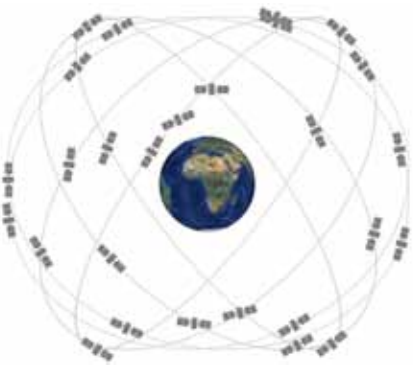


## Technologically Advanced Ag

### *Tools for the 21st century*

From horse-drawn plows to auger wagons that are controlled from within the combine, the world of agriculture is constantly changing. Sophisticated technology that was once only used in specialized situations by organizations like the military is now being used on an everyday basis by farmers in their fields.

### Increased precision with GPS



*The GPS "constellation" of satellites transmits radio signals to users. Photo courtesy of <http://gps.gov>.*

One example of previously specialized tech that is now being used every day is the global positioning system (GPS), which was created as a military tool. GPS was patented in 1973 and the first satellite was launched in 1978.

Since then, GPS has come to be used by hikers, hunters, the military, NASCAR, and farmers—to name just a few.

Farmers are also finding new uses for GPS. It can show where your equipment is in the field, help you pinpoint the locations for soil sampling, or help auto steer so you can pinpoint right where you need to plant. Overall, GPS makes planting, tilling, fertilizing, and other functions more precise. GPS also allows the operator to have more comfort and flexibility to switch between keeping watch over the equipment and performing other tasks, such as keeping track of markets.

### Smartphone apps make life easier

Who would have thought that cell phone technology could be implemented in the fields? According to Delta Farm Press, "One of the key ingredients in the Smartphone explosion is one some would consider a privacy issue—the Global Positioning System or GPS tracking feature." GPS can be a valuable tool to farmers for managing their operation.<sup>1</sup>

Smartphone apps are being utilized more and more by farmers, and leaders in the agriculture industry have developed useful apps, many of which are free.

For example, Trimble, a GPS technology company, recently introduced its "Connected Farm" smartphone app.<sup>2</sup> This app "allows farmers or their consultants to map field boundaries, take geo-referenced photos and enter scouting information for weeds or insect pests—all from their phone," according to Delta Farm Press.

Farm Industry News released a list this year of the top agricultural apps for smartphones. The list includes farming apps that help farmers compare nitrogen prices, monitor crop moisture shrinkage, or even help with tank mix calculations for varying field sizes.<sup>3</sup>

### Crop scouting gets a makeover

Crop scouting was once an extremely time-consuming task, but in the future aerial drones may make it much easier.

---

*"Researchers at the University of Nebraska-Lincoln and private consultants are assessing the use of aerial drones—either remote-controlled airplanes or four-propeller model helicopters—for crop management."*

*- from a recent article in the Midwest Producer by Barb Bierman Batie*

---

The article goes on to say, "drones can also be used in precision agriculture such as assessing nitrogen needs or checking for weed or insect infestations."<sup>4</sup>

### Telematics tracks essential data

When it comes to agriculture, telematics may be one of the greatest advancements yet. Telematics refers to technology that can connect wirelessly to mobile devices or machines from a computer or smartphone. According to the Alabama Cooperative Extension System, telematic technology "offers wireless data transfer, remote diagnostics, equipment tracking and maintenance scheduling, and remote dealer support."<sup>5</sup>

John Deere, Trimble, and Raven Hardware have all developed telematic programs for agricultural use.

JDLINK, developed by John Deere, allows farmers to “easily see what equipment is earning and which machines are idling—all while keeping preventative-maintenance tabs on each machine in your fleet.” This enables easy monitoring of the health of machines and tracking of a machine’s location and hours.<sup>6</sup>



*The John Deere Greenstar 3 and an iPad in the tractor cab can provide full monitoring and control over your tractor, baler, combine, or sprayer. Photo courtesy of Cross Implement, [www.crossimplement.com](http://www.crossimplement.com).*

Connected Farm Systems is another telematic technology program developed by Trimble. This program delivers real-time movement data about machinery, engine performance data, and scouting data. Trimble offers a corresponding smartphone app, desktop software, and other Internet capabilities.<sup>7</sup>

Raven Hardware’s program is called Slingshot. According to Raven’s website, this program “wirelessly connects every square inch of your land to a system of intuitive [online tools](#) and premier hardware.”<sup>8</sup> Slingshot has multiple components, including Slingshot Field Hub, which enables high-speed internet on field computers, and Slingshot Online, which keeps vehicle operators connected to high-speed internet.

