

Ag Leader®
Technology

Insights

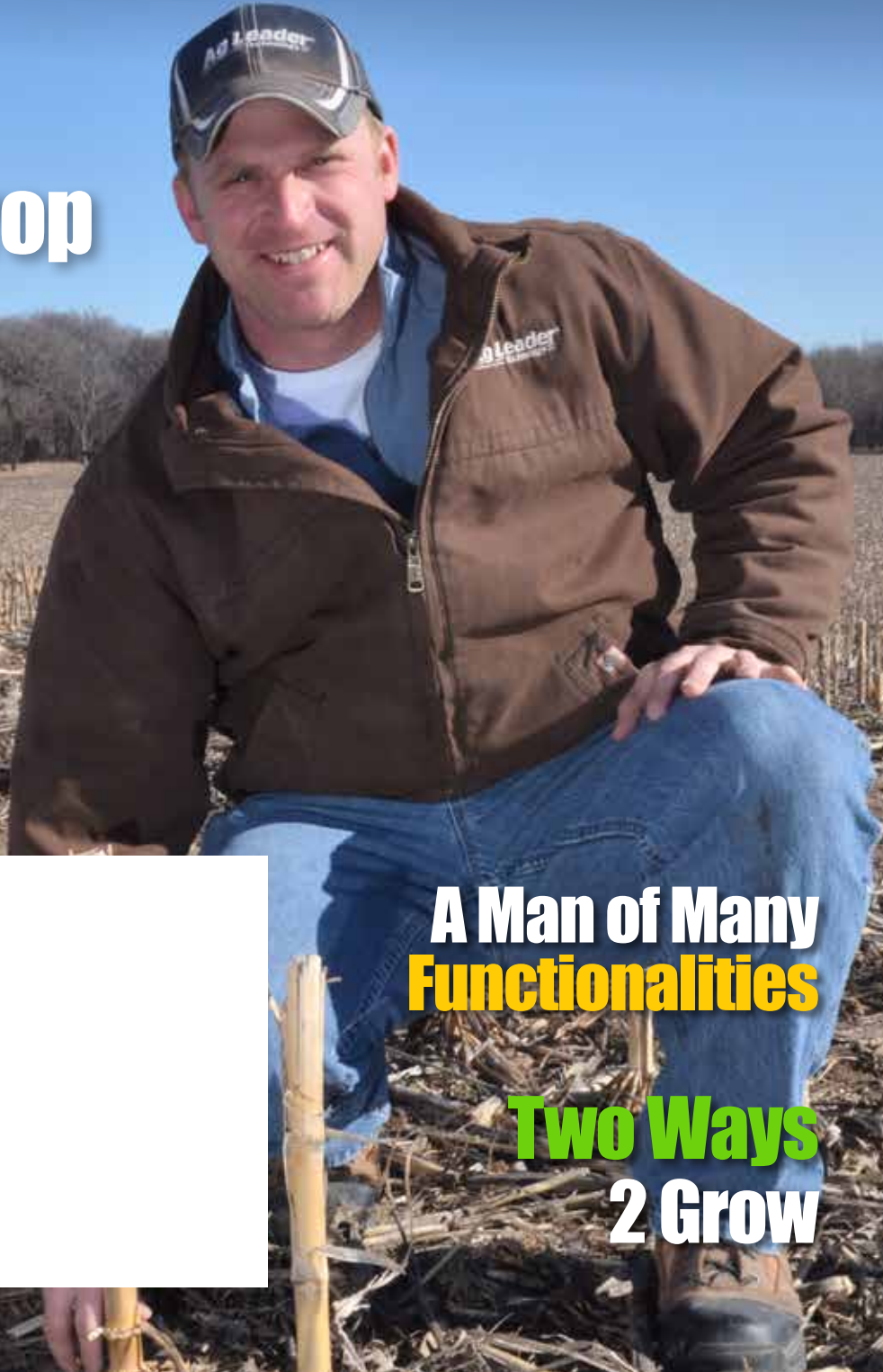
Spring 2013 - Precision Farming Magazine

**Keeping an
Eye on the Crop**

**A Triumphant
Return to
the Tractor**

**A Man of Many
Functionalities**

**Two Ways
2 Grow**



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Spring 2013



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From One Ag Leader to Another

President Al Myers spent some time in the Ag Leader environmental testing chamber overseeing a round of tests performed on products in development.

High-quality expectations mark today's precision agriculture marketplace. Add to this mix an abundance of choices at various price points and the demand for new technology, it becomes clear that every company producing precision ag tools must create high-quality products to be successful.

The best products embody quality in several ways. First, by providing a high level of

functionality for the end user. Second, by being easy to use. And finally, by being backed with excellent dealer and factory support.

At Ag Leader® Technology, our goal is to consistently exceed YOUR expectations in all aspects of quality. That's why every product we develop goes through six stages of development before it becomes part of your operation.

We start by doing research on what products and functions are needed by you, the end user. Once we decide what needs to be developed, we do thorough research to document how it should work for you before we begin to design it.

