

A woman wearing a white protective suit, hood, and face mask is smiling while holding a bunch of fresh green lettuce. She is standing in a vertical farm with multiple levels of plant trays. The background shows rows of trays with various green plants under bright, pinkish-purple lighting.

PHILIPS

Horticulture
LED Solutions

Case study
Innovatus Inc.

Fuji City, Japan



Philips GreenPower LED production module

Delivering fresh lettuce
to Tokyo **from one of the world's
largest vertical farms**

Consumers eagerly embracing pesticide-free, wash-free lettuce



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Due to the right LED modules in the right set-up, **we are producing 12,000 heads of lettuce a day.**

Hitoshi Wada, Director of management and general affairs



Background

The Innovatus agricultural business venture was established in 2014 in Fuji City, Shizuoka Prefecture, a city with spectacular views of Mount Fuji. This city was chosen for its good transportation links to Tokyo's huge consumer base and for its access to high-quality ground water at the foot of Mount Fuji. The firm's guiding mission is to "reliably supply safe and secure food and contribute to a sustainable Japan and planet". The firm has also leveraged the world-famous "Fuji" name (Mount Fuji is a cultural landmark in Japan), and its low-cost distribution and quality control to export lettuce outside Japan to Singapore and Taiwan. Innovatus was recognized by the Japanese Ministry of Economy, Trade and Industry (METI) for the high value of its vegetables and business model, when it selected Innovatus as a global Agriculture-Commerce-Industry Partnership Business. This is a mark of innovation and quality in Japan.

The challenge

In recent years, Japan's consumers have become increasingly concerned about food safety. People with small children in particular worry about pesticide-treated vegetables cultivated outdoors and the effects of fine particle pollutants that are a serious health risk. To meet these needs, Innovatus established a plant factory with very strict hygienic controls that can produce truly safe vegetables. In the factory, high-quality lettuce is cultivated without using pesticides in a clean-room environment that is insect-free.

Efficiency was a key reason that Innovatus chose Philips LED modules for the plant factory's grow lights. "Low-cost electrical power plays a huge role in the plant factory. LED lighting uses less energy and lasts longer than fluorescent lights, so it helps reduce electricity costs. What's more, Philips is way ahead of other companies in terms of extensive worldwide experience and success. We selected only the most reliable equipment precisely because the plant factory is so large," explains Hitoshi Wada, director of management and general affairs.

The solution

Innovatus began operating the Fuji Farm in March 2015. The factory has a total floor area of 1,851 m² and produces 12,000 heads of lettuce a day. It is one of the largest completely closed-environment vertical farms in the world using LED lighting. The factory grows five varieties of lettuces, mainly frilled lettuce, green leaf and romaine. It has advanced, automatically-controlled equipment that monitors everything from air temperature, humidity, and CO₂ concentration to nutrient liquid.

Achieving stable production of such large amounts of lettuce just one year after start-up has amazed their competitors and the Innovatus management. “We were really impressed by how well-suited the Philips LED modules are for vertical farming. They allow us to create consistent quality locally, using only a fraction of the water and electricity compared to open field lettuce or fluorescent lighting,” says cultivation management group team leader Shinichi Kitamura.

Benefits

It’s a known fact that harvesting lettuce in the morning reduces bitterness and improves flavor. Innovatus coordinates LED exposure time with shipping times so that even lettuce picked in the afternoon has the same quality as lettuce picked in the morning. Innovatus can also get lettuce into Tokyo supermarkets just two hours after shipment. Consumers have praised the lettuce for being both extremely fresh and flavorful without the inconsistencies of lettuce cultivated outdoors. What’s more, since the lettuce is grown and packaged in an extremely hygienic environment, there is no need to wash it before eating. With its package sealed, the lettuce can be stored for two weeks in a refrigerator and still retain its crisp texture and delicious flavor.

To produce even more of this fast-selling lettuce, construction plans for a new factory are already underway. Mr. Wada revealed to us, “In the future we plan to grow new produce besides just lettuce, which means we will need to rely even more fully on Philips know-how and support.”

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Customers appreciate the excellent taste and appearance of our lettuce over our competitors’ lettuce.”



Facts

Horticulturalist / grower

Innovatus Inc.

Sector

Large scale city farm (12,000 plants a day)

Crop

Frilled lettuce, Green leaf lettuce, Romaine lettuce, Red leaf lettuce, Korean lettuce

Location

1338 Denbo, Fuji-shi, Shizuoka 417-0061, Japan

Solution

Philips GreenPower LED production module

Installer

Toyobo Engineering Co., Ltd.

Results

High yields of 12,000 heads of exceptionally high-quality lettuce per day in a safe environment. Lettuce has a very long shelf-life, while maintaining a fresh, crispy texture and delicious taste



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