The main objectives of this study are:

- To design oil palm fruit collector using computer additional design software.
- To fabricate the prototype of oil palm fruit collector.

1.3 Scope of The Project

1. This project involves design and fabrication
2. Designing the product with solidwork
3. Fabricating the product
4. The product hope is to achieve the objective of this project which is to facilitate the work of farmers and save their time.

1.4 Expected Result

It turns out that there are already products that seem to be the same in terms of function and design, however there will make sure the more improvements make to make this product more awesome and sophisticated than other product lines. This oil palm fruit cllector will use methods such as vacuum to suck up the oil palm seeds and be able to collect these oil palm seeds faster. This product will create a product that is easy to carry and will use less cost compared to other products.