

DOCTOR DRONE

Take a moment and imagine the earliest forms of organized farming. Now, think about what farming looks like today. What influential inventions come to mind when envisioning the history of production agriculture? The plow? The tractor? Maybe even artificial insemination? How we produce our food has transformed over the past 10,000 years and the question now is: what's next?

Precision agriculture is proving to be the future of farming by using new technologies to determine the most effective method to utilize inputs and maximize yield. Unmanned Air Vehicles or UAVs, better known as drones, have become the key tool in developing individualized farming prescriptions through aerial mapping.

"Juan went to work and in a matter of minutes, he had mapped the entire field of 224 acres," said Mitchell Jansa of Apple Creek Farms out of Garden City, TX.

Juan Cantu, founder and owner of Innovative AgriVision LLC, grew up in Acuff, Texas. It was this small town West Texas upbringing where he developed a passion for agriculture.

"I've always been in ag; grew up in the farming ranch community... and I loved ag; I knew I wanted to be in the ag field," Cantu said.

Cantu followed his enthusiasm for farming to West Texas A&M where he received his bachelors in agricultural education. After graduating, he moved to Ohio and began work for the intergraded solutions department at a John Deere dealership. It was here when Cantu began experimenting with UAVs. He began to see the potential UAV's had in farming.

"I did a bunch of research in drones because it was the new ag technology coming out," Cantu said. "I fell in love with it and thought that's the way it's [the industry] gonna go."

Today Cantu commutes between Ohio and Texas attempting to find balance between work, school and family. Cantu runs his own precision ag company, Innovative AgriVision LLC, while finishing his master's in agricultural education at Texas Tech University, specializing in plant and soil science. "I am so excited to

finally be working with Texas Tech. I have wanted to be a Red Raider my whole life," Cantu said.

Innovative AgriVision represents the latest technology in the farming industry. Cantu develops custom growing prescriptions for his clients by collecting images with his drone to digitally produce a diagnostic. He does this with his Precision PaceSetter UAV by flying over the targeted area, accumulating GPS points and photos. The drone used by Cantu is a hex-copter, which is a six-winged UAV made by Procession Drone, LLC. He establishes and preprograms the desired flight path into the aircraft so the process is completely hands-off.

From the UAV, two kinds of photos are taken: a standard RGB, red, green and blue, and an IR, infrared photo. Cantu takes these two images and stitches them together on his computer to generate what is called a normalized difference vegetation index or NDVI.

"So basically it's the algorithm that shows photosynthesis based off the plant and the sunlight coming off," said Cantu. "So then you overlay those two images and you get that NDVI and that gives us the crop health imagery."

With NDVI Cantu can now identify problem areas in the field. The GPS data translates directly to his phone, allowing him and the farmer to walk directly to any point needing observation. Once the prescription is finalized the farmer can input the data from the UAV directly into his farming implement.



Photo by Rowdy Bolen



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As a new business with pioneering technology, Cantu is still building his clients. The information that he and the grower exchange is highly sensitive, as farmers tend to be private about their growing practices. These finely tuned crop plans are kept classified between him and the farmer, developing client confidentiality, similar to that of a doctor and patient relationship. The farmer is the owner of the information and Cantu is a trusted advisor.

“We could tell the parts of our field that were suffering from lack of water through our drip tape,” said Jansa. “This was the reason we had called Cantu. We knew we had some emitters clogged from higher water pressures at our drip fillers, and now Juan had mapped them for us.”

Provision Agriculture is such a specialized technology that each client has a custom plan; no two farmers will have the same prescription and some need more observation than others. In addition to scouting, Innovative AgriVision has two other services to choose from. For those that wish to survey and fly their own fields, Juan offers product kits and flight lessons. You can purchase your own UAV and learn to man your own drone.

In order to open Innovative AgriVision for commercial use, Cantu had to first apply for his Section 333 exemption through the Federal Aviation Administration. This process is meant to monitor aircraft flying in national airspace and regulates business models designed to profit from UAVs.

“Not anyone can go out there, to even take pictures and sell it,” Cantu said. “That would be highly illegal.”

It took Cantu about nine months to receive his approval for the exemption. Once the FAA approved him, he then had to apply for a certification of authorization (COA). This meant his drone is now legally considered an aircraft. All of this registration and documentation had to become

legitimate before he could establish his business.

“Now with the full business, we are able to provide a service and charge for that service,” Cantu said.

The future of Innovative AgriVision and precision agriculture is unrestrained as technology continues to develop. New technologies will arise and farming will continue to advance, improving accuracy. As efficiency improves and yields optimize, growers become more confident in how and where to make investments.

It is entrepreneurs and visionaries like Cantu who are pioneering the way in which future generations will be fed. This mentality continues to drive Cantu to be on the forefront of what is coming next. Being from a farming community, Juan has remained fiercely loyal to his roots.

“It’s always been something I want to do, bring something back home that’s going to help us out. So that’s why I started my company, Innovative AgriVision,” Cantu said.

Cantu is currently focused on building his business and working with growers, however, he said he is not limiting himself to one specific field.

“I made sure when I did my exemption...I covered anything industrial, so oil pipelines, any of that. Like construction sights, I can do like a contamination kinda deal. Anything agriculture. Anything wildlife, anything crop management, even to ocean stuff. I want to be well rounded.” 🇺🇸



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