

A man in a red t-shirt is examining an orchid in a greenhouse. The greenhouse is filled with rows of orchids in white trays. The lighting is a mix of natural light from the windows and artificial LED light from the ceiling. The man is looking at the orchid with a focused expression. The background shows the structural elements of the greenhouse, including metal frames and hanging lights.

PHILIPS



Horticulture
LED Solutions

Case study
Ter Laak Orchids

Wateringen, the Netherlands

Philips GreenPower LED toplighting

Only providing light
that the plant needs

LEDs can make a significant contribution to ensure healthy and constant plant growth



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The light recipe –only providing light that a plant needs- made it possible for us to counteract the natural decline **in the number of branches per pot at the dark time of year with a specific LED recipe.**”

Richard Driessen, Cultivation Manager, Ter Laak Orchids



Background

Ter Laak Orchids – owned by brothers Eduard and Richard ter Laak – have been working with orchids since 1980. Their modern pot-plant nursery in Wateringen covers an area of 78,500 m², with an extra 16,500 m² tier of cultivation above the processing area, and produces 4 million Phalaenopsis plants of pot size 12 cm every year. The use of LED toplighting was prompted by the increased need, at the dark time of year, for more efficient light to ensure healthy and constant plant growth. Thanks to their lower heat emission and the options they offer in terms of light spectrum, LEDs can make a significant contribution to this goal.

The challenge

Over a period of 20 weeks, plant induction and blooming is being tested in two separate compartments, one with a lighting level of 250 $\mu\text{mol/s/m}^2$ from LED toplighting and the other with 250 $\mu\text{mol/s/m}^2$ from HPS lighting. The two compartments cover an area of 180 m² containing 3,900 Phalaenopsis plants. The project involves five

species – Cambridge, Surf Song, Mira Flora, Las Palmas, Pasadena – from different suppliers. The aim is to keep the number and quality of the branches and the growing period under LEDs at least the same as under HPS lighting. Energy consumption will be monitored, but saving energy is not in itself an objective. The primary goals are to learn how to cultivate with LED toplighting (how to deal with changes in climate/plant temperature) and to achieve the same plant quality without slowing growth. Climate settings, plant temperature and photosynthesis are being monitored, and where necessary and useful, conditions will be fine-tuned so that eventually a high-quality plant is grown. Philips is arranging the plant-physiological tests, which will be conducted by an independent research bureau.

The solution

Philips GreenPower LED toplighting modules are the next step in the development and application of light recipes for crop growth in the greenhouse. They offer considerable opportunities to increase production and improve crop quality during the year. GreenPower LED toplighting

modules can offer light levels typically ranging from 40–300 $\mu\text{mol}/\text{m}^2/\text{s}$ in a highly efficient way. The plants in this project were grown in the greenhouse under HPS lighting and are being cooled in the trial greenhouses. On 5 November 2013 the plants were placed in the two separate compartments; the first day was also the first cooling day (necessary for branch induction). It is assumed that if the plants grow well in the LED-only compartment, there is not likely to be a problem in combination with HPS (hybrid) lighting. If this is the case, it will be possible to install efficient grow light in the form of LEDs in an existing situation. According to Ter Laak Orchids, the project will have been a success if the company can produce the same quality of plants using this configuration.

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The use of LED toplighting was prompted by the increased need, at the dark time of year, for more efficient light to ensure healthy and constant plant growth.”

Benefits

Though the trial with Philips GreenPower LED toplighting modules is still under way, it is expected to confirm benefits such as:

- improved climate control because of less heat radiation
- optimized spectra to stimulate photosynthesis and growth in an effective way, and/or to steer plant development and morphology
- uniform and targeted light distribution and installation, leading to low light losses
- flexible use of lighting (no heat-up time)
- significant energy savings.



Facts

Horticulturalist / grower

Ter Laak Orchids

Sector

Orchids, potted plants

Crop

Phalaenopsis

Location

Wateringen, the Netherlands

Solution

Philips GreenPower LED toplighting

Philips LED Horti Partner

Arend Sosef

Objective

Keeping the number and quality of the branches and the growing period under LEDs at least the same as under HPS lighting. Both with a lighting level of 250 $\mu\text{mol}/\text{s}/\text{m}^2$.



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