Finding inspiration in the effort to address this global dilemma, several Johnson alumni have channeled technological developments into agricultural business solutions — an area gaining traction known as ag tech. These enterprises aim to transform how farms operate, increase their yield, and enhance their sustainability. Specifically, they see new possibilities in big data’s ability to transform massive amounts of information into insights that inform farmers’ decision making, facilitate financing, enable them to generate a steady cash flow, and sustainably enhance farmers’ ability to achieve success overall.

These nimble organizations recognize farms as an underserved market. They have tailored big data solutions to meet farming’s needs while promoting an unbiased approach to help convince farmers to collaborate on data sharing and trust the data-backed advice they get in return.
WHERE BIG DATA IS OLD NEWS

“Dairy farmers have been doing what I consider ‘big data’ for a long time,” says John Tauzel ’03, MBA ’12, the director of business development at Dairy One, based in Ithaca, N.Y. Now, the ability to draw on years of data, generate new kinds of data, and analyze different sets of big data is generating increasingly valuable information.

Dairy One has helped farmers with data-based farm management solutions from its inception in the 1940s as the New York Dairy Herd Improvement Cooperative. Data on raw milk still informs its farmers’ decisions on which cows should be milked, treated for a health issue, bred, or taken out of milking rotation. For members of the Dairy One cooperative, refining those choices can translate into an average of 2,700 pounds more milk per cow annually, or roughly $23,000 of additional revenue each year for a farmer with 50 cows.

The amount of data collected from its laboratory tests over the years, together with data analyses made possible by computing advances, enable Dairy One to generate more — and more precise — solutions from big data. And since their stores of information extend beyond milk to include feed, soil, manure, and plant tissue, those solutions help more than Northeast dairy farms.

The Dairy One feed library, for example, has become a worldwide tool for optimizing livestock diets. The Agro-One branch, which provides soil testing for all types of crops across the Northeast, also leverages Dairy One’s laboratory and library-building capabilities to help Finger Lakes wineries decide how to grow the best grapes based on data gathered for a dedicated Northeast wine industry library. Through another project now in the works, Tauzel intends to provide similar data-based assessment services for the region’s hop and barley farmers.

For each agricultural sector it serves, Dairy One’s goal is “getting more out of everything that we do on the farm,” Tauzel says. “That’s really where big data is going to help us — better management down to the acre, down to the individual cow. So that by helping farmers manage each unit of production in the best way possible, we help reach that broader goal of feeding the world.”

DEMOCRATIZING DATA

As co-founder and CEO of Farmers Business Network, Amol Deshpande, MBA ’05, has brought big data services to crop farmers. His Silicon Valley-based company aggregates the digital information collected in modern farming and converts it into information farmers can use to make better farming decisions.

“Farmers Business Network turns the world into a scientific plot trial,” says Deshpande.

From the computers and GPS units on everything from tractors to harvesters and information tracked on tablets and laptops, farmers generate data on soils, seeds, fertilizers, chemicals, yields, and weather. Each Farmers Business Network member submits that data and gets data-backed analyses in exchange. These reports tell farmers which seed choices and planting and management practices, specific to the conditions on their land, have shown the greatest success rates among all members.

Now farmers can supplement the anecdotal evidence on best practices they receive at the local coffee shop with the recorded experience of vast numbers of farmers from across the United States. For everything from the speed of the seeder as it travels across the field to which hybrid seed performs best on each acre, farmers can use big data-informed analysis to make the most efficient use of their land. This, Deshpande says, is how a sharing economy “democratizes data.”

Established in 2014, Farmers Business Network differentiates itself from mammoth big data competitors as a “completely independent and unbiased” resource. Deshpande has sought to ease farmers’ concerns over privacy with strict terms and conditions and assures his clients that Farmers Business Network will not engage in ulterior business lines that conflict with their interests.

To establish that trustworthiness, Deshpande knew those “independent and unbiased” core values would have to apply to funding as well. He sought “long-term, mission-oriented, and patient investors,” and found them in Kleiner Perkins Caufield & Byers (where he was formerly a partner), Google Ventures, and DBL Investors. “They believe in the mission to help the farmers and understand that we cannot build a company fast with the intent to sell it because that goes against our commitment to the farmer.”

Those values also helped Deshpande attract a cohesive team of individuals who engage in everything from field outreach to technological innovations. “You can weave together all these different roles — from the office to the farms — when there is an underlying understanding of the mission,” he says. “We all pride ourselves in being unequivocal partners, without compromise.

“WE ALL PRIDE OURSELVES IN BEING UNEQUIVOCAL PARTNERS, WITHOUT COMPROMISE, WITH THE FARMERS.”

— AMOL DESHPANDE, MBA ’05, CEO OF FARMERS BUSINESS NETWORK

PHOTO COURTESY OF AMOL DESHPANDE
With the farmers.

With Farmers Business Network, Deshpande has found the “bold vision that could change the world” that he began to seek at Johnson. Referring to his journey from being an investor to becoming an entrepreneur and CEO, “There isn’t a good substitute for being a protagonist in this sector,” he says. “You have to take ownership and drive change and set the culture and values for an enterprise. This mission of helping farmers and transforming global agriculture needs that type of commitment. You can’t really do that as a board member or an investor.”

By enabling big data-powered decisions to be layered with local farmer intuition, Deshpande hopes to see yields go up and costs go down, more calories per acre to feed the world, and future generations holding on to family farms.

