



**BrightBox**  
Clear, smart  
research for  
growers and  
entrepreneurs

## 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 to feed the world. This can only be achieved with new, efficient and sustainable production methods that do not involve chemical pesticides. In addition, the production will need to take place in densely populated areas. 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<sub>2</sub> emissions is a 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."

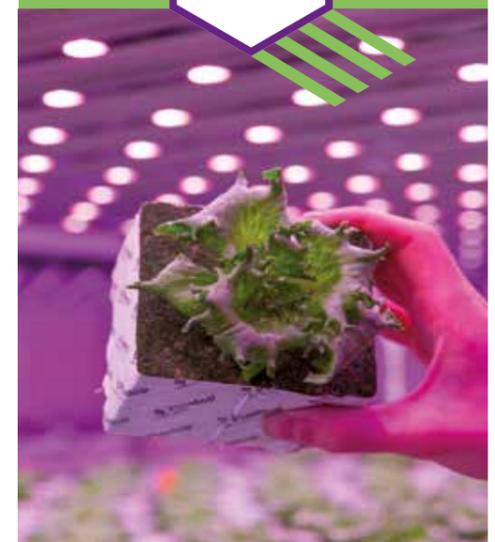
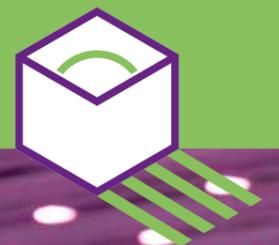
## Advantages

- As the three participants all have a different background and expertise that are truly complementary, BrightBox offers many benefits. 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 delivering the best growing systems.
- As a research center BrightBox 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."
- 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.

## The solution

BrightBox consists of climate chambers for research and production. Two cells, each with a surface area of 46 m<sup>2</sup>, 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). Roel Janssen of Philips 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<sup>2</sup> 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.





**24 LIGHT  
RECIPES  
PER CELL**



**92M<sup>2</sup>  
RESEARCH  
CELL**



**192 M<sup>2</sup>  
PRODUCTION  
CELL**

**Are you looking for a high-quality, reliable and affordable research for daylight-free multi-layer cultivation? Then BrightBox is the site for you.**

**Research**

We help you answer research questions related to delivery, reliability, quality consistency, shelf life, compactness, management of process components and finding the optimal cultivation system or growth recipe.

Our research cells consist of two climate chambers, each with two racks and three cultivation layers. Each layer has four cultivation tables (1.6 m x 1.2 m). The total net surface area of the two cells is 92 m<sup>2</sup>. We can set the LED light above each table independently. This makes it possible to test 24 light recipes per cell at a time.

**Production**

We help support your business case by providing entrepreneurs and investors with facts and figures. BrightBox allows you to cultivate your own crops on a large or small scale. One climate chamber with a surface area of 192 m<sup>2</sup> is reserved purely for this purpose. The emphasis here is on ideal light conditions so as to demonstrate that daylight-free multi-layer cultivation is also financially viable.

**Business case calculations**

Do you have a great idea on indoor growing, but don't know how to check its feasibility? BrightBox can help you

figure out the economics and project planning. With years of research and expertise in the field of indoor cultivation we can make a complete business case calculation.

**Training**

Do you already have a specific plan, but require additional cultivation expertise? BrightBox performs research and trains entrepreneurs and staff to expert level. Courses are available both on-line and on-location. The training courses are arranged by HAS Training and Consultancy.

**For more information:**

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**Open hour** every Thursday at 15.00 hours, you can visit BrightBox during our walk-in hour. Please subscribe by sending an email to [welkom@brightbox-venlo.nl](mailto:welkom@brightbox-venlo.nl)



[www.brightbox-venlo.nl](http://www.brightbox-venlo.nl)

BrightBox is an initiative of Botany, HAS Hogeschool and Philips Lighting. Province of Limburg is closely involved in the initiative.



provincie limburg

