

UNIVERSITI TEKNOLOGI MARA

**DEVELOPMENT OF REFLECTANCE
INDICATOR USING OPTICAL
SENSING ON LATEX**

FARIDATUL AIMA BINTI ISMAIL

MSc

May 2017

ABSTRACT

Rubber breeding program is initiated by Rubber Research Institute of Malaysia for focusing on the best clone production which relies on the quality of the latex yielding for both latex and latex timber clones and known as RRIM clone series. Even though RRIM had overcome the problem to increase the yield of latex, but the difficulties in differentiating the clone series still prevailing due to lack of information in reference books and required skill from the expertise. Therefore, the objectives are to design measure and discriminate the latex of RRIM clones using optical sensing indicator via reflectance technique. This indicator used Near-Infrared LED to transmit the light and the photodiode will received the reflectance light and converted into voltage. The measured voltage then analyzed using SPSS tool to investigate the discrimination between clones. Based on the analysis, there are three clones (RRIM2002, 2007 and 3001) are distinguished between each other with p-value 0.000. However RRIM2008 and 2014 not distinguished amongst others and could be seen as one group. Yet these two groups are discriminated between each other. By completing the analysis, only four clones were decided to use as an input parameter for ANN toolbox. The best optimized hidden layer size at ± 0.5 fixed thresholds was 25 neurons with the testing accuracy of 74.4% and the true positive rate of this case is 73.9% (RRIM2002), 72.2% (RRIM2007), 61.4% (RRIM2008) and 94.1% (RRIM3001). Based on the findings, the objectives to measure latex via reflectance, identify and discriminate the selected RRIM clones series was successfully achieved.