

BECK'S Remote Sensing Infrared Study – 2008

Beck's Practical Farm Research team tested the use of Remote Sensing using Infrared Imaging this past growing season. Infrared Imaging uses aerial photography and light source reflectance to give geo-referenced crop health images. When used appropriately, remote sensing with aerial imagery can reveal a great deal about soil and crop conditions. The "bird's eye" view an aerial image provides combined with field knowledge allows growers to better understand factors that affect yield. This technology enhances the ability to be proactive and identify site-specific problematic areas before yield loss occurs.

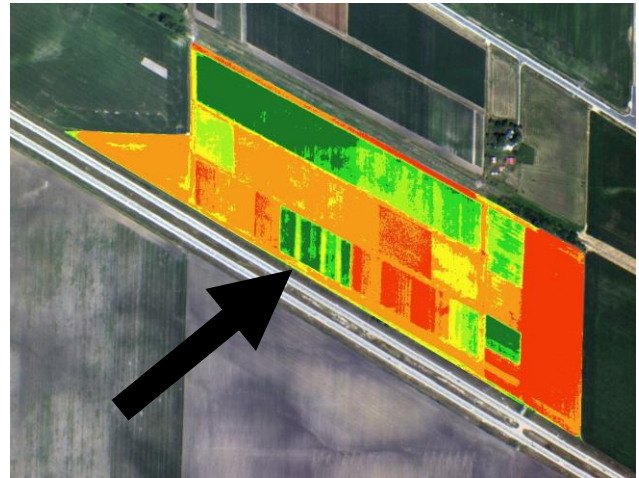
Infrared imagery identifies variability in crop health and biomass which can be used to pinpoint crop stressors and accurately have the ability to remediate the problem before it is too late. This high resolution imagery combined with ground-truthing can provide a great ability to monitor crop health and yield.

The following are case farms where infrared imagery was acquired on July 5, 2008 and evaluated for crop health and yield:

Case Farm #1: Illinois PFR Center



Color Digital Image



Color Digital Image w/Infrared Overlay

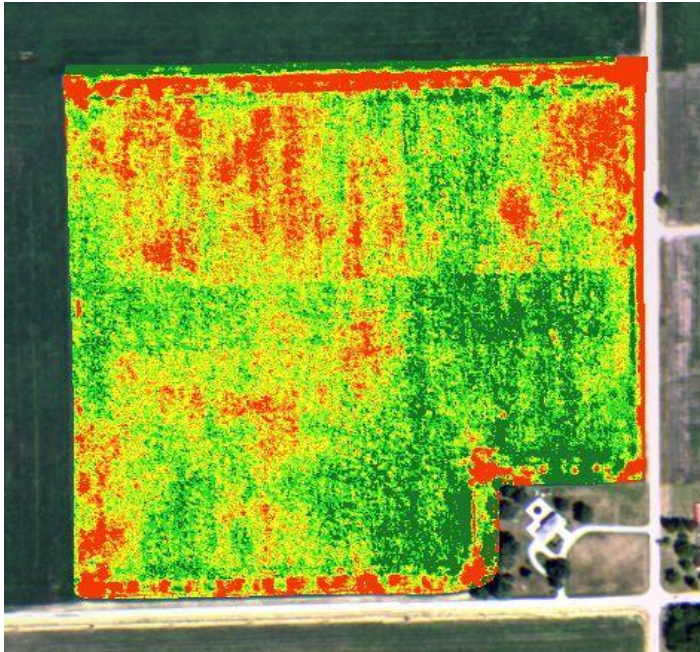
Case Farm #1 is Becks IL PFR Center located in Downs, Illinois. With infrared imaging, we receive two types of images that show crop characteristics. We receive a color digital picture as well as an infrared photo. Both are geo-referenced and can be exported to a mobile computer for ground-truthing or for precision farming applications.

The left image is a digital color picture taken at 2500 feet. The corresponding image to the right is the infrared image showing the different levels of crop reflectance, which are an indicator of yield potential or crop health. Green colors represent healthier crops and yellow to red colors indicate lower plant health or problem areas. Please notice the arrow that points to a nitrogen study that contains rates of 0 lb.-200 lbs. of nitrogen. The three yellow strips next to the tip of the arrow are the 0 lb. rates in the University of Illinois Nitrogen Rate Study. The darkest green strips are the 200 lb. rates of nitrogen.

