Prasertsa Yakham 2012: Application of SMMS Satellite Imagery to Estimate Age of Rubber Plantation. Master of Engineering (Civil Engineering), Major Field: Civil Engineering, Department of Civil Engineering. Thesis Advisor: Associate Professor Deeboon Mathakullachat, Ph.D. 127 pages.

This research proposes a study on the potential application of satellite images SMMS, a new remote sensing satellite for the prediction of rubber trees' age. Normalize Differenced Vegetation Index (NDVI) and field investigations were used for estimation of rubber trees' age.

Based on the test results of the studied areas that composed of 6 districts in Sakhon Nakhon Province, the relationship between age and perimeter of the plantations can be observed. The plantations with the age less than 15 years old revealed that their perimeters increased rapidly as the age increased. However, growth rate of their perimeters tends to decrease as the rubber trees are older than 15 years old. As the result of the findings, the relationship of age and perimeter of the rubbers can be expressed in a formed of logarithm function: $y = 19.91 \ln(x) - 2.132$ with an R^2 of 0.731.

The study of a relationship between age of rubber and NDVI and corrected NDVI revealed that the rubber trees younger than 10 years showed the increases of NDVI with the trees' age. When the rubber trees are older than 10 years, both values of NDVI and corrected NDVI tend to have minimal change of 0.550 to 0.659 and 0.709 to 0.818 respectively. Therefore, the age of rubber trees at 10 years old are proposed as a preliminary boundary to subdivide the ranges of rubber ages.

The NDVI values can be accurately used for age prediction of the rubber trees. of old, respectively. For this study, both uncorrected and corrected values of NDVI of rubber trees less than 5, 7 and 10 years were proposed as 0.409 0.477 0.592 and 0.527, 0.608, 0.746, respectively with reliability more than 70%.

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