POLITEKNIK SULTAN SALAHUDDIN ABDUL AZIZ SHAH

MECHANICAL ENGINEERING DEPARTMENT

DJJ 50193 PROJECT 2

SESSION 2 2022 / 2023

PROJECT REPORT

STUDENT INFORMATION

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PROGRAMME / CLASS	DMP5A
SUPERVISOR'S NAME	SALHANA BINTI SAHIDIN @ SALEHUDIN
FYP TITLE	PORTABLE PALM SEED COLLECTOR
MYIPO	LY2022W04614

TITLE: PORTABLE PALM SEED COLLECTOR

SESSION: 2 2022/2023

1. We, i) NURUL NAJIHAH BINTI ADNAN (08DMP20F1002)

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is a final year student of **Diploma in Mechanical Engineering (Packaging)**, Mechanical Engineering Department, Politeknik Sultan Salahuddin Abdul Aziz Shah, which is located in Persiaran Usahawan, Seksyen 1, 40150 Shah Alam, Selangor.

2. We acknowledge that Portable Palm Seed Collector and the intellectual property contained therein are our original works/designs without taking or copying any intellectual property from other parties.

3. We agree to release the Portable Palm Seed Collector intellectual property selection to the Politeknik Sultan Salahuddin Abdul Aziz Shah to meet the requirements for the awarding of the Diploma in Mechanical Engineering (Packaging) to us.

Done and truly acknowledged by :

a) NURUL NAJIHAH BINTI ADNAN

(IC Number : 020620101098)

……..

(Nurul Najihah Binti Adnan)

b) NURNISA NABILA BINTI MALIKI

(IC Number : 021105110066)

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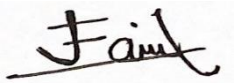
(Nurnisa Nabila Binti Maliki)

c) MUHAMMAD FAIZAL BIN MUHAMAD SANIP

(IC Number : 020302010537)



……

(Muhammad Faizal Bin Muhamad Sanip)

d) SALHANA BINTI SAHIDIN @ SALEHUDIN

(IC Number : 760228016116

……

As a project supervisor : Portable Palm Seed Collector

APPRECIATION

Alhamdulillah, bersyukur ke hadrat Ilahi because we are able to take on projects and responsibilities in the recently established period. The Portable Palm Seed Collector project may be completed with ease because to the cooperation, enthusiasm, and teamwork of every member of our group.

We express our utmost appreciation to Mrs. Salhana Binti Sahidin @ Salehudin as the supervisor of our Portable Palm Seed Collector project for she has helped a lot by giving guidance, suggestions and emphasis as well as monitoring the projects we implemented to run smoothly.

We also not forgetting to say a thousand thanks to my colleagues who gave a lot of support and opinions in completing this project. In addition, not forgotten to all the lecturers who are directly and indirectly involved in the production of this project.

On this occasion also not to be forgotten, we would like to say a million thanks to our parents and all our family members who have given a lot of support, encouragement and enthusiasm throughout this project. Finally, thanks to anyone who helped us complete this project.

Thank you.

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CHAPTER 1:

INTRODUCTION

1.1 Abstract

This project concerns the assessment of making a product, the coconut palm collector, which will consider all aspects and concepts for satisfaction of the users. One sign of fresh fruit bunches that are ready to be picked is the appearance of loose fruit on the ground. In order to increase the oil content during processing, loose fruit must be gathered up when bunches fall to the ground after cutting. The method used to gather loose fruit from the fields hasn't changed significantly in the century since this crop was first farmed for profit in Malaysia. Manual labor is used to collect the loose fruit, which is then put into a bag, a container, or a trailer after being physically picked or raked. This work requires bending motions, which frequently give workers back pain. For oil palm plantation workers who must gather palm oil seeds in challenging circumstances, several observations are taken into consideration when creating a portable palm seed collector in an effort to reduce this issue and boost collection productivity. They must undoubtedly surrender for a protracted period of time, which requires time. Farmers may experience back pain from doing this, and it requires a lot of labor. As a result, the project's objective is to make users' participation in collection operations more convenient and comfortable. The project began with the development of a design concept. Combine several ideas as well as all parameters and factors related to user satisfaction, such as it has also been examined whether it is simple to maintain or simple to use.

1.2 Introduction

In Malaysia, one of the key economic goods is palm oil. In order to make the task of unloading and cutting bunches and palm fronds easier, numerous new machines and tools have been developed. However, no tools exist to make the task of gathering loose palm fruit easier. Therefore, to pick loose oil palm fruit, oil palm operators continue to use their hands or inadequate instruments. Due to the importance of oil palm seeds and how they contribute to an individual's overall income, oil palm entrepreneurs will also make sure to collect the loose fruit of the palm oil plantation.

As a result, as students living in the village, we can observe the growth of palm oil plantations owned by some of the village families. One way to make a living is by working on oil palm plantations or by consuming oil palm products. Palm oil from loose fruit can be profitable if marketed. Because the things can be sold for a profit, theft occurs frequently as a result. This occurs as a result of some oil palm plantation workers or gardeners delaying or abandoning the collection of the loose oil palm fruit after plucking the palm oil fruit since it requires time and effort. In order to make it simpler for farmers to collect loose palm oil fruit, this concept was created. The initial facility in this project is a roller to collect loose fruit, which is one of multiple facilities in one tool. The second is that the tool has an insect sprayer and a spot for the palm oil loading iron to be placed on one of the project's sides. the part of the instrument used to take loose fruit out of the catch basket.

1.3 Project background

Malaysia is either the world's biggest producer of palm oil. Since Malaysia has been in the palm oil business for more than a century and dominates the market in terms of productivity and R&D, it enjoys a competitive edge. The fourth-largest contribution to Malaysia's Gross National Product (Gross National Product; GNP) is the palm oil sector. West Asia, Pakistan, Singapore, Japan, China, and the EU all import palm oil (European Union). Palm oil may be processed to create a variety of commercial products that are needed by the market. A few are in high demand from nearby enterprises that produce goods for the market like soap, candles, cooking oil, margarine, biscuits, etc.

The palm oil facility makes significant profits. Tons of palm oil are thought to be worth more than RM 1500. Five tons or more of fresh palm oil bunches must be used to generate one ton of palm oil. At least 5% of each bunch of cuttings will result in palm fruit. Tumbled to the ground in pieces. In addition to paying for the upkeep of the region, palm oil grower entrepreneurs will lose a sizable profit if this fruit is not harvested. For this plant businessman, the buildup of loose palm fruit is a significant challenge.

This fruit is still picked using the conventional or traditional method, which is still commonly used in the field. Typically, the loose palm fruit is manually collected and placed in a bucket, bag, or gunny. Additionally, there are other choices including using rakes, boards, and spoons. Employees had to stoop moving from one tree to another while collecting fruit with their bodies.

According to Mohd Zohadie (1992), fruit collection typically consumes around 30% of the time needed for harvesting. This practice is ineffective, wastes time, inconveniences the employee, and hurts the worker's waist. Oil processing operations are hampered by the presence of trash and impurities. Factory with oil palm. It is estimated that 20% or less waste gets delivered to factories. Different methods and procedures have been used up to this point for gathering loose oil palm fruits. New approaches to the issue and potential solutions are being investigated as challenges in these activities are uncovered. Portable oil palm seed collectors were created to solve this problem. A portable oil palm seed collector is a method and apparatus for collecting loose fruit on the ground. Portable oil palm seed collectors can also be taken anywhere. The design of the palm oil collector should be easy to repair or change when nails are damaged.

A fully portable oil palm seed collector has been designed using recycled materials, for example we use iron board legs to make the body project to avoid the project being too heavy and easy to carry. Other materials to do this project include blind rivets, hose clips, bolts and nuts, L-shaped angle steel, bicycle side wheels, bicycle handlebars, push button switches, switches, spiral wrap wire protectors, transparent hoses, rectangular plastic containers, junction box, corrugated plastic board, battery holder, water pump, basket, adjustable nozzle, wire, and battery lion. This products mostly use the drilling process to install mild steel, bolts and nuts and other materials to assemble all the parts.

Fruits can be collected and removed at once because this product has a mechanism to remove fruit from the nail. So, workers do not take long to collect and remove the fruits from the spikes. Employee no need to bend their body to pick fruit on the ground.

Employees just need to hold this product in a standing state and workers do not suffer from back pain. However, this it is possible that the product may cause litter or leaves to be collected when the fruits are collected. Several aspects need to be taken into account to ensure the collection of machines or tools loose palm fruit can be commercialized for the local market and catch from parties involved. Effective research through the development of machines and tools need to be carried out to meet the needs of small farmers in the plantation and oil sector Palm. Machines and tools to collect loose fruits that are efficient and effective can facilitate for collecting loose fruits which has been carried out manually. Collection of methods by different also need to think especially to get machines or tools that are easy, safe and cheap and comfortable.

1.4 Problem statement

- Need more workers or human energy in order to collect loose palm oil fruits.
- Time consuming.
- Low mass production.
- Can cause employees to suffer from back pain.
- The conventional method are manually operated.

1.5 Project objectives

- To design a palm seed picking tool that is comfortable for use by all ages.
- To fabricate portable palm seed rollers that can reduce time to collect palm seed.
- To analyze the performance of oil palm fruit collection using the tool.

1.6 Project scope

The scope or limits of project implementation should be made as a reference for ensure that each project implementation does not deviate from the desired objectives achieved. The scope of project implementation is set based on objectives or goals project. Therefore, “this portable palm seed collector must not go beyond the goal and its function.

For project scope this portable palm seed collector can accommodate a maximum weight of 2-5 kg. This portable palm seed can also make it easier for workers, especially for plantation workers to pick palm kernels and can also make it easier for workers because in this portable palm seed collector there is also an insect repellent and a place to place the palm loading iron allows workers to carry it at once without carrying it. Separately. This portable palm seed can also be used at any time without limit and charged.

Boundaries and restrictions are something that can be expected with the production of this project before it is implemented. This is because it is critical to consider every component of a production. We can see how much this project will benefit employees and run successfully for a while based on this explanation. This 'Portable palm seed collector' is expected to take 5 months to create and can survive for 5 years if used and maintained properly. Because of the project's long-term viability, it is expected to save expenses for each user while also providing valuable 'input' from the consumers.

1.7 Importance of the project

The importance of this project is to meet the objectives set forth at the outset. This project (*Lerai Seed Collector*) aims to make it easier for plantation workers to collect *"lerai"* seeds from large palm fragments with their hands. Reduce the usage of heavy machinery that creates strong smoke anywhere to save farm laborer's. The major goal of this initiative is to make the ripening of oil palm fruits easier and faster. The focus is on people of all ages, particularly the elderly, because this equipment can replace the traditional way of collecting oil palm fruit, which relied solely on one's hands. This tool is simple and practical to use. It can help to relieve discomfort and keep the spine in fantastic health for a long time. Furthermore, because it is easy to carry and operate, this equipment was designed to be a helper for oil palm plantation workers. In other words, because the production cost is cheaper than that of other heavy machines, this tool has the potential to become the primary tool for every oil palm plantation worker

1.8 Summary

The origins of ideas and inspiration have been discussed in this chapter. The stated objectives can be fulfilled by stating the challenges that have been encountered. As a result, when collecting dissolving palm seeds, the 'Portable palm seed collector' can help all oil palm plantation farmers. Finally, the 'Portable Palm Seed Collector' can benefit consumers in terms of comfort, portability, and the ability to save producers' manpower and time.

CHAPTER 2 LITERATURE / FIELD STUDY

2.1 Introduction

Various innovative technologies are now being developed to help human life progress. As a result, in order to generate a project that is more efficient, it is required to do a more in-depth investigation. As a result, a review of the literature is critical as a reference or guide in developing a project that meets engineering criteria and meets the demands of current users. It is critical that the design corresponds to the engineering features of the design in order to avoid unfavorable outcomes when in use.

2.2 Previous Studies/Comments/Investigations

Mechanical Movement as a Theory

The third edition of the Hall Dictionary defines movement as "the act of moving." A moving state is described as a phenomena of movement in the Student Dictionary. As a result, movement as a whole may be described as the act of moving from one location to another. A mechanism or system that permits items to operate, move, or spin automatically or manually is known as mechanical movement. Mechanical motions are employed in everyday life to help humans do their tasks. Mechanical movement is utilized to move one source of movement (input) through a process in order to create another movement (output).

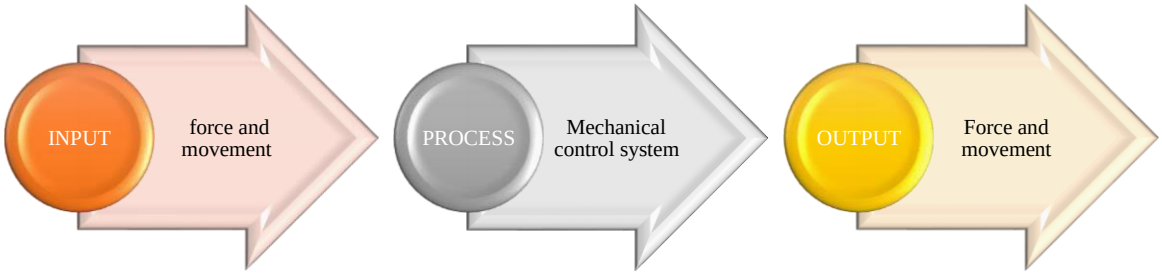


Figure 2.2 Concept of Mechanical Movement

In order to perform work, mechanical systems in everyday life integrate linear and rotational motions. Mechanical motions can be created manually, with the help of an engine, or with the help of an electric motor. Manual mechanical movement techniques, engines, and motors are the three categories of mechanical movement methods. Manual movement is a way of moving an item that makes use of human energy.

