Crop Production

Choose the biggest payback punch

THERE was a time when you couldn't open a magazine or turn on a farm radio program without seeing or hearing someone talking about precision agriculture. Today, the language has changed, and terms such as GPS, yield mapping and grid sampling are part of agriculture's vocabulary. Yet many producers are still moving forward slowly to bring the top-end practices of technology into their businesses.

If you're still inching toward adding more precision farming technology to your business, which practices are going to bring you the best bang for the buck right out of the starting gate? The answer probably changes from year to year, but starting out, Viacheslav Adamchuk, assistant professor of biological systems engineering at the University of Nebraska, talks about one area: autoguidance.

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"There are several technologies marketed under the precision agriculture umbrella out there, but adding autoguidance is a good place to start," he says. "The technology goes a long way toward ending the waste of overlapping applications or skips."

Beyond the up-front savings from reduced overlap, which some say can be as much as 10% to 15%, Adamchuk notes there are ergonomic benefits from using autoguidance systems. "You can accomplish more while driving the machine, operate under poor visibility or hire less-experienced labor to do a job," he says. "At the end of the day, there's less fatigue." He adds that it is hard to put a dollar figure on those benefits.

Controlling traffic

Autoguidance can help implement controlled-traffic management. For farmers using ridges, that may not be an issue, but for a majority of crop operations, adding controlled traffic can make a difference, Adamchuk says. With controlled traffic you can reduce compaction by driving along dedicated tracks. The systems also work well with strip-tillage and drip-irrigation operations. "It's almost impossible to farm in some of those systems without centimeter-level autoguidance," he says.

Key Points

- Appropriate technology can put plenty of useful information at your fingertips.
- Rising costs offer a bigger payback for use of precision technology.
- There are economical ways to tackle precision ag and get useful information.

In some areas of the country, precise real-time kinematic systems are getting less expensive. "Farmers and co-ops are getting together to create networks of base stations," Adamchuk says. When using RTK systems, a single base station can provide a corrective signal as far as five to 10 miles. In Kansas and North Dakota, farm groups are coming together to create networks of these base stations using existing elevators and other tall structures or permanent towers. "That can lower the cost for many producers."

Prices are falling

As the technology of precision agriculture has evolved over the years, farmers are also finding they can start with an initial investment, and the major players have made it relatively easy to upgrade. Often the upgrade is a change in software or the addition of some new hardware that works with the system.

But Todd Peterson, emerging technologies manager, Pioneer Hi-Bred International, notes there are cheaper upgrades that can really add value to a system. "If you already have the GPS yield-mapping system, why not move it to the tractor at planting or spraying time and map those applications?" he asks. "Depending on your system, it may only cost $150 for a bracket and some wire to move that mapping system out of the combine and into the planter tractor or sprayer cab."

Peterson notes that those planting and spraying maps pay off in providing more information when looking at yield maps. As for yield maps, a lot of combines in the field have yield monitors still not linked to GPS.

"It's like buying a pickup and never putting anything in the back; you are not using the capability of the tool you already purchased. A yield-monitor-to-mapping upgrade is an investment more growers should be looking at," he adds. Peterson tells of growers using handheld GPS units they purchased for hunting or fishing to provide the signal for that yield monitor and creating some "pretty good maps."

Peterson notes that Pioneer is offering a new mapping service for 2006. A Pioneer sales representative can send a copy of a grower's yield data to the Pioneer mapping center where high-quality yield maps will be printed and sent back to the Pioneer agent, who then delivers them soon after harvest.

"That's something that kept coming up in surveys with growers: Make mapping easier," Peterson says. The program is available at no cost for Pioneer customers.

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CASE IH

Match fertility of fields to crop yields

WITH nitrogen and other energy-related prices riding high, a lot of growers are looking at a number of ways to optimize fertilizer use. Viacheslav Adamchuk, University of Nebraska biological systems engineer, says two questions growers should ask are: "Is there variability in the field?" and "Does it matter?"

Site-specific crop management is still a hot topic after all these years, as farmers find they can optimize management of pH, N and other inputs using this technology. In a year when fertility costs are higher than ever, cutting back on N may work in some areas. Or better yet, keep N use the same and put it where it will do the most good.

"It depends on the field," Adamchuk says. "You'll either get the same yield with lower input rates or a yield increase with the same average input rates." Different soil and crop on-the-go sensors can increase feasibility of many management strategies aimed at achieving this goal.

The key is to work with an agronomist or crop consultant to find the approach that works best for each operation. Soil-sampling data matched up with several years of yield maps and other data layers should give an idea of which parts of the field can respond to optimized fertilizer use the best. It's worth looking into.

Find tools online for precision ag

A LOT of Web sites with precision agriculture information exist. Simply type "precision agriculture" into a search engine such as Google, and you'll get a big list.

Major manufacturers like Trimble and AgLeader have good background information on their sites. Check out the following sites if you are looking for more information:

- *www.gpsreview.net* — blog that covers GPS issues
- *www.agriculture.purdue.edu/ssmc* — Purdue's site-specific management center with many useful publications
- *precisionagriculture.unl.edu* — University of Nebraska site dedicated to precision ag