



Sensible Solutions

News & Information For On-The-Go Sensing

GreenSeeker
Variable Rate Application and Mapping Systems

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And They're Off...

The 2008 growing season is underway and the American farmer is already facing an abnormally high number of challenges. Some areas are wet, some are dry, some are ahead of planting schedules and others are behind. Commodity prices are swinging more in a day than we are used to seeing all season, while input prices trend higher at alarming rates. Decisions on how much to invest in a crop change with each passing day. With this kind of uncertainty in the marketplace, producers have a tough job ahead.

In this issue of Sensible Solutions, we will attempt to provide sound information on a product that excels where variability is high. GreenSeeker mapping and variable rate technology can take the guesswork out of production decisions so that producers and consultants have more time to spend on other issues they will face this growing season. Read the various accounts of how GreenSeeker is helping producers from all across the country achieve their production goals. Contact your GreenSeeker representative to find out how to put GreenSeeker to work on your farm.

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Why Is GreenSeeker Nitrogen Management So Effective?

Field trials conducted across the diverse geographies and diverse crops have consistently shown that GreenSeeker enabled nitrogen prescriptions deliver the most efficient use of nitrogen. To help understand how GreenSeeker technology can deliver these results, it is helpful to first define a few concepts that are unique to the GreenSeeker nitrogen management approach.

Yield Potential. This is the maximum yield that can be attained when the crop is constrained only by the limitations of a particular growing season.

Yield Goal. The often unrealistic yield objective that a producer desires without any consideration for the limitations of a particular growing season.

Nitrogen Rich Strip. A pass or area in a field where GreenSeeker sensors can identify seasonal yield potential as a result of placement of a non-limiting amount of nitrogen.

Traditional nitrogen management is inefficient for one or more of the following reasons:

1. Nitrogen rates are based on rarely achieved yield goals.
2. Nitrogen rates are determined before the growing season even begins.
3. Often no allowance is made for unused nitrogen from a previous crop.
4. Little or no allowance is made for soil organic matter turnover (mineralization).
5. One flat nitrogen rate is deemed appropriate for the entire field, leading to over-fertilization of surplus areas and under-fertilization of deficit areas.
6. Nitrogen is applied all at once, leaving it subject to leaching and de-nitrification.
7. In exceptional growing seasons, too little nitrogen is applied to maximize yield.

GreenSeeker nitrogen management uses a much different approach to achieve ideal nitrogen efficiency without limiting the Yield Potential of the growing season. This is achieved through the following process:

1. Applying a base rate of nitrogen (50-

70% of historic rates) to the field prior to or immediately after planting.

2. Placing one nitrogen rich reference strip (NRS) into the field to demonstrate optimum crop vigor subject to the constraints of the growing season.

3. Evaluating the NRS with GreenSeeker sensors in combination with heat units to quantify true yield potential.

4. Comparing the remainder of the field to the NRS to variable rate apply just the amount of nitrogen needed to attain yield potential.

5. If areas of the field are very poor, nitrogen rates are reduced and eventually are cut off completely.

6. All sensing and application is done in real time (one pass).



High Prices, Rainfall Put Spotlight On Nitrogen Management

With record grain prices and much of the country experiencing planting delays due to wet conditions, the focus is again shifting to flexible nitrogen management strategies. In a recent news release, Dr. Tracy Blackmer, Director of Research for the Iowa Soybean Association's On-Farm Network, reports that "There is so much money being invested in the crop, and the crop is so valuable, that growers need to devise strategies to counteract what could be a challenging year for supplying adequate nitrogen to the crop."

His advice? Be prepared to make in-season side-dress nitrogen applications. Nitrogen applied at or before planting could be wasted if conditions are conducive to large N losses.

Optical sensing, such as GreenSeeker technology, assesses actual crop needs and applies the appropriate additional fertilizer rate in a single field pass. The On-Farm Network tested the GreenSeeker optical sensing and variable-rate application system in 2007, when many Iowa farmers also faced saturated soil conditions that short-changed the crop on nitrogen.

Blackmer adds, "The research showed that GreenSeeker detected nitrogen stress and applied the amount of nitrogen needed to alleviate it. It provided an economic yield response to the extra nitrogen. The sensors can detect early on which plants are stressed. Often, by the time you can visually see that additional nitrogen is needed, it's too late."

