



PHILIPS

Horticulture
LED Solutions

Case study
Shandong D&F
Agriculture Co., Ltd.

Rizhao, Shandong, China



Philips GreenPower LED Production Module

Light recipes **improve** **plant quality**

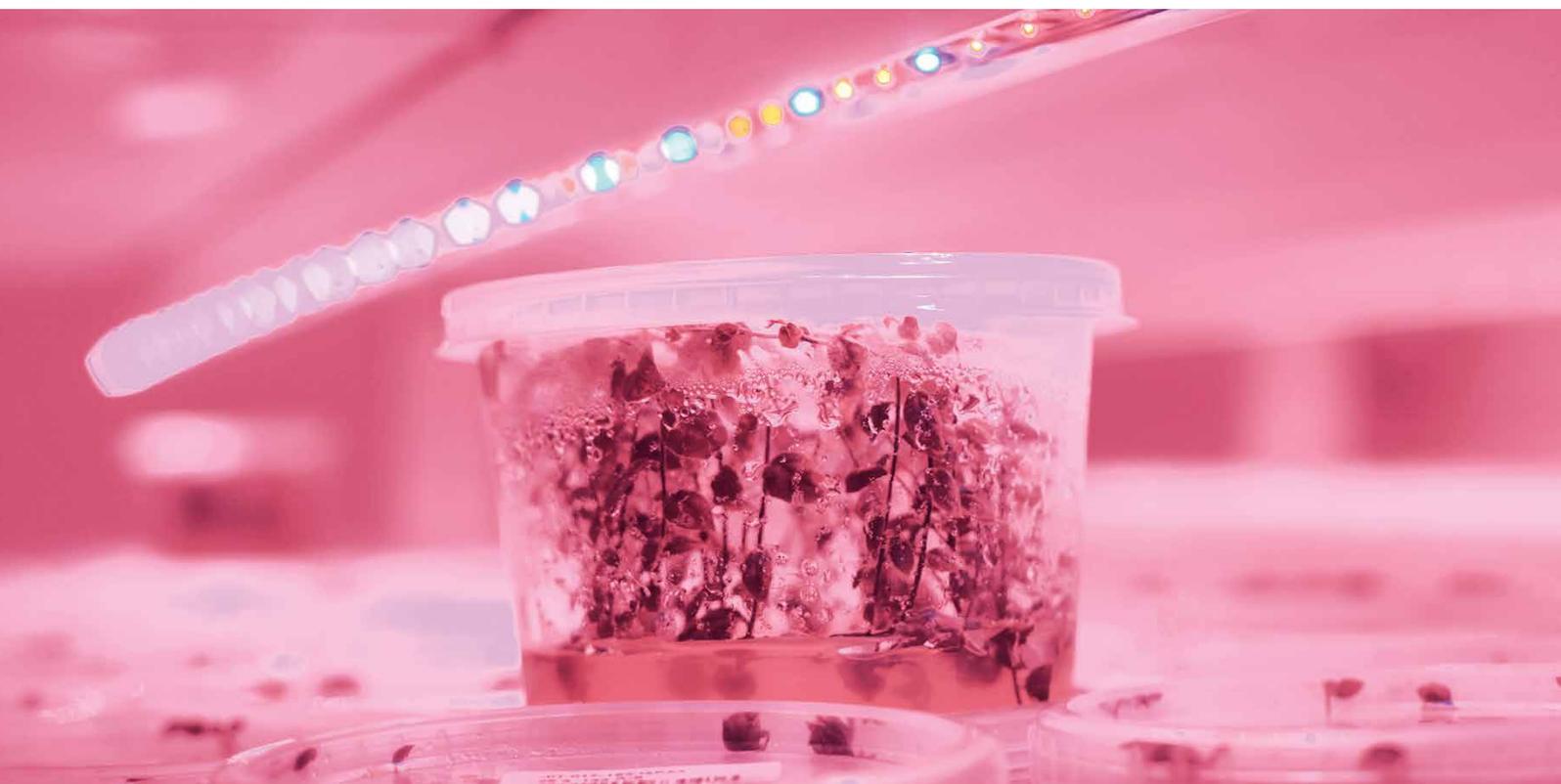
LEDs reduced energy usage and space between layers, increasing the number of layers and yields



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We firmly believe that LED lighting is the emerging trend in tissue culture production, vertical farms and indeed for all agricultural facilities”

Wang Xiao Fei, Vice General Manager of Production
Shandong D&F Agriculture Co., Ltd.



