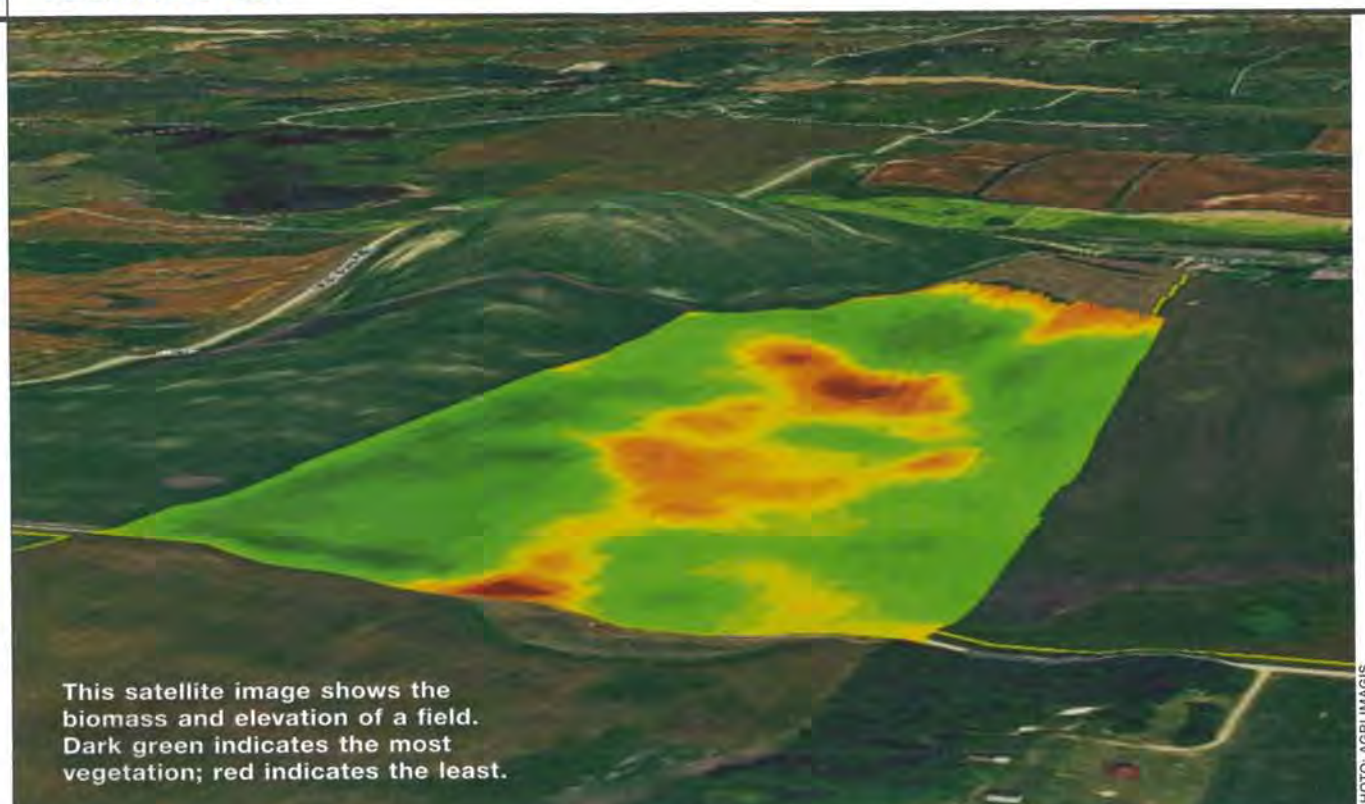

This satellite image shows the biomass and elevation of a field. Dark green indicates the most vegetation; red indicates the least.

PHOTO: AGRI IMAGIS

Manage Fields By Biomass

Satellite imagery uses crop density instead of yield to determine field variability and define management zones. **BY KURT LAWTON**

Former farmer turned satellite-based field mapper Lanny Faleide isn't popular with ag retailers who push precision farming by grids. "Field variability doesn't occur in squares, and nothing in a field works that way, so we don't agree at all with grids," he says.

Faleide founded Agri ImaGIS in Fargo, N.D., in 1994, and has been helping growers, dealers and consultants use crop biomass satellite imagery and 3-D field elevation to build management zones. The company also offers software so anyone can write their own variable-rate fertility prescriptions.

"Dealers are making good money on grids, as well as adding many layers of data on top of each other, which can really confuse management decisions," Faleide says. "The computer software is not intelligent, and we [the industry] don't have the rationale to figure out combined data layers. It's not a linear scale. One data set combined with three more doesn't equal four; it could equal 257."

