

[TECHNOLOGY](#)

Silicon Valley Firms Plant Roots in Farm Belt

Venture capitalists bet on 'indoor farming,' lasers that monitor crops and Soylent drinks



Fledgling basil plants grown at the FarmedHere indoor vertical farm in Bedford Park, Ill. PHOTO: MARTHA IRVINE/ASSOCIATED PRESS

By
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New technologies that promise to change how food is grown, transported and sold are attracting increased interest from the kinds of investors that have fueled Silicon Valley powerhouses.

The money involved in U.S. food startups is still small compared with Internet companies. But venture-capital investment in agriculture and food soared 54% to \$486 million last year, according to Dow Jones VentureSource.

Big [agribusinesses have launched their own VC initiatives](#), and investment managers have raised funds dedicated to food and agriculture technology. New York-based private-equity firm Paine & Partners, for instance, raised \$893 million in January for investments in boosting productivity in areas like protein production and food safety, according to its president, Kevin Schwartz.

Driving the investments are a combination of cheap wireless technology, improved tools for collecting data and monitoring crops, and budding entrepreneurs looking to address new market demands and feed a growing global population. Increasingly health-conscious consumers also are scrutinizing what is in their food, pushing vendors to boost the transparency of their supply chains.

“Agriculture is the last frontier for a lot of different technologies,” said Roger Royse, a Silicon Valley lawyer who started an agricultural-technology conference in the San Francisco Bay area two years ago. Here are five key areas drawing interest in the food-investment wave.

Precision Agriculture

Farmers are starting to harness the kind of intricately detailed and up-to-the-minute data about production costs, speed and output that have become standard in many U.S. factories. Corn and soybean farmers in recent years started adopting such [“precision agriculture” techniques](#) to make better-informed decisions, and it’s spreading throughout the sector.

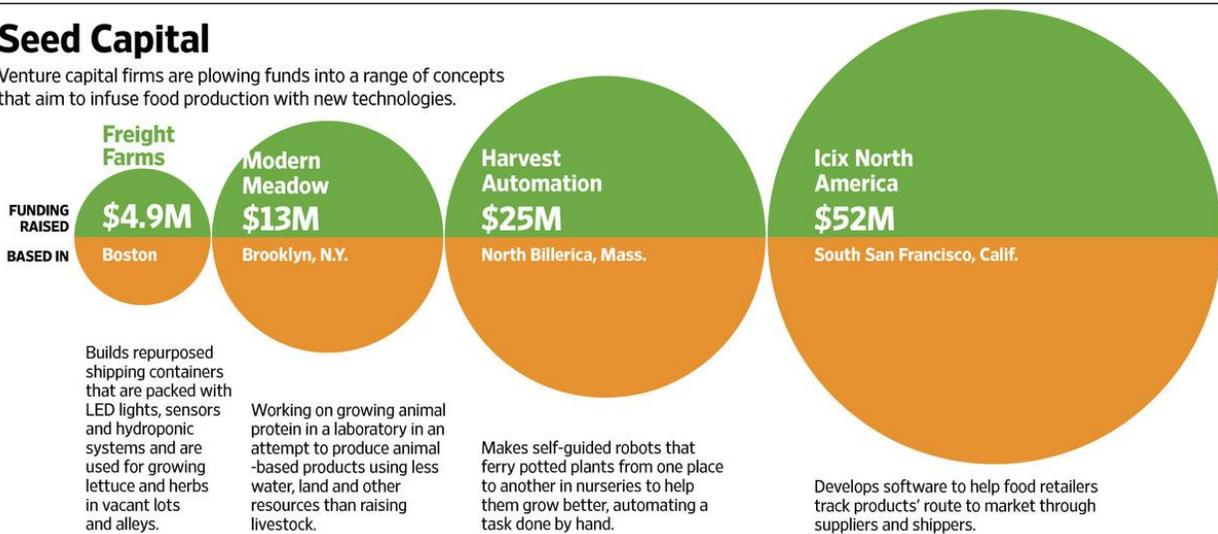
Thomas McPeck, for example, has adapted for Florida orange groves a laser-scanning technology used in architectural work to accurately measure every nook inside and outside a building. Positioned on a small truck that can cover 300 acres a day, a mobile scanning device developed by his company, AGERPoint Inc., analyzes how light reflects off trees to determine everything from the height and density of their canopies to which oranges or trunks are starved for water or afflicted with diseases or pests. It yields a map that some farmers are using to more precisely apply water, pesticides and fertilizer and treat ailing trees.

Harnessing more data, “we’re helping cut a lot of waste out of agriculture,” Mr. McPeck said. His company is finalizing an investment from a venture-capital firm that would triple the company’s staff to 12 people, he said. AGERPoint declined to disclose how much money it was raising.

