



اَبُو سَيِّدِي تَكُونُ لِي مَعَاذًا
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MARA

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Kampus Bukit Besi

TITLE:

**THE GROWTH TRIAL OF SPINACH USING TEA-CHAR
PREPARED AT THE BEST CARBONIZATION
TEMPERATURE**

SUPERVISOR:

IR. MOHD SAUFI BIN MOHD ZAINI

WRITTEN BY:

AESYA UMAIRAH BINTI SAIFUL NIZAM

**SCHOOL OF CHEMICAL ENGINEERING
COLLEGE OF ENGINEERING**

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AUTHOR'S DECLARATION

“ I hereby declare that this report is the result of my own work except for quotations and summaries which have been duly acknowledged.”

Name of Student	:	Aesya Umairah Binti Saiful Nizam
Student I.D. No.	:	2022473492
Programme	:	Diploma in Chemical Engineering
College/School	:	College of Engineering/School of Chemical Engineering
Signature of Student	:
Date	:	February 12, 2025

ABSTRACT

Tea-char is a specific type of soil amendment that is produced by pyrolysis method in limited-oxygen environment. It is to enhance soil fertility, nutrient retention and water-holding capacity. This research aims to analyzing the effect of tea-char produced at different carbonization temperatures which is at 400°C, 500°C, and 600°C on its benefit on soil amendment and the impacts of different composition of tea-char and soil on plant growth development. Elemental Analysis (EA) is conducted on the tea-char sample from the pyrolysis process to obtain precise data on the component content in tea-char produced. The result shows the higher carbonization temperature, the higher carbon content within the tea-char. While nitrogen and hydrogen content decrease with higher temperature because of volatilization of organic compound. Also, plant growth conducted to evaluate the efficiency of tea-char as a soil amendment and the result show that tea-char alone is insufficient to support plant growth that stop the plant growth. However, if tea-char is combined with the soil it will significantly enhance the soil health and the plant growth development with the best efficiency compared to soil and tea-char alone. The significant impact is from the tea-char ability to increase soil fertility, nutrient retention and water retention. These researches found that tea-char at 400°C offer the most sustainable and effective soil amendment compared to 500°C, and 600°C. Recommendation to further studies this research is by conducting a lasting long-term effect of tea-char and conduct more detailed chemical properties of tea-char to promote a sustainable agriculture practice in the future.

TABLE OF CONTENTS

	Page
AUTHOR'S DECLARATION	2
ABSTRACT	3
TABLE OF CONTENTS	4
1.1 Introduction	6
1.2 Effect of Tea-char at Different Carbonization Temperature on its Property and The Effect of Different Composition Of Tea-char	7
1.2.1 Elemental Analysis (EA) of Tea-char at Different Carbonization Temperature	7
1.2.2 Effect Of Different Composition Tea-Char and Soil on Plant Growth	8
1.3 Problem Statement	8
1.4 Objectives	9
1.5 Scope of Study	9
 CHAPTER TWO METHODOLOGY	 10
2.1 Introduction	10
2.2 Materials	11
2.3 Method/synthesis	12
 CHAPTER THREE RESULT AND DISCUSSION	 14
3.1 Introduction	15
3.2 Data Analysis	15
3.2.1 Elemental Analysis (EA)	15
3.2.2 Plant Growth Experiment	17
 CHAPTER FOUR CONCLUSION AND RECOMMENDATION	 21
4.1 Conclusion	21
4.2 Recommendation	21

