

A New Angle

Apex Farms aims to transform the world of agriculture with vertical farming.

By Mikenna Pierotti

Imagine an agricultural world where feeding the more than seven billion people on our planet didn't deplete fresh water resources, didn't force impoverished communities to tear down rainforest to plant crops, and didn't bankrupt farmers and push generations of families off the lands of their ancestors in search of a better life. Lofty goals, yes, but entrepreneur and founder of Wilmington, Delaware-based, **Apex Farms Corp.** **Alex Leo**, is convinced, with the right technology and the right mindset, we'll get there. And with his revolutionary take on vertical farming, he's poised to help us move the needle.

What's so revolutionary about his vertical farming systems? Leo says it's partly the simplicity. "We've been marketing our solutions as vertical farming systems for hydroponics and aquaponics use, both outdoor and indoor. In times past, you couldn't have that capability without investing in multiple, complex products." In other words, vertical farming systems weren't always hydroponic. Hydroponic systems couldn't necessarily do aquaponics. And often, all of these systems required specially designed, cost-prohibitive facilities, complex pump systems, and a host of trained staff to run and monitor it all. Add to that the fact that many of the vertical farming systems that were designed for outdoor use didn't allow adequate light distribution to all plants in the system, and you have the makings of a technology with many potential drawbacks.

The Problem

For the modern farmer, already strapped for cash and time, vertical farming often isn't an option, Leo says. When farmers do take on the investment of such a system, they are often forced into a selective and highly competitive market, where only immature crops such as micro-greens and specialty plants yield the returns they need to stay in business. "For a lot of these systems, a farmer would need a special facility, different workers, a



The triangle shape allows sunlight to hit all plants in the system evenly.

new business model, a million dollars to invest, and, oh yeah, six months to wait while the whole system comes online with no money coming in," he says. "The questions we started with were: How can we get nearly any full-sized crop to maturity with vertical technology in an efficient way that would work even for entry-level commercial and residential customers? And how can we use the same premise of hydroponics and vertical farming technology, which looks to save on water, space, electricity, and other resources, but make it as efficient and attainable as possible?"

The Solution

The answer hinged on designing a simple, cost-effective vertical farming system that could be used indoors or out to grow nearly any plant. To do that Leo made use of an ancient technology—the triangle. This shape allowed sunlight to hit all plants in the system evenly, no matter the environment, while saving space and, with the system being closer to the ground, making harvesting easier. And rather than incorporating multiple pumps as many other systems do, Leo simplified the technology, adding just one special pump. "We chose what's called a sewage station, which has a grinder on it that will break up anything that's in the water. That was because we wanted to be able to supply aquaponics, which are systems that include fish and use the waste from the fish as fertilizer for the plants."

Over three years of research, development, and testing, Leo added other simple features, like turn stop valves on each channel, which prevent leaks from shutting down the entire system, and space for farmers to add water sensors to monitor their water's parameters. Most recently, Leo and **Rob White**, vice president of prefabrication, have been working on making the system completely collapsible and mobile, so the entire system can be constructed and deconstructed with simple tools. "We wanted to make a system that could be up quickly and operational for a long duration of time without really much hassle or need for updating," Leo says. "The solution was simple and elegant."

Thinking Outside the Box

That solution made perfect sense to **Shay Thompson**, Apex Farms' first customer, when he overheard Leo discussing his systems at a local grocery store. "I'd been doing a lot of research on different side businesses I could get into. I looked into growing produce for the local farmers' market. But when I

WHY THIS MATTERS

Approximately 37% of land on Earth is used for growing food, and yet nearly 13% of the world's population remains undernourished. Vertical farming aims to solve the problem. While traditional farming is costly—expensive equipment plus labor—solutions like Apex Farming save time and money. The Apex Vertical Farming system has been tested across three years to reduce the water usage both indoors and outdoors by more than 85%. You can use the Apex System indoors or out, and it has the ability to grow everything but trees.

looked into hydroponics, it was all pretty much indoors. And I don't have the space for that, so I had pretty much given up on the idea," Thompson says.

Leo quickly sold Thompson on the concept of being able to grow nearly any type of produce to meet the needs of his local community (and himself) by installing a small, 10-foot residential system on his property. "You can put it out in the middle of nowhere. The system doesn't require any regular land. You could put it on asphalt, concrete, desert—the top of a skyscraper. [Leo] even talked about the possibility of using solar panels to power it. You really could do this off-grid. That's the kind of thing I'm into," Thompson says.

Leo says that although the system itself is revolutionary, and has potentially far-reaching implications, he has far bigger plans for the company as a whole. "What we're ultimately looking to do is to become a segue between all the aspects of farming," Leo says. "If a farmer doesn't want to worry about the business or marketing aspect of the industry, if they just want to wholesale their products and not worry about finding buyers or retailers, if they don't want to worry about marketing, we want to eventually be able to step in and do all that for them. We want to be a hub for farmers." Leo also hopes to branch into education, helping school systems and state governments set up training programs to help introduce the next generation to farming and entrepreneurship as a viable career.

For Leo, a young entrepreneur himself, the issue is vital. "Our company can't tackle all these issues all on our own, but we can start to connect these problems with solutions—sustainable farming, environmental issues, the decline of farming around the world—that's the idea." **gb&d**

