4TH EDITION

E-EXTENDED

ABSTRACT

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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THEOBROMA TECHNOLOGY (DRYER)

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ABSTRACT - First and foremost, the purpose of this innovation is to build a technology which can help in addressing the manpower shortage, reducing cost and time of operation for cocoa seed drying and making the post-harvest processing more easy. In order to get the idea to innovate this technology, our group used qualitative method for research. Qualitative research - involving the thorough use and gathering of a wide range of empirical resources, including case studies, personal experiences, and observational studies that explain both routines and troubling situations in people's lives. Therefore, the technique for drying cocoa beans is based on the idea of forced convection for heat transmission. Convection is the process of transferring heat inside a fluid. A hot, dry gas (often air) is utilized to both provide the heat required for evaporation and to remove water vapor from an object's surface. In conclusion, the development of new technology has made it easier to manage the post- harvest processing of cocoa. As well as helping to solve the issue of a labor shortage, technology can also solve other issues that arise in the cocoa processing industry. Due to Theobroma technology's (dryer's) ability to take the place of human labor, a lack of labor is not a concern now. Additionally, this cutting-edge technology can expedite and save time during the post-harvest processing of cocoa goods.

Keywords: dryer, qualitative, convection heat, post-harvest processing.

INTRODUCTION

A new or better product or method with significantly different technological properties from the competition is considered an innovation in technology. New items or procedures that have been commercialized that use a technological innovation are known as implemented products. For this project, our group has decided to innovate a technology related to cocoa post-harvest technology which is Theobroma Technology (Dryer). The objective of this innovation is to build a technology which can help in addressing the manpower shortage, reducing cost and time of operation for cocoa seed drying.

Tropical plants native to the equatorial regions of the Americas include *Theobroma cacao*, commonly referred to as cocoa. A variety of culinary and beverage products are made from the seed, which is high in fat. For instance, cocoa butter, cocoa powder, chocolate, cocoa beverages, and cocoa liquor. Furthermore, cocoa is largely grown to supply the cacao and chocolate industries with the raw materials they need to make products with cocoa as an ingredient. We chose cocoa since the crop needs technology for operation that assists in resolving manpower shortage, time-consuming work, and high maintenance costs. This decision is in line with innovation for cocoa post-harvest technology.

METHODOLOGY

Methodology (Research)

Qualitative research - involving the thorough use and gathering of a wide range of empirical resources, including case studies, personal experiences, and observational studies that explain both routines and troubling situations in people's lives.

Methodology (Design)

The technique for drying cocoa beans is based on the idea of forced convection for heat transmission. Convection is the process of transferring heat inside a fluid. A hot, dry gas (often air) is utilized to both provide the heat required for evaporation and to remove water vapor from an object's surface.

RESULTS AND DISCUSSION

Detail of innovation

2.3 Storage Box - use to store cocoa beans; will be use at full capacity/maximum weight
2.4 Spinning Rod - to spin the cocoa beans inside the storage
2.5 Fan - use to exchange heat/air inside the storage box

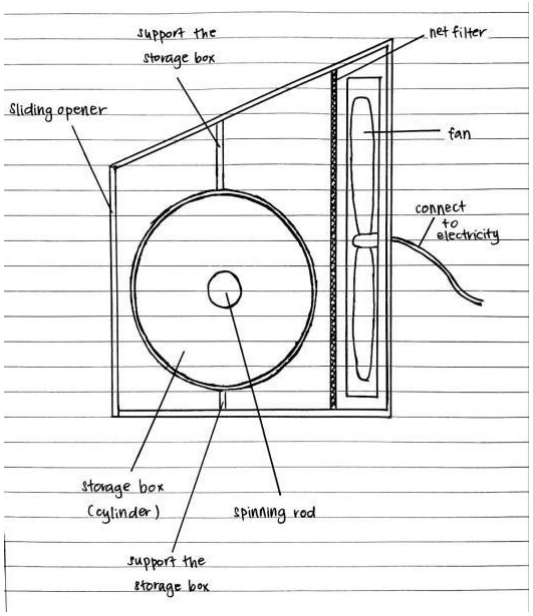

Figure 1 : Side view of Theobroma technology (dryer)

How it work:

1. Hot air will be put into the storage box first.
2. To prevent the cocoa beans from cracking, the spinning rod will slowly rotate the storage box.
3. The fan will automatically turn on when the spinning rod rotates.

Inspired technology

Figure 2:Sun-drying Method

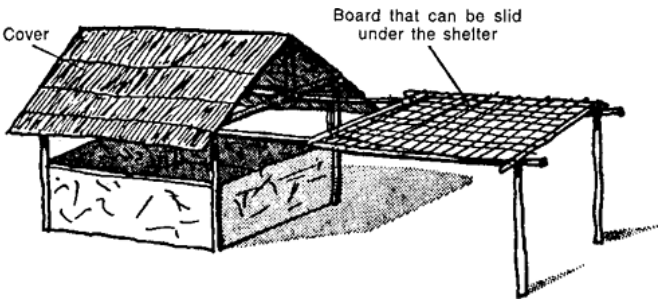

Figure 3:Sliding Tray Drier Method

Innovation Technology Theobroma Technology (dryer)

CONCLUSION

In conclusion, the development of new technology has made it easier to manage the post-harvest processing of cocoa. As well as helping to solve the issue of a labor shortage, technology can also solve other issues that arise in the cocoa processing industry. Due to Theobroma technology's (dryer's) ability to take the place of human labor, a lack of labor is not a concern now. Additionally, this cutting-edge technology can expedite and save time during the post-harvest processing of cocoa goods.

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