



PHILIPS

Horticulture
LED Solutions

Case study
Philips GrowWise Center

Eindhoven, the Netherlands



Growth recipes, research and business advice for city farming

Proving the concept of **vertical farming**

We are showing every day that it works



“

It's exciting to pioneer new crops, like an XL, heavy head of lettuce with consistently low concentrations of nitrate.”

Stefan van de Voort, Plant Specialist Philips Horti



Background

Consumers are more food-conscious, demanding locally grown food from trusted sources. At the same time, the supply chain must meet ever stricter production and hygienic regulations, which make it difficult to supply fresh and consistent quality vegetables year round. City farming is an innovative new production method designed to answer this need. Also known as vertical farming or indoor farming, in these facilities crops are grown indoors in multi-layer systems.

There are many advantages. Since crops are grown indoors, the growing climate and lighting levels can be kept uniform throughout the seasons. This means a city farm can produce high-quality vegetables, herbs and fruits all year round - anywhere. It gives consumers access to fresh, pesticide-free food, that's locally grown, using a fraction of the water, fertilizers and land associated with conventional farming.

The challenge

The concept of city farms is relatively new and establishing a sustainable and profitable city farm facility is challenging. Gus van der Feltz, Global Director City Farming says, “The success of a city farm depends on connecting all the right components. That means getting the lighting, climate, nutrition, irrigation, software and sensors right for a specific growth environment, for a growth recipe for that particular crop.”

Realizing such a project involves experts across the supply chain who cooperate closely to deliver an integral solution for indoor farming. One example of the importance of an integral approach is the growth recipes that Philips is developing with plant specialists and technical specialists. Stefan van de Voort, Plant Specialist Philips Horti says, “Not only are we pioneering new lighting solutions and crops, we are also pioneering how to get the best results in crops to meet our customers' needs. For one it might be the highest volume, for others it might be a crispier texture, or a more intense taste or color.

The solution

GrowWise Center supports our integrated solutions for city farming – from research into new growth recipes and the development of new lighting innovations, to business advice and system integration with our Philips Horti LED partners. GrowWise is the culmination of Philips experience in state-of-the-art lighting, more than 80 years of experience in horticultural lighting applications and knowledge gained from various LED horticultural lighting projects since 2008.

Our ultimate goal is to help customers realize a city farm that meets their business goals and brings a high return on their investment. Philips GrowWise Center, based at the High Tech Campus in Eindhoven, is our testing ground for developing lighting and other technological innovations, as well as the growth recipes our customers need to make city farming feasible. In this Global G.A.P. (Good Agriculture Practice) certified facility, we are working on solutions that will enable high quality leafy vegetables, soft fruits and herbs to be harvested year-round, using a fraction of the resources required for conventional farming.

Not only do we look at the technologies used for growing plants indoors, we also look at optimizing specific plant characteristics by teaming up with plant breeders from all parts of the world

Benefits

Results from our first research experiments at the GrowWise Center are very promising. For example, within six weeks a trial with a variety of lettuce produced heads of lettuce weighing 200 grams each with a total yield of more than 100 kg/m² a year. Another lettuce variety also showed excellent red coloration after a specific light treatment during the final phase of the growth. Adjusting the growth parameters resulted in lettuce with lower concentrations of nitrate.

By applying different growth recipes to cultivate plants it is possible to influence a wide range of variables, including higher yields, earlier flowering, faster root growth/germination, enhanced taste and coloration to name a few. There are many other benefits from growing crops in a city farm. Very consistent, high quality crops can be grown that are free of pesticides and insects. Crops can be locally grown, resulting in a fresher, tastier product that can command premium prices.

Research insights. Innovative growth recipes. New technical solutions and business approaches. Together we are helping make the promise of city farming – of fresh, locally sourced crops – a reality for consumers today.

“We are proving that city farming is feasible today. We are doing it with our customers and we are showing every day that it works.”

Gus van der Feltz, Global Director City Farming



Philips GreenPower LED production module



Philips GreenPower LED research module



This picture shows coloration achieved by applying different light recipes on the same red oak lettuce.

Facts

Horticulturalist / grower

Philips GrowWise Center

Segment

City Farming

Crop

Leafy vegetables, soft fruits and herbs

Location

Eindhoven, the Netherlands

Solution

Integrated City Farming research center driven by Philips GreenPower LED research and production modules

Philips LED Horti Partner

CambridgeHOK

Results

Consistent, high quality crops, grown locally year-round



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