"More than 30% of the fields we tested (in 2007) were low on nitrogen," he says. "Growers were horrified by what they saw from aerial imagery and the stalk tests. They lost money because they didn't have enough N for the crop. That really hurts at \$5 corn. Growers have to do what they can to protect this high-value yield."

"Optical-sensing technology such as GreenSeeker could be the solution to managing nitrogen," he adds. "It makes more sense to monitor the plant to determine how much N you need than presuming you know how much the crop needs ahead of time. Because of the complex factors affecting nitrogen availability, this just isn't realistic."

The ISA On-Farm Network plans to conduct additional field trials with GreenSeeker technology in 2008.

2007 On-Farm Network GreenSeeker Corn Field Trial Results

Trial / Rotation N Source	Method	Pre-Plant N (lb/ac)	Side- Dress N (lb/ac)	Total Applied N (lb/ac)	Change In Total N (lb/ac)	Total Yield bu/ac	Change In Yield bu/ac	Revenue After N Cost \$/ac	Change In Revenue With G'Seeker \$/ac
Trial 1: Corn/Soybean	Farmer	135	0	135		224.0		\$996.50	
Fall NH3	GreenSeeker	135	29	164	29	229.0	5.0	\$1,005.75	\$9.25
Trial 2: Corn/Soybean	Farmer	120	0	120		205.0		\$913.75	
Side-Dress UAN	GreenSeeker	120	31	151	31	215.0	10.0	\$945.75	\$32.00
Trial 3: Corn/Soybean	Farmer	122	0	122		181.0		\$798.75	
Fall Swine Manure	GreenSeeker	122	37	159	37	189.0	8.0	\$818.25	\$19.50
Trial 4: Corn/Corn	Farmer	0	100	100		148.0		\$653.00	
Side-Dress NH3	GreenSeeker	0	137	137	37	152.0	4.0	\$653.50	\$0.50
Ave of All Trials	Farmer			94.3		189.5		\$840.5	
	GreenSeeker			152.75	33.50	196.25	6.8	\$855.8	\$15.31

Corn: \$4.75/bu, Pre-Plant N: \$.50/lb, Side-Dress N: \$.50/lb

Jefferson County, Iowa

GreenSeeker[®]
Variable Rate Application and Mapping Systems



Montana Producer Finds Satisfaction in GS Purchase

One of the most enjoyable parts of my job is finding solutions that work for my customers. This past week I helped a Montana farmer install a new RT200 GreenSeeker on his self propelled sprayer. This customer is a cereal grain producer, who is looking to maximize production efficiency on his land. Implementing GreenSeeker into his production formula was not an easy decision to make. The grower had already evolved to no till farming and recently adopted variable rate nitrogen top-dress, based upon satellite images, and soil nitrate testing.

The grower felt that there had to be a better way to manage top-dress nitrogen. He was concerned that if he used previous years' data, he would miss out on the high profit potential of 2008. He wanted a program that allowed him to manage his crop according to "how it was growing this year" while still addressing his variable soil conditions.

After completing the installation, I got the sense that the grower had become hesitant about the extent of variability across his acres and that maybe this investment decision was made too hastily. I asked the grower if we could field-test the GreenSeeker equipped sprayer to verify a successful installation. Since the spring wheat crop had just emerged, we simply drove a couple of passes and variably applied water; all mapping and variable rate systems checked out.

Upon returning to the farmstead, I downloaded the GreenSeeker data file, and opened up the NDVI (vigor) map on my laptop. The grower was astounded at the amount of variability in his field. Areas that he felt were the most vigorous were not as vigorous as others. The grower suddenly realized that the decision to purchase the GreenSeeker had been a sound business decision. Within 30 minutes, the grower had gone from

buyer's remorse, to wildly enthusiastic.

I worked with the grower to point out the many areas of opportunity that were present. The grower will first field spray herbicide and map NDVI simultaneously. These early season maps will be used for scouting purposes to help determine the underlying cause of low NDVI scores. The next pass will be real-time top-dress nitrogen application, followed by fungicide applications. All in-season sprayer work will generate NDVI maps. Through his mapping activities, the grower is looking forward to watching his crop develop, quantifying the response to applications, identifying seasonal yield potential and making sound management decisions right through to harvest. The grower likened the GreenSeeker technology to opening a whole new frontier in crop management.

