

2ND EDITION

E-EXTENDED
ABSTRACT

**INTERNATIONAL
AGROTECHNOLOGY
INNOVATION
SYMPOSIUM (i-AIS)**



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INTERNATIONAL AGROTECHNOLOGY INNOVATION SYMPOSIUM (i-AIS)

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ABOUT FACULTY OF PLANTATION AND AGROTECHNOLOGY

The Faculty of Plantation and Agrotechnology was established in 2010 at Universiti Teknologi MARA (UiTM). The mission of the faculty is to play the vital role of producing well-trained professionals in all areas of plantation and agriculture-related industries at national and international levels.

Bachelor of Science (Hons) Plantation Technology and Management is a three-year program that strongly emphasizes the various aspects of Production Technology, Management, and Information Technology highly sought after by the agricultural and plantation sectors. Students in this program will be fully trained to serve as professionals in the plantation sector and related industries. They will have ample opportunities to fulfill important positions in the plantation industry such as plantation executives. This program provides a strong balance of technology and management courses essential for the plantation industry such as management of plantation crops, soil fertility, plantation management operation, plantation crop mechanization, and agricultural precision. As an integral part of the program, students will be required to undergo industrial attachment to gain managerial skills in the plantation industry.

The faculty is highly committed to disseminating, imparting, and fostering intellectual development and research to meet the changing needs of the plantation and agriculture sectors. With this regard, numerous undergraduate and postgraduate programs have been offered by the government's intention to produce professionals and entrepreneurs who are knowledgeable and highly skilled in the plantation, agriculture, and agrotechnology sectors.

PREFACE

International Agrotechnology Innovation Symposium (i-AIS) is a platform to be formed for students/lecturers/staff to share creativity in applying the knowledge that is related to the world of Agrotechnology in the form of posters. This virtual poster competition takes place on the 1st of December 2022 and ends on the 8th of January 2023. This competition is an assessment of students in determining the level of understanding, creativity, and group work for the subject related to agrotechnology and being able to apply it to the field of Agrotechnology. The i-AIS 2022 program takes place from December 1, 2022, to January 8, 2023. The program was officiated by the Dean of the Faculty of Plantation and Agrotechnology, namely Prof. Madya Ts. Dr. Azma Yusuf. The program involves students from faculties of the Faculty of Plantation and Agrotechnology (FPA) and HEP participating in i-AIS 2022, namely, the Faculty of Education and Pre-Higher Education. This program involves the UiTM student and some of the non-UiTM students which come from the international university and the local university. Two categories are contested, namely UiTM and non-UiTM. To date, students from these programs have shown remarkable achievements in academic performance and participation in national as well as international competitions.

This competition is an open door for the students and lecturers to exhibit creative minds stemming from curiosity. Several e-content projects have been evaluated by esteemed judges and that has led to the birth of this E-Poster Book. Ideas and novelties are celebrated, and participants are applauded for displaying ingenious minds in their ideas.

It is hoped that such an effort continues to breed so that there is always an outlet for these creative minds to grow.

Thank you.

Dean
On behalf of the Organizing Committee
Conference Chair
Universiti Teknologi MARA
Faculty of Plantation and Agrotechnology
<http://fpa.uitm.edu.my>

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USED OF SEMI-MANUAL HARVESTER IN HARVESTING CASSAVA

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ABSTRACT - Harvesting plays a critical role in the cassava production value chain. cassava harvesting options is necessary to facilitate the proper adaption and uptake of improved harvesting methods applicable to farmers. Earlier attempts at mechanising cassava harvesting have been challenged mainly by inappropriate method of planting, field topography and scale of cultivation. The use of machinery in plantation are needed to improve yield and reduce the labour shortage problem in plantation sector.

Keywords: cassava, semi-manual harvester, manual harvester

INTRODUCTION

Cassava (*Manihot esculenta* Crantz) is a perennial woody shrub native to Latin America (Bellotti et al., 2011; El-Sharkawy, 2012) and is primarily grown as an annual crop in the humid tropics. The crop is an essential source of food and income throughout the tropics providing livelihood for countless farmers, processors and traders worldwide. Almost 60 percent of world pro-duction is concentrated in five countries Nigeria, Brazil, Thailand, Indonesia and Malaysia.