Product Comparison

(In Market)

Product	Advantage	Disadvantage
	• light • facilitates movement where there are wheels on the shovel • durable material, does not rust and rot	• unable to support a large mass • not suitable for tall individuals • requires a lot of use energy
	• light • easy to carry anywhere • durable material, does not rust and rot	• unable to support a large mass • take a long time to complete the work • not suitable for high temperatures • requires a lot of use energy
	• light • reduce the risk of injury in waist	• requires a lot of use energy • easily broken on the side of the scraper teeth

(Our Product)

Product	Advantage	Disadvantage
	• reduce the risk of injury in waist • the accumulated palm seeds are clean from sand and soil impurities • reducing manpower • easy to use • 3 in 1 which has a roller to collect palm fruit seeds, insect spray and a place to place the palm loading iron • Save time	• cannot accommodate a large capacity • high cost • not resistant to high/low temperatures

2.3 Summary

This chapter explain about the study and investigation of this 'Portable palm seed collector' project. Literature review is important for every project to be made, this review is the details that need to be taken into account while producing project. Literature review allows students to make a study of what will be done to produce the project. In conclusion, existing projects and projects to be done have the same function which is to collect oil palm seeds. Concept which will be used in this project are different from the existing tools, however, more research and testing is needed to gain a better understanding to produce this project. It is important to conduct more research on the results and reasons why previous projects were created for community use.

CHAPTER 3: METHODOLOGY

3.1 Introduction

Methodology is a chapter that explain about the activity that we can solve any issues or problems. Choosing methodology to build a project is one of an important aspect to ensure that the project is build according to the right steps so it is systematic and tidy. In this chapter, we will explain the flow of choosing the title for this project until the presentation day. For this chapter, it also contain project design, procedure, materials and equipment used and analysis data. For more detail information about how its implementation, the methodology will shows in the form of flow chart.

The invention of "Portable Palm Seed Collector" is invented by ourselves based on our group suggestions and discussions. This innovation needs to be taken into account from the original aspects and theories in making palm seed collectors. The design of the project must not be that difficult, lightweight, easy to carry, easy to operate and store. Choosing the component is based on some studies and tests in order to ensure the portable palm seed collector functioning well and perfect. Therefore, the safety and comfort aspect also go in advance.

The effectiveness of this study is to determine whether the oil palm seed collectors that we produce are able to alleviate the burden in the process of oil palm seed collection done by gardeners or farmers and can save their time. To ensure that our oil palm seed collectors function properly, they need to be monitored and managed systematically from time to time. Manual or traditional collection of oil palm seeds requires more manpower and is risky. Therefore, we created this tool to lighten and reduce their burden.

Gantt chart

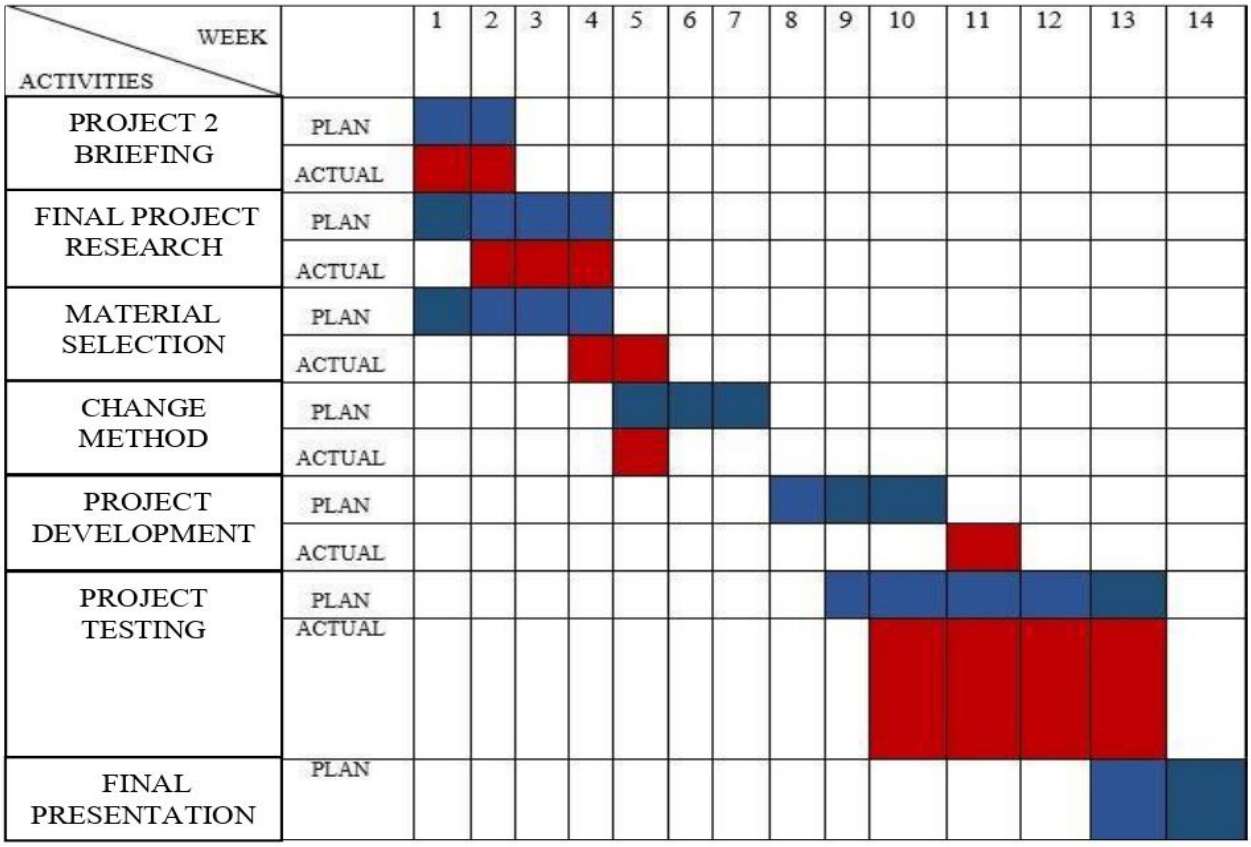
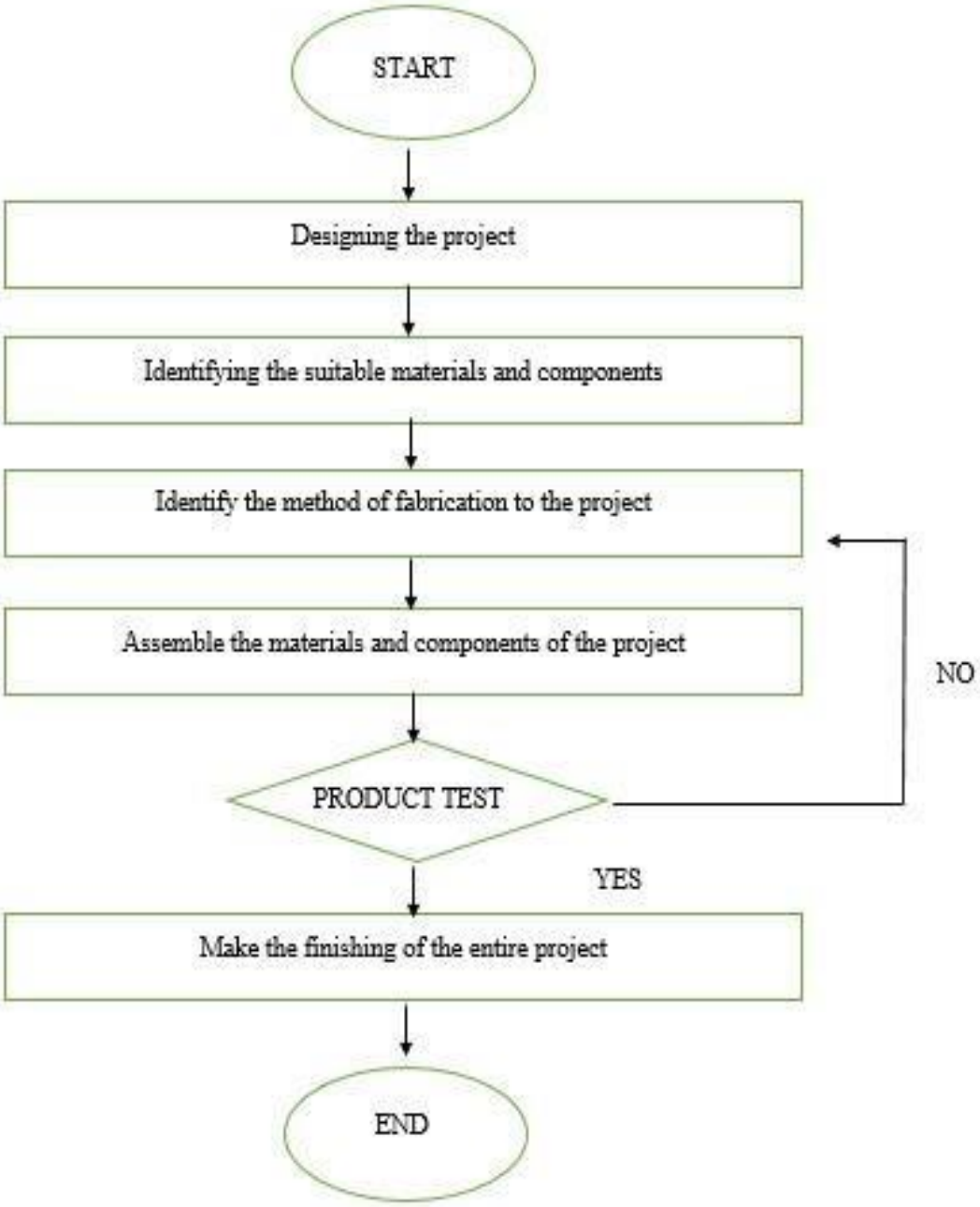


Table 3.1.1

Implementation / Actual date

Planned date

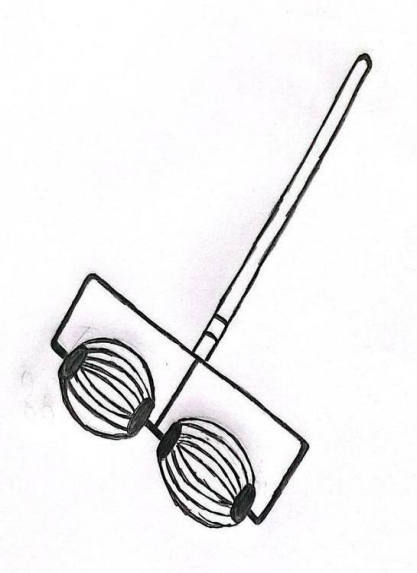
Flow Chart

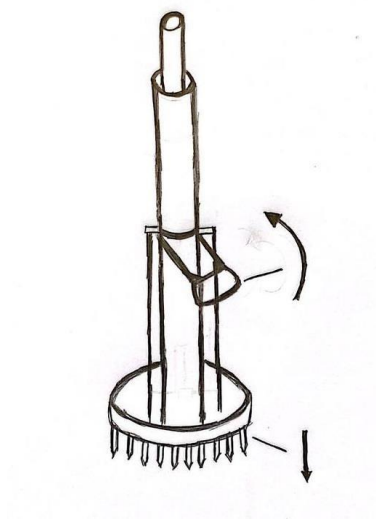

START
Designing the project
Identifying the suitable materials and components
Identify the method of fabrication to the project
Assemble the materials and components of the project
PRODUCT TEST
NO
YES
Make the finishing of the entire project
END

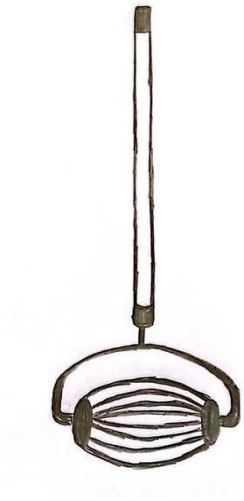
3.2 Project Design

A detailed drawing of the design of a portable palm seed collector will describe more clearly about the layout of the design parts or components and the materials used. Even the location or place of each component on this palm seed collector can be identified based on the size of the component and the suitability of the material to which it is connected and placed. Here the initial planning of the design is done before the design selection is chosen.

