



Precision Agriculture

For over 12 years airborne hyperspectral data has been used in the management of agriculture research programs and provides important information about crops and field conditions. It has proved most effective in settings that are intensely monitored with ground truth instrumentation that connects the airborne data to conditions on the ground. Some examples of successful data collections include:

USDA ARS. SpecTIR personnel have provided annual hyperspectral data collections over the BARC facility for the past 10 years. The crops in the field include corn, soy beans and wheat and are in fields that are monitored for soil moisture, plant vigor, micronutrient uptake, Leaf Area Index, crop species and sub species, pest control, and plant stress. There have been several articles published by Dr. Craig Daughtry and Dr. Charles Walthall regarding the usefulness of AISA hyperspectral data at the field level research, and their programs have been extended to the USDA National Soil Tilth Lab in IA, and to Purdue University with SpecTIR hyperspectral data collections. This work targets crop residue in the form of cellulose left on the fields after harvest.

Mississippi State University. For the past two seasons MS St. has contracted SpecTIR to collect very high spatial and spectral resolution on test plots at the university. The data is being used in agricultural research programs by graduate students and research professors for a number of studies.

DuPont. In the past DuPont contracted to have hyperspectral data collected from their research farm on the Eastern Shore of MD. The work included weed detection and location, plant health, crop response to nutrients, drought stress, and identification and differentiation of genetically modified crops from the other plants in the field. This work also included a commercial farm management company, and a product was developed and tested to use the hyperspectral imagery as a aid to field scouting. This allowed an agricultural agent to cover about four times as many fields in a day because the good sections of the fields could be identified and ignored, and he only had to look at the problem areas.

Much of the excitement in the agricultural community about hyperspectral imagery is in anticipation of hyperspectral satellites for agriculture management. There are already satellites over Europe, India and Japan for the purpose of monitoring crops, some with a three day revisit time. Many of our clients are already building the analysis tools to use with the hyperspectral satellite data from our airborne data so that when the systems are in place all the data can be put to immediate use.