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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APPROVAL SHEET

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

FINAL PROJECT

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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.

Photo 4 x 6

Color

Palembang, Desember 2025

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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:

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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
BINTANG ANANDA SAPUTRA
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.

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