After initial development, the product then goes to the Engineering lab for torture

testing. Hardware must be tough enough to take on extreme electrical stress, vibration, shock, scorching and frigid temperatures, humidity and harsh chemicals. Ag Leader puts every product to the test before it even makes it out of the building.

The next step in the process is in-field testing at the Ag Leader Test Farm. Using the

STEPS OF QUALITY ASSURANCE

- 1 Research
- 2 Design
- 3 Torture Testing
- 4 In-Field Testing
- 5 Complete System Testing
- 6 Modifications



same equipment growers use in the field, Ag Leader's precision farming experts "go live" with the products and see how they respond in different farming situations and conditions. Once they determine that the products are ready for the 'real world,' producers across the country test Ag Leader products on their own farms and give feedback to Ag Leader on what worked well and what needs to be improved.

Why do we put so much emphasis in on-farm testing? Growers are usually very adept at observing how a new practice or management option performs, and make decisions based on their own farming experiences. If they weren't right most of the time, they probably wouldn't be in business today. And, that's how we determine when a product is ready for market.

Once we know the hardware is reliable and the software functionality is correct, the final step before shipping production products is to thoroughly wring-out the firmware by testing complete systems of displays, modules, actuators and sensors together with every supported combination of setups and operating conditions. Any bugs found that affect functionality send the product back to stage two for further development. Once it's modified, it's ready for your farm. We work hard to make sure that the Ag Leader product you buy will give you years of trouble-free service.

Best regards,

Al Myers



Precision farming experts perform steering testing on different brands of ParaDyme-equipped tractors at the Ag Leader Test Farm.

"At Ag Leader Technology, our goal is to consistently exceed YOUR expectations in all aspects of quality. That's why every product we develop goes through six stages of development before it becomes part of your operation," Al said.

Two Ways 2 Grow

Investing for the greatest return

Acquisition

**Organic
Growth**



"...maximizing land potential will result in greater yields and profitability than underutilizing a greater amount of land," Swanson said.

Michael Swanson will tell you farmers aren't just farmers anymore. These days the job is much more complex, analytical and demanding. They aren't just running a farm – they're running a business.

"I tell farmers they are the CEO and CFO of an agri-production company," said Swanson, Senior Vice President and Agricultural Economist at Wells Fargo. "When you look at the amount of assets even a modest-sized farm has, they can no longer pretend they're just a little old farmer."

As the acting CEO and CFO of an agri-production company, growers face increasingly difficult financial decisions. This is a particularly interesting time because, as Swanson points out, crop prices are up and financing costs are at historical lows.

This influx in revenue and access to cheap money is empowering growers to explore ways to bolster their operations. Swanson notes that there are two primary ways to achieve growth, acquisition and organic growth. Maximizing return on investment requires that you choose the growth path best suited to your operation.

Acquisition vs. Organic Growth

Swanson notes that acquisitions typically yield quicker returns since the



operations acquired will provide immediate cash flow and revenue growth. However, he warns that, "When the market is pretty optimistic and acquisition pricing is fully priced or above price, in a sense, you're paying more than you're going to get back."

How do you know when land is overpriced, underpriced or priced just right?

"No one knows for sure because that's a question of futures," Swanson said. "There are two things that give land value. One is the cash flow that it's going to produce. The other is: What's the alternative

cost of money? In other words, where else could you put your money to get a return?"

Here he's referring to organic growth, or finding ways to enhance the productivity and profitability of your current assets. This, according to Swanson, can be a slower, more complicated process than acquisition, but also may prove to be the more profitable, long-term approach.

Which growth path is better?

"I tell people to think of it like an annuity. What you're buying today with an investment – whether it's new ground or a

new asset like an irrigation system – should be seen as an annuity," Swanson said. "I'd rather put that thousand dollars into an annuity that gives me seventeen bushels of corn versus one that gives me twelve bushels."

America versus the world

Swanson points out that 85 percent of the world's grain ground resides outside the United States, but the yields of that soil are less than half of what we find here in America.

There are two reasons for this. First, most crops planted

outside the United States are typically varieties of wheat, barley, oats and other low-input crops that have low genetic potential. Secondly, application of nutrients, pesticides, herbicides, insecticides and fungicides is much lower outside the country.

Why is this important? It supports the notion that maximizing land potential will result in greater yields and profitability than underutilizing a greater amount of land.

To support this point further, Swanson offered an example from his native home in western Minnesota, where the difference between 150 bushels and 220 bushels of corn is usually eight to 12 inches of water each year.

When Swanson hears farmers say it doesn't pay to irrigate, he agrees that it doesn't when you're running estimates with \$2 corn prices. But run the numbers with corn at \$5-\$6 and suddenly the jump from 150 to 220 bushels per acre makes a great deal of sense.

Savings versus increasing profits

Swanson says many growers focus too keenly on cost minimization while ignoring profit maximization. In other words, they would rather save \$1 than make \$1.50.

"Farmers were so constrained by revenue for so many decades that they adopted a cost minimization model with no regard to marginal revenue," Swanson said. "You have to think about both things simultaneously. Otherwise you're cheating yourself in terms of doing well for your family."

