

## How Land O'Lakes is cultivating ag-tech to help farmers harvest healthier profits

The time to choose his career had come. So, in 1994, Teddy Bekele asked his dad for advice.

His father, a lifelong farmer, offered stark wisdom: Don't follow me into farming. Working the land, he warned, was risky business.

Bekele listened. He earned a mechanical engineering degree at North Carolina State University. But now, as chief technical officer at Land O'Lakes, he is investing that knowledge into the world he once left behind, leading the creation of new technologies to make farmers more profitable, productive and environmentally sustainable.

Thursday, [Land O'Lakes](#) and Microsoft announced a multi-year strategic alliance to pioneer agricultural innovations, enhance the supply chain, expand sustainability practices for farmers and the food system, and close the rural broadband gap.

That vision meshes with the 99-year mission at Land O'Lakes. The company, based in Minnesota, is a [farmer-owned cooperative](#) with a network spanning more than 300,000 producers and touching about half of America's harvested areas. In other words, Land O'Lakes is way bigger than butter.

Through the alliance, digital solutions built on Microsoft Azure and its artificial intelligence (AI) capabilities will help farmers better react to current and future challenges that impact their bottom lines. The timing is urgent.

In recent years, U.S. farmers have been squeezed by [international trade issues](#) and [changing consumer appetites](#). This year, [COVID-19](#) has affected the food and ag supply chain, leaving farmers with millions of pounds in produce they can't sell. Increasingly, each year [climate change](#) affects their operations and their bottom line.

Transform recently spoke with Bekele to hear more about his work to fortify American farmers – and honor his father's legacy.

**TRANSFORM: What is it like for you to blend your family's agricultural history with your own tech expertise to help today's farmers thrive?**

BEKELE: That's why I wake up. It gets me going every day. At Land O'Lakes, I started to see the impact tech could have on farming, how it could revolutionize this business and bring more stability during uncertain times.

Weather dictates 70 percent of what's going to happen on a farm. Weather is still something we can't predict accurately at the hyper-local level. But what if farmers could prepare themselves for these risks and react to them with data and insights?

I looked at what technology could do to protect the decisions farmers were making. I fell in love with that.

**TRANSFORM: Your dad was an agronomist, yet he relied on his intuition to raise crops – as generations of farmers have done. How eager are modern farmers to use data, the cloud and AI to make crucial decisions on planting, feeding and harvesting?**

BEKELE: Farmers in general like taking risks. If you didn't like taking risks, I don't think you'd be a farmer. That's because every year is different and unpredictable. What you did last year won't work out the same way this year. The challenges you face are going to be different, down to the individual field level.

So more of them would love to rely on the technology to make decisions and use data to be able to improve themselves from one year to the next.

**TRANSFORM: By harnessing Azure, how will Land O'Lakes help farmers – and their fields – become more productive?**

BELEKE: For almost 20 years, we've done research plots across the farming areas we serve. We planted different seed varieties and crop-protection applications, put in different farming practices then collected data on those plots to provide insights to farmers – like the right crop variety for the type of soil. But that research was all brute force, planting and collecting the data by hand.

Azure brings machine learning and artificial intelligence to the brute force that we applied in the fields. We use computer modeling, algorithms and replicated trials to derive the insights. The plots can then be used to validate our models and findings.

**TRANSFORM: How do you envision farmers in the Land O'Lakes cooperative using AI recommendations to specifically react to what their fields are telling them?**

BEKELE: It starts when you create the plan for the fields you will manage this year. What's the best prescription for each field, given the topography, soil type and climate?

After planting, can you get early detection of where diseases might be occurring? If you give the fields nutrients like nitrogen or potassium, which field needs the most help today? What's the right balance between what you put into the ground versus how many bushels per acre you will harvest?

Today, those calculations happen in a farmer's head. But instead of manual thinking, an optimized algorithm says: This is how much money you should spend today for the outcome you are seeking.

**TRANSFORM: Can you describe one way that the alliance with Microsoft will help improve sustainability on American farms?**

BEKELE: For years, farmers put nutrients down in the fall to prep the fields they'll plant in the spring. That was the old-school way. But what if you know – throughout the growing season – exactly what and how to feed the crop? That makes that field perform better now and in the future.

That can improve productivity. And you can do it in an environmentally sound way, for example by avoiding nutrients leaching out of the field into waterways when it rains. Any nutrient you put into the ground should stay in the ground – and then in the plant to make it healthier and more productive.

**TRANSFORM: Land O'Lakes and Microsoft are working together to deliver AI solutions that will help farmers' profit potential. What would that mean for one farm now on the financial edge?**

BEKELE: If you're at break-even today, the technology gets you to a spot where farming is exciting – you become a profitable farm. And you would not have to add more acres or put yourself at greater risk to get there. It just means you're making better-optimized decisions with the technology.

For the smaller farmer who is facing a drop in commodity prices, they may be operating in the red. An improvement of 10 to 30 percent means they are no longer losing money. A life-altering change.

**TRANSFORM: Could such an increase in profitability lead farmers to experiment with new techniques or new crops that improve the overall food supply?**

BEKELE: If you're questioning whether you will make it financially, you're less willing to try different farming practices or change your nutrient recipe or try another crop. Maybe a farmer who has been growing corn and soybeans for years should be looking at lentils or peas. But when you're at break-even, you're not going to try something that might lose you money.

That reduces innovation and the diversity of crops. But if we can get folks into a position where they can try things, now you also have diversity of crops, which betters their business and betters everybody else.

**TRANSFORM: How would these innovations have changed your dad's life as a farmer – and maybe your own life?**

BEKELE: If my dad had access to this technology, he would have tried it, for sure. He was on the bleeding edge when it came to emerging technologies. I would have then been exposed to them. If I had seen the transformation they were bringing, I might have stuck to a career in agriculture.

Or maybe I would have pursued computer science with a focus on agriculture. That would have been an interesting path – although I guess I still landed in basically the same spot 25 years later.

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