

2ND EDITION

E-EXTENDED
ABSTRACT

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



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INTERNATIONAL AGROTECHNOLOGY INNOVATION SYMPOSIUM (i-AIS)

19 June 2023

Faculty of Plantation and Agrotechnology UiTM Cawangan Melaka Kampus Jasin

Published 2023

Faculty of Plantation and Agrotechnology

Universiti Teknologi MARA Cawangan Melaka Kampus Jasin

77300 Merlimau Melaka.

E-EXTENDED ABSTRACT of the INTERNATIONAL AGROTECHNOLOGY INNOVATION SYMPOSIUM (i-AIS) (2nd EDITION)

Mode of access Internet

<https://sites.google.com/view/ais2023/publication>

Perpustakaan Negara Malaysia Cataloguing -in – Publication Data

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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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BANANA BARK FIRE STARTER

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ABSTRACT - The main purpose that we have done in this research is to reduce the waste in the banana industry. Based on research almost 60% of banana biomass was left as waste only. In this paper we will focus of the use of banana bark to be change into fire starter. Along the process we have combine it with the wood particles before becoming fire starter. The method that will be use in producing banana bark fire starter is by using the pellet machine to make sure the combination of banana bark and wood particles become more compact. Banana bark has high content of cellulose which about 67.97% and cellulose it is considered as flammability properties that use in many applications in the world. The development of fire starter based on banana bark is cost effective because in producing it we completely used waste material that we can get from banana industry and wood industry. Many innovations being develop in agriculture industry but without a suitable cost and price the product will just be the innovation without going into the industry. In spite of that, we hope that our product will successfully enter the innovation industry in agriculture and contribute a lot of positive effect onto it.

Keywords: innovation, banana bark, wood particles, cellulose, fire starter.

INTR0DUCTION

The scope of this study is mainly based on banana bark. The main objective of this paper is to suggest the way in reducing banana waste in banana industry. Based on research banana bark has high content of cellulose which is good for burning. On top of that by doing an analysis, banana bark has been chosen to create an innovation which is a fire starter. The fire starter nowadays has been used widely as important product especially toward the traveler, people who love campsite and love using the wood stove. In this study, the fire starter consists of two main material which is the banana bark that has going into several process and cut into small pieces and the wood particle which is to increase an optimum burning combination. Throughout the process combining both of that material, we will be used the pellet machine to make sure that two kind of material blend in well and producing a compact fire starter as our valuable product (Bajo & Acda, 2017).

MATERIAL AND METHOD

The material being used in this innovation is banana bark and wood particles. In this study, we will mix dry banana bark with wood particle to get a compact fire starter. Besides that, we need prepare raw material, including estimating how many uses of dried banana bark and wood particle will go into the pellet machine and to prevent any mechanical issues, the machine is being given the proper quantity. Cut the dry peel into small pieces to get the best product of pellet shape. However, before insert the dry peel into the machine, it should adjust the press roller screw with wrench because to get a gap between the press rollers. The gap between press roller is important because if there is small gap, that can damage the press roller and millstone. Moisture of the pellet can be adjusted according to the requirement, moderated moisture content will be used in this study because when the moisture percentage is 10-15% it will be easily to form into pellet and best formability (Ungureanu, 2019). The product will be flow into the bucket through outlet.

RESULT AND DISCUSSION

Pellet produces by the pellet machine show that smaller particles of a larger surface area during the densification process will affect the density and durability of the pellets are often inversely related to the particle size of banana bark and wood particle. In studies on alfalfa according to Bajo & Acda, 2017, it was found that medium or fine sized materials in the compaction process, they have larger areas of moisture during steam conditioning, which results in increased starch gelatinization. In the size of pieces dry banana bark we form it into 4-6 cm and wood particles 3-4 cm to get an optimize in compress between these two materials. Banana bark consist of biomass contain 300-400% of carbon dioxide of natural gas per unit energy produced and good option to mix with wood particle to get optimum burning when our product was produced (Maharani Dian Permanasari, 2022). Initially, to create fire starter base on banana bark that come from the research that we do, banana bark has high content of cellulose (Satibi, 2010). In raw with untreated banana bark, the content of cellulose, hemicellulose and total lignin are at 67.97%, 18.9%, and 5.4% respectively (Binling Ai, 2021). Cellulose is the main component of banana bark, it is a natural, renewable, and biodegradable polymer that can be used in many applications such as raw materials for construction, paper, insulation materials, adsorption materials and environmental treatment (Nguyen Thi Thuy Van, 2022). In our innovation we will use the combination of two material which is banana bark and wood particles to produce our fire starter.

Table 1: Mixture of Fire Starter

Material	Percentage that involved in fire starter (%)
Banana bark	72.6
Wood particles	27.4



Figure 1: Banana Stem



Figure 2: Fresh Banana Bark



Figure 4: Dry Banana Bark Cut into Small Pieces



Figure 5: Banana Bark Before



Figure 6: Wood Particles Compaction Before Compaction

CONCLUSION

The development of fire starter from banana bark could help reduce the amount of waste material from dead banana tree, that are thrown away in banana industry. Fire starter can be applied in many applications, such as in heating furnaces, boilers, pellet stoves, traditional stoves, and others heating systems. Many innovations have been done in this industry but the innovation that going into the agriculture industry is quite low, that was the main reason why we choose banana bark that have cellulose to be enhance being fire starter with an effective cost (K. Berhe, 2010). By that if we just make a lot of innovations, we can keep them in the book of innovation, not for use in the plantation.

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(i-AIS) (2nd EDITION)

e ISBN 978-629 -97220-4-5



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