The Sky's No Lo

A dealer perspective on precision farming

By Tim Nix, StraightLine Ag, Harristown, Illinois



Since 2010, Nix has been with StraightLine Ag, a Blue Delta Ag Leader dealer in central Illinois. StraightLine Ag owns and operates more than 100 radio bases which provide RTK signals for Ag Leader ParaDyme and GeoSteer automatic steering systems.

Growing up about 45 years ago, I read all of the science fiction works I could get my hands on. Many of the books were about space travel, time travel, super smart computers, telepathic mind-reading and so on. But I can't recall a single reference to what has become a scientific fact in agriculture during the past 15 years: automatic steering guided by an array of satellites. This technological advancement has changed the way that many growers operate, and will continue to advance in features.

Checking out the options for auto steering at a farm show or on the web will quickly confuse the uninformed. There are a large number of companies

selling an even larger variety of equipment. Prices vary widely, often getting buried in the cost of new tractors and combines. Systems are available from WAAS (satellite only) with year-to-year repeatability of about eight inches and ranging from \$5-\$10,000 installed to RTK correction with accuracy of less than one inch and complete system price tags often above \$20,000.

Today, RTK steering (sub-inch accuracy) is often paired with AutoSwath™ control. Using the foundation of the advanced accurate steering at its core, the AutoSwath feature controls equipment such as planters, fertilizer equipment and sprayers to ensure there

is complete coverage of the operation in the field, yet with minimum overlap. This is often enhanced with section control or even individual row control on the equipment so that operations on point rows and waterways are optimized.

Benefits

So, what are the benefits of auto steering and why are some growers flocking to buy systems? The benefits generally fall into one of two categories of operator and economic advantages.

Advantages to the Operator:

- Reduced stress and fatigue for the operator on long days.

- Expanding work hours into the night, which can be critical with limited weather windows.
- Faster speeds with improved steering accuracy means more acres covered in the same amount of time.
- Better monitoring of other facets of the operation, such as application rates and plugging, because the driver spends less time with steering.

Economic Advantages:

- The profit advantages of the improved operating window mentioned above. Imagine the profit improvement of planting on time simply because the grower was able to complete the operation using auto steer.

nger the Limit

■ More efficient tillage operations, as the pass-to-pass accuracy will be better than most farmers can steer. (Through research, we found that most operator's steering tillage manually would be off the recommended width by as much as 15 inches or more. On a five-shank ripper with working width of 12.5 feet, that's ten percent – either 10 percent wasted fuel or 10 percent of the field not getting the benefits of tillage, both of which are costly.)

■ Reduced product input costs when AutoSwath control is used. The rule of thumb is three to seven percent less seed, fertilizer and chemical cost with AutoSwath in typical fields. On fields with a lot of

point rows and waterways, this can be as high as 10 percent.

■ Increased yields and profits due to precise variable seeding and fertilizer rates.

Other Considerations

It goes without saying that not all auto steering systems are alike. Even within the same class of precision equipment, such as equipment which functions with RTK sub-inch repeatability, there are many differences. Some questions to consider when selecting a system include:

■ Can I use the system on various pieces of equipment? Or is it dedicated to a single tractor or combine? If the cost

of a system can be spread out over various operations such as harvest, tillage, planting and spraying, it can save the grower a bundle. (Note: The major tractor/combine companies want you to use their OEM precision equipment, and will make it easy to purchase it with a new piece of equipment. But that may not be the best option for you, and the dealer will still sell you the tractor even if you have to insist that the OEM steering equipment and cost not be included.)

■ What is the ease of operation of the equipment? Can I easily make field boundaries and A-B lines? Will the steering portion of the operation basically be

the same in my sprayer and combine as it is in my tractor, or do I have to learn a completely different set of button pushes for each?

■ Will it do what I need and want it to do now and in the future? Is it easily expandable as my operation grows?

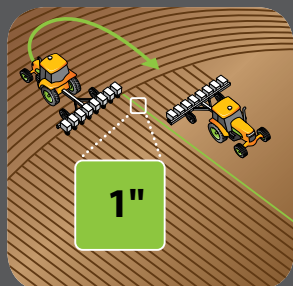


"More precision, more automation and more adoption of this technology will lead to increased efficiency and yields to feed a world exploding in population," Nix said.

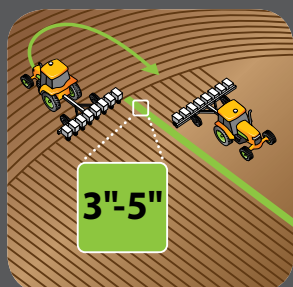
Auto Steer Accuracy Depends on GPS Signal

Ag Leader's automated steering systems are designed to work with a variety of GPS signals, including RTK networks. That means you can choose the level of accuracy you need based on the field operation you are performing.

