PHILIPS

Horticulture LED Solutions

Case study 808FACTORY

Yaizu, Shizuoka Prefecture

GreenPower LED production module

High-efficiency production of high quality vegetables supported by Philips LED lighting

LED

Introduction of Philips LEDs reduces costs and boosts growth rates





Our lighting costs have reduced by about 40%. At the same time, the growth rate of our vegetables has increased by 20 to 30%. We want to make it easier to buy factory-produced vegetables grown using high-efficiency and high-quality production methods. "

Katashi Kai, General Manager, Agri Business Division, Shinnippou Co. Ltd.



Background

Yaizu in Shizuoka Prefecture is a city with a population of approximately 140,000, extending across the plain formed by the Oigawa River, which originates at Ainodake in the southern part of the Southern Alps at an altitude of 3,198 m. The town is known throughout Japan for its thriving deep-sea fishery and fish processing industry, but thanks to a temperate climate and nutrient-rich water, the entire region is suitable for intensive agriculture. Tea and citrus fruits come from the hills, lowland rice and vegetables cultivated both indoors and outdoors come from the plain. Shinnippou, a company which has been in business in Yaizu for around 40 years, has been running 808FACTORY since January 2014. According to the company, "With food security and safety being a modern-day necessity, it is our mission to deliver fresh and tasty vegetables cultivated in a factory subject to careful quality control". In a large-scale plant factory with artificial light, occupying around 3,000 m² of a 5,000 m² site, the company is producing 4 types of salad-leaf vegetables.

Challenges

Looking inside the facility, it can be seen that 12-level cultivation racks have been installed in the 2,000 m² cultivation room to improve the cultivation efficiency per unit area. These provide space for at least 300,000 plants, and a daily harvest of 20,000 plants. An optimal cultivation environment for the plants is maintained by integral control using data obtained from various types of measurement sensor and cameras. Moreover, hygiene is controlled to maintain cleanliness to the level of a food processing factory and to protect the risk of disease, pests, and foreign substances contamination. Katashi Kai, General Manager, describes the advantages of plant factory cultivation as follows: "The greatest advantage of a plant factory with artificial light is that it can produce and supply steadily throughout the year, irrespective of climate and environmental variations. Also, by completely eliminating dust, insects and foreign substances contamination through advanced cultivation management and hygiene control, we can produce very safe vegetables of high quality without using pesticides at all." At the same time Mr. Kai, mentions that the constraints and greatest challenges of a plant factory are the equipment costs and running costs.

Solution

When the plant factory started operations, the company used fluorescent lamps as the source of artificial light. According to Mr. Kai, at the time, it was too expensive to introduce LEDs as the light source, and there were concerns about their reliability and track record. For this reason, as part of the initial 3-year plan, arrangements were made to research and investigate fluorescent lights and LEDs in the course of production. The fluorescent lamps were found to have various problems. It was discovered for instance that heat from lamps burned the leaves and shortened the lifetime of the vegetable product, that the intensity of the light weakened after about six months due to the lifetime of the lamp, and that, although no incident occurred, there was an ever-present risk of foreign substances contamination due to lamp breakage. "However, with the LEDs there are no such problems or risks. And we decided to go for Philips LEDs because of the significant reductions in both equipment cost and running costs that would be possible in the medium and long term and because they gave us the best results in comparative tests with other LED lighting."

Benefits

The company has now installed about 12,000 Philips LEDs in their first factory which has been operating since 2014 and almost same quantity in their second factory which was completed in 2017. As a result, electricity costs are around 40% lower than when fluorescent lights were used, and the growth rate of the vegetables is 20 to 30% faster. The higher growth rate means higher yields in the same facility of a given area, which in turn means that the cost of producing a vegetable of the same quality and the same size can be reduced. At the same time, there was no change at all in the taste or nutritional value of the vegetables. Thus, in the 808FACTORY, the introduction of Philips LEDs has enabled substantial cost reductions and increased yields. Moreover, Mr. Kai gave us the following insight into the company's vision for the future: "As climate change makes it increasingly difficult to produce vegetables in open-field cultivation, we anticipate that vegetable production in a large-scale plant factory will be the focus of much attention both in Japan and overseas. And so we're looking to spread the know-how we have here and make the vegetables produced in factories like this a standard foodstuff that is more readily available."



In 10 years, plant factory-produced vegetables may be a standard foodstuff all over the world"





Facts

Grower 808FACTORY

Segment Plant factory with artificial light

Crop Lettuces (green leaf, frill lettuce, romaine lettuce and silk lettuce)

Location 834-1 Nakane Shindenn, Yaizu, Shizuoka Prefecture

Solution Philips GreenPower LED production module

Philips LED Horti Partner CCS Inc

Results

Introduction of Philips LEDs brings cost reductions and improvement in growth rate. Running costs reduced by around 40% while maintaining quality

© 2018 Signify Holding. All rights reserved. The information provided herein is subject to change, without notice. Signify does not give any representation or warranty as to the accuracy or completeness of the information included herein and shall not be bable for any action in reliance thereon. The information presented in this document is not intended as any commercial offer and does not form part of any quotation or contract.

PH

Philips and the Philips Shield Emblem are registered trademarks of Koninklijke Philips N.V. All other trademarks are owned by Signify Holding or their respective owners.

Document order number: 4422 944 07225 A 12/2018 Data subject to change

11

HI

For more information about Philips Horticulture LED Solutions visit: www.philips.com/horti

1

2111

Write us an e-mail: horti.info@signify.com

TO

Or tweet us: @PhilipsHorti