



AG DRONE STARTUP READY TO TAKE OFF

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In the 21st-century version of a land rush, more than 600 companies have received permission to fly drones over farm fields and collect agricultural data.

Only one of them is headed by a 27-year-old experimental physicist and headquartered in an old warehouse building in downtown St. Louis. Harrison Knoll, the founder and chief executive of Aerial Agriculture, thinks his company stands out in other ways, too.

For starters, there's the artificial intelligence system his team has built. It will take the data gathered by the drones and turn it into actionable advice for farmers, telling them which part of a field needs more nitrogen and which plants are showing signs of a pest infestation.

What's more, the system will get better with each pass over the field. The more data it has, the more specific its prescriptions can be.

"We're not just another drone company that's coming in to do imagery of your field," says Ali Ahmadi, Aerial Agriculture's chief operating officer.

In fact, the company's unmanned aircraft system looks nothing like the helicopter-like drones flown

by many hobbyists. The fixed-wing plane has a 10½-foot wingspan and will carry multiple sensors.

Among them is a spectrometer that detects fine variations in the wavelengths, or color, of light. Knowing the exact shade of green on a plant's leaves will tell the farmer if it is healthy or stressed.

Inside Aerial Agriculture's cavernous office, at any given moment some of the company's 10 employees might be tinkering with the aircraft or testing the sensors on a box containing two dozen small corn and soybean plants.

Knoll says the Globe building is the ideal location for his startup. Not only does it have the big, flexible space he wanted, but it's also home to Datotel, which hosts the company's cloud-based data.

Aerial Agriculture got its start last year in Columbia, Mo., in Knoll's living room. So far it's been funded by a single angel investor.

When he decided to leave the University of Missouri, where he was a postgraduate researcher, Knoll assembled a team of friends including Alex St. John, his roommate and fellow physicist, and Will Beever and Kadie Crivello, a married couple who used to run a small organic farm.

They moved to St. Louis last fall and obtained certification from the Federal Aviation Administration in February. The company expects to have contracts covering 30,000 acres this year, and plans to fly over each field 12 times during the growing season.

From there, the sky literally is the limit. The Association for Unmanned Vehicle Systems International, a trade group, estimated in 2013 that the drone industry would employ 50,000 people by 2025, with an economic impact of more than \$4 billion a year. Most of that impact, it said, would come from agricultural uses.

Those are big numbers for an industry that's still in its infancy. The FAA began permitting commercial drone use only in late 2014, and fewer than a dozen agricultural users were approved by this time last year.

As of last week, the number was up to 622, and it may rise even more quickly under the streamlined application process that the FAA introduced Friday.

Knoll says he isn't intimidated by the potential competition.

"I know a lot of the other drone companies, and I really want to find a competitor for us," he said. "I haven't found one yet. We're not like anything else I've seen."

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