

CURRENT STATUS AND CHALLENGES OF UAV AND OTHER REMOTE SENSING TECHNOLOGIES FOR SMART AGRICULTURE IN THAILAND

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ABSTRACT

UAV and remote sensing technologies have been playing an increasingly important role in Thai agricultural sector. Typical applications range from crop/species identification to planting areas, yield forecast, monitoring for health and stress, detection of pest and disease problems, managing of fertilizer, irrigation, and pesticides/herbicides. Technological readiness varies depending on applications on specific crops. Currently, the most popular commercial farm-level use of UAV in Thai Agriculture is for spraying applications including pesticide, herbicide, and foliar fertilizer, due mainly to the competitive advantages in reduced cost, time, and labor involved. UAV applications in smart farming has gained significant attention from farmers especially for the optimization of fertilizer and irrigation through the use of multi-spectrum camera/sensor to detect crop health, water stress and macro nutrient deficiency (i.e. NPK). However, significantly more on-farm researches and field trials are needed to provide proper crop management recommendations. Early detection of weed, pest and disease issues using UAV in monitoring applications is rapidly gaining attention, especially on the large-scale, estate plantation levels such as in rice, sugarcane and oil palm industries. In addition, UAV equipped with multispectral camera has successfully been applied to estimate sugar level in sugarcane plantations, which is a big step leading to yield forecast using UAV in the near future. Beside the slow pace of technical development among local industries, the most significant challenge of UAV application in Thai agriculture may be the issues related to law/regulations. Satellite remote sensing has been used to identify and to provide necessary information, and regular updates, on planting area and yielding area of major economic crops in Thailand. Thai government has relied on satellite information to monitor the weather related disasters, such as drought and flooding, which could seriously affect agriculture. Additional valuable application of satellite remote sensing has been to monitor the spread of several pests and diseases affecting rice, sugarcane, cassava, and rubber. Funding from several government agencies has recently been provided to support research on various satellite applications for agriculture, such as rice yield forecasting, crop health/stress monitoring of economic crops. Finally, the main challenge in satellite remote sensing is probably the human resource limitation.

Keywords: UAV, Satellite, remote sensing, agriculture, Thailand

