

Tractors go high-tech

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Doug Mellon's tractor is controlled from outer space. Like dozens of Arizona farmers, he has bought the latest in agricultural technology - a GPS-guided tractor, which, among other things, can steer itself.

A receiver on the tractor picks up signals from the Global Positioning System, a satellite-based electronic tracking system used commercially for navigating trucks, ships and airplanes, including crop dusters. Adding another signal from a base station on the ground, the system pinpoints the tractor's position within an inch. This allows farmers to maintain straight rows of crops and create, with the assistance of computer software, accurate maps of their fields.

"This is one of the best inventions that has come along in the past 20 or 30 years in agriculture," said Mellon, who farms about 6,000 acres in Yuma and Tacna. "We're going to use this tracking system to figure out where our stronger and weaker parts of the field are."

That knowledge, he said, means more precise irrigation and application of fertilizers and other chemicals. Applying substances only where they're needed saves money and lessens environmental impact.

Three major manufacturers of the technology have been selling in Arizona since the first of the year, so many of the tractors are entering their first winter vegetable season, part of an industry that in 2000 had an economic impact of about \$6 billion, according to the Arizona Agricultural Statistics Service.

Manufacturers predict and farmers hope the technology could ultimately increase yield. Normally, the driver errs on the side of caution in spacing, resulting in certain rows placed farther apart than others. A few inches every few rows add up over the



course of a field, but with the GPS system that extra space isn't wasted, so a field can fit more rows.

Whether or not manufacturers' predictions of increased yield will come true has yet to be seen, but Mellon, for one, has seen a positive impact on his operations. Normally, he runs two tractors when he prepares his fields for the broccoli, romaine, head and leaf lettuce he grows during the winter.

This year, he spared one tractor and used a GPS-equipped tractor around the clock. The GPS system can steer straight at night, as well as in the rain and fog. A human driver still sits in the cab to make turns, but on the straightaway the GPS system takes over, reducing fatigue.

Each field is programmed into the system by moving the tractor to the beginning, and then the end, of the first row. The system creates a straight line between the two points, and then makes parallel rows, at whatever distance is selected, with no more input from the driver.

The cost of the GPS system is about \$50,000, which is significant, he said, considering that tractors alone are priced from \$60,000 to \$120,000.

David Wuertz, of Sundance Farms in Coolidge, said he knows the problem of low-priced cotton firsthand, but he

went ahead and bought a GPS system in June.

"As prices of commodities drop, to stay in the business, we have to find ways to cut costs," he said.

Wuertz is hoping that the AutoFarm he purchased from IntegriNautics Corp. will allow him to be more cost-efficient, especially with water use. For 20 years, his family has been using an embedded irrigation system on 5,000 acres in and around Coolidge and Casa Grande. Each year, he said, it is a battle to plant directly over the irrigation lines. The tractor drivers used to get within 4 to 6 inches, said Wuertz, though he would have preferred 2.

Using his new GPS system, he can. He'll also be able to farm more acres per day by running the tractor at night.

"You can see it starting to be adopted across North America," Maxwell said. "It's going to be a major change in agriculture. We're going to sit here 10 years from now and say, 'Wow, how did we ever farm without it?'"

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