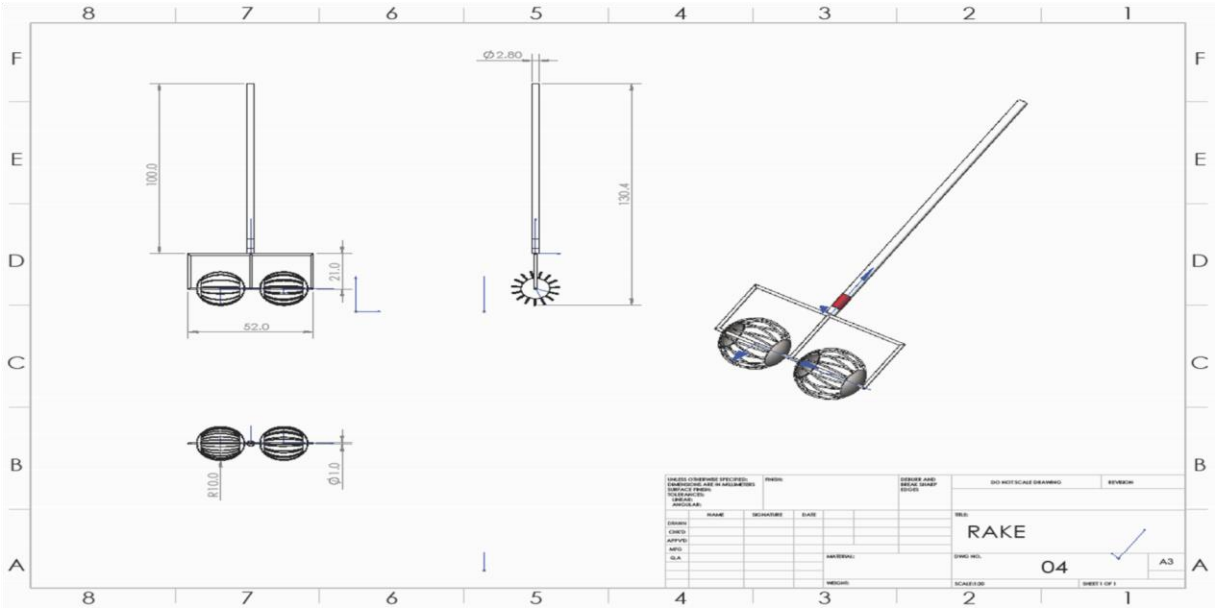
i) Successfully generated 3 idea generation for the first design sketch.



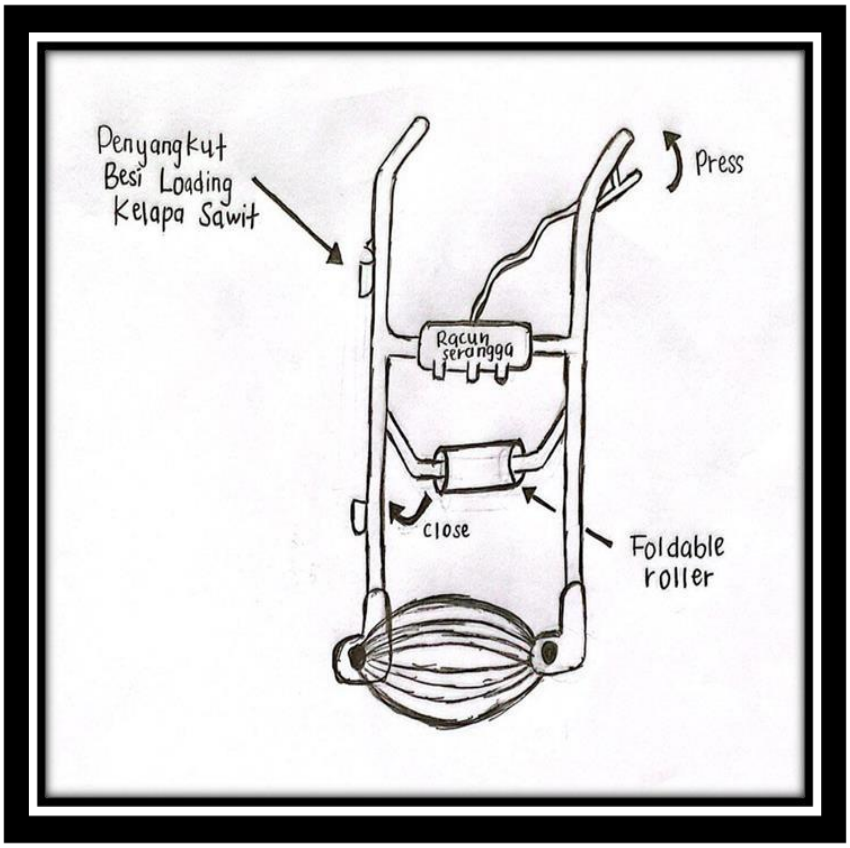




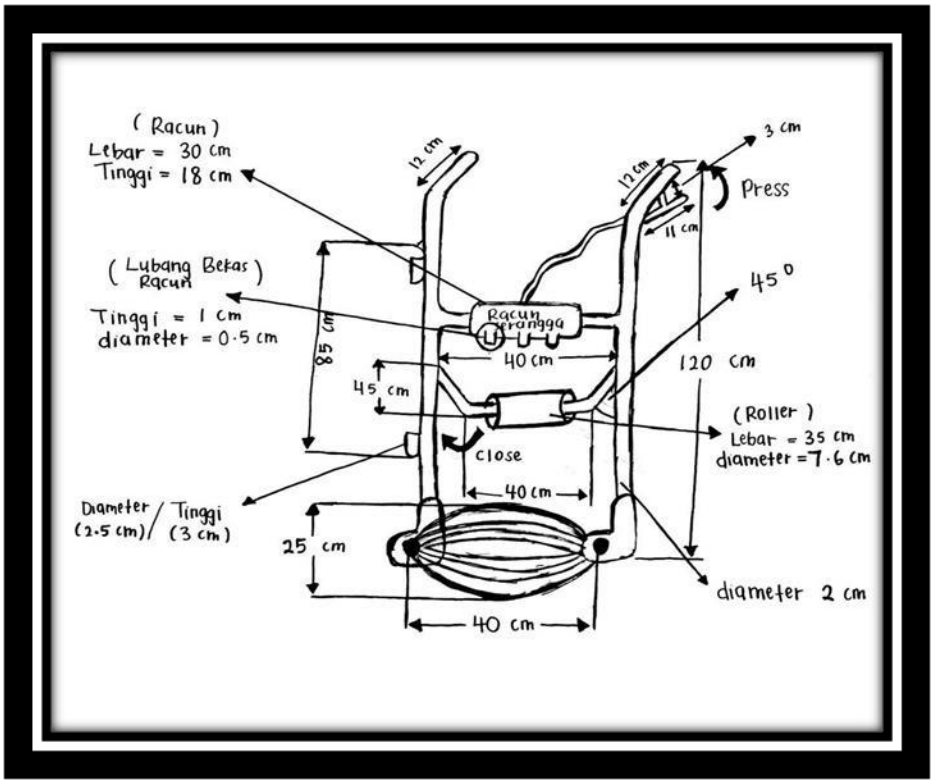
ii) Choose one of the 3 design sketches above.

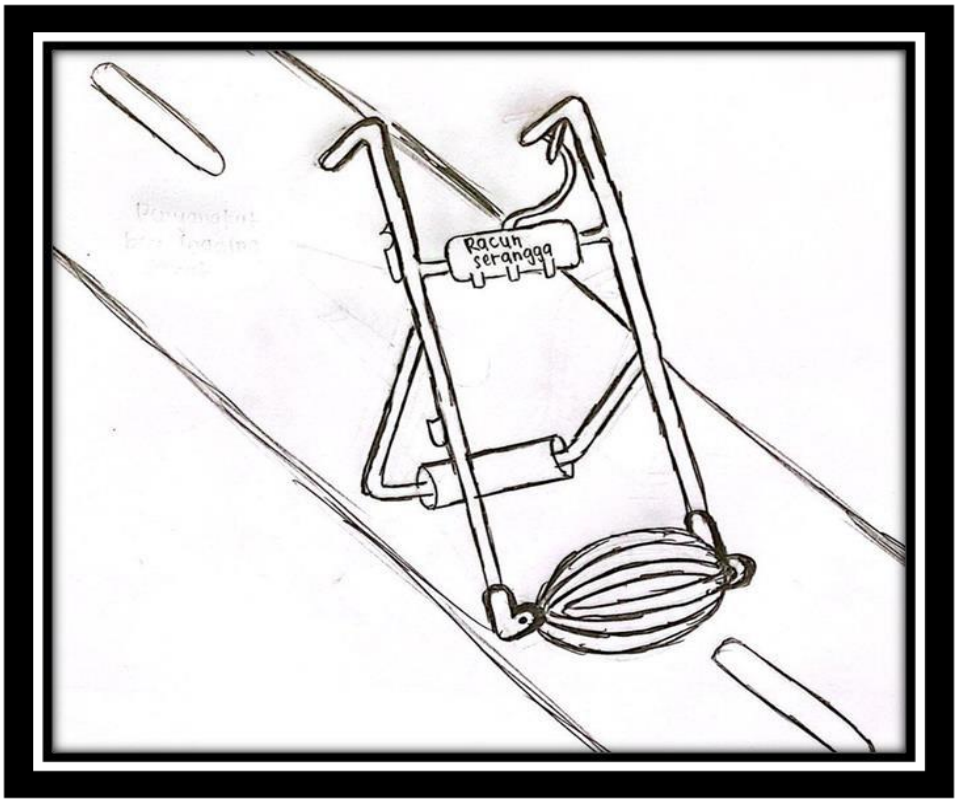


iii) Change and add a little innovation to the chosen design (Raw sketch for the final design).

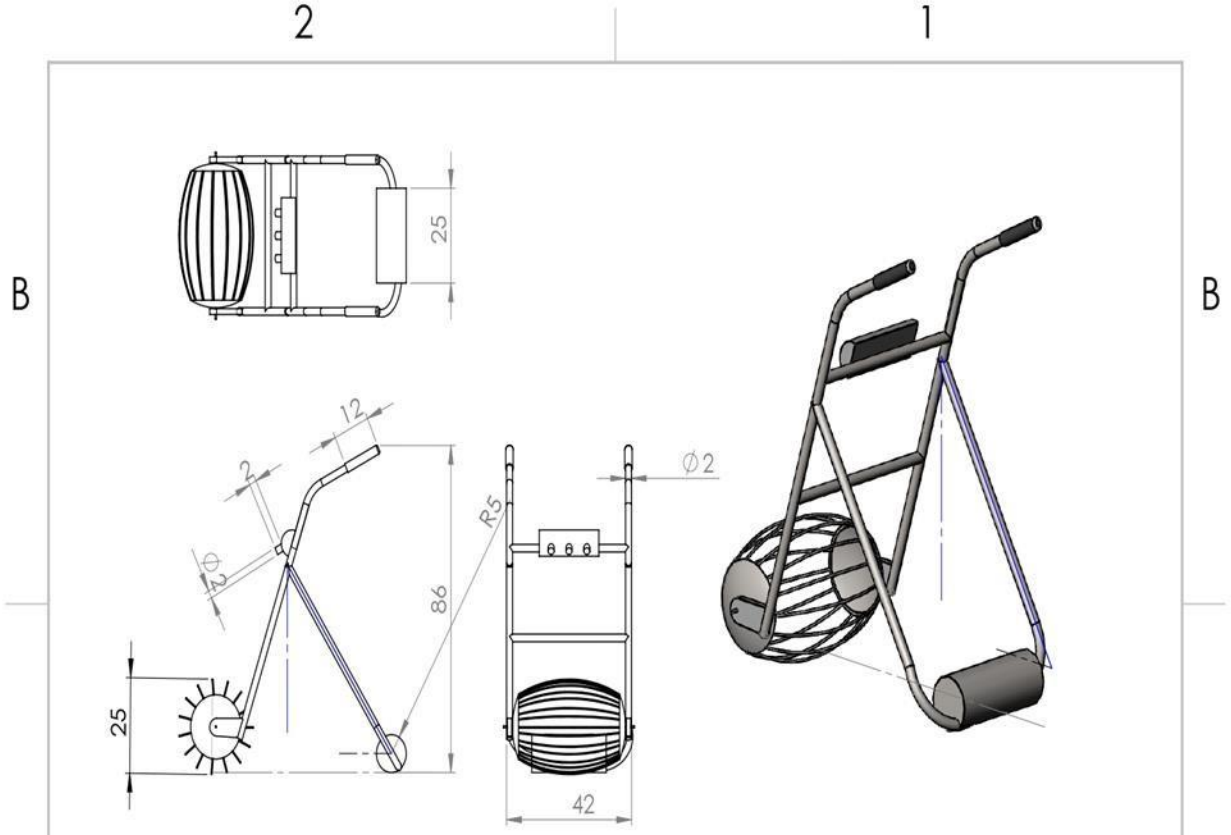


iv) Put measurements on the project design (height, width and diameter).





V) Final design (Semester 4).



