

**DEVELOPMENT OF AN AUTOMATED POLYBAG FILLING  
MACHINE FOR SMALL-SCALE AGRICULTURE**



**Submitted to Comply with Terms of Study Completion in Mechanical  
Engineering Production and Maintenance Study Program  
Mechanical Engineering Department by**

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**STATE POLYTECHNIC OF SRIWIJAYA PALEMBANG  
2025**

## APPROVAL SHEET

### DEVELOPMENT OF AN AUTOMATED POLYBAG FILLING MACHINE FOR SMALL-SCALE AGRICULTURE



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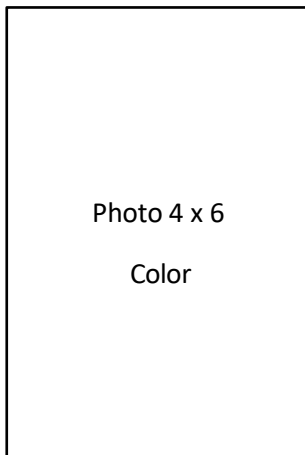
## STATEMENT OF INTEGRITY

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I declare that my final project is my own work and is accompanied by a team of supervisors and is not the result of plagiarism. If in the future elements of plagiarism are found in my final project, I am willing to accept academic sanctions from Sriwijaya State Polytechnic.

Thus, I make this statement in a state of consciousness and not forced.



Palembang, Desember 2025

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## ACKNOWLEDGMENTS

I give all my praise and gratitude to God Almighty for his mercy and grace, so that I can finish this thesis well. This thesis entitled " Development of An Automated Polybag Filling Machine for Small-Scale Agriculture"

I realize that the completion of this thesis cannot be separated from the support and assistance from various parties. Therefore, with all due respect, allow me to express my sincere thanks to:

- Dr. Nur Faiqa binti Ismail as the main supervisor who has provided invaluable guidance, direction, motivation, input, criticism and constructive suggestions. Thank you for your patience and time spent guiding me at every stage of preparing this thesis.
- Dr. Adian Aristia Anas as the main supervisor who has provided invaluable guidance, direction, motivation, input, criticism, and constructive advice. Thank you for your patience and time spent guiding me through every stage of writing this thesis.
- A big thank you to my parents, who always provide endless support, encouragement, prayers and love.

Finally, I realize that this thesis is still far from perfect. Therefore, I am very open to constructive criticism and suggestions for future improvements. Hopefully this thesis can provide benefits for readers and all interested parties.

## **ABSTRACT**

### **DEVELOPMENT OF AN AUTOMATED POLYBAG FILLING MACHINE FOR SMALL-SCALE AGRICULTURE**

**By**

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**Desember 2025**

This study presents the development of an automated polybag filling machine tailored for small-scale agriculture. The machine is designed to reduce manual labour, improve efficiency, and ensure consistent media filling. It incorporates an Arduino-based control system, screw conveyor, ultrasonic sensor, and AC motor. The design process involved modelling with Autodesk Inventor, prototype assembly, and system testing. Results show a significant reduction in filling time and labour cost, with improved accuracy and uniformity compared to manual methods. The machine successfully supports higher productivity while reducing physical strain on farmers. Overall, this project offers a practical and scalable solution to enhance nursery operations and promote more sustainable agricultural practices.

Keywords: Sand polybag filling machine, Small-scale agriculture, Automation in agriculture, Arduino, Ultrasonic sensor.

