

Ditch Assist is an automated RTK machine control system designed for use with scrapers, ditchers and land levelers.



System Offers Precision Control Land Shaping

Whether leveling fields or improving drainage, Northern Plains Drainage Systems (NPDS) has the technology needed. The company made its name with RTK GPS field surveying and drainage before moving into supplying tile plows. From there, it was a simple step to address land shaping for drainage.

"Farmers have always been our main focus," says Joel Classen, NPDS. "We started off as a family farm operation with lots of drainage challenges. My brother-in-law went to school for GIS (geographic information systems), and we teamed up doing drainage design for contractors."

In 2016, they introduced Ditch Assist, an automated RTK machine control system designed for use with scrapers, ditchers and land levelers. Ditch Assist can also be used to control grade on many pitch and cantilever tile plows.

They later introduced Ditch Assist X for use with excavator and backhoe on-grade guidance. It's an add-on to a Ditch Assist system. Utilizing RTK GPS and machine-mounted sensors, it provides operators with precise information on bucket elevation, enabling accurate digging without the need

for manual grade checks or laser setups.

The company later developed Ditch Assist DIG as a less expensive, stand-alone system for excavator grade control in simple, straight-line work. Unlike Ditch Assist X, it doesn't offer mapping capabilities, survey data exports or 3D design imports.

"We have large and small farms using our systems, with larger farms often using multiple systems," says Classen. "The systems offer machine control beyond drainage. A lot of what we sell internationally is for earthmoving for irrigation. Quite a bit goes to South America for rice production."

Classen notes that the farmer/customer can do the installation of the wireless systems.

"It's color blind and can be moved from brand to brand and between different types of equipment," he says. "It's designed to be easy to install and one size fits all."

The entry point for a complete Ditch Assist kit with hydraulic automation is around \$7,500.

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French Company Turns Smartphones Into Grain Analyzers

When grain farmers can't accurately assess crop quality, they typically face pricing difficulties. These issues result in wasted time, uncertainty, and lost opportunities, as most grading processes involve lengthy visual analysis and laboratory testing.

France-based Inarix aims to change the agricultural landscape by turning typical smartphones into pocket laboratories. Their PocketLab platform leverages the power of AI and machine learning to analyze visual data provided by customers and farmers.

Inarix Chief Technology Officer Artemis Llamosi explains they're working at the frontier between AI and agriculture.

"It's our mission to get the best out of each grain," he says. "This innovative approach helps farmers more accurately price their grains, improving their overall profitability."

To use the technology, farmers simply take a picture of their grains, and the technology takes it from there, using various criteria to provide a detailed analysis.

Inarix's database is continuously growing, now containing over a billion items. The platform is built on the DINOv2 computer vision model from Meta, and contains pre-existing crop knowledge, helping to reduce data requirements and training time while improving performance across different phone models. This makes it easier for Inarix to learn additional criteria and expand its user base while reducing product development costs.



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Using the DINO modeling, Inarix advanced its precision and analysis within 2% to 3% accuracy in predicting composition, a specificity allowing more confident decision-making and improved profitability.

Currently, the platform can assess barley, wheat and corn. Soybean trials are ongoing. The Paris-based company covers approximately 40% of the French barley industry and has gained significant traction operating in more than 10 European countries and across North America.

"Our vision is to spread both upstream and downstream, and DINO is an important element of this strategy," Llamosi says. "Given this new lens that we provide, we think we'll transform the agricultural supply chain."

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Repair Kits Mold Concrete To Concrete

A California-based concrete company recently transitioned its 30 years of commercial services into nationwide retail, adding a pair of Like-Nu Concrete Restoration kits to its product line.

The spray-on and restoration kits utilize a patented process that combines proprietary, specialized concrete formulas and binding materials to easily transform worn, stained, discolored, or repaired concrete to a like-new condition. Each comes in a 5-gal. pail for mixing the Part A and Part B materials.

"Just mix the different parts, put them through a supplied strainer net for smooth application, and pour it into an ordinary garden pump sprayer," says Like-Nu president, Todd Harris. "Spray it on the old concrete and over the repairs that always look like a scar. With our product, you won't even notice them."

Harris says a mix of professionals and do-it-yourselfers are purchasing the Texas-manufactured kits, which are available across the U.S.

"The difference between our kits and our competitors is ours are concrete that penetrates concrete so it never blisters, chips, or peels," he says. "We're cost-effective at under a dollar a square foot, and time-effective for



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complete jobs in only two hours."

The kits cover from 400 to 600 sq. ft. and sell directly from the website or Western-based Home Depot stores for \$269 and \$369, respectively.

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Biodegradable sensor (left) is partially submerged in the soil. Reusable electronics, which will help enable digital agriculture readings, are connected by wires.

Biodegradable Sensor Project Benefits Soil

Researchers in Scotland have developed pH sensors that, at the end of the season, biodegrade into the soil and eventually feed new plant growth. The sensors are the work of engineers from the James Watt School of Engineering, University of Glasgow. They collaborated with researchers from universities and research centers in Canada, Finland, Poland and Switzerland. The effort to create electronic materials that degrade into plant nutrients is part of a larger project called the Transient Electronics for Sustainable ICT in Digital Agriculture.

The sensor project included powering the sensors with solar cells and supercapacitors made from sustainable materials. The goal is to enable an environmentally friendly solution for precision agricultural monitoring.

While the front-end sensing modules would biodegrade, they would be paired with reusable electronic systems. The combination is seen as reducing the environmental impact of digital agriculture's use of networked sensors.

Currently, networked sensors are non-recyclable. As digital agriculture and networked sensors grow, they'll add to electronic waste.

To make the degradable sensors, the research team printed circuits using graphene-

carbon ink on a biodegradable polymer substrate. A sensing layer of molybdenum disulfide was then printed on top. All the materials naturally break down into nutrients.

The sensors consistently monitored soil pH levels in solutions from pH 3 to pH 8 over a two-week period. They also detected traces of ethephon, a common plant growth regulator. It can be toxic to humans and wildlife if it contaminates groundwater.

Soil pH is only the first application of the technology.

"We're keen to continue expanding our biodegradable sensor's ability to detect other key indicators of plant growth and soil health," says Jeff Kettle, who led the research team. "That could include adding sensitivity to forever chemicals like PFAs, which have significant environmental impact."

Another application the international research team is considering is a solar-powered patch that can be applied to the surface of crop leaves. It'll measure key indicators of growth and transmit the information collected to a central computer.

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