

A man with a beard and short brown hair, wearing a purple button-down shirt, is smiling and looking towards the left. He is in a greenhouse, surrounded by rose bushes. A single red rose is in sharp focus in the foreground on the left. The background shows the glass and metal structure of the greenhouse with pinkish-red strings hanging from the ceiling.

**PHILIPS**

Horticulture  
LED Solutions

Case study  
Delphy Improvement  
Centre  
Bleiswijk, The Netherlands

Philips GreenPower LED toplighting

# First large production trial with roses with 100% LED

Better control of the greenhouse temperature



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By quickly switching the LEDs on and off, the light level in the greenhouse stays the same, even if the outdoor conditions change.”

**Rick van der Burg**, Cultivation Manager, Delphy Improvement Centre



### Background

The Delphy Improvement Centre in Bleiswijk is a modern greenhouse complex, in which new cultivation concepts and technical installations from all parts of the world are developed, tested and demonstrated. “We are always looking for new ways to grow and how we can adapt them to various crops”, says cultivation manager Rick van der Burg. In one department of 1,000 m<sup>2</sup> with diffuse glass, a three-year study was done within several projects, all with the goal of growing a perfect rose in an energy-efficient way. The cultivar is ‘Red Naomi’. Management of this study is in the hands of Wageningen University & Research and the project fell within the program ‘Kas als Energiebron’. In October 2015, the department obtained OPAC heat exchangers, with air suction above the screen cloth. This improved the climate in the greenhouse so much that the production increased. Until April 2016, the department had a conventional lighting installation with HPS lamps with a light intensity of 200  $\mu\text{mol}/\text{m}^2/\text{s}$ . In the meantime, this installation was replaced by 205  $\mu\text{mol}/\text{m}^2/\text{s}$  Philips GreenPower LED toplighting.

### The challenge

Rose growers in the Netherlands have to deal with stricter regulations concerning light emissions. Therefore, they must provide a total blackout from daylight for a large part of the lighting hours. HPS lamps emit more warmth than LEDs. If the temperature under the screen runs up to, for example, 22–23 °C, then that has a negative influence on the quality of the rose. Cooler LEDs can solve that problem. The production and quality increase to the extent the level of light rises. Rose growers therefore want to light more intensively. There as well they face the limitations of HPS lamps, due to the heat radiation. The growers value tests with LEDs, because that is how they obtain more knowledge and information that they can apply in their own greenhouse.

### The solution

The new study with 100% LED is an initiative of the Rose Cultivation Cooperative and falls under the program ‘Kas als Energiebron’. Philips Lighting, LTO Glaskracht and the Ministry of Economic Affairs support this project. Philips Horticulture

prepared a lighting plan with 100% LED, in which the light level had to stay the same as the HPS installation from previous years. In this test as well, saving energy was included as one of the goals. The LED installation can be switched on in two steps. This makes it possible to turn the installation on for only 50%. One advantage of the LEDs is the speed at which you can switch them on and off. That way, the light level stays the same during the day, even if the amount of daylight changes. This means that there are no dips. Two thirds of the LEDs have the color spectrum DR/B-LB, and one third DR/W-LB. The white LEDs are used to be able to properly assess the color of crops and flowers in a situation where no other light source is present.

#### The advantages

The first results of the study demonstrate that the combination of lighting with LED and the use of OPAC heat exchangers provides a beautiful, stable climate. With 100% LED, the quality of the roses in the period from July through September is even better than before with only HPS lighting.

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We can provide ample lighting and screening, **and thus handle the installation in a smarter way.**”

**Rick van der Burg**, Cultivation Manager, Delphy Improvement Centre

The combination of decreasing light in September and high daytime temperatures has not resulted in any loss of quality. On the contrary, the quality of the harvested product was outstanding. Rick says this about it: "It seems that with LED we are, after all, able to obtain the desired amount of light intensity on dark, warm summer days. We can also screen more, or rather, handle the installation more intelligently." LEDs switch on and off faster than HPS lamps. Furthermore, they provide the desired light intensity immediately after being switched on. This makes it possible to react more quickly to changing outdoor conditions. This has made the crop stronger. "You can also see it clearly on the buds, but also on the red color of the crop. The leaves are thick, almost leathery", says Rick. From July through September 100% Philips GreenPower LED toplighting, in combination with cooling, provides cool, uniform branches. Winter quality is central to the next part of the test. The current study lasts for a total of one year. Information from this test can be applied by the sector and lowers the threshold for applying this lighting method in practice.



## Facts

#### Greenhouse producers/growers

Cultivation manager Rick van der Burg and researcher Lisanne Schuddebeurs from Delphy, Philips Horticulture plant specialist Leontiene van Genuchten and the Rose Crop Cooperative. Arie de Gelder from Wageningen University&Research is the project leader.

#### Segment

Horticulture

#### Crop

Rose, Red Naomi

#### Location

Bleiswijk, The Netherlands

#### Solution

Philips GreenPower LED toplighting

#### Philips LED Horti Partner

Certhon

#### Advantages

Better control of the climate, namely on days with unstable outdoor conditions and high temperatures. Long-term lighting with a closed screen without a sharp increase of the greenhouse temperature. Production and quality increase in the late summer.



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