

Power Planting

GPS system boosts production efficiency

By Larry Stalcup
Special Correspondent

By using a revolutionary automatic steering system on their tractors, managers of a 4,600-acre Nebraska potato farm have sliced away the need to pre-mark fields for planting. That's a stout savings in itself. And, by holding guess-row errors to about the width of a French fry, they are capturing at least one acre of production more per field and hope to pay for the system in less than a year.

"With 40 fields, that's an extra 400 bags (cwt. bags). At \$5 cwt. on the fresh market, that's an extra \$80,000 in income," said Ron Kohlman, manager of Nonpareil/RDO Farms outside O'Neill, Neb.

Nonpareil, with its headquarters in Blackfoot, Idaho, has had its brands of potatoes on the market since 1945. It has been a leading fresh market potato company. RDO Farms has its headquarters in Fargo, N.D.

Both companies teamed up to establish the northern Nebraska operation. The 4,600 acres of russets and a few reds are all under low-pressure center pivot irrigation. The operation also features a major storage and processing plant.

Growing that many acres of potatoes requires top management in all areas. It starts at the field, where Kohlman and his associates take pride in producing high yields and top quality spuds. In 2003, they began depending on the AutoFarm global positioning system (GPS) and its AutoSteer feature to further enhance their farming efficiency.

A division of IntegriNautics Corp. of Menlo Park, Calif., AutoFarm uses GPS technology that has become popular in many West Coast crop production areas.

It is also seen on more and more Great Plains farms, especially where center pivot irrigation is often vital to top production.

The system features a touch screen mounted just to the right of the steering wheel in the tractor cab. It is fed data from three antennas mounted on top of the cab

that tells the system sub-inch tractor position, as well as roll, pitch and crabbing angles. A radio antenna receives data from a portable base station antenna usually located within a few miles of the field being worked. The base station is powered by a standard 12-volt marine or automobile battery, receives its data from the 25 GPS satellites circling the globe.

Merle Hagemann, the farm's shop foreman in charge of the system, said the tractor steering system is linked to the display panel. Tractors steer themselves on the exact line entered into the in-cab box and computer screen.

Three John Deere 8410 tractors are equipped with the GPS system. The system was first put to the test at planting time earlier this year.

"Before installing the AutoSteer system, we had to pre-mark rows – 12 rows at a time – to establish our guess rows," Kohlman said. "That involved two tractors. We then planted, using six-row, Kverneland

planters. That involved tractor drivers in the field up to 16 hours a day. Like any field operation, steering the tractors for that long caused much fatigue. The margin for error was too high for us.

"We had to solve our row problems," he added, "If they were too wide, we had excess weed growth between rows. If they were too narrow, we were slicing some potatoes during harvest. And in the fresh market, any cut potato is a throw away potato."

"With the AutoSteer system, we no longer needed to use our tractors for marking fields before planting," Hagemann said. "That was about a \$5,000 savings for each tractor. We also had fewer labor costs that equaled about \$5,000."

Hagemann oversees the farm's program. He was anxious early on, especially since he had been a novice with computers. He quickly discovered the ease of operating the system.

"The AutoFarm reps did all the initial



The display, left, gives operators information on the fly.



Ron Kohlman with Nonpareil/RDO Farms, center, says that the system's value became apparent immediately. Kohlman and Merle Hagemann, above, move the portable base station antenna that will add an extra 400 bags on 40 fields.

calibration," he said. "They then explained to us how it worked. I was able to pick it up in less than an hour after

one field demonstration. Another system we saw required about eight hours to program. Even if major adjustments are needed, they can be made over the telephone with the reps. It's a very easy system to operate."

Before planting, a lead tractor sets its A-B line adjacent to the center pivot road. Once the line has been established, two other tractors set their steering lines at the same reading. When planting started, all three tractors, pulling planters weighted down with about 9,000 pounds of tubers for planting, were exactly on line.

"We were very impressed," Kohlman said, noting that planting was at 4 mph with the 220-hp tractors. "Since drivers did not have to steer, they were able to keep a much closer eye on the planters. We had at least 75% fewer skips and plugged rows. And the driver fatigue factor was minimal if anything."

The system was then used for cultivating.

"What was impressive was being able to cultivate in a precise line 24 hours a day," Hagemann said. "The tractor driver did not have to worry about plowing up any young vines."

The final step was harvest this fall, which took place around Sept. 15 through

Oct. 15. Eight additional tractors were leased to tackle the effort.

"We are using our standard three sets of four-row system of harvesting," Kohlman said. "We will run one four-row Double L harvester and two four-row windrowers. Potatoes are planted 6 to 8 inches deep. The lead tractor in each field will have AutoSteer engaged and the two other tractors will follow in the line it establishes. With the AutoSteer program, we know our tractors will be within sub-inch accuracy."

Hagemann noted that new software for the system is enabling tractor operators to determine the number of satellites within range if relaying data to the base station, then to the tractor.

"If we see that one field has access to only three or four satellites and another has access to nine, we might move to that field to make sure there is no break in the data link," he said. "But that is a rarity. Also, if there are lots of trees or other structures blocking the way of the base station, we can use a 'bender' antenna to boost the signal."

The system costs about \$45,000 per unit. That may sound expensive, but with a reported \$95,000 savings in tractor time, less labor and added production, the advantages make it worth the cost, according to the company.

For further information on the system, visit the Web site at www.gpsfarm.com.