Detecting Agricultural Trends and Evaluating Remote Sensing for Precision Agriculture

Summary:
Detecting agricultural trends and evaluating the use of remote sensing technology for the grower utilizing site specific farming technology.

ABSTRACT:

Precision Agriculture, also known as Site Specific Farming, Variable Rate Technology and Prescription Farming, have caused farmers and Agricultural suppliers to concentrate their efforts on soil and crop conditions within a specific field. The primary objective of the research is to determine what soil and crop information can be verified from remotely sensed technologies during the growing season. Specifically: the application of remote sensing technologies such as sensor, GIS and GPS to Precision Agriculture. Remotely sensed data from aircraft and spaceborne platforms will provide data at 1, 2.5, 4, 10, 20, and 30-meter spatial resolution. These data sets will be analyzed for vegetation, soil and water categories and crop rotation trends. Anomalies within soils and crops will be evaluated to assist in their prediction as to causality. Crop stress conditions will be evaluated to learn how remote sensing can play an important role in delineation and monitoring. Yield monitor images collected by harvesting equipment will be correlated with remotely sensed images from multispectral sensors to evaluate the ability to forecast yield during the growing season. Soil patterns will be studied and evaluated for the purpose of improving current soil maps as well as defining soil management zones to improve crop production. Image classification, NDVI (Non Differentiated Vegetation Index or crop vigor maps) and crop trends will be analyzed and conducted utilizing Erdas Imagine®, ArcView 3.2® and Multispec® software packages.

The studies, involving multi-year tasks, will be conducted at the Purdue Davis Agricultural Centers (DPAC) and on selected farmer cooperator fields. Additional information determined for private agricultural holdings will be shared with landowners for evaluation. Testing of results will be done by selecting large fields not used in research at the PACs as well as private farms and obtaining multispectral data over their farms.

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