WATERMELON RIPENESS DETERMINATION USING ACOUSTIC METHOD AND FUZZY LOGIC

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ABSTRACT

A non destructive classification watermelon ripeness using acoustic wave and fuzzy logic is designed in this research. The watermelon weight and propagation frequency of acoustic wave inside watermelon are defined as the input variables. Percentage of watermelon ripeness is defined as the output variable. Acoustic waves were measured by knocking and tapping with and without test base and the output sound is detected by using microphone. The fuzzy rules are designed based on interviewing human experts. Some samples are tested using this system confirmed that, fuzzy logic is able to determine watermelon ripeness. From the findings, it shows that the best model produced an accuracy of 91.38%.

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CHAPTER 1

INTRODUCTION

1.0 BACKGROUND OF THE RESEARCH

Watermelons have its own market to commercialize [1]. Seeing it as the most popular and have its own bright future to sell at any country, watermelon is also been grown in Malaysia [2]. One of the most important objectives in the food industry is that of achieving a uniform quality both from raw materials and also from the final product. The main concerns of the food industry are the systematic determination of fruit ripeness under harvest and post-harvests condition, because variability in ripeness is perceived by consumers as lack of quality [3].

Watermelon are being planted either through hybrid seeds or open pollination of pure seeds. A nursery is required to ensure high germination and seedling establishment. However, direct planting can also be done using higher rate of seeds [23]. Conventionally, maturity of watermelon is decided by counting the numbers of days after the watermelon is planted. For seedless watermelon, harvesting would take after around 65 - 70 days where mostly all the watermelons are matured [24].

1.1 PROBLEM STATEMENTS

FAMA realized that the main problem is comes from customer needs of fresh and matured watermelon. To overcome this, more research methods were created in order to find the matured watermelon. From the common method, the accuracy was obtained by using destructive method. This can be proven by cutting up that watermelon and find out the ripeness by looking or taste it. This method cannot be used commercially because of if the customer does not satisfy, it would be wasted