

Research into lighting – factoring in costs

Adrian Tatum reports

Getting the right amount of light on the crop is crucial to its development. Much research has been undertaken over the years surrounding the numerous benefits of artificial light and the amounts needed to encourage photosynthesis and other growth factors.

But as glasshouses get bigger and more lights are needed growers have had to think about costs too. During the last 18 months alone, electricity prices have shot up 23% and although prices have levelled off in the first part of 2009, future hikes are predicted to hit horticulture again.

In the last few years most of the research in this field has been dedicated towards LEDs and whether they are ready to be applied to the horticultural sector.

Recently, lighting specialist **Philips** joined forces with Dutch based horticultural supplier, **BVB Substrates**, to develop solid-state LED lighting-based applications for glasshouse-based flower and vegetable cultivation.

Through its partnership, Philips and BVB Substrates will identify applications of energy-efficient LED lighting to lower this energy consumption, while at the same time improving the quality and yield



Lots of lights over cucumbers, these lamps are Helle Interlights units left high, later as the cucumbers grow these lamps will be lowered to approximately the centre of the plants to add energy where the natural daylight is lacking.

of production.

At HortiFair last year Philips launched its vision to bring the benefits of LED lighting to horticulture. Udo van Slooten, global product marketing director, horticultural lighting, at Philips' solid state lighting business unit says: "In horticulture, our aim is to innovate in order to create value. We are embarking upon an extensive programme of practical testing. In this way, we can develop complete solutions

that help growers and breeders improve the quality of their crop and their cost efficiency."

Philips says LEDs are set to play a major role in horticultural lighting, and they are about to make inroads into the multilayer segment. "With LED lighting, we can tune the growth light, which makes it possible to apply the optimum light recipe at every stage of a crop's growth. This capability, together with our LED systems' effective heat

management and energy efficiency, opens up tremendous new opportunities for growers and breeders," said Mr Van Slooten.

In developing its LED-based solutions, Philips has conducted field tests with growers and breeders. This thorough process has proven the effectiveness of LED-based solutions for the multilayer segment that lead to the launch, at HortiFair, of the Philips GreenPower LED

For Grow Lighting - Assimilating or Periodic

Helle have the solution to meet your requirements and will be pleased to advise as to the correct type of lamp and installation – and what a choice! So easy to be confused?

230 or 400 volt – 250/400/600/750 & 1000 watt – Electronic or Electro Magnetic Ballasts Top lighting – Inter-lighting (lamps between the plants) Or a mixture ?
Helle *Guarantee* honest engineering and cost based recommendations

Please phone David Skeggs HELLE International Ltd

P - 07 919 890 808 T - 01487 815 952 - F 01487 710 719 prylorn@aol.com

module and LED string.

Specially designed for multilayer cultivation and plant research in conditioned environments, the Philips GreenPower LED module makes it possible to use light as a tool to control plant growth and development. The module (50-150 $\mu\text{mol/s/m}^2$) consists of five LEDs, dedicated optics and electronics, enclosed in a waterproof carrier. Available in red, blue and far-red versions, any desired light intensity and colour ratio can be created and reproduced. In this way, it is possible to tune the light to the specific needs of each crop in all its growth phases.

The Philips GreenPower LED string is designed for multilayer applications requiring low growth light levels, such as tissue culture and plant storage and transport. This chain of LED devices is connected by



Philips has joined forces with BVB Substrates to develop solid-state LED lighting-based applications for glasshouse-based flower and vegetable cultivation.

band cable, and provides maximal freedom in installation. It enables a uniform light distribution

across the shelf, ensuring that every crop receives the same level and quality of light. The LED string (5-25 $\mu\text{mol/s/m}^2$) is available in red and blue light versions, the colours most essential for crop growth. According to Philips, it is a cost-effective solution. Tests have shown 50-80% energy savings while improving plant quality, according to the company.

It also says it will continue to invest in research and development in this sector. The company is currently conducting a major field test – together with a leading tomato grower – with a hybrid of HID and LED lighting. Philips says its ultimate aim is to ‘facilitate the development of the optimum light recipe, thereby exploiting LEDs’ potential to increase crop growth and yield.’

But not everybody in the horticultural industry is so keen. David Skeggs of **Helle Oy** told *The Commercial Greenhouse Grower* that more work needs to be done in the area of LED lighting in horticulture before they are really ready for use on glasshouse crops. “There are

some very promising developments in the UK and although we may have worked out the right level of power I don’t believe we have worked out the best way to get rid of the heat that these LED’s produce,” he says.

He describes the UK horticultural lighting sector as ‘very quiet’ at the moment as the UK tries to find its way out of the recession. “There has obviously been a bit of a crisis everywhere in the last year and that has affected the horticultural industry like any other industry,” says Mr Skeggs.

There has also been a shift in the market, he observed, where some growers are turning back to magnetic lighting despite the fact energy savings on electric options are often higher. “Some growers, while they realise they will be making a saving on installing electric lamps have realised that the failure rate can lead to expensive replacement costs and have been asking us for recommendations for magnetic systems,” he said.

