Practical Applications in Remote Sensing, or Science from Space

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Everywhere you turn these days, information is being disseminated on the availability of GPS / GIS, remote sensing, yield mapping, field mapping, variable rate fertilizer, and even variable rate pesticide applications. Everyone has a piece of software, hardware, or information that they want you to buy. Unfortunately, at this time, very little if any data has been generated on the cost effectiveness of this type of technology. We know that we can map fields and variably apply fertilizers, we can also map the yield (to some degree of accuracy), and at the end of the year we can generate nice looking maps with lots of colors. But, will this technology pay for itself, or help reduce risk, or even increase profitability? No one has the answer at this time. And, it may be several years before we can fully answer that question. We are only in the infancy of learning to use this technology. I do however, think that this technology will be valuable in the future.

What will this technology do for us? I see several potential applications. Within the next five years, the use of satellite imagery in production systems may be commonplace. Using spectral analysis from satellites that will be launched in the next couple of years, we may be able to detect the first occurrence of late blight infection in the State, and using environmental modeling, be able to predict how and where that infection will spread. The same type of spectral analysis may be able to detect weed infestations in the middle of fields, and be able to tell us what that weed species is. We may also be able to detect plant stress (nitrogen, water, etc.) and be able to make more site specific recommendations on crop management. While some of these applications seem improbable, I think all of them are possible. Look at where we were 10 years ago in relation to computers. In 1987, I started graduate school and bought a computer that had 640 Kbytes of RAM, had a 20 Megabyte hard drive, a amber monochrome monitor, and used 5 1⁄4 inch floppy drives. Today, for about the same money, I have a computer that has 64 Megabytes of RAM, 3 Gigabytes of hard drive space, and a monitor that will display millions of colors. The leap in technology we have seen in computers will occur in the availability and applicability of remote sensing.

Will this mean an end to field scouting and reduce the need for human evaluation in crop management? No. Technology will never replace the need for human inputs. In fact, technology usually increases the need for human expertise, and increases the need for management. What this type of technology will provide is another tool to aid in the never-ending fight to control weeds, diseases and insects, manage fertilizer and irrigation, and of course, at the end of the year, make a profit.