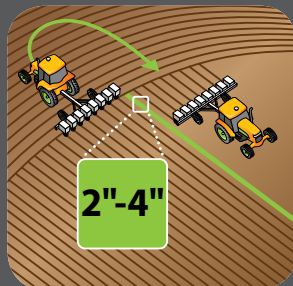
RTK



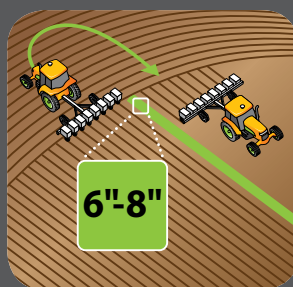
OmniSTAR XP



OmniSTAR HP



WAAS/EGNOS



The Sky's No Longer the Limit

■ Can I transfer the data easily between various operations and to desktop software?

■ Will it really give me the RTK accuracy I need? How close are my fields to the correction base? (Important note: Just because a system can receive an RTK signal does not mean the system is true RTK. What really matters is the distance to the base, and a distance of 10 miles or more will degrade the accuracy rapidly.)

■ Finally, the most important factor: What is the service capability of my dealer? Will the dealer be there if there is a problem? Does the dealer know how to properly calibrate the system for the best steering? Will the dealer explain to me the operation and thoroughly train me? Will the dealer be available on the phone or in person to talk me through even my basic questions? Or, is the dealer just selling me a system and throwing it over the fence to me?

In Conclusion

I'm here to say, auto steer is here to stay. And, it will become more widespread by those who must adopt this technology if they are to survive in the competitive market. There are already technical features available which would have amazed every single grower even 10 years ago, and there is no end in sight to the improvements.

"I'm here to say, auto steer is here to stay. And, it will become more widespread by those who must adopt this technology," Nix said.

Guidance and Steering Solutions

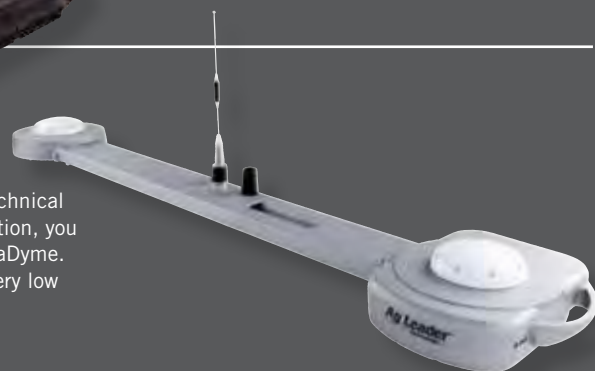


GeoSteer®

Designed to meet the steering needs required for small grain crops and emerging markets, GeoSteer bridges the gap between expensive, full-featured systems and less costly systems that don't provide the necessary functionality or level of precision desired.

PARADYME

For sub-inch accuracy, simple setup and technical support troubleshooting from a remote location, you won't find a system that is equal to the ParaDyme. Plus, a ParaDyme offers high accuracy at very low operating speeds.



A photograph of two men on a green tractor inside a barn. One man, wearing a green jacket, stands by the tractor's controls. The other man, wearing a plaid shirt and a cap, sits on the tractor's seat. The background shows the interior of a wooden barn with various equipment.

A Triumphant Return to the Tractor

Precision ag technology assists
in reaching one man's goal

For some, the July 4th holiday is often referred to as Independence Day. In a strange twist of fate, that term became even more meaningful for 25-year-old producer Jared Gueldener of Moro, Illinois.



"Instantly, it was a life-changing moment for Jared, as well as for the family. We've always been close, but it brought us all even closer," Tim said.

It was on a hot July 4th day in 2005 when Jared and his friends decided to cool off with a swim in a nearby lake. Everyone jumped in. Jared dove in, hitting his head at the bottom. Immediately, he knew something was wrong. He couldn't move to come back up, so he tried to relax his body, thinking it was a momentary problem. But when he couldn't come up for air on his own, his friends pulled him to safety and asked him if he could move. His answer was "No." Jared was airlifted to St. Louis and in intensive care for weeks, eventually diagnosed as a quadriplegic.

"As I was going through this, one of my first thoughts was am I going to be able to help out on the farm?" Jared said. "I think farming and the goal of getting back to it is what kept me going ... to get back into the tractor. That was my goal."

Jared is part of a multi-generational family farm operation started by his great-grandparents. The 2,000-plus acre dairy and crop farm is now operated by his father and uncles, which includes twins Larry and Terry and brother Don, as well as their sons, Jared (Larry's son), Tim (Terry's son) and Darren (Don's son).

Tim remembers the day of Jared's accident. He was supposed to leave for his first year of college just a few months later, but postponed it for a year to help with the farm. Both Tim and Jared describe the Gueldener family as "close knit," and always pulling

together for the good of the family and the operation.

"We have all been involved in the family farm from a young age. Jared and I grew up together. We are more like brothers than cousins," said Tim, a Dupont® Pioneer® seed representative and precision ag manager at Shipman Elevator

in his honor. The family also sold two steers that belonged to Jared and Tim (the new owners donated them back so they could be sold again). In total, the fundraisers allowed Jared to return to a newly renovated home to accommodate his electric wheelchair and other needs.