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			Q.A.		
		INTERPRET GEOMETRIC TOLERANCING PER:	COMMENTS:		
		MATERIAL			
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APPLICATION		DO NOT SCALE DRAWING			

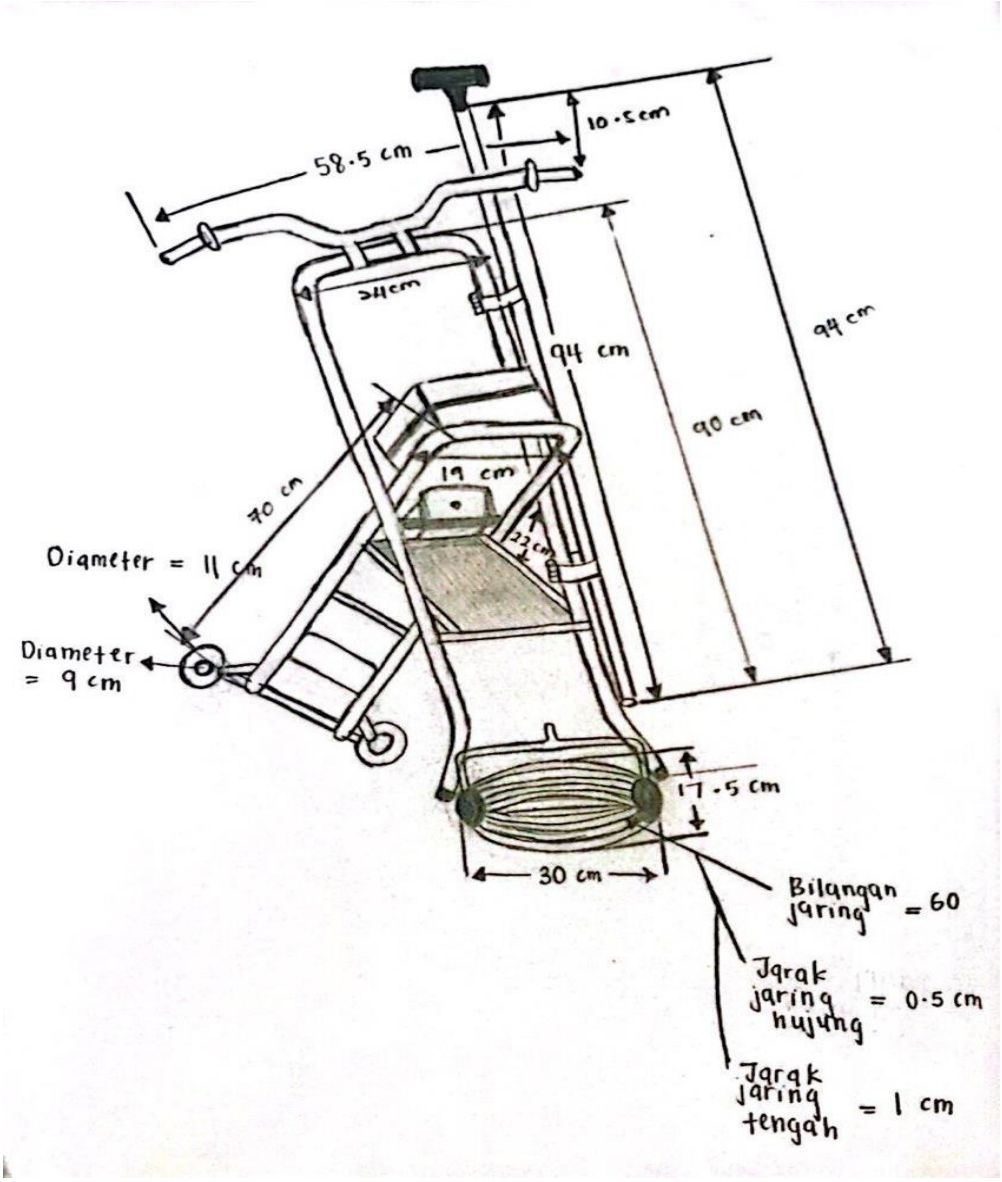
<COMPANY NAME>

TITLE:

SIZE A | DWG. NO. DRAFTINGS | REV

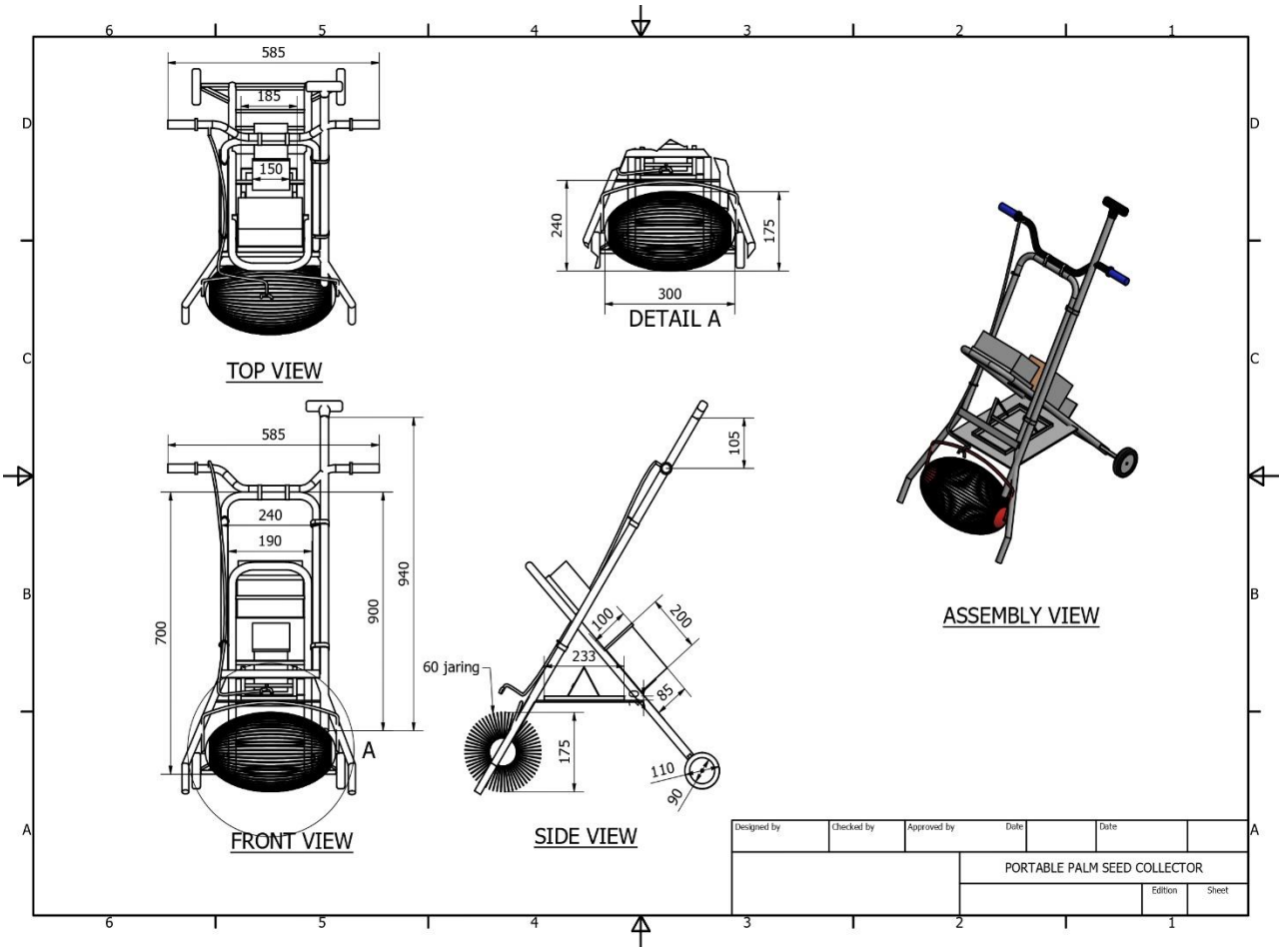
SCALE: 1:20 | SHEET 1 OF 1

VI) We redrew the design of our project that we had completed in semester 4 due to several factors. The first factor is that we want to change the position of the insecticide sprayer. The second factor is that we want to add a place to put the palm oil loading iron. The last factor is that we changed the roller to a bicycle wheel. (Semester 5)

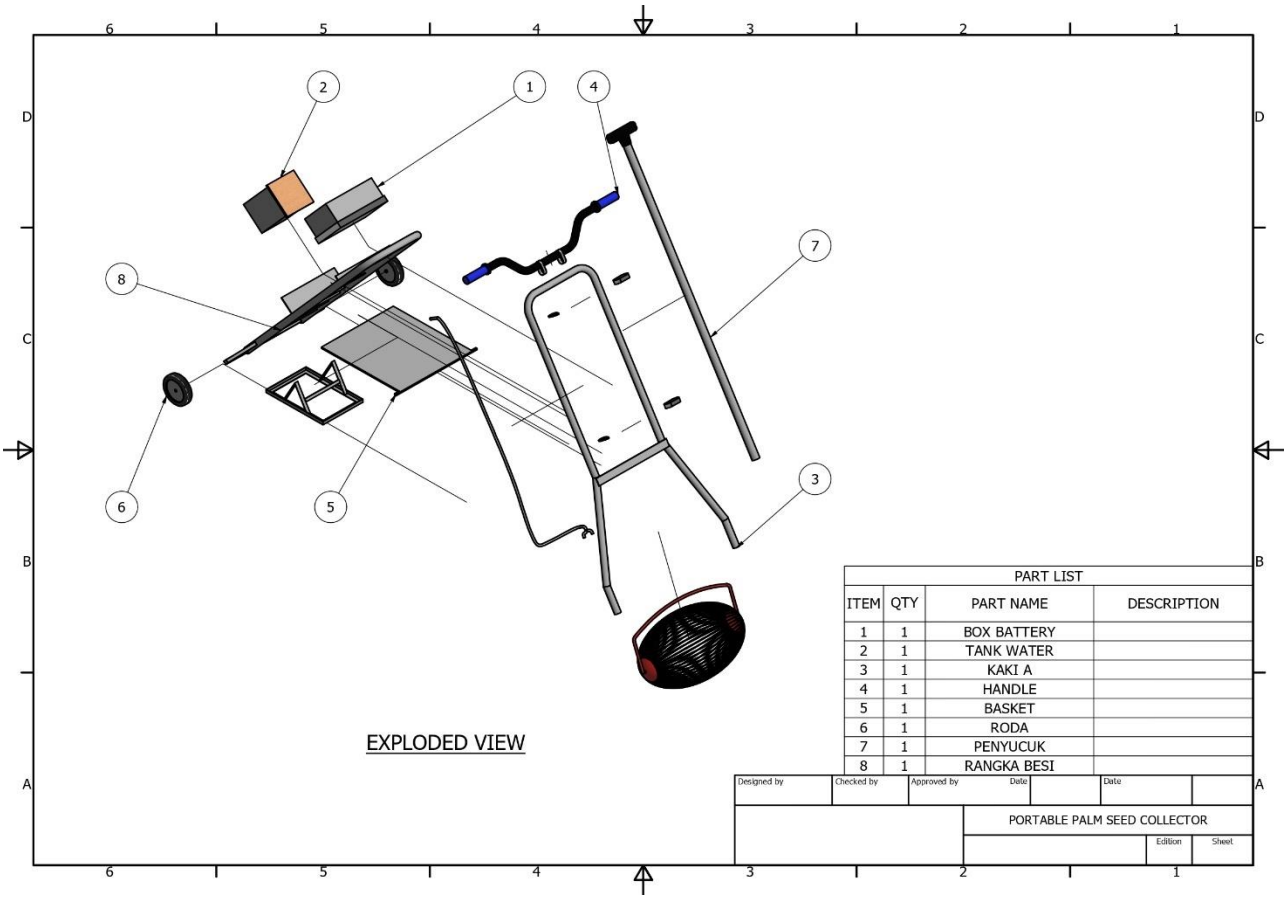


VII) This is the last design we produced in semester 5.

