



**PHILIPS**

Horticulture  
LED Solutions

Case study  
Handelsträdgård Harf

Närpes, Finland



Philips GreenPower LED toplighting  
Philips GreenPower LED interlighting

# High goals for **high tech cucumbers**

With LEDs I expect a better climate and more control

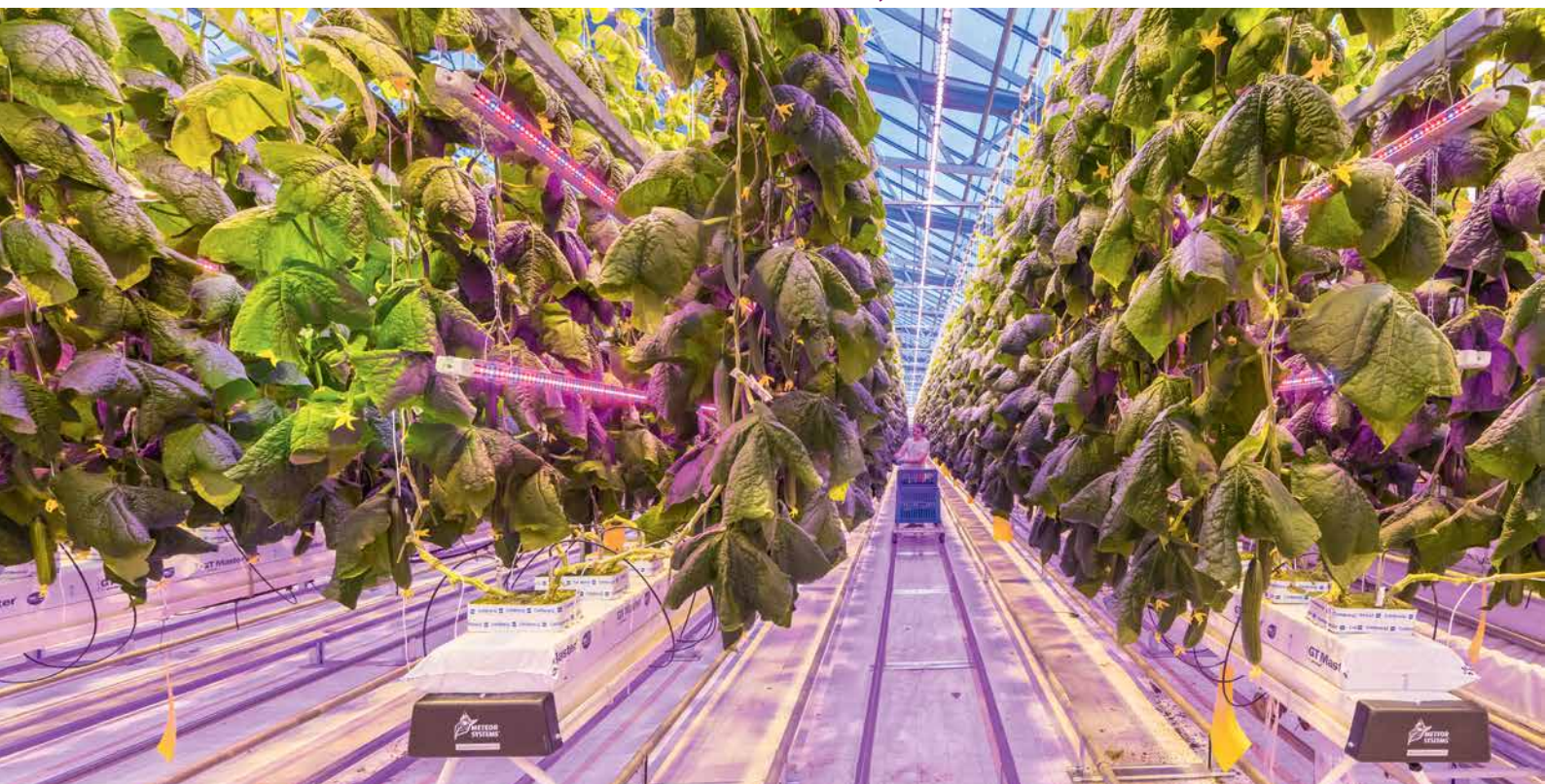




“

The Philips plant specialist had so much promising data that I could relate to with my own business. I had to at least try out LEDs”

Ulf Harf, Grower



### Background

One way to stand out when you are located in Närpes, the tomato capital of Finland, is to grow cucumbers. The Harf family has been successful by growing high wire cucumbers in high tech greenhouses. Ulf Harf is the third generation to run this trend setting company which spans 6400 m<sup>2</sup>. Their cucumbers are grown in a 12 meter long truss supported by 6.7 meter long posts. Ulf's father was one of the first to use artificial lighting in his time and Ulf has the same innovative spirit flowing through his veins. He wants to expand the business and is currently investigating the latest and greatest technologies to use. His greenhouses are currently equipped with high pressure sodium interlighting. To see how crops could benefit from additional LED light, he is trialing the cucumber variety Imea with LED interlighting and a hybrid installation LED/HPS toplighting in a 1000 m<sup>2</sup> closed compartment. Philips Horti Partner Schetelig installed the set-up. Before this trial, Harf was a bit skeptical about the amount of light an LED could produce, but he saw positive results after just three weeks.

