Barn Owl Precision Agriculture Creates a Homebase in Fremont County

Getting Back to Their Roots

The amount of farmland in the United States is not increasing. Indeed, it decreased from 945 million acres in 2000 to around 896 million acres last year. At the same time, revenue for family farms dropped precipitously over the past few years, falling nearly 50% drop in net farm income with prices for crops and animals crashed between 2013 and 2019. The struggles of family farms are certainly not tied to lack of a work ethic or even innovation. During peak seasons, farmers may work 80 hours per week. Even during the winter, most farmers still log 40 hours per week or more.

Siblings Jaron and Sarah Hinkley have roots in farm country in eastern Colorado and the western slope of the Colorado Rocky Mountains and grew up knowing the challenges faced by their neighbors. Even though the two of them left the area to pursue academic and professional paths, they didn't forget their beginnings. While Sarah matriculated toward a bachelor's degree in business administration and management at Texas State University, she worked at a local Chick-fil-A restaurant in San Marcos, Texas. "Much of the foundation that I have in management was laid while working at Chick-Fil-A," Sarah observes, who served in supervisorial positions while completing her college degree. After graduation and seeking additional business experience, Sarah and Jaron launched their own business—5th Man Window Cleaning, a window washing business. "It wasn't a passion for either of us, but it gave us an opportunity to start a business and learn how to run it," she says.

Barn Owl Precision Agriculture

Founded: 2017

Locations: Florence, CO
La Junta, CO

Capital Raised: $685,000

Services: Robotic Weeders, Planters, and Harvesters; Crop Monitoring, Soil Testing, and Precision Scouts Through Drone Services

URL: www.Barnowlds.com

It Started with Drones

At about the same time, Jaron got a job flying drones for volume measurements in the mining industry that took him around the country. But when the health of the Hinkley's grandparents began to deteriorate they decided to return to Colorado to be closer to them. Sarah had met Bryan Stafford while studying at Texas State University, and "we brought him along with us," she jokes. Sarah and Bryan, who married in 2017, settled in Colorado Springs, while Jaron moved back to La Junta.

Jaron saw the potential of drone technology while surveying mines with them and wanted to start a business using them as the foundation. He broached the idea with Sarah and Bryan, and they were all for starting a business together with him. All three of them had experience in the restaurant industry, working on the table side of the farm-to-table equation. Now, back to their roots, they sought to flip the focus to the farm and started Barn Owl Precision Agriculture (formerly Barn Owl Drone Services) in 2017.

They spent a lot of time speaking with farmers in the La Junta and Rocky Ford areas, getting to know their challenges and business requirements. Making their farming operations efficient and profitable while promoting environmental farming methods were at the top of

the list. “Farmers don’t want someone from Denver or a big city coming out and telling them what to do,” Sarah notes. “Having someone who lives in their same communities and understands the local climate and weather lends a lot of credibility to our interactions.”

Using drones to monitor crops and map planted acres and monitoring soil moisture with Internet-of-Things (IoT) devices were some of the early use cases they tackled. “We customize everything for each farmer based on the problems they want to solve,” Sarah says. One of the monitoring services includes identification and removal of male hemp plants, as unpollinated female hemp plants are the desired crop. Another use case involves utilization of artificial intelligence (AI) to monitor crop growing stages used to make watering decisions.