The most difficult operation in cassava production is harvesting. This is so because cassava is a highly perishable crop and begins to deteriorate as early as 1–3 days after harvest. It is therefore important to harvest cassava at the right time and in the proper manner. This situation tends to increase the total cost of production because more farm hands are usually required to harvest in order to meet industrial and local demands coupled with an increase in cassava prices on the market.

Manual harvesting is slow and associated with drudgery and high root damage, especially under arid conditions. Semi-manual harvesters are harvesting aids that usually adopt the lever principle to ensure that little human effort is used in uprooting the cassava. Various harvesting aids can be found in different cassava growing regions across the globe.

Semi-manual harvester is one of the simple technologies that can be used and it can give huge benefits to the harvesting process. Harvesting process need to be done quickly and in smooth process to ensure the quality of the yield and can increase the yield in the farm. The usage of technology is very important in farming sector nowadays.

MATERIAL AND METHOD

Material Used

1. Stopwatch
2. Gloves
3. Heartbeat rate apps
4. Semi-manual harvester

Method Used

- 1) The manual harvesting method being used. Hand pull techniques being used. The heart beat rate (BPM) being recorded for harvesting one cassava tree. Time taken for harvesting one tree being recorded by using smartwatch.
- 2) The semi-manual harvesting method being used. This method used the tools as lever to dig and pull out the cassava. The weight of pulling out the cassava from soil had greatly reduced since there are lever used at the tools. The heart beat rate (BPM) being recorded for harvesting one cassava tree. Time taken for harvesting one tree being recorded by using smartwatch.

RESULTS AND DISCUSSION

The findings and results of the work should be explicitly described and illustrated. Subtitles should be used when necessary. Supporting figures, tables and images of the results may also be included in the extended abstract.

The used of semi-manual harvester give more advantage compared to traditional way or using the manual harvester. It can save more time and can reduce the use of energy during harvesting. More improvement can be done to make the harvesting process of cassava much easier. Semi-manual harvester can reduce the number of labour and can reduce the labour cost at the same time. It is more efficient to use compared traditional way of harvesting cassava. When using the manual harvester technique, it way harder and time consume. Many labours are needed and more cost will be used. In the cassava farm, not many workers are needed since the price of cassava are not that high. So, the semi-manual harvester is really good additional help to reduce labour cost in the field.

When using the manual harvesting method, the use of energy is really big. The heart beat increase to 160 BPM. The time taken are 1.40 minutes for one cassava tree. It took a lot of time since it is hard to pull the cassava by using bare hand

Compared to semi-annual harvester, the results were completely different where the heart beat rate are 120 BPM much lower than manual harvester. Time taken for harvesting are 0.40 minutes which are faster compared to the manual harvester.

Table 1 shows the result of heartbeat rate and time taken in minutes of harvesting one cassava tree by using manual and semi-manual harvester.

Table 1: Result of using manual and semi-manual harvester

Method	Heartbeat Rate (minutes)	Time (minutes)
Manual harvester	150 BPM	1.40 minutes
Semi-manual harvester	120 BPM	0.40 minutes

CONCLUSION

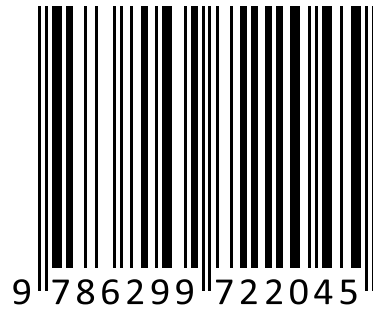
Best efficiency of manual harvesting is achieved when the upper cassava plant biomass is removed or coppiced before harvesting. Semi-manual harvesters are harvesting aids that usually adopt the lever principle to ensure that little human effort is used in uprooting the cassava. It is very important in that removal of the source of waist pain prolong the life span of the farmer. It also enhances increase in output of the farmers. This by implication shows that using the lifter reduces the stress involved in harvesting cassava.

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