Background

Shandong D&F Agriculture Co., Ltd. is a modern and professional seed and seedling breeding enterprise that combines tissue culture seedling development, propagation, production, and sales. In cooperation with the U.S. and the Netherlands, the company specializes in plant tissue cultures. The company produces a wide range of tissue culture seedlings, including blueberry, raspberry, blackberry, cherry rootstock, and red maple. It has 3,000 m² of tissue culture laboratory space and 5,000 m² of smart greenhouses. It is equipped with cutting-edge tissue culture production equipment (ViCabin) and production management technologies from the Netherlands. Annually, the company provides customers with 20 million high-quality seedling strains. D&F maintains a long-term technical cooperation partnership with the Dutch company ViVi (Visser, Vitroplus), which ensures they always stay at the cutting edge of the industry. The company believes that, in the future, the Chinese nursery industry will embrace an all-new qualitative shift, and the customer demand will shift from quantity to high-quality and new high-end varieties.

The challenge

D&F aims to provide customers with high-quality tissue culture seedlings. To maintain their strong competitive position in the Chinese and international market, the company continuously pursues innovation and spares no expense in acquiring the latest equipment and technology to efficiently produce high-quality nursery stock. “Our specialized laboratories and high-tech production equipment ensure that our products remain highly competitive”, says Wang Xiao Fei, Vice General Manager of Production Shandong D&F Agriculture Co., LTD. “We strive to boost productivity throughout the whole production process and reduce energy consumption! High-quality, efficient, and professional lighting naturally plays a major role in our efforts.” LED grow lights from Philips has been successfully used in various large-scale tissue culture enterprises, and D&F became very interested in Philips LED products. In the course of D&F’s technical cooperation with ViVi (Visser, Vitroplus), they saw the successful application of Philips LED plant lighting in Vitro Plus. Tissue culture labs that use LED lighting produce high-quality tissue culture seedlings, while consuming much less energy. This made a

deep impression on D&F's technical staff. Since 2014, D&F has used Philips LED grow lights in its tissue culture labs, with the goal of maintaining a steady increase in plant quality while reducing energy consumption in the production process and achieving efficient production operations.

The solution

D&F is deeply impressed with the professional, highly efficient LED lighting solutions provided by Philips. "Initially, we learned that Philips had begun to successfully apply its light recipe experience in several large-scale tissue culture enterprises. The large-scale success of this application in the Vitro Plus company impressed us most." These light recipes not only include light spectrum ratios and light intensities, but also installation suggestions and lighting durations. The light recipes also take other aspects of the overall cultivation process into account, such as the ambient temperature and humidity. Applying the unique and comprehensive 'light recipe' helped Vitro Plus significantly improve the quality and yield of fern tissue cultures, while reducing energy consumption. Currently, D&F has four labs. Three of these use Philips LED grow lights and one uses conventional fluorescent lighting. After switching to LED, the efficient, multi-level production lines met all of D&F's expectations and targets. The low heat dissipation of LED lighting allows the frames of each tissue

culture level to be lowered so that the LED labs have space for eight tissue culture levels, while fluorescent lighting only allows for six. According to the laboratory staff, after switching to LED, "the quality of the tissue culture seedlings increased, with all seedlings being of uniform quality. The plants all grow healthy and strong and the tissue culture seedling propagation cycle is shortened, increasing the overall propagation factor." D&F had this final comment about their Philips LED application experience: "After we began using Philips LED light formulas in our tissue culture labs, they perfectly met our expected targets. to visibly improve seedling quality in terms of tissue culture nursery stock growth conditions and robustness; to use LED lighting to greatly reduce energy consumption; and to increase the usable space in our tissue culture labs and improve our utilization of this space. These visible results have led us to firmly believe that LED lighting is the emerging trend in tissue culture production, vertical farms, and indeed for all agricultural facilities."



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We visibly improved seedling quality in terms of nursery stock growth conditions and robustness”



Facts

Horticulturalist / grower

Shandong D&F Agriculture Co., Ltd.

Segment

Tissue culture and seedling production

Crop

Blueberries, raspberries, blackberries, etc.

