

Rice Crop Monitoring Using RADARSAT

Waraporn Suchaichit

Geo-Informatics Center

Geo-Informatics & Space Technology Development Agency : GISTDA (Public Organization)

196 Phaholyothin Road, Chatuchak, Bangkok 10900 Thailand

Tel : 66-2-940-6420-9 ext 211 Fax : 66-2-561-4830

wasus@gistda.or.th, suchaiwa@yahoo.com

Abstract :

Rice is one of the most important crop in the world and is a major export of Thailand. Optical sensors are not useful for rice monitoring, because most cultivated areas are often obscured by cloud during the growing period, especially in South East Asia. Spaceborne Synthetic Aperture Radar (SAR) such as RADARSAT, can see through regardless of weather condition which make it possible to monitor rice growth and to retrieve rice acreage, using the unique temporal signature of rice fields. This paper presents the result of a study of examining the backscatter behavior of rice using multi-temporal RADARSAT dataset. Ground measurements of paddy parameters and water and soil condition were collected. The ground truth information was also used to identify mature rice crops, orchard, road, residence, and aquaculture ponds. Land use class distributions from

Keywords : Rice monitoring, multitemporal rice monitoring

the RADARSAT image were analyzed. Comparison of the mean DB of each land use class indicated significant differences. Schematic representation of temporal backscatter of rice crop were plotted. Based on the study carried out in Pathum Thani Province test site, the results showed variation of sigma naught from first tillering vegetative phase until ripening phase. It is suggested that at least, three radar data acquisitions taken at 3 stages of rice growth cycle namely; those are at the beginning of rice growth when the field is still covered with water, in the ear differentiation period, and at the beginning of the harvest season, are required for rice monitoring. This pilot project was an experimental one aiming at future operational rice monitoring and potential yield prediction.