Indoor Farming

Seed Capital

Venture capital firms are plowing funds into a range of concepts that aim to infuse food production with new technologies.



Source: The companies

THE WALL STREET JOURNAL.

The amount of U.S. farmland isn’t growing, so entrepreneurs are starting to farm up. Indoor farms are popping up, arranging dense rows of leafy greens onto shelves [layered atop each other](#) in former warehouses and other buildings across the country. New ventures in so-called “protected agriculture” include The Plant, FarmedHere LLC, and Green Spirit Farms LLC. They say they’re saving the need to transport leafy greens cross-country, which adds costs and reduces shelf life.

“We’re trying to establish a legion of urban farmers,” said Todd Dages, general partner at Spark Capital. The venture-capital firm, which has invested in Web-publishing platform Tumblr and online glasses retailer Warby Parker, last December led a \$3.7 million financing round in Boston-based Freight Farms Inc.

Freight Farms’s repurposed shipping containers, packed with LED lights, sensors and hydroponic systems and producing lettuce and herbs, are appearing in vacant lots and alleys. The

sealed containers can yield about 500 full heads of lettuce a week, year-round—even in Minnesota and Canada, where some of the 25 units sold so far by Freight Farms now operate. Co-founder and Chief Executive Brad McNamara said the units sell for \$76,000 each and require no pesticides.

Food Safety

A spate of recalls in the 2000s, of food that sickened or killed hundreds of people, alarmed the nation's farmers and spurred federal legislators to clamp down with new food-safety regulations. A burgeoning array of companies are hoping to benefit from a new mandate for more stringent and consistent food-safety testing and tracking, something on which food companies currently spend billions every year.

They include South San Francisco-based Ixix North America LLC, which develops software to help food retailers track the route of products to market through suppliers and shippers. Invisible Sentinel Inc., based in Philadelphia, is rolling out systems designed to quickly check food and beverages for pathogens like salmonella and listeria, incorporating hand-held indicators resembling a pregnancy test. And RapidBio Systems Inc. says it can cut hours out of the process for testing leafy greens and other foods for various toxic pathogens through its hand-held device that can do it in minutes where the food is harvested and processed.

Alternative Foods

Younger consumers are warming to healthier and distinct fare, and concerned more about the way food animals are treated and the water, land and other resources consumed in food production. So investors are betting that foods with alternative production methods will become hot. Hampton Creek Inc., Impossible Foods and [Beyond Meat](#), among a host of other startups, are churning out foods like burgers and mayonnaise using plant-based ingredients instead of animal proteins. One company, Modern Meadow Inc., is even making animal protein in a lab from animal cells, while Rosa Labs is formulating a nutritional drink called [Soylent](#) from vitamins, minerals and other nutrients to replace outright the need to chew a well-balanced diet. They say their production methods can taste just as good, obviate animal-welfare concerns and make food production more efficient and environmentally friendly by consuming less water and

other resources than animals. Such startups have won backing from notable investors including Microsoft Corp. co-founder Bill Gates, Hong Kong billionaire Li Ka-shing and [Google Ventures](#). In December, Hampton Creek, which uses Canadian yellow peas and sorghum instead of eggs in mayonnaise and cookies, raised \$90 million in an investment round led by Mr. Li's Horizons Ventures and Khosla Ventures, a Silicon Valley venture-capital firm.

“Now that people are becoming conscious of the negative consequences of some of our [food-production] practices, there's a renewed interest in reimagining how we can do better,” said Sarah Scarsic, business director for Modern Meadow. “We're looking to reimagine food production from the standpoint of sustainability and health.”

Farm Robots



Harvest Automation believes robots could help grow more berries and vegetables at a lower cost. Above, one of its machines in 2012. *PHOTO: DINA RUDICK/BOSTON GLOBE/GETTY IMAGES*

Much of the picking on produce farms falls to humans. Harvest Automation Inc., whose founders included inventors of the Roomba automated vacuum, believes robots could help grow more

berries and vegetables at a lower cost by outsourcing some of the work to self-guided machines a bit larger than a five-gallon bucket.

Harvest, which already has 30 customers using its HV-100 robot to manage potted poinsettias and mums in the \$14.5 billion U.S. nursery business, now is eyeing produce, where Chief Executive John Kawola says potted plants managed by robot fleets could enable about 50% more plants to be grown per acre.

In a business beset with labor shortages, Mr. Kawola said, a robot “potentially changes the labor equation in a significant way.” The North Billerica, Mass., firm has raised about \$25 million in funding from investment firms since 2010.