(ORTHOGRAPHIC)



(EXPLODED)


EXPLODED VIEW
PART LIST
ITEM QTY PART NAME DESCRIPTION
1 1 BOX BATTERY
2 1 TANK WATER
3 1 KAKI A
4 1 HANDLE
5 1 BASKET
6 1 RODA
7 1 PENYUCUK
8 1 RANGKA BESI
Designed by
Checked by
Approved by
Date
Date
PORTABLE PALM SEED COLLECTOR
Edition
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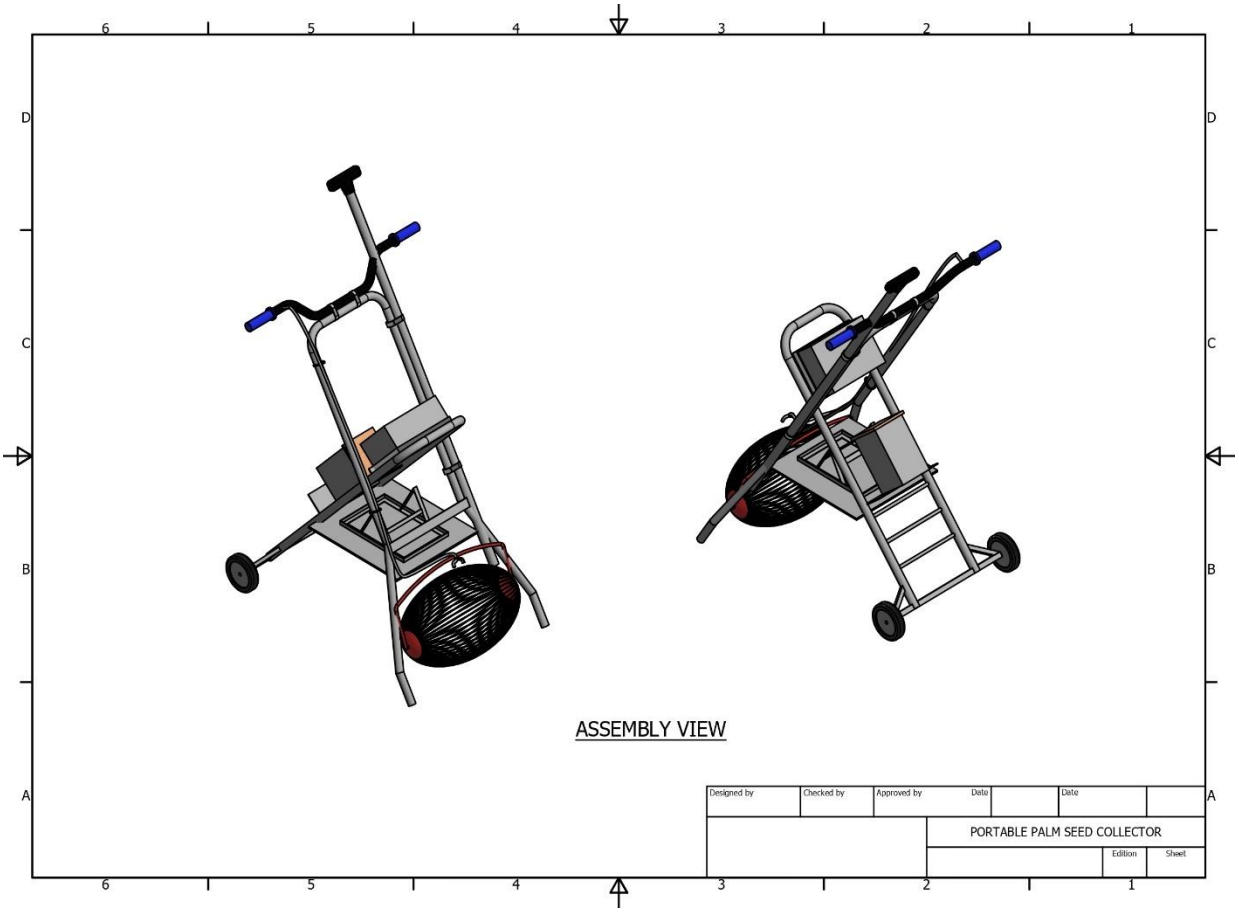
(ASSEMBLY)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3.2.1 METHODS / PROCESSES / TECHNIQUES OF PROJECT PRODUCTION

Step 1

Provide all necessary materials and equipment's before starting to develop a project. (Such as blind rivet, hose clip, bicycle side wheel, bolt and nut, push button switch, junction box, leg ironing board and other.

Step 2

Cut off the unnecessary parts of the ironing board legs using a grinder.

Step 3

Drill a hole in the bottom of the leg of the ironing board then attach the bicycle side wheel to the part that has been drilled using screws.

Step 4

Then attach the basket to the bottom front of the ironing board leg using a hose clip.

Step 5

Install rubber hand grips on both sides of the handlebar. Then tie the handlebar to the top of the ironing board leg using a hose clip.

Step 6

Install L shapes angle on the back of the ironing board leg using the rivet method.

Step 7

Drill and screw the junction box on the top of the ironing board leg. Then install the 6w water pump motor and battery holder in the junction box. After installation, connect the wires on both sides correctly.

Step 8

Attach a transparent hose to the water pump and channel the hose until it enters the plastic container. Then another transparent hose is connected with an adjustable nozzle and its position is placed with a basket.

Step 9

Install the on/off switch on the junction box and install the push button switch on the handlebar.

Step 10

Install a spiral wrapping wire protector on the wire connected to the push button to prevent the wire from being exposed to water and to prevent any damage to the project**.**

Step 11

Take the hollow iron and cut the hollow iron to a length of 94 cm using a grinder. Then tie the hollow iron on the left side of the project using a hose clip.

Step 12

Stainless steel plate is used to make an A-shaped palm seed extraction tool. First, cut a 23 cm long stainless steel plate into two pieces. Next, cut a 16 cm long stainless steel plate into four pieces. Then connect the pieces into an A shape using rivets.

3.2.2 MATERIALS AND EQUIPMENT

The selection of the right components is very important in designing a portable seed collector plug to avoid any misuse of materials or components used so that the project becomes a user-friendly or easy-to-use project. Among the components used are:

i. blind rivet
ii. hose clip
iii. bicycle side wheel
iv. bolt and nut
v. bike handlebar
vi. push button switch
vii. rubber hand grip
viii. rectangular plastic container (1600 ml)
ix. transparent hose
x. spiral wire protector
xi. switch
xii. plastic enclosure
xiii. ironing board leg
xiv. corrugated plastic board
xv. battery holder
xvi. water pump motor 6w
xvii. battery li-ion
xviii. wire
xix. adjustable nozzle
xx. basket
xxi. hollow iron

(Materials)

Hollow iron

Where we have used hollow iron material from iron legs as a frame for the portable palm seed collector project. This is to save costs in producing this project.

Blind rivet

Blind rivets have been used for the connection process. we use this blind rivet so that the project produced is neater and does not interfere when the process of collecting palm kernels is done.

Hose clip

Clip host is used to combine two items into one. It is connected from the carrying frame to the basket by using 2 clip hoses. Apart from that, a steel tube cover incorporate to be used as protection for loading oil palm kelp to make it easier for oil palm workers to collect oil palm seeds.

Bicyle side wheel

Bicycle side wheel is a supporting wheel to move our project to run. This is because without wheels our project will not move.

Bolt and nut

Bolts and nuts are used to connect the wheels to the project frame at the bottom. with this extension, it is easier for this project to move. and safely used as a connecting screw.

Bile handlebar

Iron for the handle that will be used and connected with a rubber handle so that it can be used as a handle to push the project comfortably

Push button switch

Acts to release the insecticide when pressed.

Rubber hand grip

Handle to make it easier for users to push the project comfortably.

Rectangular plastic container (1600ml)

For pesticide storage

Transparent hose

The connection that flows the insecticide from the tank to the nozzle.

Spiral wrapping wire protector

Spiral wrapping wire protector is to protect the wire from external elements so as not to be damaged.

Switch

Switch is to turn on and off the movement of the insecticide spray. this is so that it can be used only when necessary and can save the use of battery energy.

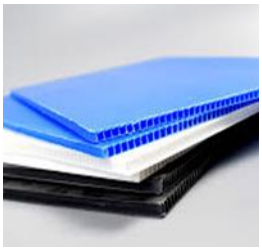
Plastic Enclosure (Junction Box)

Plastic Enclosure is a cover to protect the battery and pump from environmental hazards. and store batteries and pumps safely.

Ironing Board Leg

Frame for Portable Palm Seed Collector Project.

Corrugated Plastic Board



Base for foot storage A.

Battery holder

So that the battery does not move and disturb the position of other wires.

Water Pump Motor 6W

The pump is used to drain the insecticide from the tank out of the area to be sprayed.

Battery Li-ion

Produce energy to move the motor so that the motor works well.

Wire

connect the battery to the motor

Adjustable Nozzle

Helps to spray and produce sparks towards insects by using insecticides.

L Shapes Angle Steel

- L Shapes Angle Steel is used in this project to produce legs A.
- In addition, it is used as a stepping stone to lift the project to extract palm kernels.

Basket

Baskets are used to collect palm seeds. nets used from alloys that . is a net that is flexible to use and makes it easy to collect palm seeds.

(Equipment)

- **Rivet gun**

used to connect blind rivets with the irons that want to be joined.

- **Test pen**

to open and close the screws, as well as open the battery and pump storage box.

- **Grinder**

cutting irons to make connections more neatly.

- Drill cordless

Hole the iron to make the connection of iron iron with blind rivets.

- Silicone tape
  to paste the wire so that it does not move and be disturbed.

- Screwdriver

  loosen and tighten the screws

- Wire cutter

cut the excessively long electronic wire and cut the tube so it looks neat

Material and Manufacturing Costs

No	Material	Quantity	Price (RM)
1.	Hollow iron	2	40.00
2.	Blind rivet	30	15.00
3.	Hose clip	12	22.40
4.	Bicycle side wheel	2	11.00
5.	Bolt and nut	5	7.00
6.	Bike handlebar	1	24.90
7.	Push button switch	1	1.50
8.	Rubber hand grip	2	6.00
9.	Rectangular plastic container (1600 ml)	1	5.50
10.	Transparent hose	1	3.00
11.	Spiral wire protector	1	6.00
12.	Switch on/off	1	5.00
13.	Plastic enclosure	1	29.00
14.	Battery holder	1	3.70
15.	Water pump motor 6w	1	26.00
16.	Battery li-ion	3	22.00
17.	Wire	3	7.00
18.	Adjustable nozzle	1	5.00
19.	L Shapes Angle Steel	4	17.60
20.	Stainless steel plate	4	57.00
	TOTAL		**RM 314.60**

3.2.3 DATA ANALYSIS METHODS

Every project that is implemented and done must have its own advantages and disadvantages. After completing of the manufacturing process and testing of this project, it was found that this Portable Palm Seed Collector has several advantages and disadvantages. Among the advantages of this Portable Palm Seed Collector is that it can reduce injuries in the waist and back pain because by using this Portable Palm Seed Collector, users no longer have to bend over to collect palm seeds. Furthermore, this Portable Palm Seed Collector can save time and manpower. While the disadvantage of this Portable Palm Seed Collector is that this tool is a little heavier because it uses steel instead of plastic. The cost of making this tool is also high and quite a bit expensive. In addition, this Portable Palm Seed Collector is easy to store and carry even though the size is a bit large because this Portable Palm Seed Collector has a foldable roller that can be folded. Therefore, this tool can be reclined or leaned back indirectly it can also save space.

3.3 SUMMARY

The conclusion that can be made in this chapter is that, after doing this chapter 3 we gain the knowledge of how to make the project more clear, detailed, and simple. This further simplifies our work to do our project manufacturing work. The data we collect, and we analyze is very important data for us in the further success of our project. All this data was all collected through various means such as surfing the internet, reading some related books, and asking our lecturers. Through this chapter we can also identify the appropriate materials and components to be used to ensure the selection of these materials and components is appropriate for the product that we will produce. Therefore, through work such as material selection, design concepts, dimensions and cost estimates can certainly create quality products and produce modern products and can display conducive and innovative advertising displays to attract consumers.

CHAPTER 4

PRELIMINARY FINDINGS OF THE STUDY

4.1 INTRODUCTION

After all the data and the information are obtained, analysis need to be done to see the reaction of user of this product. The results obtained in this chapter are the results obtained from the online questionnaire which is made by using Google form. The data obtained from this online questionnaire are analyzed in more detail to get conclusions based on the objectives of the study that have been stated. The study was conducted by using respondents who have filled in the online questionnaire. There are several aspects that are the main focus, namely:

1. Profile of respondent (gender and age)
2. Respondent perspective on petrol station
   - How oil palm plantation workers collect oil palm seeds
   - The effect of collecting oil palm seeds using the current method.
   - The idea of innovation.

Project questions

Part 1

How oil palm plantation workers collect oil palm seeds?

i. Picking palm seeds by hand. ii. Using a scraper iii.

Using a broom and shovel iv. Using “palm baskets

Part 2

The effect of collecting palm seeds using the present method? i.

Took a long time to collect.

ii. Causes back pain iii. Dirty hands iv. Causes itching on the

hands due to pests found on palm seeds.

Part 3

The idea of innovation

i. Farm organizations need this "Portable Palm Seed Collector".

ii. This ‘Portable Palm Seed Collector’ works mobile.

iii. Palm seeds will be easy to pick.