## TABLE OF CONTENT

<b>APPROVAL SHEET</b> .....	<b>ii</b>
<b>STATEMENT OF INTEGRITY</b> .....	<b>iii</b>
<b>ACKNOWLEDGMENTS</b> .....	<b>iv</b>
<b>ABSTRACT</b> .....	<b>v</b>
<b>LIST OF TABLES</b> .....	<b>viii</b>
<b>TABLE OF CONTENT</b> .....	<b>vi</b>
<b>LIST OF FIGURES</b> .....	<b>ix</b>
<b>CHAPTER I INTRODUCTION</b> .....	<b>1</b>
1.1 Project Background .....	1
1.2 Problem Statement .....	1
1.3 Objectives of the Project.....	3
1.4 Scope of the Project .....	4
1.5 Significant of the Project .....	5
<b>CHAPTER II LITERATURE REVIEW</b> .....	<b>8</b>
2.1 The Technology Automatic Polybag Filling Machine .....	8
2.1.1 Basic Explanation Automatic Polybag Filling Machine .....	9
2.1.2 Literature Review of Automatic Polybag Filling Machine .....	9
2.1.3 Summary Of Automatic Polybag Filling Machine .....	10
2.2 Design Considerations .....	10
2.3 Mechanical Design .....	11
2.4 Propose of Automatic Polybag Filling Machine for Small Scale Farming.....	11
2.4.1 Increased Work Efficiency .....	12
2.4.2 Save on Labor and Operational Costs .....	12
2.4.3 Increase Productivity .....	12
2.4.4 Improve Crop Yield Quality .....	12
2.4.5 Reduced Physical Fatigue.....	13
<b>CHAPTER III RESEARCH &amp; DESIGN METHODOLOGY</b> .....	<b>14</b>
3.1 Introduction .....	14
3.2 Project Flowchart .....	14
3.3 3-Dimensional Model of the Polybag Filling Machine.....	16
3.4 Fabrication Process of the Polybag Filling Machine.....	17
3.4.1 Control Valve or Screw Conveyor .....	17
3.4.2 Machine Frame .....	18
3.4.3 Motor AC.....	18
3.4.4 Arduimo Uno .....	18
3.4.5 LCD 1602 Char.....	19
3.4.6 Power Supply 5V .....	20
3.4.7 Weight Sensor.....	21
3.4.8 Relay 5V .....	22
3.4.9 Sensor infrared.....	23
3.5 System Architecture and Operation.....	24

3.5.1 System Flowchart.....	24
3.5.2 Block Diagram .....	25
3.5.3 Schematic Diagram .....	26
3.5.4 System Coding and Integration.....	26
<b>CHAPTER IV RESULT AND DISCUSSION .....</b>	<b>27</b>
4.1 Automatic Polybag Filling Machine Manufacturing .....	27
4.1.1 Mechanical Component Manufacturing .....	27
4.1.2 Electrical Component Assembly .....	29
4.2 System Integration and Control Systems.....	30
4.2.1 Control System Design Using Arduino .....	30
4.2.2 Sensor Calibration and Actuator Setup.....	32
4.3 Mechanical Drawing .....	33
4.4.1 Hopper for Conveyor .....	37
4.4.2 Pipe for Conveyor .....	38
4.4.3 Stell Tube Frame .....	39
4.4 Testing and Calibration Process .....	41
4.5.1 Accuracy of Filling .....	41
4.5.2 Time Efficiency Test .....	42
<b>CHAPTER V CONCLUSION .....</b>	<b>44</b>
5.1 Summary of Key Findings .....	44
5.2 Evaluation of the Proposed Solution .....	44
5.3 Future Work and Recommendation.....	45
<b>REFERENCES .....</b>	<b>x</b>

## LIST OF TABLES

<b>Table 4. 1. System Component.....</b>	<b>32</b>
<b>Table 4. 2. Accuracy of Filling .....</b>	<b>41</b>
<b>Table 4. 3. Time Efficiency Test .....</b>	<b>42</b>

## LIST OF FIGURES

Figure 1. 1 Graph of Comparison.....	2
Figure 3. 1 Block Diagram.....	25
Figure 3. 2. Flowchart.....	14
Figure 3. 3 Growing Media Tank.....	17
Figure 3. 4 Screw Conveyor .....	17
Figure 3. 5 Machine Frame .....	18
Figure 3. 6 Motor AC .....	18
Figure 3. 7 Arduimo Uno .....	18
Figure 3. 8 LCD 1602 Char .....	19
Figure 3. 9 Power Supply 5V.....	20
Figure 3. 10 Sensor Weight.....	21
Figure 3. 11 Relay 5V .....	22
Figure 3. 12 Sensor Infrared .....	23
Figure 3. 13 Inventor.....	16
Figure 3. 14 Figure all view .....	17
Figure 3. 15 Circuit Diagram .....	26
Figure 4. 1 Main Frame Structure.....	27
Figure 4. 2 The hopper.....	28
Figure 4. 3 Polybag Holder.....	28
Figure 4. 4 Cable Layout .....	29
Figure 4. 5 Program Trial.....	30
Figure 4. 6 Program Arduino .....	31
Figure 4. 7 Hopper for Conveyor.....	37
Figure 4. 8 Pipe for Conveyor .....	38
Figure 4. 9 Stell Tube Frame .....	39
Figure 4. 10 Accuracy of Filling.....	42
Figure 4. 11 Time Efficiency .....	43