Many of these telematic programs offer similar capabilities, but there should be something that fulfills everyone’s needs.

### Other technological advancements

Modern equipment technology has made adjusting equipment attachments a simple process that can be done from the comfort of the cab by the touch of a button on a controller or monitor.

Examples include [air adjust residue managers](#), attachments for



*Air adjust residue managers, such as the Yetter 2940 for Case, and other new technology have allowed farmers to make adjustments from the cab with a touch of the button.*

planters or toolbars. These tools use pneumatic up pressure and down pressure to fine-tune the down pressure to

the attachments for varying tillage practices and soil conditions.

Yetter Territory Manager Jared Head says, “Being able to adjust with a controller in the cab saves farmers’ time because they don’t have to get out and make adjustments for changing field conditions.”

Another example is variable-rate application fertilizer. Variable-rate application allows producers to apply different rates of fertilizer across the field at different locations. According to experts at North Dakota State University, “The technology needed to accomplish variable-rate fertilization includes an in-cab computer and software with a field zone application map, fertilizer equipment capable of changing rates during operation and the Global Positioning System (GPS).”<sup>9</sup>

### Looking towards the future

This is only a snapshot of how changes in technology have advanced and shaped agriculture. Smartphone and tablet applications, telematic programs, GPS, and other advancements appear especially amazing when looking back only 20 years to when the bag phone was state-of-the-art technology. It will be exciting to see what the next twenty years will bring in the advancement of technology—and agriculture.

### Endnotes

<sup>1</sup> Forrest Laws, “Smartphones and apps taking agriculture by storm,” Western Farm Press, <<http://westernfarmpress.com/equipment/smartphones-and-apps-taking-agriculture-storm>>.

<sup>2</sup> Connected Farm, <<http://www.connectedfarm.com>>.

<sup>3</sup> “Top agricultural mobile apps for smartphones,” Farm Industry News, March 12, 2012, [http://farmindustrynews.com/precision-farming/top-agricultural-mobile-apps-your-smartphone#slide-8-field\\_images-54491](http://farmindustrynews.com/precision-farming/top-agricultural-mobile-apps-your-smartphone#slide-8-field_images-54491)>.

<sup>4</sup> Barbara Bierman Batie, “New view: Four-rotor model helicopters, remote-controlled airplanes could provide different perspectives for crop management,” Midwest Producer, February 23, 2012, <[http://www.midwestproducer.com/news/agri-tech/new-view-four-rotor-model-helicopters-remote-controlled-airplanes-could/article\\_e15ff16c-5e47-11e1-94dd-001871e3ce6c.html](http://www.midwestproducer.com/news/agri-tech/new-view-four-rotor-model-helicopters-remote-controlled-airplanes-could/article_e15ff16c-5e47-11e1-94dd-001871e3ce6c.html)>.

<sup>5</sup> “Telematics: Wireless Connection and Data Transfer,” Alabama Precision Ag Extension, July 2012, <<http://www.aces.edu/anr/precisionag/documents/Telematics.pdf>>.

<sup>6</sup> JDLINK Machine Monitoring, 2012, <[http://www.deere.com/wps/wcom/en\\_US/services\\_and\\_support/product\\_support/construction\\_technology\\_solutions/machine\\_monitoring/machine\\_monitoring.page](http://www.deere.com/wps/wcom/en_US/services_and_support/product_support/construction_technology_solutions/machine_monitoring/machine_monitoring.page)>.

<sup>7</sup> Connected Farm.

<sup>8</sup> Slingshot, <<http://ravenslingshot.com/>>.

<sup>9</sup> John Nowatzki and Vern Hofman, “Variable-rate Fertilization for Field Crops,” NDSU Extension Service, December 2009, <<http://www.ag.ndsu.edu/pubs/ageng/machine/ae1445.pdf>>.