Jared uses a chair lift to transfer from his wheelchair to the tractor and truck.

in Shipman, Illinois. "Instantly, it was a life-changing moment for Jared, as well as for the family. We've always been close, but it brought us all even closer."

Not long after Jared's accident, the community rallied around his future by hosting a benefit

Soon after, the Gueldener family connected with AgrAbility, whose vision is to enable a lifestyle of high-quality for farmers, ranchers and other agricultural workers with disabilities, so that they, their families, and their communities continue to succeed in rural America.

AgrAbility defines its success by aiding in gainful employment in production agriculture or a related occupation; access to appropriate assistive technology needed for work and daily living activities; evidence-based information related to the treatment and rehabilitation of disabling conditions, and targeted support for family caregivers of AgrAbility customers. The organization addresses a wide variety of disabling conditions in agriculture, including arthritis, spinal cord injuries/paralysis, back impairments, amputations, brain injury, visual/hearing impairments, disabling diseases, cerebral palsy, respiratory impairments and brain injury.

"Once Jared got out of the hospital, our goal was to put him back in the tractor that first fall," Tim said. "It was then that we heard about Ag Leader's precision ag products and we decided to check out a demo."

There wasn't a moment of hesitation. The Gueldener family was sold on installing their first assisted steering system. After seeing the benefits that precision ag products brought to their operation, the Gueldener's chose to add an Ag Leader® Integra display and OnTrac2+™- assisted steering system on one of its John Deere® tractors.

"We are currently working on adding a third Ag Leader Integra display and GeoSteer® steering system," Tim said.



"As I was going through this, one of my first thoughts was am I going to be able to help out on the farm? I think farming and the goal of getting back to it is what kept me going ... to get back into the tractor. That was my goal," Jared said.



"Once he's in that tractor, there's no difference between the Jared of today and the Jared of 2005 before the accident," Tim said.

Jared, who cannot move his fingers, is able to easily operate the Ag Leader Integra display with his hand and thumb. He uses a chair lift to transfer from his wheelchair to the tractor, and then, he said, "Away I go!"

"Precision ag has not only allowed me to return to farming, it's made our operation more efficient," Jared said. "I run our combine, do tillage, bale, cut hay, etc., by paying attention to my surroundings and the data. Most of the time, the guys have

to tell me to quit because I'm in there so long!"

Jared also relies on a hand brake system, as well as his cell phone for assistance. What he can't do is leave the tractor and repair something if it breaks down in the field. But the cell phone solves that problem.

Tim said Jared tells him he "feels at home when he's in the tractor," and that they hope Ag Leader products will offer Jared additional options for continued farming success.

"Once he's in that tractor, there's no difference between the Jared of today and the Jared of 2005 before the accident," Tim said. "People would be surprised at how successful he is."

In reality, people are inspired by Jared's success, which is why he receives calls from all around the country from other producers and their families.

The key to making it work, he tells others, is setting a high goal, taking small steps toward

meeting that goal and always keeping a positive attitude.

"I'm not able-bodied and most people are amazed by what I've accomplished. They say it's because I have a good head on my shoulders, positive attitude, a great supportive family and know that if something doesn't work, I'll find another way to do it, because if there is a will there is a way" Jared said. "I was put in this situation, but I set a big goal and I conquered that goal."



A Man of Many Functionalities

Irrigation and Ag Leader® puts
Kentucky farmer in the record books



"I had intentionally ordered the combine with the steering valve, so the first thing I did was buy a ParaDyme® unit so I could have automated steering on the combine," Armistead said.

Fields don't sit idle very long around Adairville, Kentucky, where Joel Armistead grows approximately 1,500 acres of corn, soybeans and wheat with the help of his son, Zach. In fact, with the exception of 150 acres that hosts a 122-acre center pivot unit, Armistead typically harvests three crops in two years. It's little wonder he relies on Ag Leader® products at every stage of production just to keep up.

"The 150 acres that has the permanent irrigation pivot has been corn on corn for the past five years," he said, noting that he also has a towable pivot. "However, on the rest of the acres, I plant wheat as soon as the corn comes off. Then, once the wheat is harvested in June, we plant soybeans into the stubble. The following spring, it starts all over with corn."

Consequently, half of the acres each summer will be in corn and the other half in wheat and soybeans. That means Armistead relies on his pull-type Hardi® sprayer and his Lexion® combine several times per year. Fortunately, those two machines are also the ones supported by the Ag Leader® Integra display.

"This is my fifth Lexion combine and it actually came with the Ag Leader Integra display," he said. "But it wasn't until the previous one we owned, which had an Insight display, that we began using it with other applications, as well."

"Sprayer control and AutoSwath™ were the coming thing at the time, so we had ordered a Hardi sprayer with four shutoffs, instead of three, to cover the 60-foot boom width, just to reduce the overlap."

Armistead went ahead and put a new wiring harness on the sprayer so he could run it with

variable-rate apply a liquid potash and phosphate product that has been blended for his farm. So, for three years now, everything from seed monitoring to automatic shut-off of seed and fertilizer has been controlled through a single display. In the meantime, he has been using automatic steering since 2005.

could have automated steering on the combine."