Location

Rizhao, Shandong, China

Solution

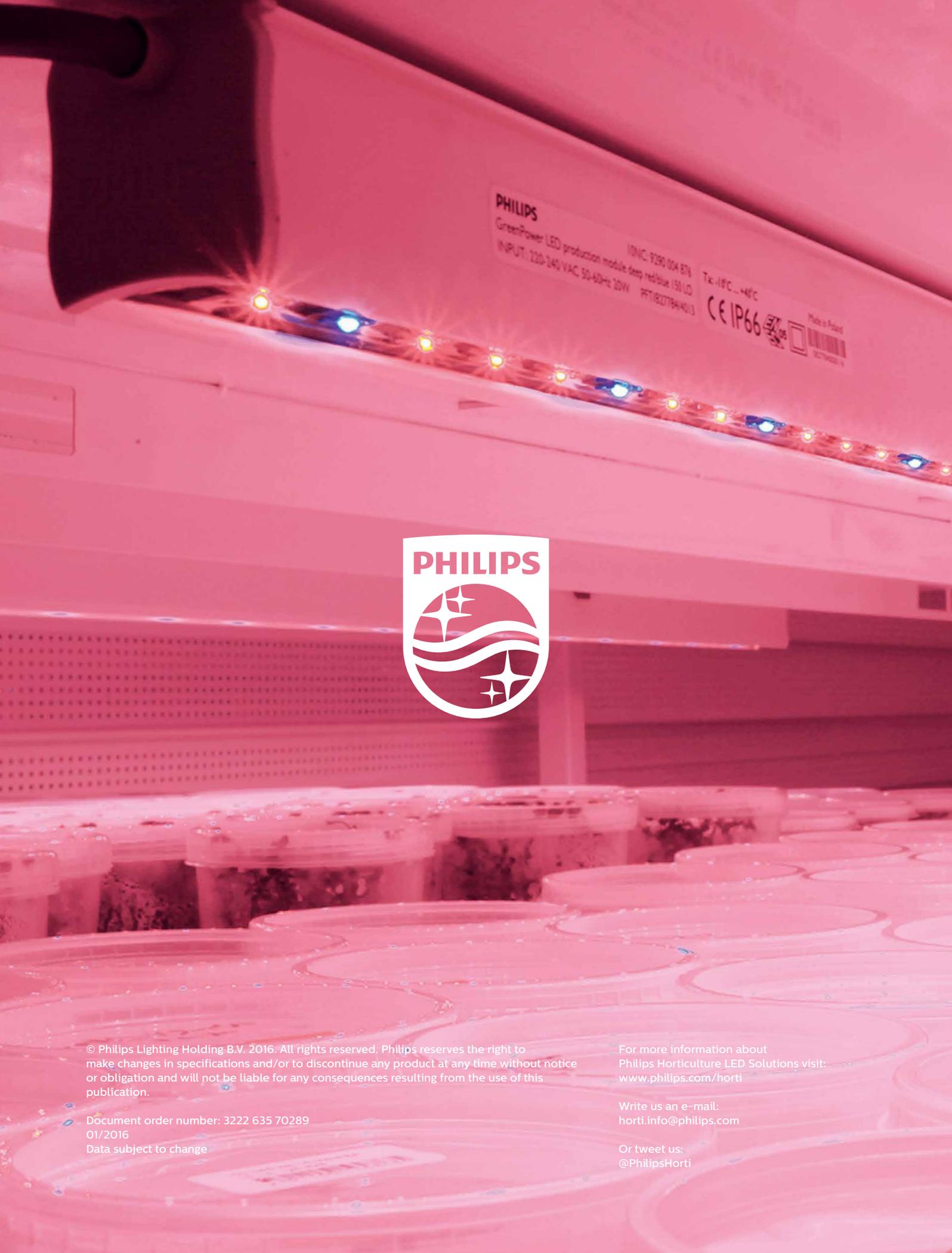
Philips GreenPower LED Production Module

Philips LED Horti Partner

ViVi (Visser, Vitroplus)

Results

LEDs reduced energy consumption, improved seedling quality, and improved utilization of the tissue culture lab space.



PHILIPS
GreenPower LED production module deep red/blue 150 LD
INPUT: 220-240 VAC 50-60Hz 20W PFT18Z7784K013
IDNC: 9290 004 876
T_{amb}: -10°C...+40°C
CE IP66
Eco
Made in Poland
182784013



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