Building a Fleet of Robots

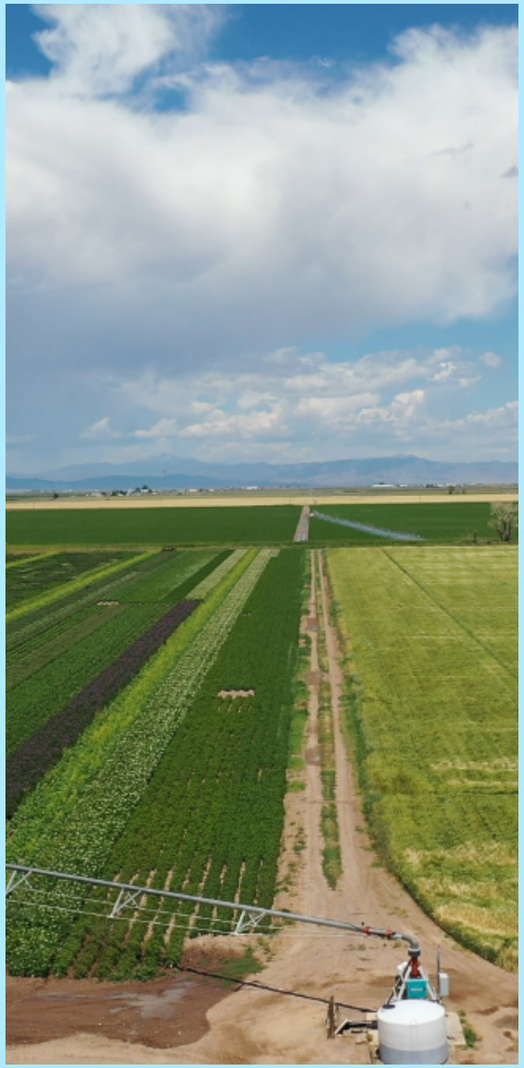
While Jaron, Sarah, and Bryan spent the first couple years running the business exploring drone-related services, they turned their attention to robotic capabilities in 2020. “Farmers face growing labor shortages and consumers increasingly want food grown organically and grown and harvested with processes that are environmentally friendly,” Sarah says. “For the past year, we concentrated our efforts developing robotic planting, weeding, and harvesting capabilities.”

Each of the robots are 30 inches wide and designed to maneuver down one row at a time. Employing a fleet of 30 robots at a time, the Barn Owl team will be able to quickly plant, weed, and harvest myriad crops—sweetcorn, hemp, peppers, beans, sugar beets, soybeans, and potatoes, among others. “We fly drones to map the field and use the GPS data to guide the robots at the level of centimeter accuracy down each row,” Sarah says. “They are powered by lithium batteries that can be recharged via solar-charging panels.”

The ROI the robotic solutions deliver for farmers is dramatic. “We’re able to cut their labor budget in half,” Sarah says. “They pay us half of what they would have spent on labor and keep the other half. This enables them to increase their operating margins and profitability.”

For the design of the robots, the Barn Owl team is doing all of the work themselves. “We have 3D printers and a CAD system,” Sarah explains. “About half of our parts are 3D printed, and the other half is metal. For software used to power the robots, the code is comprised of proprietary code as well as open-source code that is developed and managed by an open-source community. Finally, because we are able to control our own supply chain, we largely not affected by the supply chain issues we’ve seen due to COVID-19. Instead of relying on parts manufactured overseas, we are able to create our own supply chain.”

The Barn Owl team plans to manufacture between 60 and 100 robots by the spring 2022 planting season. And as planting and harvesting times vary between different crops, Barn Owl anticipates that their fleet of robots will remain busy through most of the spring, summer, and fall. “We have connections in Australia and South America,” Sarah adds. “We eventually plan to take our fleet of robotic planters, weeders, and harvesters overseas during the offseason.”



Winning and Receiving a Prestigious Grant

Currently, Sarah indicates Barn Owl have letters of intent from around 15 farmers scattered between the western slopes of Colorado and western Kansas with about 3,000 acres. “This will generate about $900,000 of revenue for us,” she says. “With this business growth, we will be able to hire staff—software engineer, hardware engineer, and seasonable robotic operators.”

Getting to the point of being able to demonstrate rapid revenue growth and profitability was not an easy undertaking for Barn Owl. “Initially, we raised funding from family members, angel investors, and several small grant awards,” Sarah explains. But Barn Owl required additional monies beyond these initial investments. Sarah did her research and identified a grant from the Colorado Advanced Industries Business Accelerator.

The Barn Owl team had applied and received other grants but nothing close to the size of the potential grant amount from the Advanced Industries Business Accelerator. Sarah and the team spent about a month on the application and delivered a comprehensive pitch to the committee. The committee approved the pitch and advanced Barn Owl to the next round when the $200,000 grant was awarded. But there was a catch. Barn Owl had to raise a full $400,000 of “matching” funds for the grant to be released. “We worked with several VC firms and angel investments to get us over the hump,” Sarah says. “This is a very prestigious grant that is typically awarded to tech companies in the Denver-Boulder corridor. We were thrilled to be among the recipients this year.”