Ironically, the ParaDyme system came with its own Ag Leader Integra display as part of a special offer. So Armistead took that display and put it in his sprayer tractor for use with a new Hardi sprayer that was delivered in early 2012.



In a typical year, Armistead grows about 1500 acres of corn, soybeans and wheat.

DirectCommand™ and an Ag Leader Integra display.

Since that time, Armistead has also converted his planter for row shut-off and variable-rate control of both seed and liquid nitrogen that is applied next to the row. He also added SeedCommand™ to his Ag Leader Insight display to

"Now that I finally got the planter all set up, I bought a new Lexion, which came with the Ag Leader Integra display," he said, explaining that he is similarly taking full advantage of that system. "I had intentionally ordered the combine with the steering valve, so the first thing I did was buy a ParaDyme® unit so I

"I had actually looked at the sprayer the previous fall and the thing that caught my eye was the fact that they were adapting to small boom sections and that they were now working closely with Ag Leader for monitoring and control," he added. "I told them, 'This is what I've been waiting for; I've been wanting to get a new sprayer.'"



Consequently, Armistead deleted the controller from the sprayer order and used his extra Ag Leader Integra display to operate a new Commander 440I with a 90-foot boom that's divided into nine 10-foot sections.

"With that many sections, it would be impossible for a person to manually turn them on and off in time to cut down on any waste," he reasoned. "But with the Ag Leader Integra display, I just make the first round on manual boom control and then turn the automatic system on and it does the rest."

Considering the number of applications he makes each year, the automatic shut-offs alone save a substantial amount on chemicals and fertilizer. Armistead said

he makes four or five trips over the wheat crop between the time it is planted and harvested. That includes two trips with liquid fertilizer, a herbicide/insecticide trip, and a fungicide/insecticide trip. Any other problem would add a fifth trip. Corn and soybeans, meanwhile, involve burn-down passes, as well as post-applications of Roundup® agricultural herbicide, since both crops are Roundup Ready® varieties.

"Since we're on an RTK system, we're also running the sprayer tractor on the same set of tracks all the way through the wheat crop and the following soybean crop, which is also drilled," he said, noting that he uses a rubber track tractor on the sprayer. "So we're not only reducing compaction, but covering

fewer acres due to the reduced amount of overlap."

Armistead said the automated steering is just as valuable on the combine, especially when he is cutting wheat and soybeans with his 35-foot header.

"It's hard to watch the outer ends of that header without overlapping," he said. "It's a huge stress reliever. But there have also been times when the wind has been behind me during soybean harvest and I could hardly see through the dust. So the ParaDyme system really pays off in those conditions."

He believes the ability to variable-rate seed and fertilizer has paid even greater returns, and he has the numbers to prove it.

In 2008, Armistead broke the 300-bushel yield barrier for the first time in Kentucky with a 305.9 bushel-per-acre test sample within his irrigated circle. He also won the 2008 National Corn Growers Association (NCGA) Corn Yield Contest in Kentucky. Since that time, he has won the state NCGA competition four more times in two different categories — irrigated and no-till/strip-till irrigated.

"So far, I've just been using a straight rate of seed and fertilizer under the pivot, while using variable rates everywhere else ... which is one of the beauties of the Ag Leader system," he said. "But I think this next year, I'm going to start variable-rating the pivot, as well. There are a few 'sweet spots' within the circle where I believe it will pay."

▶ *"So we're not only reducing compaction, but covering fewer acres due to the reduced amount of overlap," Armistead said.*



Making Sense of Precision Ag's Alphabet Soup

Digesting precision ag terminology

Precision farming tools are designed to simplify things for growers, and yet the terminology used in precision farming isn't always so simple. But have no fear. The following definitions will guide you through the mysterious twists and terms found in the world of GPS (Psst ... that stands for Global Positioning System).

GNSS: Global Navigation Satellite System is a navigation system with global coverage. GNSS is a method of improving the navigation system's attributes, such as accuracy, reliability and availability through the integration of external information into the calculation. GNSS 1 consists of GPS, GLONASS, WAAS, SBAS and EGNOS.

GPS: The Global Positioning System is a U.S.-owned utility that provides position, navigation and timing. There are three segments – space, control and user. The space segment consists of the satellites in space, the control segment consists of the people who manage and maintain the space segment and the user segment are those of us who use GPS. GPS is what allows us to map fields and auto-steer equipment.

GLONASS: Global Navigation Satellite System is the Russian-owned utility equivalent to GPS. This system can be used in the U.S. if your receiver is set up to receive GLONASS signal.

WAAS: Wide Area Augmentation System is a supplement to GPS created with the goal of improving accuracy, integrity and availability of GPS correction in the U.S.

EGNOS: European Geostationary Navigation Overlay Service is the European version of WAAS.

SBAS: Satellite Based Augmentation System is a system that supports wide-area or regional supplementation through the use of additional satellites broadcast messages.