Gavita is another company that thinks LEDs have a way

SOUTH WEST GROWERS SHOW

7th October 2009
Matford Centre, Exeter, Devon

The South West's leading trade show for commercial horticulture

Bringing suppliers and buyers together from garden centres, retail outlets, landscaping and local authorities

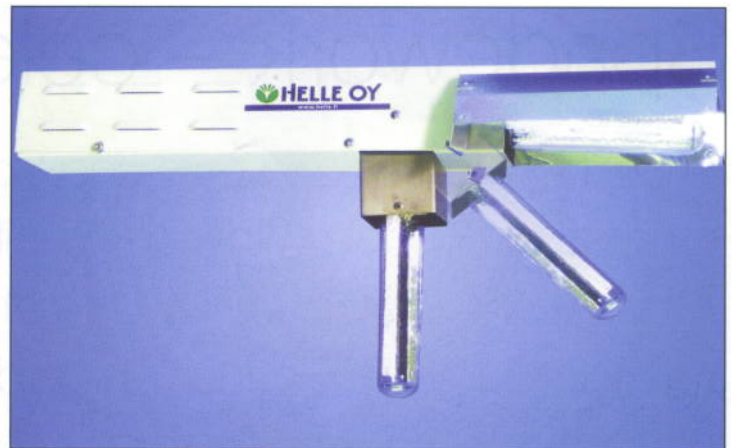
Organised by growers for growers

For visitor or exhibitor information
www.southwestgrowersshow.co.uk
 or telephone 01684 576427

SOUTH WEST GROWERS GROUP



A Turnlight between the cucumbers with the lamp in the vertical position.



The Helle Turnlight. The lamps in the horizontal and the vertical position (as well as the lamp moving between the two).

to go before they are ideal for the horticultural market. "LED is a fantastic low voltage product but in my opinion it is not effective enough yet for the horticultural market," says Trond Vegger, founder of Gavita. He says more research is needed to try and produce bigger LED lights for horticulture. "The next five years will no doubt show us more useful research on LEDs but my feeling is that there is a 50% chance that LEDs won't be successful in the horticulture sector." Instead, he thinks the future is all about fusion and CMH lighting. Both, according to Mr Vegger, have the potential to be more effective than any horticultural lamp on the market at the moment.

Gavita has had success with its high pressure sodium range of lamps. An average lamp will last 10,000-12,000 hours with only a 10% in quality of light output during that time. Gavita says its GE range of 400, 600 and 750 watt lamps have shown results of only a 5% drop during 12,000 hours of use.

Lemnis Lighting has also undertaken several trials with LEDs. One major trial has taken place in the Improvement Center in Bleiswijk where the company installed the LED in combination with HPS system. The Improvement Center calculated that the 'effectiveness' of the LED lighting was between 1.4 to 1.7 times better than HPS.

Lemnis says that with these results in mind, LED systems could be a 'cost effective and sustainable investment, providing a perfect solution for today's challenges to improve production efficiency in greenhouses, while saving energy at the same time'.

The company has also conducted trials at a rose nursery in Holland where LEDs were tested against SON-T lighting. Yields were 10-15% more under LED conditions and 30-44% more when additional lighting in between plants was added.

Managing director of the nursery, Rosaline Zuurbier, says: "Quite quickly we could see a production

increase." She adds: "The expected lower energy consumption with the LED has not been proven in this trial. However, it is very hopeful that the light output per Watt from LEDs is still growing, while developments to SON-T have more or less been stopped. Furthermore, I am very curious to see what the lifetime will be. It should be much longer, and that will make an investment in LED more interesting."

At tomato growers **Redstar Trading**, the LED trial had another positive outcome. The production of weeks 10 to 18 was 7,92 kg per m² with 205 micromol/s/m² SON-T lighting and it was 7,47 kg per m² with 92 micromol/s/m² LED lighting.

Elsewhere, **Hortilux Schreder** has recently launched the HSE NXT based on its successful range of HSE fittings. The new design causes even less shadow effect on the crop than other fittings. In addition, according to Hortilux, repair and lamp replacement are easier to do. User friendliness and product

safety are therefore specific features of this KEMA-certified fixture. The HSE NXT is combined with a totally new installation technique, called HSEasy connect. It is easy to mount this system in the greenhouse through a flat cable and a plug system. Because the work is mainly done in advance in the factory and not in the glasshouse, the grower can save considerably on labour during installation of the lighting system.

The first HSE NXT fixtures with HSEasy connect system will be installed shortly in Marjoland, a well known rose nursery in Holland.

Alongside this is the HSX fixture. This is a conventional fixture with a slim, robust housing, suitable for 600 Watt/400 Volt. The fixture has a sophisticated thermoregulation and therefore a long life and low annual costs. This fixture has all basic qualities from the product programme of Hortilux and is in particular interesting for specific export markets

Seeking a supplier?

An address?

Company information?

...go to **www.actpub.co.uk** and click on **Buyers Guides**

Buyers Guides

ACT
PUBLISHING