### The challenge

Harf's initial goal was to increase his yields. But after visiting the SGW University in Poland and talking to Philips plant specialists, he now sees opportunities to use LED lighting to improve his crop quality. He hopes to extend shelf life and grow darker green cucumbers that look more appealing to consumers.

Although electricity is less expensive than normal at the moment, Harf expects prices to rise and is interested in options that use less energy. LEDs are of particular interest to Harf because they would allow him to use space and energy more efficiently at the same time. With HPS interlighting, the standard row is 2.4 meters wide. Otherwise the crop gets too hot. Since LEDs produce less radiant heat, Harf would be able to reduce the row width to about 1.92 meters. That means he could put ±20% more plants on each square meter, delivering an immediate gain of ±20% in production capacity using a more energy efficient lighting technology.



### The solution

When looking into new options for his greenhouse, Harf first thought of using HPS again. After talking to Philips key account manager and plant specialist, he decided to visit the SGGW University in Poland to see their results. "It's always good to get an outside view of your company," says Harf. He appreciated the information he got about other cucumber projects from the Philips plant specialist. Harf says, "The Philips plant specialist had so much data. I had to at least try out LEDs based on what he said. I could already see the potential after seeing the crop in Poland, grown in a different climate situation." Harf decided to combine an end-to-end line of Philips GreenPower LED toplighting at 190  $\mu\text{mol}/\text{m}^2/\text{s}$  and a double line of Philips GreenPower LED interlighting at 91  $\mu\text{mol}/\text{m}^2/\text{s}$  between the rows. He also installed HPS lighting for another 190  $\mu\text{mol}/\text{m}^2/\text{s}$  from the top for additional radiant heat during very cold winters. To provide as much light as possible, the LEDs are on for 18.5 hours a day and the HPS lights are on 17.5 hours a day, to gradually heat-up and cool-down the crop.

### Benefits

Harf's previous HPS interlighting set-up generated quite a lot of heat in the middle of the crop. This was a major issue, especially in the warmer months of the year, because he had to vent a lot of air and he lost a lot of  $\text{CO}_2$ . With the new LED interlighting and toplighting solution, Harf can still apply additional lighting in the warmer seasons. That's important, because cucumbers require as much light as possible.

Now with the LEDs, Harf can easily apply consistent levels of light throughout the day, even in darker periods. He can use the LEDs to compensate for the absence of daylight and still ensure that his crops get the full amount of light they require. LEDs also keep the internal temperature of the greenhouse cooler, meaning less venting and less  $\text{CO}_2$  is lost. Harf says, "The plants tell you what they need. You can see whether they have gotten enough light or not. You see it very quickly so you can adjust your light and temperature accordingly."

“

We can switch off all the HPS lights **and still have uniform light levels without the heat”**

Ulf Harf, Grower

## Facts

### Grower

Ulf Harf

### Segment

Vegetables

### Crop

Imea variety of cucumbers

### Location

Närpes, Finland

### Solution

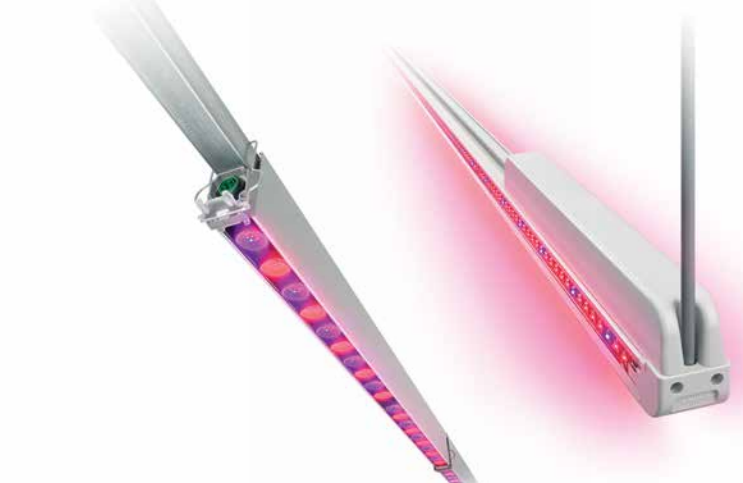
Philips GreenPower LED toplighting and LED interlighting

### Philips LED Horti Partner

Schetelig

### Results

More light without the extra heat; control over heat and light to get the best results from cucumber crops Possibility to have around 20% more plants per  $\text{m}^2$ , resulting in more yield per  $\text{m}^2$







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