4.2.1 DEMOGRAPHIC PROFILE OF RESPONDENT

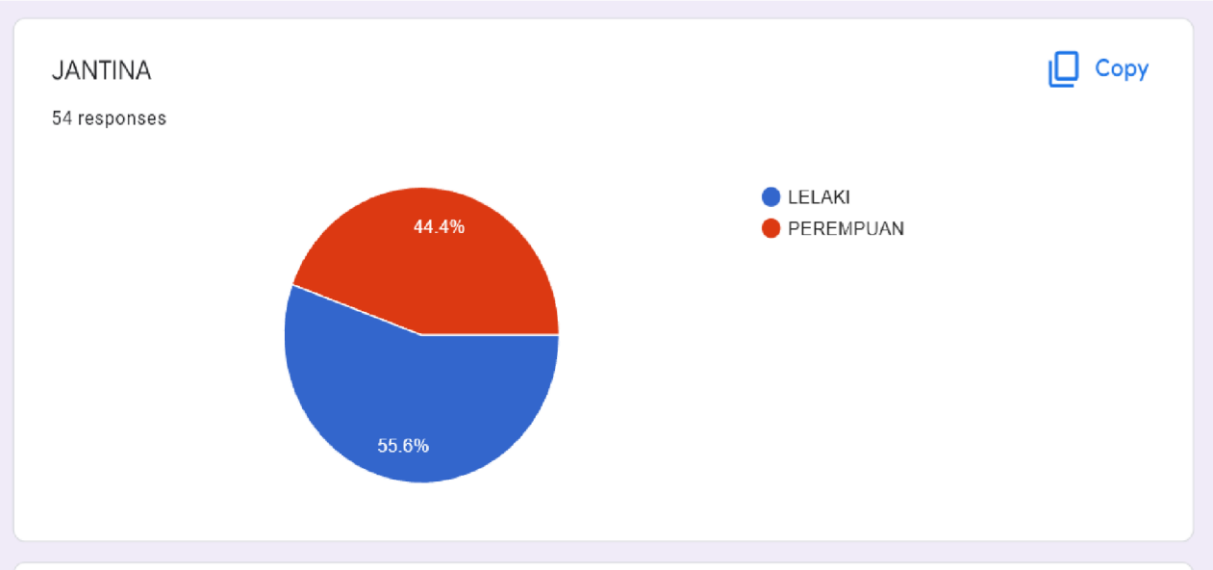


Diagram 4.2.1 Respondent gender

Diagram 4.2.1 show that the percentage of respondent gender that give respond for this project. 55.6% of the respondent are man while 44.4% of the respondent are women. The percentage for the man is the highest because tyre pump are usually use by man rather than women.

4.2.2 RESPONDENT AGE

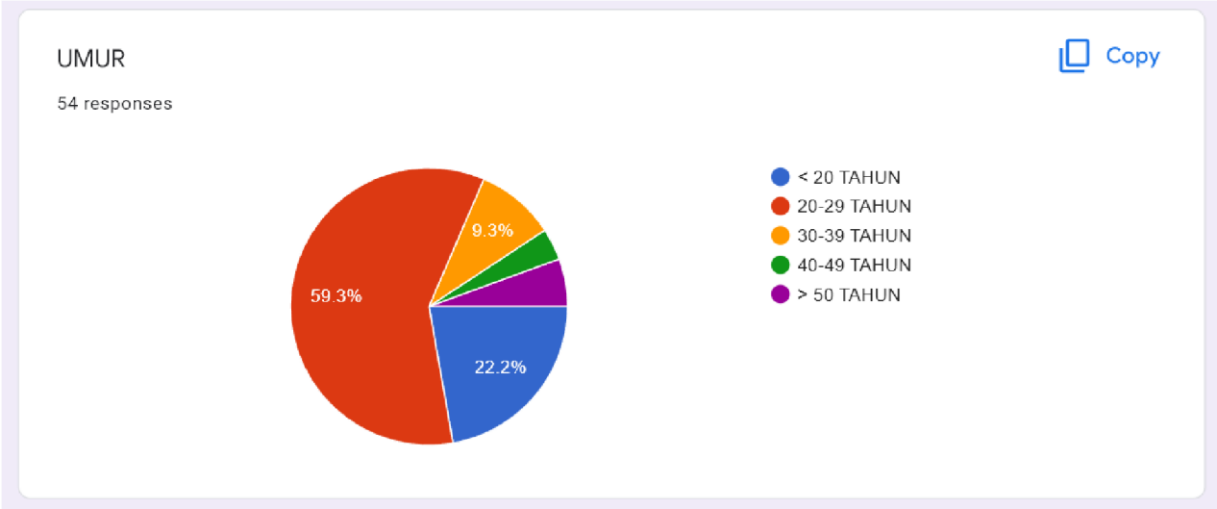


Diagram 4.2.2 Respondent age

Diagram 4.2.2 shows that the percentage of the age of our respondent. The diagram shows that 59.3% are 20 to 29 years old, 22.2% are below 20 years old , 9.3% are 30 to 39 years old and , 40 to 49 years old and 50 years old and above from highest to the lowest percentage respectively. Age 20 to 29 years old is the highest because most of the respondent are from students who is taking diploma in mechanical engineering.

4.2.3 HOW TO PICK LOOSE OIL PALM

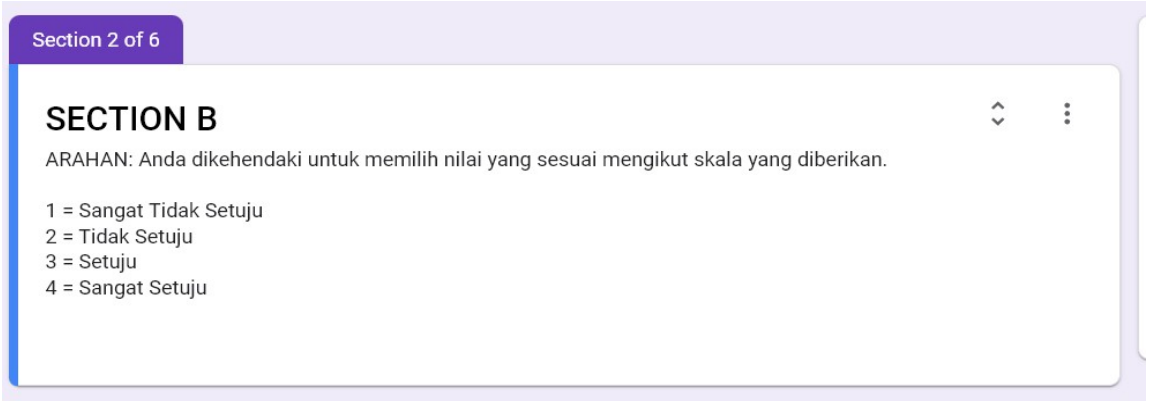


Diagram 4.2.3.1 Respondent to pick the loose by hand

Figure 4.2.3.1 shows that most of the respondents agreed and strongly agreed with the way of picking their palm loose by hand 27.8% (3) & 37% (4). and however as many as 18.5% (2) & 17.6% disagree and strongly disagree to collect loose by hand.

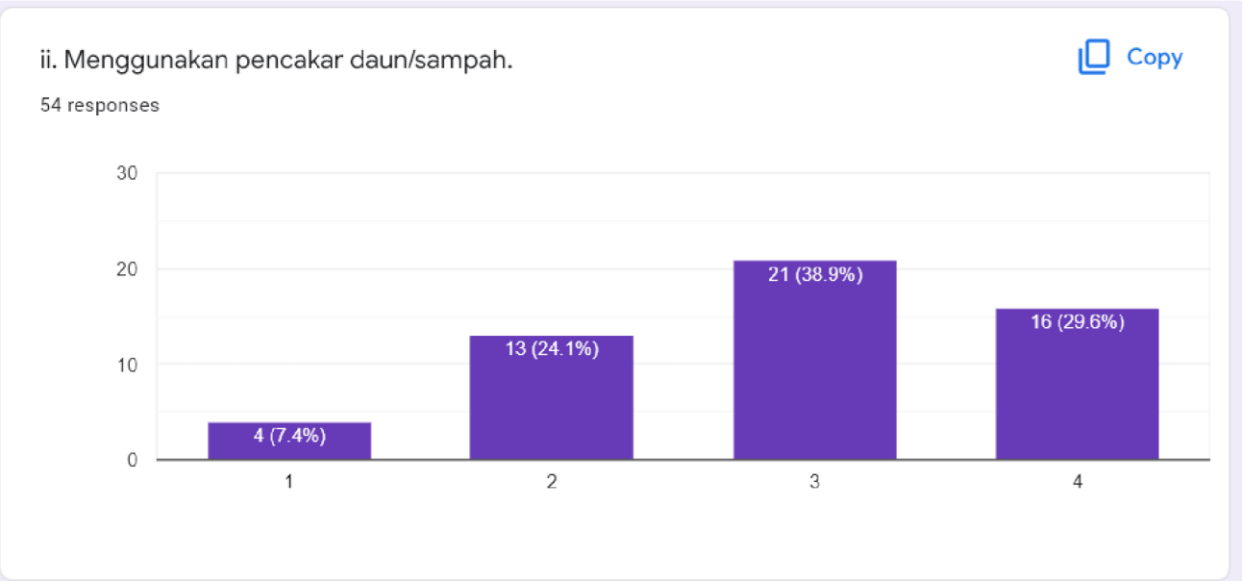


Diagram 4.2.3.2 Respondent to pick the loose by leaf scraper

Figure 4.2.3.2 shows that most of the respondents agreed and strongly agreed with the way of picking their palm loose with leaf scrapers 38.9 (3) & 29.6% (4). and however as many as 24.1% (2) & 7.4 % disagree and strongly disagree to pick loose using a leaf scraper.

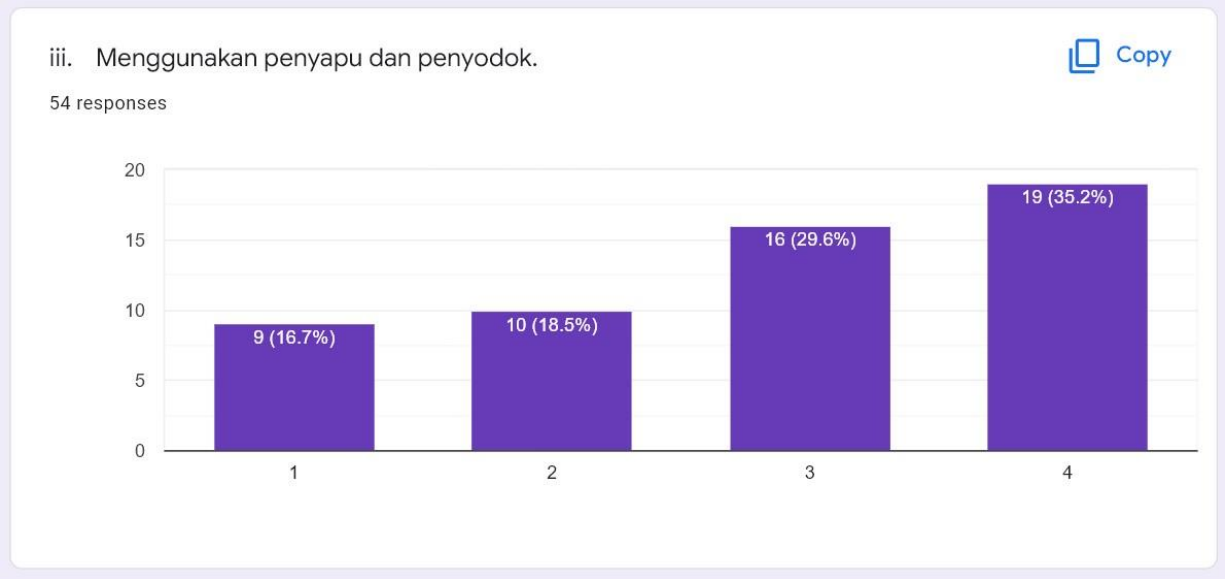


Diagram 4.2.3.2 Respondent to pick the loose by brooms and shovels

Figure 4.2.3.3 shows that most of the respondents agreed and strongly agreed with the way of picking their palm loose with brooms and shovels 29.6% (3) & 35.2% (4). and however as many as 18.5% (2) & 16.7% disagree and strongly disagree to pick up loose using brooms and shovels.

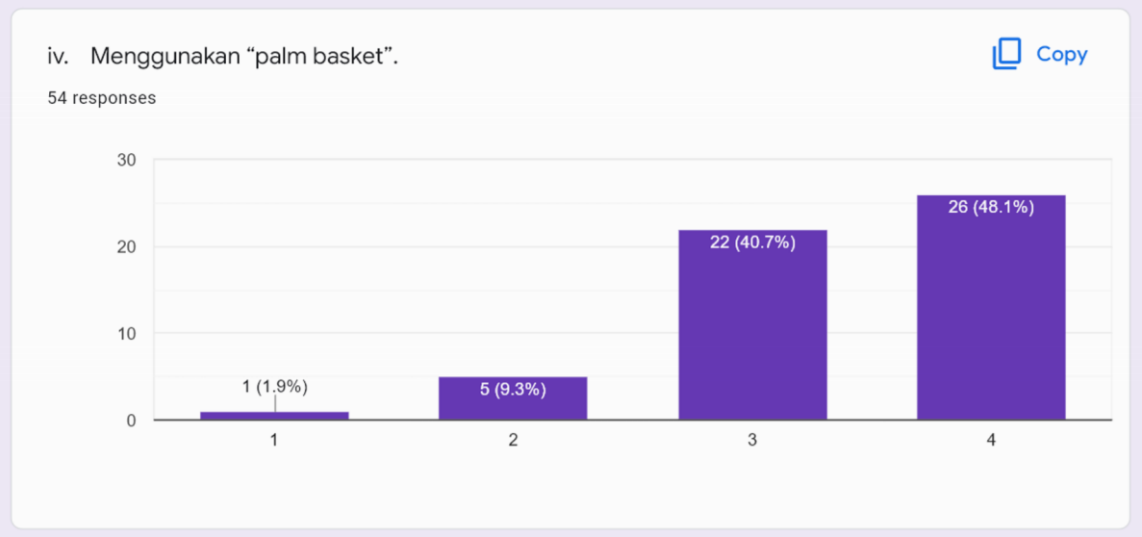


Diagram 4.2.3.4 Respondent to pick the loose by palm basket

Figure 4.2.3.4 shows that most of the respondents agreed and strongly agreed with the way of picking their palm loose with palm basket 40.7% (3) & 48.1% (4). and however as many as 9.3% (2) & 1.9 % disagree and strongly disagree to pick up loose using palm basket.

