HYDROPONICS IN 2015

Are consumers finally catching on?

BY KEITH LORIA

Commercial growers are flocking to hydroponics like never before to grow produce, but this isn't a new concept; in fact, the ability to grow plants in nutrient solutions (water mixed with minerals or water mixed with fertilizers) with or without the use of artificial environments to provide mechanical support has been around as long as history has been documented.

Howard M. Resh, author of *Hydroponic Food Production*, detailed its history in his book. "The hanging gardens of Babylon, the floating gardens of the Aztecs of Mexico, and those of the Chinese are examples of 'hydroponic culture,'" he wrote. "Egyptian hieroglyphic records dating back several hundred years B.C. describe the growing of plants in water."

Of course, there have been large innovations in hydroponics over the centuries, as more in the industry understand its power and importance. The growing method also helps to supplement areas that might have diminished farmland or less fertile land to feed the world.

Minimal diseases, pests, salinity, poor structure and/or drainage are the typical advantages of hydroponics for growing produce as compared to field-grown produce. Additionally, with more farmland making way for developments, this growing method can be done even when no suitable soil exists, regardless of the ambient temperature and seasonality.

Doug Kling, senior vice president and chief marketing officer of Village Farms International Inc., headquartered in Heathrow, FL, says the company owns and operates 240 acres of high-tech, hydroponic greenhouse and also has marketing agreements with high-tech, hydroponic greenhouse operations in Canada and Mexico.

"Hydroponics is a very sustainable, environmentally friendly, and a safe method of farming," he says. "It's great for water conservation, good for land conservation and offers a growing environment that speaks to the needs of the future in terms of growing more and using less land."

Renee Cooper, marketing manager for Hollandia Produce, L.P., headquartered in Carpinteria, CA, says hydroponic greenhouse farming is far more resource-efficient than field-grown crops, as growers can nurture and protect their crops in ways that conventional farmers cannot.

"At Hollandia Produce, our sophisticated greenhouse environment allows us to control key inputs such as light, temperature, humidity and nutrient uptake," she says. "We also can protect our crops from external factors such as drought, rain, pest infestation and disease that affect crop growth and adulteration. These factors, and some of the industry's latest trends including the use of all-natural root media and consumer demand for unadulterated produce, are helping to increase the use of hydroponic greenhouse farming globally."

THE GROWING PERSPECTIVE

While hydroponics is catching on with growers, consumers have not been as quick to adapt. This is a challenge that many in the industry face in the 21st Century.

Gotham Greens is a Brooklyn, NY-based urban agriculture company founded in 2009 with the mission of growing premium quality, local and pesticide-free produce in cities. In just five short years, it quickly became a worldwide

pioneer in the growing urban agriculture industry and is considered one of New York State's leading greenhouse growers.

In 2011, the company built its first greenhouse in Brooklyn's Greenpoint neighborhood, the first facility of its kind in the U.S. In early 2014, Gotham Greens opened its second greenhouse on the rooftop of Whole Foods Market's flagship Brooklyn store in Gowanus and is the first example of a commercial-scale greenhouse integrated into a supermarket, says Viraj Puri, co-founder and chief executive of Gotham Greens. "Perhaps the biggest challenges facing urban agriculture are the lack of safe, fertile, arable land and the cost of real estate. As a result, Gotham Greens elected to focus on hydroponics, which does not require the use of soil and can be extremely productive and space efficient."

Gotham Greens currently operates more than 35,000 square feet of greenhouse and grows more than 300 tons of salad greens and herbs annually for the New York City market. Plus, it will be expanding with its third and fourth farms opening later this year in Queens and Chicago, IL, measuring 60,000 square feet and 75,000 square feet, respectively.

Puri says almost anything can be grown hydroponically, but Gotham Greens chose to focus primarily on leafy greens, lettuce, culinary herbs and tomatoes using organic, non-GMO seeds, as these vegetables are highly perishable and are difficult to find locally year-round.

"Industry wide, the most commonly grown greenhouse crops include tomatoes, peppers, and cucumbers," he says. "It should be noted that growing using sophisticated controlled-environment agriculture and hydroponics on a commercial scale requires a high degree of technical skill including both horticultural and engineering experience."

Marc Oshima, chief marketing officer and co-founder of AeroFarms, based in Newark, NJ, says there's a great amount of pressure on traditional agriculture due to water shortages, disease and other typical problems with growing in the field.

"We typically use 90 percent less water, and we manage the growing much more efficiently," he says. "There are a number of key things we are doing to help address the global food shortage, and we are leveraging science and innovation to cultivate a sustainable growing environment."

Because AeroFarms can provide the perfect amount of light and the exact nutrients, photosynthesis is done much easier in a controlled environment.

Hollandia Produce has been growing crops hydroponically since 1986. Over the past 17 years, its focus has been on growing conventional and certified organic brands of living lettuce and leafy greens.

"While one can grow almost anything hydroponically, some vegetables will thrive in hydroponic systems more than others. What will grow best depends on the particular system used," says Cooper. "Hollandia Produce uses a Nutrient Film Technique (NFT) system, and it works best with plants that have long root systems. This circulatory system allows nutrient-based water to be continuously pumped into the channel, while the roots dangle in the solution."

