AIRBORNE HYPERSPECTRAL IMAGING FOR SOIL NUTRIENT VARIABILITY MAPPING IN UiTM PERLIS RESEARCH STATION

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Tuan/Puan,

LAPORAN AKHIR PENYELIDIKAN `AIRBORNE HYPERSPECTRAL IMAGING FOR SOIL NUTRIENT VARIABILITY MAPPING IN UiTM RESEARCH STATION´

Merujuk kepada perkara di atas, bersama-sama ini disertakan 3 (tiga) naskah Laporan Akhir Penyelidikan bertajuk ` AIRBORNE HYPERSPECTRAL IMAGING FOR SOIL NUTRIENT VARIABILITY MAPPING IN UiTM PERLIS RESEARCH STATION' untuk makluman pihak tuan/puan.

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ABSTRACT

The application of Airborne Imaging Spectrometer for Different Application (AISA) is a hyperspectral sensing to improve land management. Result from airborne hyperspectral imaging provide unprecended detail in mapping soil nutrient status. Such maps may indicate to farm manager the existence of localized problems of soils, pests or fertility and quantity of the effects of those problems. The study area was undertaken to determine the status of soil nitrogen (N), phosphorus (P) and potassium (K) variability in the UiTM Research Station Area. The study area covers 52.4 hectare which was newly acquired. Its location is between latitude 100° 16.5′ East and 100° 17.5′ East, while longitude 06° 26.5′ East and 06° 28′ East. The study area was formerly planted with rubber approximately 70% and 15 % paddy field and the balance are waste land.The result of the analysis shows that the soil spatial variability of nitrogen,phosphorus and potassium (NPK) of the study area ranges between 0.098 to 0.147 % N, 10.0 to 24.2 (ppm) P, and 62 to 129 (ppm) K respectively.The spatial soil variability maps analyzed implies that UiTM Research Station Area can be classified as very low in nitrogen (N), while the status of phosphorus (P) is moderate, and the potassium (K) status is in the very high range. Since the Research Station Area will be cultivated with different crops thus the soil nutrient variability maps will be a useful guide in the future planning of the manuring programe and other cultivation practices.

CHAPTER ONE

1.0 INTRODUCTION

Airborne Hyperspectral Imaging For Soil Nutrient Variability Mapping is one of the tools in the management practice of precision agriculture, that has enabled the use of Geospatial Information Technology (GIT) application and provide framework, which enables managers to understand more precisely what happens on their farms. Nowadays, precision agriculture has become increasingly significant in the agricultural operations for the site-specific management. The management and manipulation of farming operations are vital decision-making process in improving crop productivity where there is a need to ensure the efficiency in the management of agriculture.

Precision agriculture has many technologies and approaches being introduced through the involvement of hardware and software, which is used to collect spatial data. These efforts have resulted in the ability to collect massive quantities of data. Technologies now need to be developed or adapted to organize and interpret the data. It is clear that Geographic Information System (GIS) including other technologies will play a vital role in adoption of precision agriculture in the future. Various decision aids are sure to be developed in response to producer, consultant and agribusiness needs. The yield different in quantity and quality can be improved by analyzing layers including remote sensed imagery in GIS. New and innovative applications for site-specific management will address waste utilization, erosion control and environmental concerns (James and Dennis,1998).