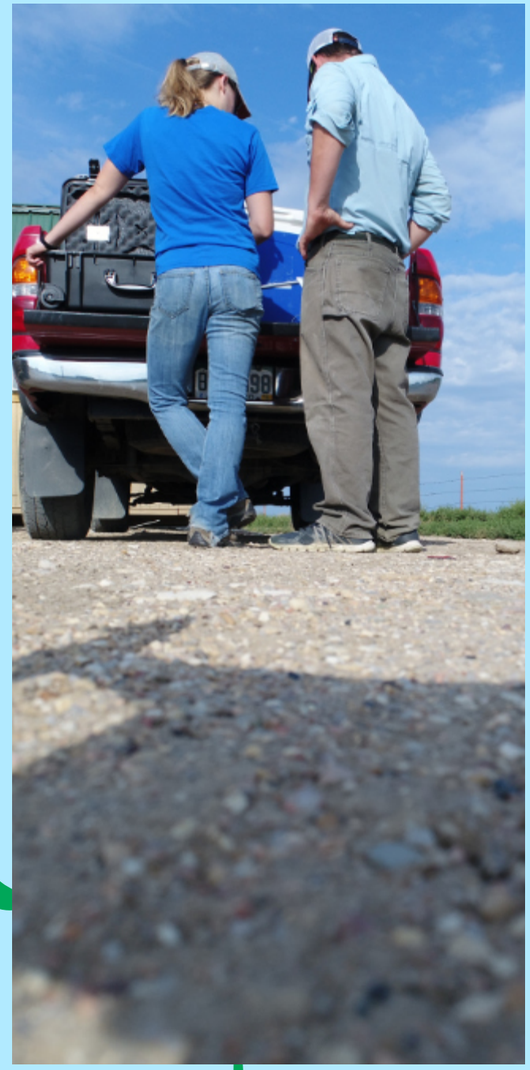
Making Florence Home, Looking to the Horizon

As the Barn Owl’s team built out their business plan and launched their initial services, Sarah embarked on a formal and informal education plan. In addition to finding time to complete a master’s degree in health care administration and management at Colorado State University in 2019, she attended numerous entrepreneurship seminars and workshops on marketing, accounting, innovation, and other business-related issues. Earlier this year, when attending a Southern Colorado Innovation Link Startup Bootcamp, Sarah met Brad Rowland, the general manager of the Emergent Campus in Florence.

“We had run everything out of Jaron’s house in La Junta and ours in Colorado Springs,” Sarah notes. “Now that we were scaling the business, we required an actual location. A traditional office space was too expensive for a startup business like ours, and thus the Emergent Campus was a perfect fit. The former music room was actually available, so we have plenty of space for the design and manufacturing of our robotic fleet. Additionally, we have customers all of the way to the western slopes in Colorado, and Florence gives us a location that is closer to them.”

Once the Barn Owl team got its operations—include 3D printers—up and running in March 2021. And just as they always have done so, the team sought opportunities to engage with its local community. One of the programs with which Barn Owl is involved with the HS Pathways Program at Florence High School that assigns students to complete a Professional and Internship Community Experience (PaICE) with a local business. The Barn Owl team didn’t need to look very far. One of the students at Optimum Guidance Behavior Consulting, which serves clients with intellectual disabilities and is also located in the Emergent Campus, was fascinated with Barn Owl’s 3D printer. “We’re excited about the chance to foster his interest in the technology and help him to map out a career path,” Sarah says.

The Barn Owl team is very excited about the company's horizons. In addition to the new robotic planters, weeders, and planters, Barn Owl offers customers a centralized portal that delivers a consolidated data view of crop population, growth states and rates, soil moisture, and more captured via drones and IoT devices in real time. "We're looking at other cases as well," Sarah adds. "For example, we see possibilities in ranching. A potential grower of Wagyu beef in Oklahoma is looking at having us use our drones to count cattle, measure the amount of feed and water that is left. Beyond, Colorado and Kansas, we have customers in Arkansas, Wyoming, and Missouri and are confident we can expand into more locations with these new service offerings in 2022."



About Fremont Economic Development Corporation (FEDC):

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FEDC directly manages or assists in supporting multiple sector partnerships across the Upper Arkansas region of Colorado, serving Fremont, Custer, Chaffee, and Lake Counties.
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