

PRECISIONAG™

I L L U S T R A T E D

Site-specific how-to for ag dealerships

February 2003

Excerpt from *Cyber Dealer*

By Scott C. Lucas

Trains Without Rails

LIGHTBAR GUIDANCE WAS A BIG DEAL in chemical application - it still is. GPS has gone from marvel to mundane to become the rule rather than the exception in agriculture, but ag technology companies say that the ride isn't over yet. Lightbar guidance might have just been a step, a link in the evolutionary chain of automated application. By now, you've probably already heard about its next evolution: Auto-steer.

"It's the next logical step for custom applicators," says Bridget Kirkwood, BEELINE Technologies, Inc., Westminster, CO. "You don't have to look out in front of you, you can watch what's going on in the field."

Besides allowing the applicator to concentrate on the job rather than on steering, auto-steer also can eliminate downtime caused by visibility issues. "You can work in day or night, in fog, you're just not shut down," says Lars Leckie of AutoFarm, Menlo Park, CA. He adds that expanding service areas for dealers make auto-steer even more valuable, since driver fatigue is less of an issue, meaning more hours can be spent in the field.

Steve Robisky, product manager for John Deere Ag Management Solutions (AMS), Des Moines, IA, stresses the quantifiable financial rewards that the technology can provide. "There's a visible economic payback," he says. "It's not hard to see what you're saving in terms of overlap. Imagine 2,000 acres with 10% overlap - that's equal to 2,200 acres of application. If you can reduce that overlap to 1%, it's only 2,020 acres, meaning you've effectively saved 180 acres worth of inputs."

He adds that other benefits may follow as well, and points to corn as an example. Since corn is sensitive to the date of planting, the ability of auto-steer technology to run all night means that more acres can be planted in that optimal window, which can boost yields.

Up And Running

BEELINE's Kirkwood says that an added perk of self-steering systems like BEELINE's Arro is their remarkable ease of use.

"When we first launched the Arro, I was at the Ontario farm show, and we had a ride-and-drive demo," she relates. "This group of

fellows came up, and one of them got in with our engineer. After a run that was about 200 meters long, he came back and said to our engineer, 'You can get out,' and one of the man's buddies hopped in. So after being on the tractor less than five minutes, he taught his friend how to use it. And they went through the whole group, just passing the baton from one to the other, until they had each taken one ride and taught the next in line how to use the system."

AutoFarm's Leckie has seen the same quick uptake. "We firmly believe that we can get anyone up and running in an hour," he says. "Our system uses a large color touchscreen that works like an ATM bank machine. You hit a button, it asks you a question, you hit another button, and you're set."

While the systems are easy to use, they are not always easy to retrofit to existing vehicles. Depending on the make, model, and age of a machine, there may be more set-up time required. However, if the machines you want to auto-steer are newer and more popular models, set-up will likely be a breeze. John Deere's Robisky adds that beginning this year, the company's track tractors will be made ready for the John Deere Greenstar AutoTrac system, requiring just the KeyCard software component to be used with the three-piece Greenstar system (display, mobile processor, and StarFire receiver) that forms the back-bone of Deere's high-tech products. The company even has its own signal, the SF2 (see "A Matter Of Inches," p.10).

Using a signal is one method of attaining the accuracy for auto-steer, although John Deere's SF2 and OmniSTAR's High Performance (HP) dual frequency signals are the only ones currently capable of achieving the needed accuracy repeatedly.

For sub-inch performance, most manufacturers recommend using a real-time kinematic (RTK) base station. However, the downside of the station is that it requires line-of-sight connection to any vehicles running off of it, and it has a limited range of operation from its fixed position. The Autopilot RTK from Trimble Navigation, Overland Park, KS, uses such a system, and the upside it has shown is that an unlimited number of vehicles can work off of the station at sub-inch accuracy. A station may be either portable or permanent; while a portable station can help to overcome the service area restriction, its range is smaller than a permanent station's, and it requires daily set-up.

However, AutoFarm's Leckie says that moving a station is no sweat. "We've got guys that just bring the station with them in the truck every morning. All you need to do is stick a pole in the ground and attach a car battery and it's up and running."

Since the source of DGPS is one of the main determinates of a system's accuracy, the manufacturers agree that choosing the right source of DGPS for auto-steer – signal, permanent RTK station, or portable RTK station – depends on a dealer's service area and services provided.

Just Ride

While there are differences, the general procedure for using these auto-steer systems is similar.

"Basically, you get in and turn the vehicle on, and the system powers up," says BEELINE's Kirkwood. "You have to tell the system what kind of implement you're working with, so it can use the implement width to measure field passes." Most of the systems store a number of implements in memory, so you only need to input the specs once. But even at that, it's a simple process of typing in the implement width and the desired overlap, and the system will be ready to go. "The system will also ask whether the implement follows directly behind the vehicle or if it is offset to one side. Then it will line up the implement pass-to-pass rather than the tractor," Leckie explains.

The next step is setting a waypoint that tells the system where to begin. "You just drop an electronic marker, drive to the other end of the field, and drop another, and the system draws infinite perfect lines relative to the line drawn between those two points," says John Deere's Robisky. Leckie adds that many operators will make this first run without doing any applying or with the implement out of the ground, and just drive to the end of the field as quickly as they like.

Next, it is just a matter of pushing a button. The system locks on to the line and guides the vehicle on a straight path to the other side of the field. When the end of the field is reached, the operator can grab the wheel, which disengages the auto-steering, and make the turn, pointing the vehicle to the next pass he would like to make, whether it is one row over or several. Hit the 'Go' button again, and the system will complete the turn for you and lock you on to that next desired pass.

"If you need to stop or back up, just hit the brakes or put it in reverse," says Leckie. "Then you can back right up that line if you like, just like you're riding on rails."

He adds that for all the usefulness of such systems, the value of the operator is not threatened. "It's not about replacing the driver, it's about the driver becoming an operator. The essence is that he's now doing the job you really need him to, he's watching the quality of the work, and not worrying about the monotonous task of driving. We've taken care of that for him."