*Submitted by Russ Linhart;
GreenSeeker Territory
Manager*

Cotton Producers Capture Increased Yields From VR Growth Regulators And Harvest Aids

While GreenSeeker nitrogen management has recently received much attention, variable rate plant growth regulators and defoliant for cotton offer some of the most simple and immediate opportunities for profit. Many producers report saving money on inputs, and capturing increased lint yield from more even stands at harvest time.

Nicky Burgess, Precision Crop Management Consultant for Fullen Farms near Ripley, TN, has used both the GreenSeeker Hand Held sensor and the RT200 multi sensor system for 3 years now and reports, "We have maps that clearly document the benefits of variable rate plant growth regulators. Fields that show high variability early in the season have been made much more even using GreenSeeker." These even stands open the door for 1-pass defoliation. Burgess goes on to say, "the biggest thing is the ease of use — it is way more efficient (than aerial imagery). There is no waiting. When you want to go spray, you just go spray."

Burgess has this advice for producers considering GreenSeeker. "If you're presently buying imagery for cotton production, then GreenSeeker is a no-brainer. It is more efficient, there are no in field holdups (waiting for prescriptions to arrive) and you have better timing of application overall. Compared to aerial imagery, you will be well pleased."

Consultant's Corner

All across the country, consultants are analyzing GreenSeeker generated NDVI maps to become more efficient in their scouting efforts. Areas of a field with low NDVI values are an automatic starting place for field visits. Without this foresight, consultants often spend needless time walking to distant corners of a field just to find out there are no concerns.

In wheat country, consultants are using Hand Held sensors to determine yield potential and the optimum top-dress nitrogen recommendation for a given field and growing season. In-season yield prediction can be performed with the Hand Held sensor allowing consultants to advise on how much money a producer can afford to invest in the crop.

Cotton consultants who utilize Hand Held sensors can even help producers who own GreenSeeker variable rate systems. By getting out in front of the applicator, minimum and maximum application rates for plant growth regulators and harvest aids can be established before the producer even reaches the field. This saves the producer time in developing custom prescriptions and lets him focus on quick, variable-rate delivery of the input based on a range of rates that the consultant has established for his specific fields.

These are just a few of the many ways that GreenSeeker technology is improving consulting services and value.



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GreenSeeker Financing

Parties interested in buying GreenSeeker can now take advantage of GreenSeeker's 0, 0, 12 Financing Program. This is a very attractive financing program featuring 0% interest, and \$0 down, for the first 12 months. The amortization period is 5 years with annual payments, fixed interest rates and a \$100 application fee. With this program, even farmers with relatively low acres can expect to quickly benefit from using GreenSeeker technology. See your authorized GreenSeeker dealer to learn more about this program.

GreenSeeker RT Commander Update Released

On May 1, 2008, NTech Industries released the latest edition of RT Commander software (Version 1.3.6). This is NTech's flagship software for use with the GreenSeeker RT200 multi-sensor system. RT Commander is proprietary Windows based software that facilitates real time vigor mapping and variable rate applications.

RT Commander v1.3.6 is a field proven software package that has many new features that improve diagnostics and ease of use. One important new feature is compatibility with John Deere self-propelled sprayers using GreenStar2 monitors. The latest RT Commander update also includes many new nitrogen prescriptions supplied by various universities and public research institutions from across the US and Canada.

New nitrogen prescriptions for 2008 include corn prescriptions for the Coastal Plains (Virginia Tech), Great Plains, Ohio and Minnesota regions. New spring wheat, and canola prescriptions from Agriculture and Agri-Foods Canada accompany the existing durum and winter wheat prescriptions. There is also a joint Oklahoma State and Kansas State sorghum prescription, and the first-ever nitrogen prescription for cotton (OK State). As always, producer-generated prescriptions can be easily created using the *custom prescription* option in the RT Commander software.

This software release is free to owners of RT200 systems and is electronically available at www.GreenSeeker.com