DESIGN, FABRICATION AND PERFORMANCE EVALUATION OF SQUASH (*Cucurbita maxima L.*) REFUGE SHREDDER

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(Major in AB Machinery and Power Engineering)

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ABSTRACT

DE GUZMAN, PRINCESS ERJEN R. and **DELA CRUZ, JHANICA S.** Department of Agricultural and Biosystems Engineering, College of Engineering, Central Luzon State University, Science City of Muñoz, Nueva Ecija, DECEMBER 2023. **DESIGN, FABRICATION AND PERFORMANCE EVALUTATION OF SQUASH (*Cucurbita maxima L.*) REFUGE SHREDDER.**

Adviser: **JOHN VINCENT A. NATE, M.Sc.**

The thesis paper focuses on the design, fabrication, and evaluation of a squash (Cucurbita maxima L.) refuge shredder machine, aiming to reduce the time and labor required for shredding and grating agricultural waste, specifically squash, to produce fermented solution fertilizer. The study utilized an input-process-output model and conducted a preliminary testing to evaluate the functionality of the shredder, followed by adjustments and repairs. Performance evaluation of the machine was conducted, assessing shredding capacity, efficiency, unshredded material percentage, and power consumption at different speed levels (1100rpm, 1400rpm, 1700rpm, 2000rpm). The study also considered a partial budget analysis to compare the added income from using the machine versus old method of operation. The proposed shredder machine consisted of five major components: feeding hopper, shredding chamber, meal outlet, transmission assembly, and frame. The general objective was to design, fabricate, and evaluate the squash shredder.

The study utilized a completely randomized design (CRD) for statistical analysis, and analysis of variance (ANOVA) was employed to compare treatment means. The findings indicated significant differences in shredding capacity, shredding efficiency, and power consumption across different rotational speeds of the shredder, with the highest efficiency observed at 1700rpm and 2000rpm. The performance of the machine was also

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