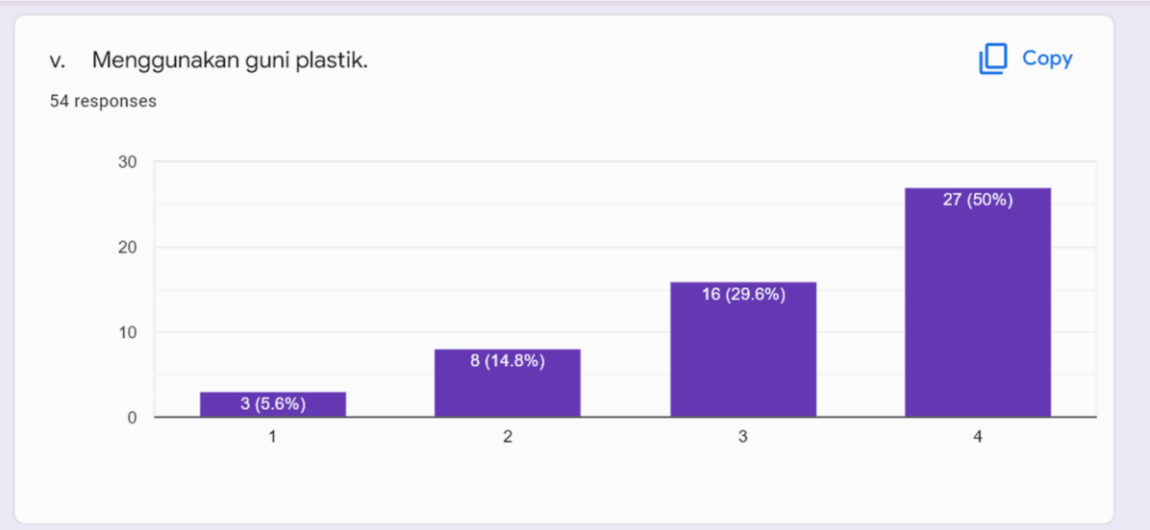


Diagram 4.2.3.5 Respondent to pick the loose by use a sack

Figure 4.2.3.5 shows that most of the respondents agreed and strongly agreed with the way of picking their palm loose use a sack 29.6% (3) & 50% (4). and however as many as 14.8% (2) & 5.6 % disagree and strongly disagree to pick up loose by using a sack.

4.2.4 THE EFFECT OF COLLECTING PALM SEEDS USING THE PRESENT METHOD

Diagram 4.2.4.1 Respondent the effect of collecting palm seeds is take a long time

Figure 4.2.4.1 shows that most of the respondents agreed and strongly agreed with the effect of collecting palm seeds is take a long time 25.9% (3) & 68.5% (4). and however as many as 1.9% (2) & 3.7 % (1) disagree and strongly disagree to the effect of collecting palm seeds is take a long time .

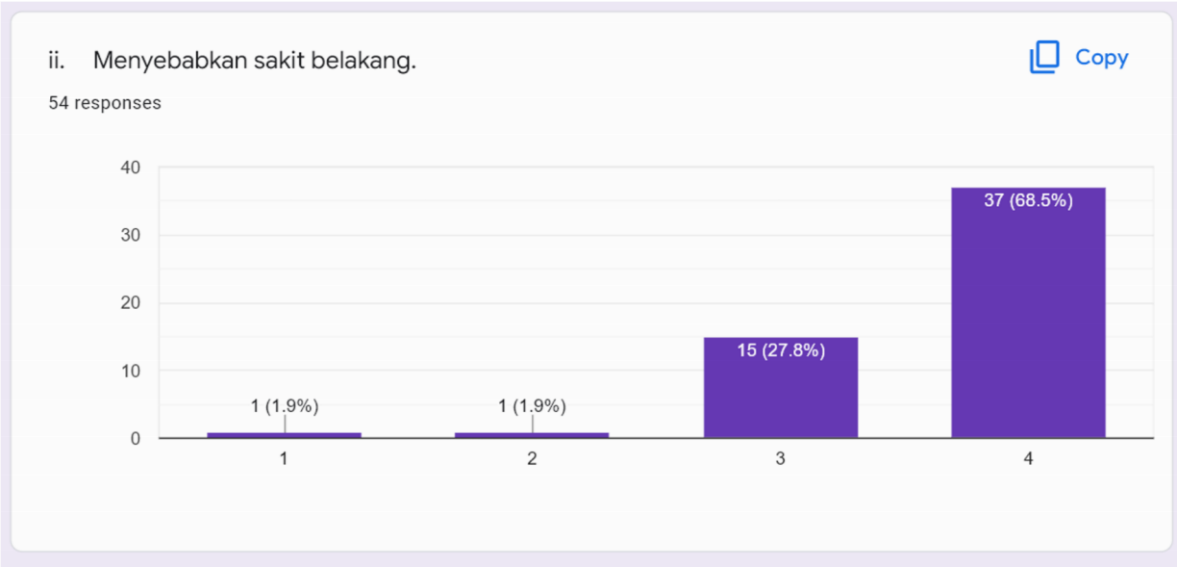


Diagram 4.2.4.2 Respondent the effect of collecting palm seeds is causing back pain

Figure 4.2.4.2 shows that most of the respondents agreed and strongly agreed with the effect of collecting palm seeds is causing back pain 27.8% (3) & 68.5% (4). and however as many as 1.9% (2) & 3.7 % (1) disagree and strongly disagree to the effect of collecting palm seeds is causing back pain.

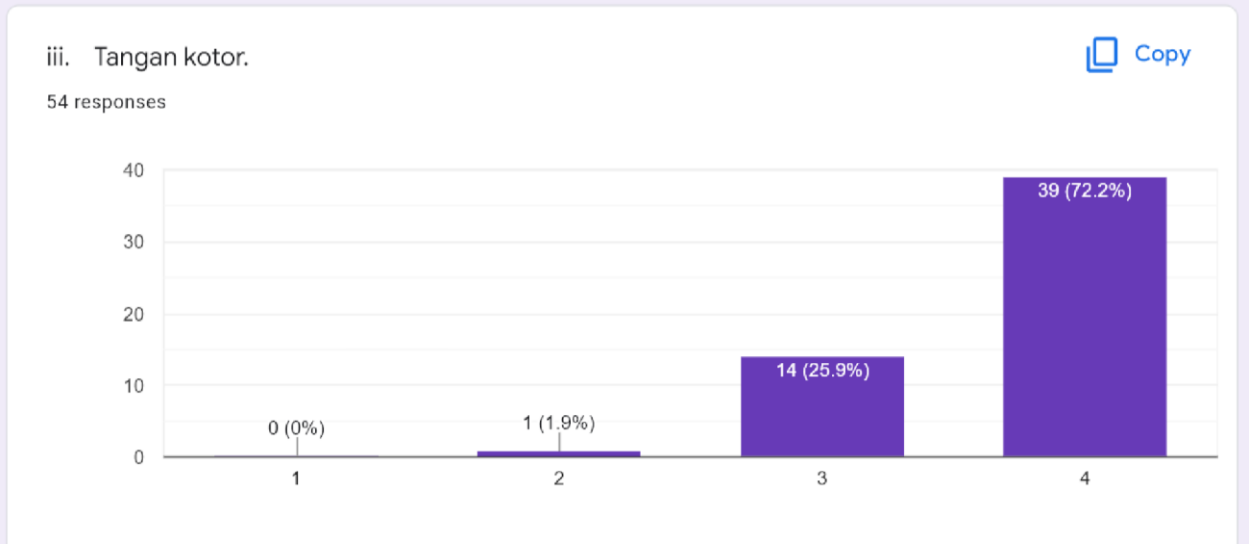


Diagram 4.2.4.3 Respondent the effect of collecting palm seeds is causing dirty hands

Figure 4.2.4.3 shows that most of the respondents agreed and strongly agreed with the effect of collecting palm seeds is causing dirty hands 25.9% (3) & 72.2% (4). and however as many as 1.9% (2) & 0 % (1) disagree and strongly disagree to the effect of collecting palm seeds is causing dirty hands.

Diagram 4.2.4.4 Respondent the effect of collecting palm seeds is Causes itching on the hands due to pests found on palm seeds.

Figure 4.2.4.4 shows that most of the respondents agreed and strongly agreed with the effect of collecting palm seeds is Causes itching on the hands due to pests found on palm seeds. 25.9% (3) & 72.2% (4). and however as many as 1.9% (2) & 0 % (1) disagree and strongly disagree to the effect of collecting palm seeds is Causes itching on the hands due to pests found on palm seeds.

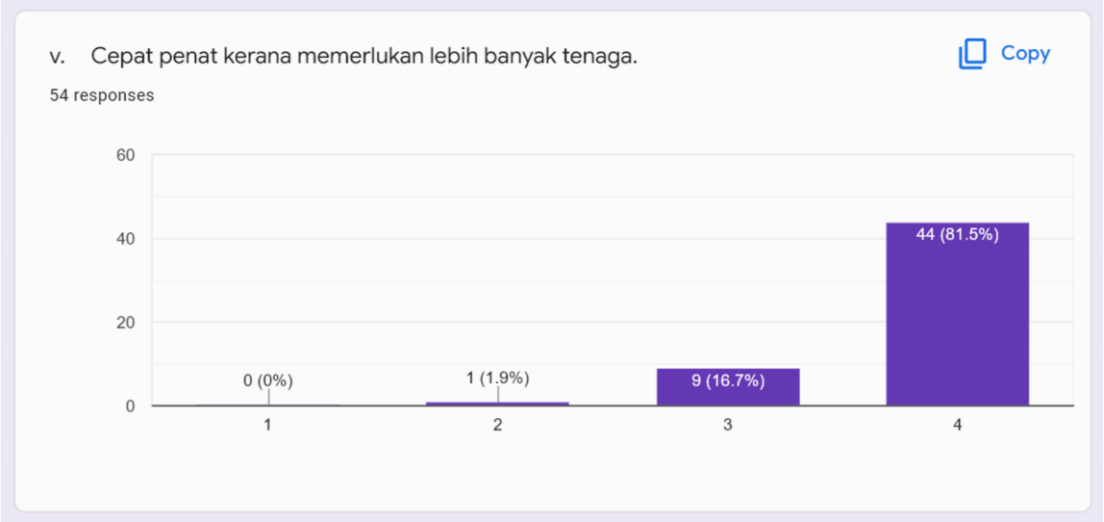


Diagram 4.2.4.5 Respondent the effect of collecting palm seeds is quickly tired because it requires more energy

Figure 4.2.4.5 shows that most of the respondents agreed and strongly agreed with the effect of collecting palm seeds is quickly tired because it requires more energy 81.5% (3) & 16.7% (4). and however as many as 1.9% (2) & 0 % (1) disagree and strongly disagree to the effect of collecting palm seeds is quickly tired because it requires more energy .

4.2.5 INNOVATION IDEA

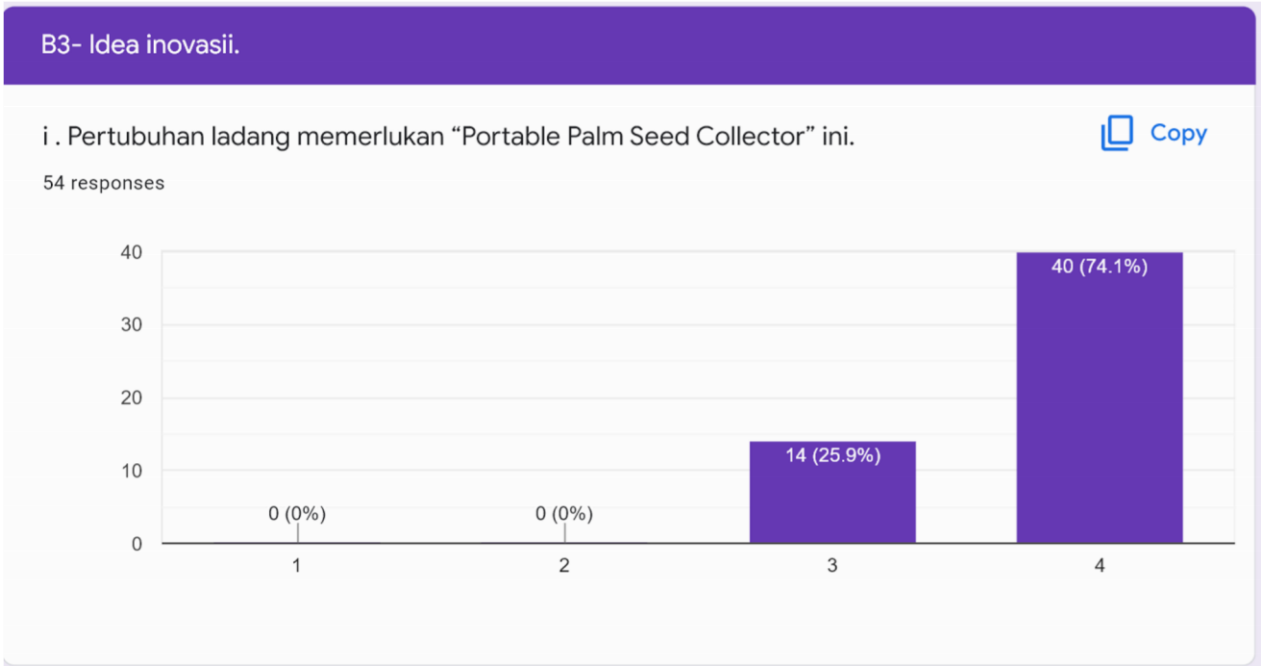


Diagram 4.2.5.1 Respondent Farm organizations need this "Portable Palm Seed Collector".