Base Station: The base station is a receiver and transmitter that is stationary. It receives GPS information, corrects and then transmits the corrected information to the rover.

Rover: We refer to the moving equipment as the rover. For example a tractor with receiver would be referred to as the rover.

Differential Correction: Uses two GPS receivers to determine position. One is typically on a tractor in the field known as the rover and the other is in a fixed location referred to as the base. The base is in a known surveyed location. It calculates GPS correction using the almanac to determine timing errors, compares actual timing to what it should be and then broadcasts a timing correction for each satellite. There are different levels of differential correction including Coast Guard Beacon, WAAS, OmniSTAR and RTK.



OmniSTAR: A type of differential correction that is privately offered and can be obtained by paying a subscription fee. There are three levels; HP with 2-4 inch accuracy, XP with 3-5 inch accuracy and VBS with 6-8 inch accuracy.

RTK: Real Time Kinematic navigation provides real time correction. RTK can achieve sub-inch accuracy through the use of two GPS receivers. Using a short baseline distance allows the RTK base station to correct for local atmospheric conditions, as well as GPS timing errors to achieve higher accuracy and better reliability.

NTRIP/CORS: Network Transport of RTCM via Internet Protocol and CORS – Continuously Operating Reference Stations – are forms of RTK differential correction that are done through the use of a cellular modem and base station network. This means that instead of using the traditional base station and radio to send correction data to a rover, data is sent using the internet to a cellular modem with a data plan.

VRS: Virtual Reference Solution requires the rover to send a latitude and longitude position to the VRS network. The network then creates a computer generated base close to the rover that is used for correction.

PRN: Pseudo Random Number is a numerical identifier used by the GPS receiver to determine which satellite it is looking at.

PRL: Preferred Roaming List refers to the cellular provider or set of providers that you will use to get a cellular signal for NTRIP/CORS correction.

Convergence: The act of converging is when the satellites used for differential correction or base satellites are matching up with those being used by the rover. This process determines if there are enough satellites in common for the best possible solution.

NMEA: One-way GPS communication. The receiver sends signal to the monitor. Messages cannot be changed and contain information about latitude/longitude, fix quality, number of satellites, HDOP, altitude, speed and other information.

Baud Rate: Bandwidth of message or the number of characters it contains.

Hertz Rate: How often the message is sent. One Hz equals one message per second.

Pass-to-Pass Accuracy: Indicates the relative accuracy of a GPS receiver over a 15-minute period.

Keeping an Eye on the Crop

This Nebraska farmer personally uses every Ag Leader® product he sells, including OptRx™ crop sensors

When Matt Helmke talks to a customer about Ag Leader® products, he speaks from experience in terms of both longevity and practice. That's because Helmke, who works as a sales and service representative for Miller Sales near Clatonia, Nebraska, uses virtually every Ag Leader product he sells on his own 900-acre farm. That includes the OptRx™ crop sensors, which measure and record data about crops in real-time using the reflectance of light shined on the growing plants.

"This is our second year with the OptRx system," said Helmke, whose dad, Myron Helmke, is still involved with the farm. "We have a total of three sensors on a Hagie® sprayer with a 60-foot boom. Those are then averaged together for one rate across the full width of the boom.

The OptRx system is only the most recent of the Ag Leader products that Helmke has used or sold, however. His history with the products actually goes back to 2003 when he was working as a crop consultant for a co-op near Kearney,

Helmke recalled that it was during his years of soil testing and grid sampling that he became most interested in the use of GPS. About the same time, his employer added the Ag Leader product line to their sales inventory,

opportunity to return to the family farm, while still working for the same cooperative. Finally, in 2009 he joined Miller Sales, where he remains today when he's not working his own fields. Needless to say, Ag Leader still plays a major role in both vocations.



Helmke has installed Ag Leader's new GeoSteer® system for use with planter and spinner spreader that is used to variable-rate dry fertilizer.

Nebraska. Helmke completed his ag business degree in Kearney, as well.

which piqued his interest even more. A few years later, after being promoted to agronomy manager, Helmke had the

"Dad and I have a 12-row Kinze® planter with SeedCommand™, and SureStop™ clutches that automatically shut off the row units to prevent overlap on end rows and point rows," he said. "Plus, we have automatic shutoff for the fertilizer that we put on with the planter. The seeding units are set up for shut-off on every two rows and the fertilizer units, which apply starter fertilizer and liquid nitrogen, sulfur and zinc over the furrow, are set up on four sections of three rows each."

“Unfortunately, by the time plants show stress that’s visible to the human eye, that yield determination has been made. That’s where you see the true benefit of the OptRx system,” Helmke said.

In addition, Helmke has installed Ag Leader’s new GeoSteer® automated steering system in their Case IH Magnum™ tractor for use with the planter and a spinner spreader that is used to variable-rate dry fertilizer. All are operated with an Ag Leader® Integra display that is moved around between machines.

“All total, we’re using the Ag Leader Integra display on three different machines for four different operations,” he said. “That includes the tractor for planting, spraying and fertilizer; the Hagie for liquid nitrogen with the OptRx system; and finally, the combine at harvest for auto-steering and yield mapping.”



