PHILIPS

Horticulture
LED Solutions

Case study
BrightBox Venlo

Venlo, The Netherlands

BrightBox, an expertise center for daylight-free cultivation, makes it easier to go from research to practice

Philips GreenPower LED research and production module

Collaborating in the search for **the optimal growing formula**

Coaching experts in the field of daylight-free cultivation

> **Developing optimal growing formulas for daylight-free cultivation** while coaching experts."

Roel Janssen, Project Manager City Farming, Philips Horticulture LED Solutions

Background

The world's population is expected to undergo explosive growth. As a result, researchers predict that by 2050 as much as 70% more food will be needed than at the present. This can only be achieved with new, efficient and sustainable production methods that do not involve chemical pesticides. In the future the constituent components of food will make a significant contribution to our health. In addition, the production will need to take place in densely populated areas so that the number of logistical steps is reduced. The Dutch horticultural sector enjoys a high level of expertise and can make a significant contribution to this development by combining green fingers with high-tech solutions.

The challenge

Growing healthy and tasty products without using daylight and with limited heat input and CO_2 emissions is the great challenge for the future. Applied research is urgently required in order to achieve this. Four parties have therefore set up the BrightBox research and expertise center, located on the Brightlands Campus Greenport Venlo. Philips Horticulture LED solutions, Botany and HAS University of Applied Sciences are making an active contribution. The Province of Limburg is supporting the innovation taking place on its territory.

Together the participants aim to solve research questions for institutions and companies that do not themselves have the facilities to do this. This makes high-tech research affordable for a broad target group. Over a period of five years BrightBox aims to become the world's most important research center in the field of knowledge and implementation of daylight-free multi-layer cultivation systems.

"For many parties it is still unclear what effect daylight-free cultivation has on their crops. With BrightBox we are making representative research on a practical scale accessible to everyone at an affordable price," says Roel Janssen, Project Manager City Farming at Philips Horticulture.

"There are tremendous opportunities for city farming in both urban environments and isolated areas. We are also able to produce very cleanly, which offers major advantages for the food-processing industry."

The solution

BrightBox consists of climate chambers for research and production. Two cells, each with a surface area of 46 m^2, have been specially fitted out for research. They both have two racks with three cultivation layers. Each cultivation layer consists of four tables (1.6 m x 1.2 m). Janssen says: "We can set the light above each table independently. This makes it possible to test 24 cultivation

formulas at a time." One rack has a combination of red, white and far-red LED light. The other has red, blue and far-red LED light. The light configuration makes it possible for the entire spectrum to be tested.
In addition, one climate chamber with a surface area of 192 m^2 is set aside purely for production. Here the emphasis is on being able to demonstrate the financial viability of a specific crop on the basis of the ideal growing formula.

Advantages
As a result of the collaboration of three participants, BrightBox provides advantages. The expertise center makes research easily accessible for third parties because it is relatively inexpensive. It is precisely the participants' expertise that makes BrightBox one of the most advanced research centers on earth, so progress can rapidly be made.
BrightBox's aim is, in conjunction with customers, to develop new growth concepts that focus on knowledge of cultivation, integration of climate and optimization of light.
As a research center Botany will in the next few years endeavor to raise city farming to a higher level. Here researchers, in collaboration with entrepreneurs, can develop applied technologies. Peter Korsten, Director of Botany, expresses this as follows: "Our customers are able to differentiate themselves in new markets with parts of this concept. This means that it is important for them to be familiar with this production method in its entirety. BrightBox bundles the various skills and techniques together and makes the implementation possible."

"BrightBox is a perfect way to speed up this **worldwide innovation.**"

Peter Korsten, Director of Botany

"This state-of-the-art cultivation system is the **perfect learning environment for growers of the future.**"

Frans van Leijden, HAS University of Applied Sciences Limburg

For HAS University of Applied Sciences Limburg the practical questions posed by industry form the perfect starting-point for training students. Frans van Leijden, director of HAS University of Applied Sciences Limburg, thinks that BrightBox is a fantastic research facility through which students, entrepreneurs and their employees can learn how to work with state-of-the-art cultivation techniques. "We solve not only cultivation-related questions for companies, but also perform the business-economics analyses that accompany these cultivation systems."
BrightBox is training the growers of the future and providing training courses on how to manage a vertical farm.

Facts

Project
BrightBox Venlo

Sector
Vegetables, fruit and ornamental plant cultivation

Crop
Compact crops suitable for multi-layer cultivation

Location
Venlo, The Netherlands

Partners
Botany and HAS University of Applied Sciences

Solution
Philips GreenPower LED research and production module

Advantages
Research facility with a fully adaptable cultivation system.
Optimization of growing formulas for daylight-free cultivation.

Document order number: 3222 635 70199
08/2015
Data subject to change

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