Figure 4.2.5.1 shows that most of the respondents agreed and strongly agreed with the Farm organizations need this "Portable Palm Seed Collector 25.9% (3) & 74.1% (4).

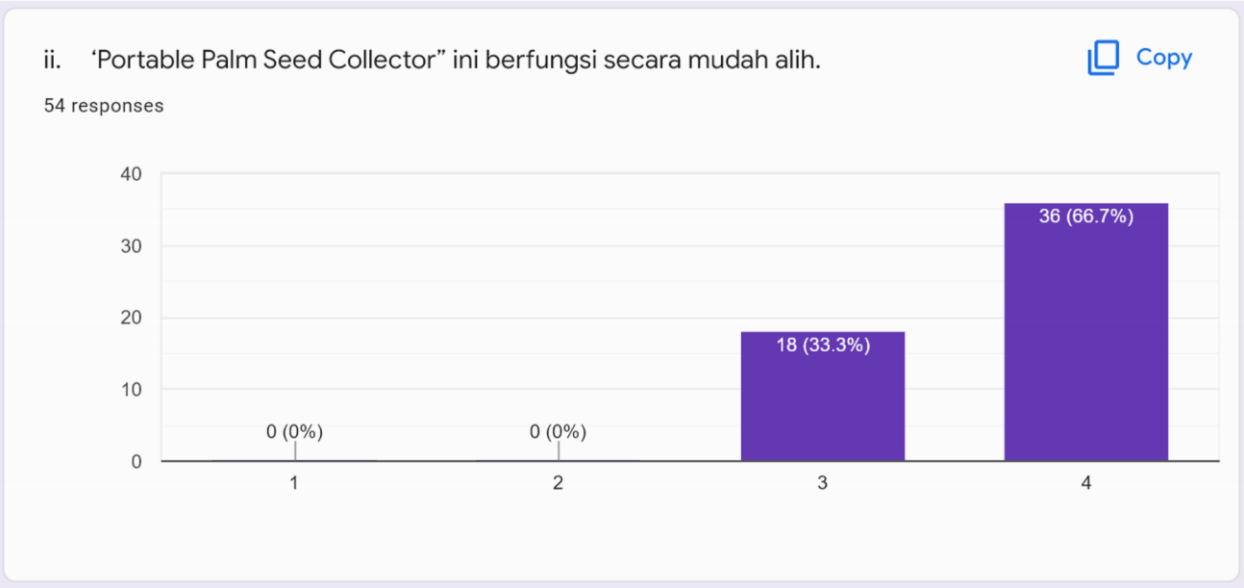


Diagram 4.2.5.2 Respondent This ‘Portable Palm Seed Collector’ works mobile.

Figure 4.2.5.2 shows that most of the respondents agreed and strongly agreed with This ‘Portable Palm Seed Collector’ works mobile 33.3% (3) & 66.7% (4).

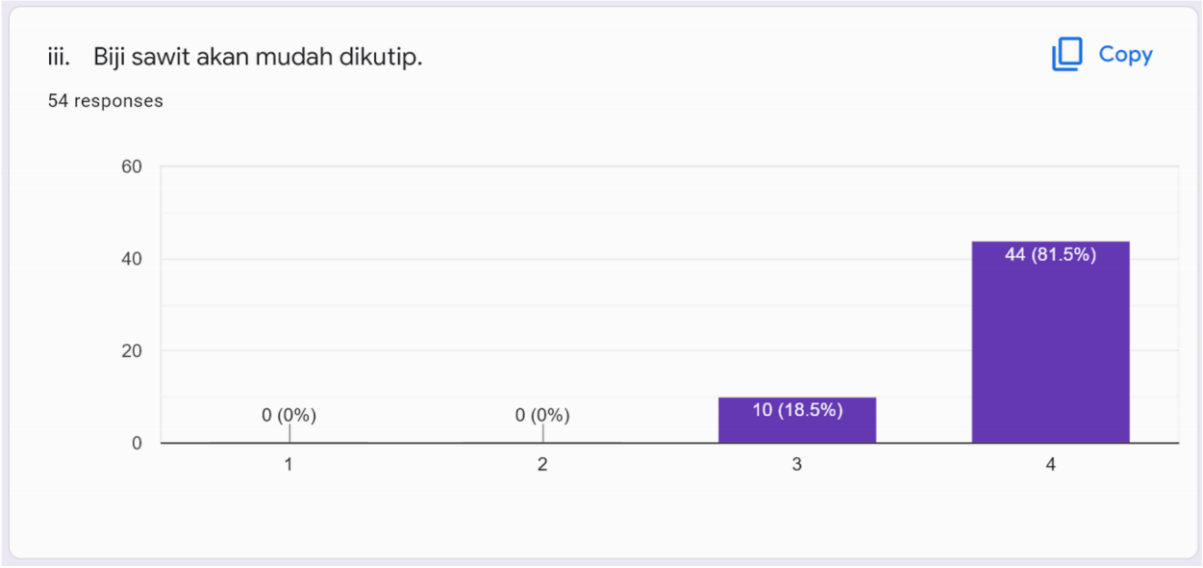


Diagram 4.2.5.3 Respondent Palm seeds will be easy to pick.

Figure 4.2.5.3 shows that most of the respondents agreed and strongly agreed with The Palm seeds will be easy to pick 18.5% (3) & 81.5% (4).

Diagram 4.2.5.4 Respondent This 'Portable Palm Seed Collector' saves storage space.

Figure 4.2.5.4 shows that most of the respondents agreed and strongly agreed with This 'Portable Palm Seed Collector' saves storage space. 16.7% (3) & 53.7% (4) and however as many 16.7% (2) & 13 % (1) disagree and strongly disagree to This 'Portable Palm Seed Collector' saves storage space.

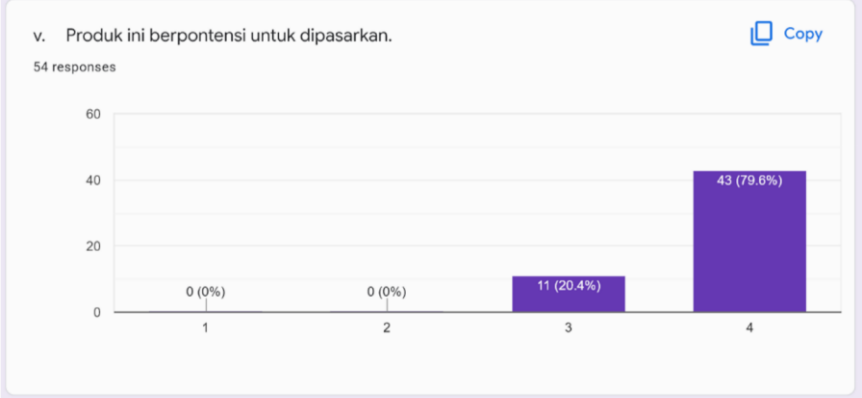
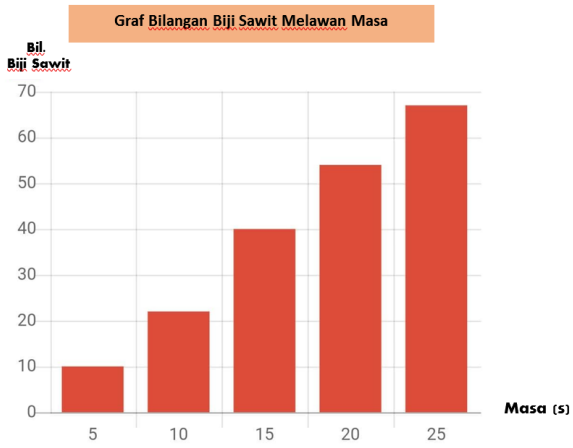


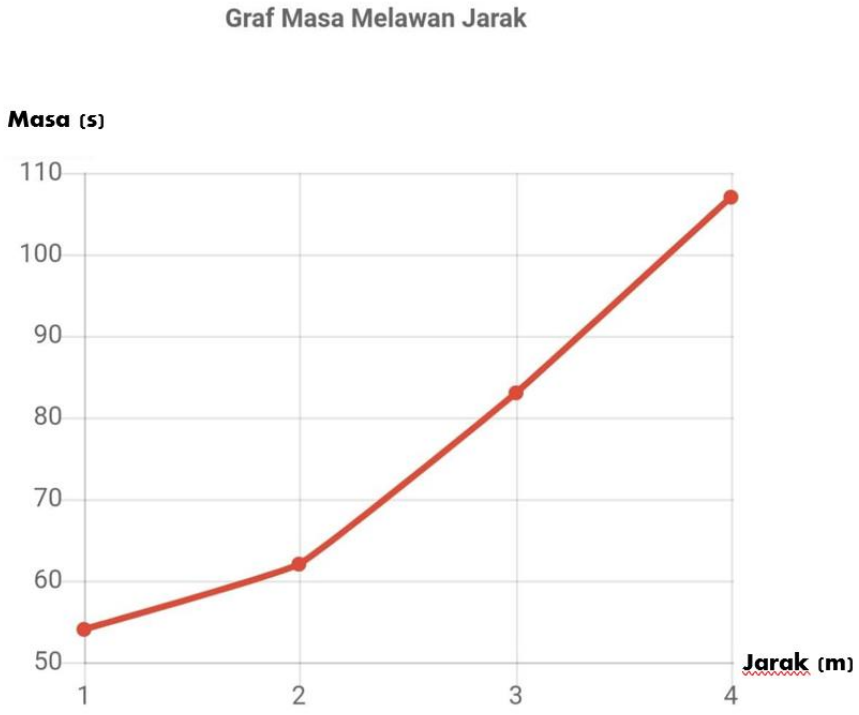
Diagram 4.2.5.5 Respondent This product has the potential to be marketed

Figure 4.2.5.5 shows that most of the respondents agreed and strongly agreed wit This product has the potential to be marketed 20.4% (3) & 79.6% (4).

DATA ANALYSIS PROJECT



The graph above shows the value of palm kernels that can be collected in a certain time in seconds. where we can see that this makes it easier for palm growers to harvest palm seeds quickly compared to using their hands



The graph above shows the time taken to collect oil palm seeds in the specified distance. as we know the oil will be scattered over a long distance and this is an alternative to shorten the time and make it easier to collect the seeds and improve the mood of the oil palm workers in work and reduce their fatigue.

4.3 PROPOSAL

Based on the survey that has been done, we will produce a product that will reduce the risk of the impact of collecting oil palm seeds to palm seed collectors. With the use of just need to be rolled "PORTABLE PALM SEED COLLECTOR" on the area where you want the palm seeds to be collected. Thus, consumers no longer need to use a lot of energy to collect palm seeds by hand. The product that we will produce will speed up the process of collecting palm seeds.

Next, the product that will be produced can facilitate users. By the way the user no longer bending the body to pick it up so that there is no back pain. With that, there are no more health problems to worry about for people who pick palm seeds. Not only that, they can save energy when collecting palm seeds. This can overcome the problem of extreme fatigue when picking palm seeds.

Additionally, we will produce a "PORTABLE PALM SEED COLLECTOR" which can save the palm seeds and the hands of the palm seed collector from insects that are on the palm seeds. This is because we will produce a place to spray pesticides on the “PORTABLE PALM SEED COLLECTOR”. The palm seeds to be collected are safe from destructive insects. It can also save the hands of the picker from being bitten by pests and free from the problem of itchy skin when picking with the "PORTABLE PALM SEED COLLECTOR".

4.4 SUMMARY

In a nutshell, the respondent respond is really good and fast. Respondent replies are also important in order to have a successful project because their perspective can help us achieve the perfect project and help us to fulfill some shortage that are lack in our project. Also, we can do more innovation in our project for PORTABLE PALM SEED COLLECTOR.

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