PHILIPS

Horticulture
LED Solutions

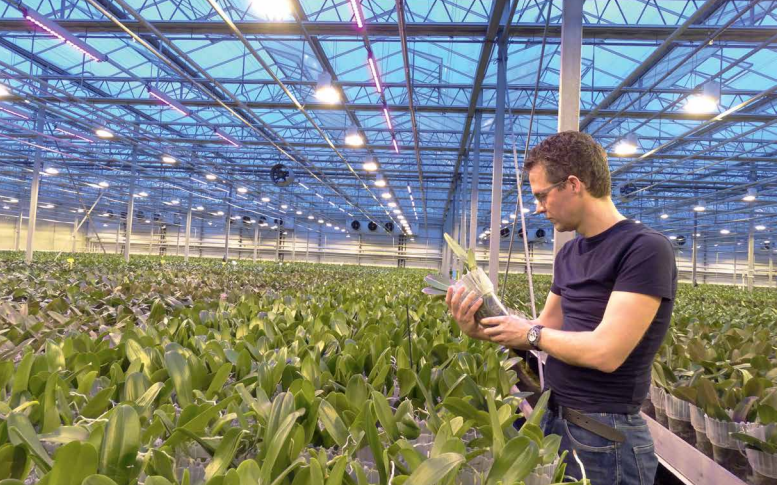
Case study
Ter Laak Orchids

Wateringen, The Netherlands

Philips GreenPower LED toplighting

# Efficient lighting during **the darkest part of the year**

Perfect record-keeping improves phalaenopsis growers' knowledge



By testing LEDs in various colors and in all phases of cultivation we are not only seeing rapid results, but also learning a great deal. **The most important thing is for us to find the best possible light solution for our crop."**

**Martin van Dijk,** Cultivation Manager, Ter Laak Orchids

## Background

Ter Laak Orchids – owned by the brothers Eduard and Richard ter Laak – is one of the most sustainable phalaenopsis nurseries in the world. The family business, which covers an area of 125,000 $m^2$, is well known for being very progressive. In 2014, for instance, a daylight greenhouse was built in which cuttings material is propagated. In addition, hot water is made using a unique layer of double glass containing Fresnel lenses.

The lenses bundle some of the incident sunlight into a concentrated, horizontal strip of light. This strip of lights falls on steel tubes that are painted black and located below the layer; as a result, the water flowing through the collectors is heated to 45 °C. The ter Laak brothers grow a top range, mostly in 12-cm pots, comprising sustainably cultivated phalaenopsis orchids. This range consists of the company's own exclusive varieties, but also several varieties produced by the most prestigious breeders in the business. Two years ago the company started testing LEDs in their test greenhouse. It has now been decided to test Philips LED toplighting further in the production greenhouse so as to add light during the darkest part of the year. "We need to have more efficient light during this period", says Cultivation Manager Martin van Dijk, who is supervising this project along with Martijn Solleveld (R&D).

## The challenge

During the three separate phases of phalaenopsis growth the plant requires specific standards of climate and light. Fundamental research has shown, for example, that the cooling phase can to some extent be replaced by lighting with deep-red light. Since LEDs in this color are available, this technique is eminently suited for further examining this phenomenon. This can create benefits, particularly during the spring and autumn. In the previous trial extremely high light levels using LEDs and HPS lamps were compared. In 2016 the challenge is into translate these results to practical conditions. The primary objective is to learn how to cultivate using a combination of LED toplighting and HPS. "We are paying particular attention to the climate settings and plant temperature," Martin tells us. "We will be monitoring those conditions closely with a view to eventually growing a top-quality plant."

## The solution

The trial is based on two setups of various colors of LEDs, each of which covers a cultivated area of 120 $m^2$. The trial area is 240 $m^2$ in each phase of cultivation. This gives a total of 720 $m^2$. Since there is already an HPS installation in the greenhouse, this will create a hybrid lighting system. The LEDs are suspended above the crop at particular points.  Careful thought was given to the light intensity of the trial. During the propagation phase the plants receive 54 µmol/$m^2$/s of light from HPS lamps and 55 µmol/$m^2$/s from the LEDs. During the cooling phase the intensity increases to 100 µmol/$m^2$/s from HPS and 55 µmol/$m^2$/s from LEDs. During the blooming phase these figures remain the same.
Every treatment involves three different cultivars. Every week the supervisors record various aspects, such as leaf split and branch induction.

## Advantages

Philips GreenPower LED toplighting is a subsequent step in the development of light recipes for the growth of crops in greenhouses. The combination of different light colors within the spectrum makes it possible to increase production and improve the year-round quality of the crop. This is an effective way of managing light levels in a highly focused manner. A further benefit is the energy saved due to the higher efficiency of the LEDs. Although the trial with LEDs is still in its early stages, Ter Laak Orchids expects several advantages to emerge soon. For instance, Martin van Dijk hopes that the climate will improve as a result of a reduction in the radiant heat from LEDs compared to HPS lamps. In addition, the LEDs have no warm-up time so that the light system can be deployed optimally when necessary. But the main thing is that the optimal light spectrum should stimulate photosynthesis and growth effectively, with control of plant development and morphology being a major challenge. “We hope that efficient light in the dark part of the year will help the plants to show healthy, constant growth,” says van Dijk.

> “By providing lighting efficiently in the darkest part of the year **our plants show healthy, constant growth.”**

**Martin van Dijk,** Cultivation Manager, Ter Laak Orchids

# Facts

**Grower**
Richard and Eduard ter Laak

**Sector**
Potted plants

**Crop**
Phalaenopsis

**Location**
Wateringen, The Netherlands

**Solution**
Philips GreenPower LED toplighting

**Philips LED Horti Partner**
Stolze BV

**Expected results**
Coordinating light and temperature with one another should make for top quality phalaenopsis and energy savings when compared to HPS



Document order number: 3222 635 70297
01/2016
Data subject to change

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

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

Or tweet us:
@PhilipsHorti