

## Crop Yield Monitoring

**Principal Investigator** Albert J. Peters,  
University of Nebraska ([apeters@calmit.unl.edu](mailto:apeters@calmit.unl.edu))

**Photon Research Associates** Incorporated is a provider of physics-based modeling, simulation and analysis products for government and commercial markets. Customers use PRA's expert research services and software tools for electro-optical sensor design; aircraft and satellite simulation; mission planning and analysis; algorithm development and data archiving. The company was founded in 1976.

**Project Goal:** To evaluate the utility of high-resolution airborne multispectral imagery as an aide to an empirical and simple crop-growth / yield - estimation model. The investigation was focused on two crops, corn and soybeans.

**Results:** Timely airborne (or satellite) imagery obtained during the grain fill stage of plant growth is moderately well correlated to grain yield. The usefulness of the imagery is greatest in delineating the relative condition of corn or soybeans in large fields.

### Conclusions:

- a high-resolution image before planting could be useful for improving upon existing soil maps of an individual farm.
- yearly updates would allow a farmer to monitor success of management decisions such as improvements to soil organic material in sandy areas.
- a simple visual comparison of vegetation index imagery and yield maps provided detailed field-specific information on yield results relative to management practices.
- remotely sensed images can assist at the field level in interpretation of simple empirical crop-growth models.

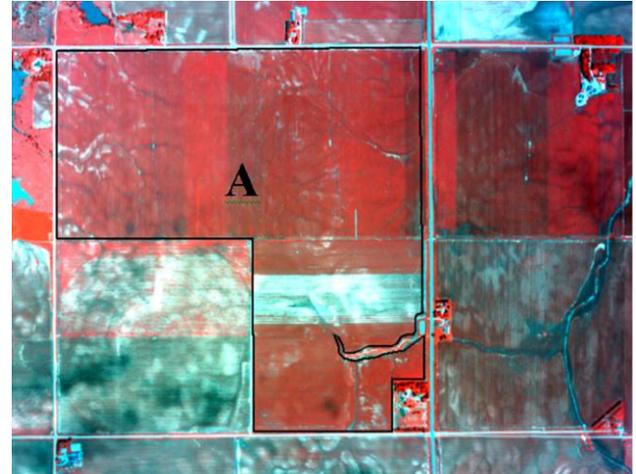


Figure 1. Aerial false color composite image of cornfields in Hamilton County, NE, during the 1999-growing season.

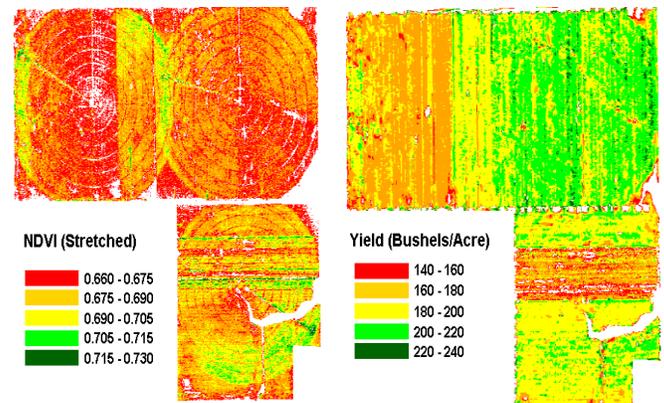


Figure 2. Vegetation index and yield maps of cornfields in Hamilton County, NE.

**Reference:** Vina, A., A. Peters and L. Ji. Use of multi-spectral IKONOS imagery for discriminating between conventional and conservation agricultural tillage practices, Photogrammetric Engineering & Remote Sensing, In Press.

### FACT SHEET

"CURRENT APPLICATIONS" PUBLIC  
OUTREACH SERIES

Funding for this project has been provided through the NASA ARC program under cooperative agreement NCC13-17: *This Fact Sheet series provides educational information on current examples of common remote sensing applications from AV Members; however, no endorsement of or association with AmericaView<sup>SM</sup> by any funding agency other than the USGS should be implied.*