In the meantime, Helmke uses Ag Leader SMS™ software to analyze the value of different inputs on their no-till operation, including the use of a vertical tillage machine last year to test the effects of residue management and light conservation tillage.

“We did see some advantage on some of our weaker ground where the plants would dry up and die early or suffer because of low nitrogen levels due to low organic matter.”

Even though the OptRx picked up many of the same spots as the yield mapping has, Helmke believes in-season crop monitoring provides advantages.

“You still find some inconsistencies,” he said. “You could variable-rate a side-dress application based on yield maps from the past couple years; but we still found some spots in the bottom that benefited from the OptRx application. It may be that it was too wet in that spot last year and this year, the moisture is just right, but some of the nitrogen has leached out. You just never know.”

“Yield monitors do a good job, but I just think plant health is a better gauge of fertilizer requirements,” he added.

Helmke believes that side dress nitrogen is also an advantage in and of itself for improving yield, primarily because a producer is able to apply nutrients when the crop is actually determining its yield potential. Plus, it puts the nitrogen where it needs to be, when it needs to be there, so the plants aren’t as likely to run out of nitrogen before the end of the growing season.

Helmke says one customer who purchased the OptRx system from him last year saw even better results.

“He was doing it a little bit different, though,” he explained. “While we were surface applying with drop



The OptRx system is one of the most recent Ag Leader products that Helmke has used or sold.

nozzles, he was injecting between the rows with a toolbar. The customer seemed to be well-satisfied with the results,” Helmke adds. “You just have a smaller window with a toolbar, since the corn has to be tall enough for the unit to read the leaf color instead of bare dirt, yet small enough to go under the toolbar without breaking stalks.

“The key is to get liquid

nitrogen delivered to the plant before it makes its yield determination, which is generally around the V6 stage of leaf development on corn,” Helmke stressed. “Unfortunately, by the time plants show stress that’s visible to the human eye, that yield determination has been made. That’s where you see the true benefit of the OptRx system.”

DAILY NEWS

EXTRA!
EXTRA!

New Ag Leader® GPS Base Station

Offers farmers accuracy, range, simplicity

Farmers requiring sub-inch accuracy for their precision farming operations without the headaches of dropped signals from distant subscription-based RTK base stations or unreliable public RTK networks, have a new GPS option from Ag Leader.

The GPS 2500B is the all-new dual-frequency companion base station for the Ag Leader GPS 2500 cab-based antenna. Designed for tiling operations where highly-accurate pass-to-pass repeatability is required, the system can access long-range baselines. The system is ideal for operators who struggle with signal interference from tree lines and buildings or from varying signal range.

Setup of the GPS 2500B base station is quick and

easy, requiring the operator to set the unit on the tripod and connect battery. Signal acquisition is fast and can be accessed by multiple vehicles simultaneously.

The base station also features improved GNSS performance with RTK and GLONASS applications, a full graphic display with menu selection keys and standard USB flash drive data transfer.

The unit is protected in a rugged, field-proven housing that is resistant to damage from dust and liquid.

For more information, visit www.agleader.com.



THE INNOVATION UPDATE

LATEST:



Experience the best technical support

When an Ag Leader customer or dealer calls technical support for assistance – even during the busy season – they talk to a real, live person and product expert. Now, that doesn't happen every day. What makes Ag Leader's tech support even more unique? Both dealers and farmers alike can call direct.

"This a commitment and ongoing tradition that as product lines grow, tech support will grow right along with it," said Scott Andrews, Ag Leader technical support department manager. "We have the ability to speak to the product testers and the folks in product development. This helps us communicate up and down the product supply chain, and helps us find answers to any problems we might encounter."

New website for 2013 to offer optimum user experience

Later this year, Ag Leader will unveil a new website that aims to optimize the user experience no matter what device you use to access the site. Using a technique called "responsive design," the new website will identify the type of device you're using and respond by providing optimum functionality. From smart phones and tablets to desktop computers, the new website will provide you with enhanced readability and simplified navigation based on the technology you're using.



"The new Ag Leader responsive website will offer a more desirable user experience regardless of how the website is accessed,"

said Jake Smith, Ag Leader web developer. "When you are in the field, you can count on our new website to give you the information you need, when you need it."



Dealer training offered online

For 2013, Ag Leader Academy is launching a new online dealer training platform. With the recent additions of the Hydraulic Down Force system and the Intellislope™ Tile PloWControl system, Ag Leader dealers can register and attend 15 courses via self-paced webinar training modules through the Ames, Iowa, Ag Leader Academy.

Why, you ask? Ag Leader wants to give its dealers another way to keep up on the latest product functionalities and provide the best customer service.

Connect with Ag Leader

Social media is a common way people are communicating today. Not only can Ag Leader fans interact with the company on Facebook, Twitter, LinkedIn and YouTube, but also on Ag Leader's blog titled Precision Point. These platforms allow Ag Leader to inform and educate, and also have a conversation with those interested in precision farming technology. Connect with us today!



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