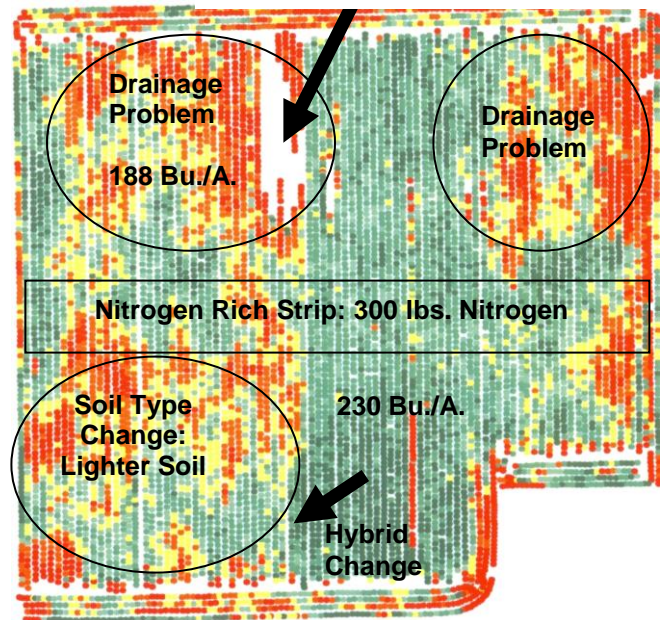
BECK'S Remote Sensing Infrared Study – Continued

Case Farm #2: Kankakee County, Illinois

Wet area that could not be harvested due to standing water



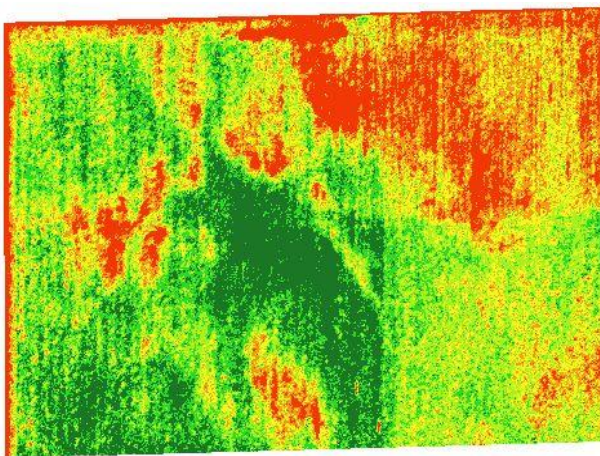
Infrared Image Taken July 5th, 2008



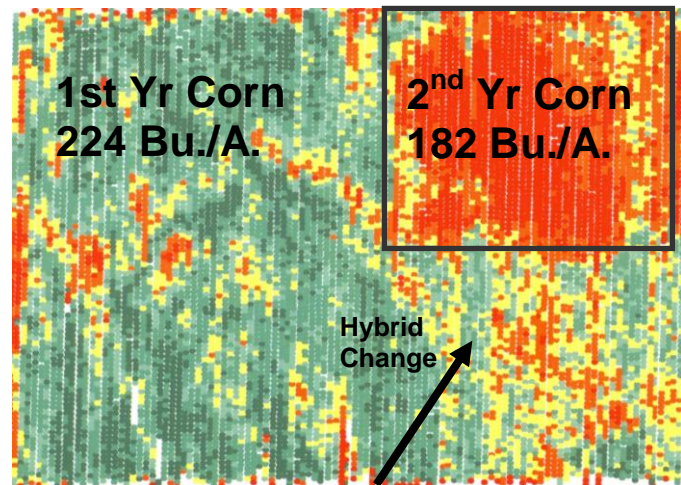
Yield Map: Harvested Oct 28th, 2008

This farm is a 37 acre farm in East Central Illinois. The nitrogen rich strip in the middle of the farm was applied across the planted rows and totaled 300 lbs. per acre. The infrared image on July 5 shows the strip in detail. As the combine harvested the field, the nitrogen strip averaged 210 Bu./A. while the same size area next to the strip averaged 196 Bu./A. Although the yield map does not show as much detail as the infrared image, yield did increase on the yield monitor as we crossed into the nitrogen rich strip. The red areas on the images show drainage problems on the farm. 2008 was a very wet spring and it took its toll on the wet areas on this farm. Please notice the arrow that shows the area that could not be harvested due to standing water. This farm averaged 200.5 Bu./A.

