

## Technologically Driven

GPS-guided tractors are steering themselves through the fields of California

### By Jamie J. Gooch Managing Editor

THE day's last rays of sunlight leave your field in shadows. You're almost done listing the field, but another field has already been prepped. If it rains tonight, the prep work is a wash. Too bad there's no way to drive a straight line in the dark. Actually now there is, if you let technology be your guide.

Global Positioning System (GPS) technology has been adapted to steer farm machinery by three companies: Beeline Navigator Inc., IntegriNautics Corp., and Trimble Co. Using a more precise form of GPS called differential GPS (DGPS), the companies claim accuracies within an inch or less. DGPS uses two GPS receivers, one stationary and one on the tractor. The stationary receiver corrects inaccuracies in the satellite GPS signals, then transmits the corrections to the tractor's GPS receiver. A mechanism attached to your tractor's steering hydraulics or electrical system and a touch-screen display mounted in the tractor cab round out the system.

#### IN THE FIELD

Once the equipment is in place, using it is as simple as touching an icon on the display unit, driving the length of the field, and touching the icon again. This, plus user-defined parameters that tell the computer how wide the implement is, allow the computer to determine where you should start the next row and how to automatically steer in a straight line.

Programming a field and implement's measurements into the computer is accomplished by scrolling through a series of menus that appear on the screen. Systems from all three GPS guidance companies allow multiple fields to be saved and recalled for future use.

"It worked slick," says Dan Ramos about the IntegriNautics Autofarm system he's trying out at Ramos Farms, Los Banos, CA. "The accuracy really amazed me. We can skip rows and work back to them and it comes out perfect."

Of course, the accuracy on the ground depends on more than the GPS signal. The signal itself may be accurate to within a few centimeters, but rough fields and loose implements can ruin that accuracy.

---When done correctly, the companies say accuracies on the ground of an inch or so are standard. And that's accurate enough for most growers to get more use out of their equipment.

"We've run in dusty conditions and never stopped," Ramos says. "We can roll at night or in fog. Before using the system, we might have to stop eight or nine times and wait for the dust to settle. That wasted a lot of time."

Round-the-clock operation allows you to make the most efficient use of your machinery. If one tractor can get the job done in 24 hours, there's no need

to buy another tractor. Add the savings associated with not having to double up on implements with the time you save, and you get a pretty good case for investing in a GPS guidance system. And that doesn't even take into account potential reductions in compaction by routinely driving over the same tracks, saving fuel and inputs by eliminating overlap, or reducing driver fatigue.

"When you figure you can list at night and the other things you can do, the value is there," says John Inman, an AVG columnist and ag engineer based in Salinas, CA. "Listing is just one application. There's a lot left to the imagination of growers willing to accept the technology."

#### THE COMPANY LINE

The three GPS guidance companies competing in the market are doing everything they can to ensure growers accept the technology. All three offer on-farm training and 24-hour customer support. Training materials and on-screen menus are written in English and Spanish.

---IntegriNautics' Lars Leckie agrees that the technology is easy to use. "Our system takes about two or three hours to install and a day of training. It basically turns a farmer into an operator, allowing him to pay attention to other details."