EXAMINE CROP MASS. He preaches agronomic simplicity in field management zone creation. "The best way to determine field variability is a biomass image, because every plant is a sensor that tells the tale of soil quality below that plant. You combine that information with field elevation using our Satshot 3D program and you have 95% of your answer for optimum zone creation," Faleide says. "Elevation can really drive a yield pattern."

In the Great Plains, Faleide says about 75% of all variable-rate applications are made using a satellite image of biomass. When growers sign up a field ($1 per acre) or whole farm for Faleide's services, they have access to the past 10 years of images. This allows them to select the image that most accurately shows the differences in a field, he says.

Most growers know their fields and can select the best map fairly quickly. And the age of the map doesn't matter. "We often recommend midsummer soybean fields that really show variability. Don't shy away from using wet years because water is determining your variability based on your elevation," he explains. And only select fields during years with no varying field trials (such as fertility and population).

Once that map is selected, a soil profile is developed to get a baseline understanding for zones, along ▶

with soil tests to determine residual levels of nitrogen, phosphorus, and potassium. "We don't use yield maps to define zones because it introduces human variables, whereas biomass shows soil quality. We use yield maps to assign yield goals by zone," says Faleide.

Beyond management zone development, using satellite images for in-season decisions remains a risky proposition—one that is better served by airplanes. "We're holding off on delivering such a product until the logistics of real-time satellite images become available," he says. "We can do aerial images for this practice, but not too many growers want to pay the price."


Matt Danner

PHOTO: JIM PATRICO

SEED COMPANY EFFORTS. Some growers choose to gain satellite-based field information through their seed company for no cost, beyond buying seed. Matt Danner, who farms in west-central Iowa near Templeton with his dad, Rich, and brother Chris, got involved with Monsanto's IntelliScan program during its pilot year in 2009. Danner liked the idea since he had experience with OptiGrow when he worked for John Deere, plus they had almost a decade of experience with grid sampling and variable-rate lime, phosphorus and potassium, and manure.

"Since we record all 'as-applied' maps for variety, population, fertility, chemicals and manure, we gave Monsanto this information, and in turn we received biomass vegetative index maps, soil maps, harvest yield maps and hybrid recommendations maps," Danner says. "The field map book is great, as are the images, but we're not at a point yet to make any drastic decisions based on the information. It's another layer, and we're still learning what these layers can do."

Danner says these maps can help with scouting and finding patterns when comparing different years. "While we scout frequently, we don't scout whole fields, so if I see something after reviewing the maps, I can go ground-truth that area to learn more about the issue," he notes.

Another potential benefit that Danner sees is with the IntelliSeed portion of Monsanto's Prescriptive Ag Solutions program. "If they can use all their hybrid and variety data and provide information on better seed and population selection for my given soils and environments, that could be a big benefit," Danner says.

MONETARY VALUE? When asked if he would pay for the maps if they weren't offered for free, Danner is not sure the value is quite there yet. "Perhaps in two or three more years—when we find that 'aha value' from such data. If they put a fixed-wing out there and I could get images in a two- to three-day turnaround, there's definite value for such a service, depending on the price and the value of the crop," he says.

Monsanto says the ultimate goal with IntelliScan and IntelliSeed is to provide growers with better product recommendations. "We want to bring all science and technology information together to our customers in an easy-to-use way that delivers the most productive and profitable recommendations," says Julie LaBonte, Monsanto's Prescriptive Ag Solutions business manager.

The company, through its DeKalb, Asgrow and Channel brands, worked with 250 farmers in 2009 and 2,500 last year in specific Corn Belt states. "We plan to expand the program more broadly in 2011, as more farmers work with their local sales representatives or retail partners," LaBonte says.

THE FUTURE. Faleide sees seed companies offering more services and potential discounts in exchange for farmer field information. "We also see equipment manufacturers preparing their GPS displays to automatically receive these satellite images and variable-rate prescription maps directly into tractors, sprayers and fertilizer rigs," he says. "This is all doable today, just like farmers can now download data maps to their web-enabled smart phones or tablet computers. These are pretty exciting times, as we continue to make this technology easier to apply to help farmers produce more grain with greater efficiency."

FOR MORE INFO

Agri ImaGIS (SATSHOT)
https://www.satshot.com/e/october2010.html

Monsanto IntelliScan program
https://www.monsantoagsolutions.com/pas/Pages/Home.aspx