Case Farm #3: Dennis Webster, Becks Dealer, Buckingham, Illinois



Infrared Image Taken July 5th, 2008

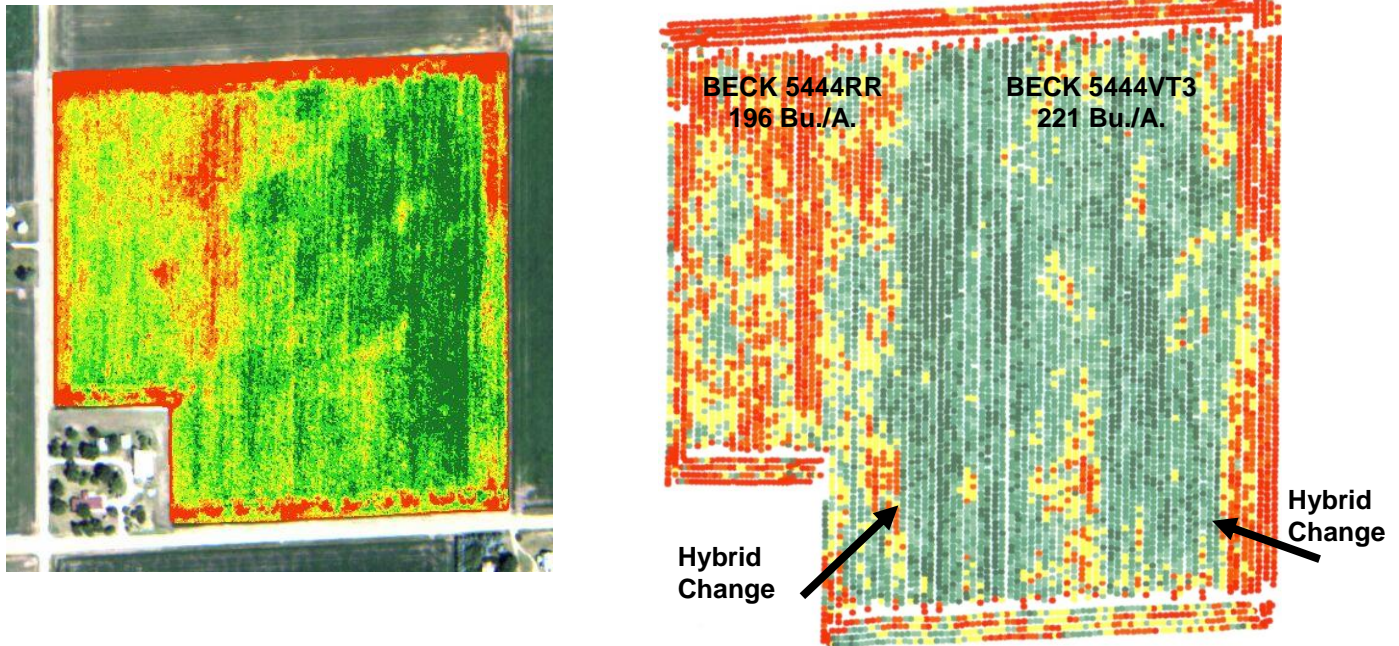


Yield Map: Harvested Oct 30th, 2008

The above farm was research plots over the past few years and as a result, the rotation has changed. The top right corner of the farm is 2nd year corn and it resulted in lower yield. The green areas of the field that are 1st year corn averaged 224 Bu./A., while the continuous corn yielded 182 Bu./A. The other red and yellow areas indicate lower yielding corn from drainage issues.

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Case Farm #4: Herscher, Illinois



This case study shows a 40 acre farm in Herscher, Illinois. There were three hybrids planted in this field. The BECK 5444VT3 in the center of the farm yielded 221 Bu./A. and the refuge, BECK 5444RR yielded 196 Bu./A. The infrared image did show the hybrid change in the field and did correlate to a yield difference on the GPS yield map.

In summary, infrared imaging did in fact offer us the ability to predict corn yield. Many times hybrid changes were identified and yield differences were apparent. In relation to yield maps, the infrared images were much more detailed and clearer than the maps from GPS yield monitors. Ground-truthing is very important when analyzing infrared images. A grower should use the geo-referenced images to scout fields and find possible problem areas.

The main question with this type of technology is “How do I use this Information”? This technology could be used for the following agronomic practices:

- Management Zone Creation for Soil Testing
- Prescription Recommendations such as variable rate planting or fertilizer
- Tile mapping or exploration
- Nutrient Monitoring such as nitrogen management
- Hybrid Performance in fungicide studies or strip trials
- Manure Management
- Weed Scouting
- Moisture Stress Management
- Yield Estimation Prior to Harvest