DIGITAL FINANCING FOR THE PRODUCE MARKET

“I find it inspiring to walk around here,” Pablo Borquez Schwarzbeck, MBA ’15, said as he regarded the boxes of bananas, onions, and strawberries at the Los Angeles Produce Market one fall morning.

Borquez Schwarzbeck’s inspiration fuels his role as founder and CEO of ProducePay, a financing solution provider that connects fresh produce farms with U.S. distributors and provides immediate access to liquidity — something growers traditionally have not had. He came up with the idea for the company at his family’s asparagus farm in Mexico, incubated and launched his startup as an MBA student at Johnson, and opened an office in a tall financial building in downtown Los Angeles, just a few blocks from the produce market, in spring 2015.

Typically, he explains, a grower assumes the risk and cost of growing and shipping produce, then waits to be paid when it sells. The limited liquidity comes just as labor-intensive harvests demand cash the most, leaving growers at the mercy of advances from their distributors.

Borquez Schwarzbeck aims to change that dynamic. Using big data analytics to set a value for that fruit or vegetable as well as to assess the risk, ProducePay facilitates immediate payment of up to 50 percent of the value of a farmer’s fresh produce shipment. The startup draws on new produce pricing information from the U.S. Department of Agriculture (USDA) to build the models that determine how much

“I WANT TO REACH PEOPLE WHO COULD BE FARMING — BUT AREN’T BECAUSE THEY DON’T HAVE THE MEANS — BY PROVIDING ACCESS TO FUNDING.”

— PABLO BORQUEZ SCHWARZBECK, MBA ’15, FOUNDER AND CEO OF PRODUCEPAY

PHOTO BY MITCH WOJNAROWICZ
to invest and how much price variability to expect. As long as sufficient pricing data are available, any fruit or vegetable shipped from anywhere in the world to the United States can be managed through ProducePay.

In spring 2016, Borquez Schwarzbeck plans to launch a ProducePay virtual marketplace that will bring more financial independence to growers, reduce price opacity for fresh produce, and bring about price stabilization by reining in the chaos of in-the-flesh markets. Currently, at wholesale markets like the one in Los Angeles, each box of bananas can sell for one price at one seller and two dollars more just a few stalls down. Even the collection of pricing information could eventually be transformed, ending the need for USDA agents to walk from stand to stand at the wholesale markets to record daily sales figures.

An efficient and transparent digital marketplace could strengthen the produce industry overall, Borquez Schwarzbeck says. He also hopes it will expand the potential pool of new farmers. “I want to reach that percentage of people [worldwide] who could be farming — but aren’t because they don’t have the means — by providing access to funding [and markets] that give them the ability to grow.”

**FOSTERING THE AG TECH FUTURE**

As the former VP of strategic negotiations for Monsanto and a member of the executive board of the Center for Emerging Technologies in St. Louis, Jeff Peterson ’77 (Eng), MBA ’88, understands the impact of big data on agriculture. In 2013, before he retired, Monsanto had already purchased a big data firm, The Climate Corporation, for nearly $1 billion and promoted big data as a major platform for growth in agriculture.

A few months into retirement, however, he decided to apply his experience in a new enterprise and became a founding partner and managing director of the Yield Lab, an agriculture technology accelerator based in St. Louis. He wanted to address what he saw as “a need to accelerate ag tech beyond what the big companies were coming up with.”

The Yield Lab’s mission is to “accelerate, mentor, and cultivate ag tech innovation that builds a sustainable, food-secure future for all.” In selecting early startups to invest in, “we closely look at the impact, scalability, and timing of the venture,” Peterson says. To find those companies that will be successful, “a big part of our job is to see things that may not be obvious to other people.”

Through mentoring, networking, training, and investment, the Yield Lab team aims to strengthen the viability and success of innovative ag tech startups. Whether or not they decide to invest in them, Peterson reveals a genuine enthusiasm for ag tech entrepreneurs when he discusses their proposals and shares his “investor’s perspective” for nudging good ideas toward success.

For example, one Yield Lab candidate Peterson encountered, a big data startup that fit much of the Yield Lab selection criteria, would be entering a crowded space among established big data service providers, in his view. So he encouraged the startup’s founders to pivot their idea toward other farmer-focused businesses that could use the data. As a result, that startup is focused now on farm insurance, banking, and leasing — a niche with a whole new set of customers and far less crowded with competition.

While that startup did not make the cut for the 2015 Yield Lab class, its founders asked to participate in the program at their own expense. Such dedication makes Peterson optimistic for future ag tech solutions.

“Ag tech is going to do some amazing things to change the world in ways that people can’t even imagine today,” Peterson says. “The need is great and the technology exists. Major investors and global tech companies not yet involved in agricultural technology are connecting the dots, and ag tech is going to take off as never before.”

**FARMERS ARE THE NEXUS**

Ag tech entrepreneurs “want to make a positive impact,” Peterson says. “They don’t want to create just another app or social media program; they want to sustainably ensure that there is affordable food on the table for everyone.”

They all start with a high regard for farmers, the work they do, and what they produce. As Deshpande puts it, “the farmers are the nexus.”

“These are people who spend every single hour of sunlight on their farms working to grow something from nothing,” Borquez Schwarzbeck says. “That creates a big human element to this industry. We have to understand that and respect that to grow within it.”