AUTOMATED RUBBER SEED CLONES IDENTIFICATION USING QRE1113 AND ARDUINO UNO

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ABSTRACT

This project is about to identify and differentiate types of rubber seed clones. Rubber seed clones differentiator consists of Arduino UNO as a microcontroller and QRE-1113 as a sensor. Reflectance, the proportion of light striking a surface which is reflected off it, produced by rubber seed clones can be verified by these two types of sensor.

In this project, there are five types of rubber seed clones used which are RRIM 2002, RRIM 2015, RRIM 2020, RRIM 2023 and RRIM 2024. Since the rubber seeds produce different reflectance intensity at different angle, there are three sensors used in this project to taken the reading from three different angles. There are 30 samples reading was taken from 5 difference clones. The readings from sensor, in voltage form, will be shown on the LCD display.

For analysis part, this project goes through the one-way analysis of variance (ANOVA) to measure the mean, median, standard error minimum value and maximum value. The Microsoft Office Excel was used to construct the error plot from the value got at one-way analysis of variance (ANOVA).

TABLE OF CONTENT

CHAPTER 1

INTRODUCTION

1.1 INTRODUCTION

First introduced natural rubber (rubber tree) in Malaysia was in 1877 when British brought 22 seedlings from 70, 000 seedlings that collected by Sir Henry Wickham in 1876 [7]. These 22 seedlings were planted at Singapore Botanical Garden and did not give much impact in Malaysian plantations. Rubber tree was only commercialized in 1888 when Henry Ridley was a Director of the Singapore Botanical Gardens. Firstly, rubber tree was planted at the Residency gardens at Kuala Kangsar, inspiration by the Resident at that time, Hugh Low [7].

The rubber industry has transformed into multi-billion industries and developed rapidly since Malaysia achieved independent from British [6]. Malaysian Government also invests in research and development through Malaysian Rubber Board and Rubber Research Institute if Malaysia (RRIM) to develop the best clones that produce higher quality and higher quantity of latex. There are more than 30 clones of rubber tree in Malaysia.

There are several ways to identify between the clones such as size of rubber seed, shape of rubber seed, and also wavelength and texture of rubber seed through the image processing and wavelet technique. The clones are differentiate using the rubber seed because the rubber seed is the important part for breeding of plant and seeds also act as finger print for rubber clones.