THE CONSUMER CONNECTION

While this vitamin-enriched produce is gaining a lot of attention in the industry, there's still a question as to whether consumers are interested and are willing to pay a little bit more for the product.

From what Village Farms' Kling has seen, today's consumers are interested in hydroponics because of a growing regard for sustainability and the environment.

"Hydroponic growing is a very safe method. It's more environmentally friendly in terms of land-use and preservation," he says. "These are all concerns that consumers and retailers have, and is a reason that there has been an increase in the hydroponic product."

Generally speaking, says Cooper, consumers who initially began regularly purchasing organic produce and hydroponically greenhouse-grown produce tended to be more affluent and educated than conventional, non-organic produce buyers.

"However, as living lettuce (heads with the roots still attached) continues to gain more mainstream awareness, our target market is broadening," she says. "Customers recognize that although our products may cost a bit more, they deliver more value because of their lasting freshness and less waste."

Gotham Greens has seen similar increases in popularity. "Our product has been very well received since we launched in the marketplace in 2011. We noticed that consumers increasingly care about how and where their food is produced," says Puri. "They are demanding more integrity and transparency in food production. Urban farming is an extension of that. It allows urban consumers to get a little closer to the food they eat and connect with it in ways that were not of as much interest or even possible in the past."

Hydroponic customers are often people who care about eating locally and who want a fresh, tasty and nutritious product. According to Puri, Gotham Greens products are competitively priced and on par with other leading local and national organic brands.

"Our products are labeled to reflect they are sustainably and greenhouse-grown using Non-GMO seeds, renewable energy and pesticide-free growing conditions. We don't just blindly talk about being 'local,' 'sustainable' and 'natural,'" says Puri. "While our business is about those things, we care about what those things stand for: flavor and nutrition, preserving water and soil resources, biodiversity, reducing harmful chemical use in food production, fair treatment of workers, and spending our dollars closer to home."

Hollandia Produce's Cooper says consumer interest in purchasing organic produce is definitely on the rise (in general) and within the business as well. "Due to the increasing demand, we are in the process of expanding our organic footprint with the addition of new greenhouses at our Oxnard, CA, facility," she says. "Upon completion of our facility expansion, we expect to double our output of hydroponically greenhouse-grown organic produce."

One way to get consumers interested, says AeroFarms' Oshima, is to focus on taste. "What we think consumers are excited about are the flavor profiles," says Oshima. "We spent the past 10 years focusing on optimizing our growing recipes for taste, texture, nutrition and yield, and that creates a lot of excitement."

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— Renee Cooper, Hollandia Produce

THE GROWING CYCLE

Since hydroponics grow in climate-controlled greenhouses, using a high level of technology, they're able to grow in almost half the time of conventional field agriculture.

"We're able to supply our customers with fresh and hyperlocal produce 365 days a year," says Puri. "Our greenhouse facilities are about 20 times more productive per acre than conventional farms in our region. Our current 35,000 square feet of greenhouse space produces the equivalent yields of a 20-acre farm. By the end of 2015, we will be producing close to 1,000 tons of fresh, local, pesticide-free produce each year."

Gotham Greens uses unique and proprietary blends of mineral salts and micronutrients including nitrogen, potassium, magnesium, selenium, etc., many of which are OMRI (Organic Materials Review Institute) certified.

Hollandia Produce's state-of-the-art greenhouses can control light, temperature, humidity, and nutrients. By controlling these factors, it can increase yields, shorten crop times and produce a uniquely uniform high-quality product on a year-round basis.

"Hydroponic greenhouse production of lettuce generally produces 3.55 times more lettuce per acre than conventional field growing methods — thereby reducing the amount of arable land necessary for production," says Cooper. "Our hydroponics system will conserve from 66 to 84 percent of the water that would be used if the lettuce were grown in the field — depending upon the region, soil structure, time of year and irrigation method used."

The continuing locavore movement is a key challenge for both consumers and retailers. Competitive pricing challenges retailers, while consumers grapple with less consistent availability, quality and uniformity. These are all key attributes that hydroponically grown produce routinely delivers. **pb**

THE RETAILERS' ROLE IN HYDROPONICS

When dealing with produce grown using hydroponics, it's important retailers take the time and effort to distinguish the produce and highlight the pros.

Marc Oshima, chief marketing officer and co-founder of AeroFarms, based in Newark, NJ, says with hydroponically grown produce, retailers should take advantage of consumers' love for local foods.

"Local is a powerful aspect," he says. "We highlight the idea that it is responsibly grown with no pesticides and the fact that we use less water on our labels, and retailers should be making that known to customers as well."

Viraj Puri, co-founder and chief executive of Gotham Greens, based in Brooklyn, NY, suggests retailers inform customers about how and where products are grown. Puri cited Whole Foods Market's Responsibly Grown Rating System, "which rewards farmers who work hard to protect human health and the environment, while providing customers with an at-a-glance rating for sustainable farming practices," he says.

With the increasing popularity of hydroponically grown organic vegetables, Renee Cooper, marketing manager for Hollandia Produce, L.P., headquartered in Carpinteria, CA, recommends retailers consider creating destination sets specific to hydroponics.

"Moreover, setting competitive price points at retail for hydroponic organics will likely impact adoption and consumption rates," she says. **pb**